Project Title	*Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa – Promoting Resilient Coastal Development in Tunisia*
UNDAF Outcome(s):	By 2011, the population has access to quality socio-economic and environmental services, and their vulnerability is reduced
Expected CP Outcome(s): (Those linked to the project and extracted from the CP)	Policies and programs towards prevention and reduction of vulnerabilities and inequities are strengthened; Participation and partnership in national decision-making at regional and local levels is consolidated; Increase in efficiency and effectiveness of public policies and institutions.
Project Objective	To strengthen the resilience of development efforts in the face of climate change, particularly in coastal zones
Expected Output(s): (Those that will result from the project)	1. Dynamic, long-term planning mechanisms to manage the inherent uncertainties of climate change introduced 2. Leadership capacities and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels strengthened 3. Climate-resilient policies and measures implemented in priority sectors 4. Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels 5. Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels
Executing Entity:	Agence de Protection et d'Aménagement du Littoral (APAL)
Implementing Agencies:	Ministère de l'Environnement et du Développement Durable (MEDD - DGEQV)

Brief Description (200 words)

Tunisia is an arid country that already faces significant challenges related to climate change especially on the coastal zones where a large majority of population and economic activity is located. Recent studies have shown that in these zones agriculture, industry and tourism are increasingly vulnerable to accelerated sea-level rise, with its associated impacts on coastal infrastructure, agricultural land, and water quality and quantity (through sea-water intrusion in aquifers).
This project will promote the **development of adaptation options in coasts of Tunisia that are cross-sectoral**, thereby breaking with the traditional, sectoral and infrastructure-heavy approaches of the past. The project will seek to **demonstrate soft and innovative technologies** to address the key coastal challenges **in pilot sites**, while **building the capacity** of local, regional and national stakeholders to **undertake** science-based adaptation planning. Financial mechanisms and risk sharing schemes will also be explored in order to internalize the costs of adaptation in the long term. The project will also aim at generating a **better understanding of climate impacts and adaptation options** through targeted research, awareness raising, and knowledge sharing and dissemination. **Measurable indicators** are defined to **monitor the expected achievements of the project**.
Finally, the project will focus on **local communities** as right holders and **partners** in climate change adaptation through **integrated and participatory approaches** taking into consideration **gender mainstreaming**.

Programme Period:	2 years	Total resources required	2.975 million US $
Key Result Area (Strategic Plan):	4.3.Promoting climate change adaptatio	Total allocated resources:	
Atlas Award ID:	00058399	• Regular	
		• Other:	
Start date:	January 2010	o Japan	2.975 million US$
End Date	December 2011	Unfunded budget:	
PAC Meeting Date	02[nd]December 2009	In-kind Contributions	

Agreed by

H.E. Mr. Nadhir Hamada	**Dr. Mohammed Belhocine**
Minister of Environment and Sustainable Development	*UNDP Resident Representative*
Le Ministre de l'Environnement et du Développement Durable	
09 DEC. 2009	
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List of acronyms

APAL	Agence de Protection et d'Aménagement du Littoral
ASLR	Accelerated Sea Level Rise
EWS	Early Warning System
GIS	Geographic Information System
GTZ	German technical cooperation agency (Deutsche Gesellschaft für Technische Zusammenarbeit)
ICAM	Integrated Coastal Area Management
ICZM	Integrated Coastal Zone Management
INSTM	Institut National des Sciences et Technologies de la Mer
MARH	Ministère de l'Agriculture et des Ressources Hydrauliques
MDCI	Ministère du Développement et de la Coopération Internationale
MEDD	Ministère de l'Environnement et du Développement Durable
MEHAT	Ministère de l'Équipement de l'Habitat et de l'Aménagement du Territoire
MTCA	Ministère du Tourisme de la Culture et de l'Artisanat
PISEAU	Programme d'Investissement dans le secteur de l'Eau
SINEAU	Système d'Information National sur l'Eau
SMP	Shoreline Management Planning
TWW	Treated Waste Waters
UNDP	United Nations Development Programme
OTEDD	Observatoire de l'Environnement et du Développement Durable

I. SITUATION ANALYSIS

1. Problem and root causes

1. Tunisia has grown as a modern middle income country as a result of structural reforms and prudent macroeconomic management. Despite its success, Tunisia faces challenges, some common to the rest of the region: in particular, bringing the benefits of growth to the people by tackling unemployment, and improving the business environment to continue to boost domestic and attract foreign direct investments. These are also challenged by the continued loss of arable land and increased coastal degradation, which are caused principally by unsustainable agricultural practices, recurrent drought and unmanaged competition for land and marine resources. It is the northernmost country on the African continent, and the smallest of the nations situated along the Atlas mountain range. Around forty percent of the country is composed of the Sahara desert, with much of the remainder consisting of particularly fertile soil and a 1300 km coastline. Because of its geographic location, Tunisia's climate is influenced by the Mediterranean Sea in the North and by the Sahara in the South, while central Tunisia's climate is influenced by the combination of both. Overall, the climate is largely characterized by aridity, with 94 % of the land directly threatened by desertification.

2. Tunisia encompasses three climatic zones that can be described as:

- North of the Dorsal (the Tell regions and those of the North-East)
- Central Tunisia and the South-East region (Gulf of Gabès littoral)
- South/South-West, forming a vast zone composed of a mix of varied topography: mountains, plateaus, plains, and finally the Sahara extending to the borders with Libya and Algeria.

3. Most regions of Tunisia have modest rainfall, whereby only one third of the territory benefits from 400 mm per year, while two thirds receive less than 400 mm per year. Rain is concentrated between May and September with a limited number of days only receiving rainfall. For example, two thirds of the country receives an average of less than 50 days of rainfall. Tunisia, like all countries in the Middle East and North African region, is characterized by overall water scarcity. Even without the impact of climate change, Tunisia is already facing increasing scarcity of water resources and is faced with a number of challenges in the water sector.

4. Precipitation is in most regions insufficient and unpredictable, and unevenly distributed across regions; groundwater supplies a large part of water resources, whether for drinking of or agriculture. The country belongs to the so-called “variability group” of countries in North Africa, which consists in countries that have more or less adequate quantities of renewable waters at the national level, but with high variation between different parts of the country and over time. The primary concern is therefore internal distribution, both geographically and temporally. Climate change is predicted to increase the natural variability of precipitation regimes in Tunisia, along with a predicted overall decrease in mean annual precipitation, which will make water management increasingly difficult for water and agriculture planners.

5. Sea Level Rise (SLR), which is being felt along the low-lying coasts of Tunisia, and which is likely to increase due to climate change, is a serious concern, in that it could damage the coastal aquifer formations and other underground water reserves by intrusion of sea waters, thus diminishing underground water quality and exacerbating existing water stress. The predicted Accelerated Sea-Level Rise (ASLR) will vary between 38 and 55 cm by 2100 and be accompanied by stronger and more frequent storms. Thus, an acceleration of the erosion/progradation phenomena, an extension of temporary or permanent submersions of the low coastal areas and an increase in saltwater intrusion into the coastal area underground waters are to be expected, causing significant damage to human and development activities.

6. In the humid coastal (littoral) zone, the closer the area is to the coastline the more vulnerable to the impact of climate change induced sea level rise. The most vulnerable humid regions are the lagoons, the salt plains (sebkhas), and the low depth coastal marches. Much of these regions will eventually be in danger of being lost to the sea. The 2007 study on Tunisia's climate vulnerability (supported by the GTZ) anticipated a substantial increase in the vulnerability of Tunisian ecosystems and predicted the following likely scenarios by 2030:

- Increase in annual average temperature by 1.1 C by 2020; the South will be affected to a much higher level than the North (1.6 C and 0.98 C respectively)
- The number and intensity of drought will increase
- An expected 28% decline in Tunisia water resources by 2050; loss of groundwater will be a particular problem.
- 20% loss of arable cropland by 2030
- 50 % loss of non-irrigated forested areas in southern Tunisia
- Drastically increased risk of forest fires

7. The overall water resources are in danger of diminishing to a significant degree. Given the degradation of water quality (salinity, sedimentation, pollution) it is likely that up to 20 % of the surface water resources will be lost to increased evaporation and due to the forecasted decrease in useable precipitation. Similarly, the groundwater resources from aquifers, in particular the underground coastal water resources will be showing increasing levels of salinization resulting from the rising sea levels.

8. While food production has increased, as a result of more widespread use of irrigation in agriculture, there are limits to how much these measures can be extended to satisfy the need of the growing population. Given the water stresses already anticipated, the limited water resources will seriously impact future food security and with it the socio-economic stability of the country. With close to 100 percent use of existing water resources by 2010, the impending future dangers that result from water scarcity loom large. In fact, by using the maximum water resources the country becomes even more vulnerable to drought periods, the water reserves degrade due to pollutions and sedimentation and the best barrier sites will be exhausted.

The Coastal Region

9. While each region faces its own challenges posed by climate change, the Tunisian coastal region is seen as particularly vulnerable in terms of environmental degradation and economic impacts. It has a varied topography and an irregular coastline extended from the North to the East. The coastal region is also considered an important water reserve for the whole country.

10. This region represents the centre of Tunisia's economy, with important agricultural activity, industry and ports offering access to external markets. Tourism is also concentrated in this region. The coast represents 79 % of economic activities and 90 % of the total housing capacity for tourists; and a large part of the irrigated agriculture is concentrated here. The Tunisian coastal area contains approximately 70% of the country's total population and shows one of the highest urban concentration rates (more than 1,000 inhabitants/km2 in Tunis and Sfax, against a national average of 57 inhabitants). It also includes a number of public facilities (universities, high schools, schools, hospitals, telecommunication and transport infrastructures, port facilities). Strong population pressure has already made this region fragile. Tunisian industries are almost exclusively based in the coastal regions: textile, metallurgical and food processing industries, etc. This region also contains the majority of large cities, placing further pressure on the fragile ecosystem. For example, in Tunis and Sfax, 68 percent of urban districts and 96 percent of residential areas lie between 0 and 2 meters above sea level.

11. Among the challenges to the coastal environment that have been identified for some time, the erosion of the coastline by the sea is regarded as the most important threat, in part as a result of natural processes, but accelerated by human intervention, and now potentially accelerated by climate change in particular:

- The beaches, extended across close to 35% of the coastline; tourist beaches in particular are threatened by over development and construction;
- The low lying islands threatened by part or total submersion into the sea;
- The large coastal plains (Utique, Soliman) ;

- The humid zones, especially marches, coastal salt plains (sebkhas) and the lagoons already threatened by the sea intrusion.

12. The importance of the coastal region for the economy of the country cannot be underestimated. Any deterioration of the coastline and the coastal region will have serious implication for development. Already now, in some areas, the sea levels have been rising at times up to four times higher than the world average (in combination with subsidence). In fact, the rising sea levels as a result of climate change maybe the most crucial aspect of Tunisia's vulnerability. As such, the recent study by the World Bank identified 6 most challenging climate change threats and the most exposed and vulnerable developing countries. The study lists Tunisia among the top 12 developing countries that are both highly exposed and vulnerable to coastal threats of sea level rise. In effect, the anticipated rise in sea levels could have devastating impacts on the economies directly linked to the sea or the coastal region as well as on the physical and biological coastal environment and human habitation in the region. Given that 70 percent of the population live in coastal regions, the government has embarked on various strategies to minimize the impacts on the environment and a number of protective measures have already been taken to minimize the erosion of the coastal regions (e.g. in the Gulfs of Tunis, Hammamet, Sousse and Kerkennah).

13. The coastal region also faces important and increasing water stress. The Northern region contains the essential water resources for the country with an average rainfall of 600mm over 17 percent of the territory (Zahar, 2002). Surface water and underground water taken together, the North contains 60 percent of the water resources for the country. Fifty percent of those water resources have currently a sufficiently low level of salinity that is usable for all types of needs, from agriculture to human needs, with 23 percent of the resource of only mediocre quality and the rest already creating serious limitation for use. However, increased droughts and variability due to climate change could threaten this repository of water resources.

14. The Medjerda river basin represents the main water system. The extensive use of this water system for agriculture has already created serious environmental problems and imbalances for Tunisia: downstream the river bed is increasingly threatened by silt and sedimentation and the barriers are in danger of being eroded by mud and silt. In addition to the growing demands for water in the north the demands from southern regions are also mounting, in particular for irrigated agriculture. Here, better technologies need to be introduced to ensure more responsible and effective use of the limited water resources, with a particular focus on previsions for increasing scarcity and decreasing quality.

15. According to Tunisia's long term water resources strategy with projections to 2030 (cited in Zahar 2002), an intensified use of ground water from existing aquifers will increasingly be necessary. This will result not only in a decrease in ground water levels but also endanger the quality of the water in areas that are already fragile, such as the coastal region. The deterioration will already be noticeable by 2010 and reach an anticipated 20% degradation by 2030. The potential of surface water resources stored in the large dams and reservoirs will reach maximum use in 2010 and after that time towards 2030 a continual degradation of resources will be the result of silt and mud build-up. To compensate the losses, new works are already planned that should address some of the shortfall. In years with abundant rainfall these can collect some of the necessary water reserves.

16. The agricultural sector could be among those most affected by the rising sea levels and increasing water stress. The range of coastal agriculture is wide in terms of products and an important surface area it covers. Rising sea levels could bring with them important losses for those lands through erosion or salinization. In addition, the rising sea level could affect the agricultural infrastructures, such as irrigation canals and drainage systems. Agricultural policies throughout the region have not been taking into account the region's increasing water scarcity and as a result water resources have not been used efficiently. Despite the great effort made by Tunisia in the mobilization of water resources and management of water demand and water economy in the field of irrigation, water scarcity still one the most problems in Tunisia, such as all arid and sub arid counties. Water scarcity is expected to be intensified with the impacts of climate change, and demand management strategies should be improved in order to response the increasing demand in water resources.

17. In light of climate change induced scarcity, maximizing water productivity will become an essential strategy for the farmers in the agricultural regions. Until now, agriculture has used about 82% of all water resources available in Tunisia. Only 6% of agricultural land, however, is irrigated, producing some 30% of revenue from a range of products. The surface of agricultural lands that may be lost due to the ASLR is estimated at approximately 11,000 hectares. The fishery sector, and in particular lagoon fisheries, is also threatened by ASLR.

2. Proposed response

18. The government is increasingly realising the current and emerging climate risks and already taking actions in addressing some of the pressing issues of coastal erosion by investing approximately $25 million in anti erosion works in selected coastal areas in 2008-2010. The Second National Communication is at its advanced stage of finalisation, with the report being put together and the major thematic reports, such as the coastal report, already released for wider circulation. In addition, the government has recently signed the protocol on Integrated Coastal Area Management under the Barcelona convention, but much remains to be done to accommodate the ICAM / ICZM principles into the national legislative and regulatory framework and translate these principles and methods into actual implementation. ICAM / ICZM can definitely provide an important framework for coastal adaptation in the country by bringing together the various local, regional and national stakeholders in improving land use decisions and coastal management practices.

19. The project envisages a comprehensive solution to the current and future challenges highlighted above by addressing key issues posed by the combined effects of *sea level rise* and climate-driven *water stress* in coastal areas. The coastal area was selected as a geographic focus of intervention because of its importance to the country's economy and development, the uniqueness and urgency of the challenges it is facing and is likely to face, and for its potential to demonstrate new, cross-sectoral ways of planning and development. In view of potential coastal land loss and exacerbated water stress risks that could affect 2/3rd of the country's population and multiple development activities, the AAP project for Tunisia will take a cross-sectoral approach in meeting multifaceted adaptation needs.

20. At a broad level, the project is expected to result in a more thorough understanding of climate challenges by decision-makers, identification of "no-regret" adaptation measures and their integration into the mainstream of development efforts, a stronger home-grown capacity to analyse climate-relevant information and adopted tools and methods for land-use planning in coastal areas. It is also expected that technologies tested would provide useful avenues for managing some of the country's key challenges that could be replicated. In support of the identification of sustainable adaptation options for Tunisian coastal areas, the project will also demonstrate a number of approaches and technologies designed to respond to challenges in water management in the face of ASLR.

21. The project will seek to introduce long-term planning tools to manage climate risks, including land-use planning tools to help deal with coastal risks and vulnerabilities. The project will, strengthen the climate monitoring function and scientific research and associated capacities. At the national level, capacities to assess, understand and valuate climate impacts will be strengthened, so as to promote the ongoing identification of cost-effective adaptation measures and their integration into planning frameworks.

22. The project will focus particularly on the critical interface between the impacts of ASLR on land and increased water stress from growing aridity. This should lead to lifting the pressures from infrastructure-heavy investments on the coast and improving aquifer management. One way of minimising sea water intrusions is to maintain groundwater balance by injecting treated waste water (TWW). Promoting artificial recharge of groundwater by TWW may be a gateway that facilitates its wider use in sectors of agriculture and tourism that will suffer the most by increasing water stress. Currently, Tunisia uses only 25% of TWW (mainly in agriculture).

23. Engineering and supply-driven solutions also dominate water use in multiple sectors (mainly agriculture that uses 80% of all available water resources). Helping the key stakeholders in applying more demand-side management techniques will be important. The need for water conservation and water efficiency is very well

understood in the country. For example, Tunisia's water saving programme, the PNEE has already equipped 305.000ha or 76% of all irrigated area with water saving technologies. This increased water efficiency from 50% in 1990 to 75% today (data from 2007). However, water consumption has stayed relatively constant because farmers have used the water they saved to expand irrigated areas or to switch to higher-value but more water intensive crops / or increased cropping intensity. It is now becoming apparent that strictly engineering and supply-driven approaches ("generating more water") won't be sustainable in the face of increasing water stress. Demand-management regulations are missing and need to be introduced. In this regard, the project will closely coordinate with the UNDP's regional Water Governance Programme for Arab States (WGP-AS). Tunisia is one of the countries that has endorsed the WGP-AS and accordingly will directly benefit from its support which is geared at supporting the government in developing and implementing their IWRMs. Currently, an assessment of the needs is being undertaken whereby the gaps will be identified and the form/scope of support by WGP-AS will be shaped up. The AAP Tunisa project will closely cooperate with this initiative in Tunisia, whereby ensuring complementarity and synergies.

24. In order to promote adaptive capacity at the local level, financial mechanisms that would support adaptation in the long-term will also be explored, both innovative and traditional. As such, placing the incentives for re-directing the investments from the coast towards inland areas (thereby reducing pressure and exposure) would be a strategic adaptation effort of the AAP project. For example, around 80% of the tourism infrastructure is located directly along the coast. Engaging with some of the tourism industry operators and helping them diversify their tourism revenues by establishing ecotourism alternatives in inland areas was identified as an important adaptation option that could release pressures on vulnerable coast and at the same time help this strategic sector in gradual adaptation (the revenues from the sector enables Tunisia to purchase food from abroad). This strategy will give additional impetus to inland investments that is to help improve local employment and socio-economic conditions of in-land populations. In addition, the design of a "climate change tax" or other financial instrument on coastal tourism could help accumulate considerable financial capital, a portion of which can be used for eco/health tourism investments inland, and the rest for investments in anti erosion and coastal protection measures. This type of instrument and other public-private partnership options will be necessary to secure long-term funding sources for adaptation.

25. Other risk transfer and risk-sharing mechanisms, such as index insurance schemes (e.g. based on rainfall), can be designed for the northern coastal area that has the largest concentration of cereal staple food production. This vast coastal area is largely reliant on rainfall which provides an opportunity to identify the feasibility of such risk-transfer scheme. Since Tunisia as a small country may not be able to generate a big portfolio to attract the private sector, such scheme should be designed by the direct engagement of the government through public private partnership. During the initial consultations of this project design, the government expressed strong interest in such a scheme. As the government that currently employs insurance scheme in the sector of agriculture finds it difficult to repay for increasing losses. In the face of increasing rainfall variability more flexible risk absorption and transfer mechanisms should be explored

26. In addition, while current coastal protection efforts, including the ones recommended by the SNC coastal report, largely consists of protective infrastructure (e.g. dikes, artificial elevation of coastal lands etc), introducing vegetative buffers, wetland restorations, coastal dune stabilisation and beach nourishment would be more effective, "no-regrets", cost efficient alternatives in certain coastal localities.

27. In this context, moving away from the rigidly sectoral towards multi-sectoral land use decisions in the coastal areas would be another important adaptation support, along with improving observation and coastal monitoring capacity (especially salt content monitoring in strategic coastal aquifers).

28. The project will develop necessary technical and institutional capacities to achieve the complex tasks outlined above within this thematic and geographic scope. As also agreed among partners, the project will strategically complement sectoral work conducted by the Ministry of Environment and Sustainable Development through GTZ support and implement some of the priority measures of sectoral adaptation strategies, in the context of coastal regions. The project will also establish linkages with related initiatives implemented through support of other partners, including JICA, who has supported the Study on Integrated Basin Management for the Medjerda River, the Water Saving in Agriculture Project in Southern Oasis Area, as well as some infrastructure development initiatives in coastal areas.

29. Finally, it is expected that the project will generate new knowledge applicable to Tunisia-wide adaptation initiatives, as well as useful lessons and knowledge that will be shared with other developing countries, in keeping with Tunisia's wishes to act as a leader in South-South capacity building in Africa.

30. The key stakeholders and beneficiaries targeted through this project are government ministries and their decentralized agencies (Ministry of Environment, Agency for the Protection of the Coast (APAL), Agriculture Ministry), scientific and academic institutions (including National Weather Service, universities and observatories), as well as local-level planners and natural resources users (water associations, regional and local development boards, agricultural producers).

31. Gender issues will be fully integrated in the project's activities, including where relevant through the gender-disaggregated analysis of climate impacts, as well as through the active participation of women in project activities, committees and structures. In addition, this project will work in close collaboration with a number of other ongoing adaptation-related initiatives, in particular GTZ-supported programming towards the development of a National Climate Vision and Strategy and sectoral adaptation strategies. Where feasible, some activities will be implemented jointly in order to increase synergy and maximize the benefits of interventions.

3. Barriers to proposed solution

32. In order to achieve its objectives, the project will have to address the following barriers that have been identified through National Communications, as well as various studies and consultations.

33. *A propensity to opt for engineering or heavy infrastructure adaptation responses prevail.* While this tendency is now declining, due to the high costs incurred, this is still a dominant feature of all coastal protection solutions. Increased awareness and knowledge of "softer" adaptation approaches is expected to allow Tunisian planners more flexibility and choices in determining adaptation options in the future. The project will seek to demonstrate the value of ICAM/ICZM [1] as an adaptive approach rather than the current models that use unsustainable response strategies to sea level rise (e.g. by raising the ground level).. Technological and engineering solutions dominate most of the coastal management, water and agriculture sectors. There is limited knowledge of various financial instruments and legal incentives that can improve development results and increase economic returns from various sectors located in the strategic regions of the Tunisian coasts. The project will build public private partnerships with coastal tourism operators as well as agricultural insurance schemes to bring innovations for climate risk transfer and generate much needed financial resources for coastal protection and management

34. *Coastal planning and land use decisions are highly sectorialised in Tunisia not allowing for more integrated approaches for use of fragile coastal resources (coastal land and water).* Often sectorial interest does not account for coastal protection objectives. Some sectorial land use decisions sometimes conflict with coastal development plans of other sectors, resulting in leveraging of the political priorities or power seniorities rather than in rational, consensus-based cross-sectorial decisions that build on risk contingency planning. The country is however, committed to move towards the ICAM/ICZM framework but does not have sufficient policy and institutional set up to uptake this approach

35. *There is limited technical capacity and knowledge of various risk assessment and decision support tools for adaptation planning*. Availability of data and information in Tunisia is staggering, however there is no institutional set-up or incentives to exchange the data and share the key findings of research among various government or research institutions. Geo- referenced data and satellite

1 ICZM is a dynamic, multi-disciplinary and iterative process to promote sustainable management of coastal zones. ICZM seeks to balance the advantages of the economic development and use of the coastal region with the protection and preservation of the coastal areas and the minimization of losses of human life and property.

maps are available in Tunisia but they are not used for improved vulnerability assessments to climate change risks and impacts or adaptation planning. Given the increasing awareness of climate change risks to social and economic assets in the coastal regions introduction of various risk assessment and adaptation planning tools will considerably improve adaptive capacity and prompt adaptation action.

36. *There is limited awareness about more cost-effective and robust adaptation solutions to address current and anticipated climate related risks in the coastal regions*. Engineering and supply driven solutions prevail for ensuring water availability. The project hopes to demonstrate the value of water demand management measures, including the use of treated waste waters, as a mechanism to minimise water stress in coastal regions (e.g. for ground water recharge, minimisation of sea water intrusion into the coastal aquifers and agricultural production). In addition, a general lack of awareness among coastal land and water users has led to significant waste in water consumption, and missed opportunities in water economy as well as resulted in overexploitation, overload with infrastructure-heavy protection, erosion and degradation of shoreline. It is expected that this project, through its training and awareness activities, as well as through the technology demonstrations, will serve as an engine for a country-wide sensitization of coastal land and water users (mainly those in the tourism and agriculture sectors) to "climate smart" solutions, .

37. *Finally, although a general understanding of climate change among decision-makers exists, most lack concrete tools and methods to integrate these considerations into their every day work and long-term planning.* By promoting economic analysis of climate change impacts, it is expected that the project will lead to gradual policy changes at the country level, thereby promoting more sustainable and adapted approaches to the country's investments in development.

II. STRATEGY

38. The project will attempt to lift the barriers identified above through a blend of institutional capacity development, technology development as well as on-the-ground demonstration of innovations to respond to major climate change challenges in the coastal areas. Activities will take place both at the national and local levels, in cooperation with major stakeholders in the coastal sectors, including agriculture, water, tourism, as well as local users and population at large.

39. This project is closely linked to the outcomes of the Country Programme for 2007-2011 in that it supports the desired outcomes of reduced vulnerabilities and inequities, the promotion of better and more efficient public policies as well as coordinated platforms of action towards adaptation in the coastal area. The project supports the following key outcomes from the CPAP and UNDAF:

- Policies and programs towards prevention and reduction of vulnerabilities and inequities are strengthened;
- Participation and partnership in national decision-making at regional and local levels is consolidated;
- Increase in efficiency and effectiveness of public policies and institutions.

1. Outputs and activity results

Output 1: Dynamic, long-term planning tools/mechanisms to manage the inherent uncertainties of climate change introduced

Activity Result 1.1 The climate change forecasting and monitoring function at national level is strengthened

40. This activity result is based on the recognition that the main barrier to adequate integration of climate information into decision-making in Tunisia is the lack of coordination, analysis and synthesis of available information. Although the coordinating department for climate change issues, the Ministry of Environment

and Sustainable Development, ensures an sufficient coordination with all involved partners, the scope of required interventions particularly in the coastal areas, and the limited human and financial capacities, require increased capacity for coordination, analysis and information synthesis.

41. The activity would therefore aim to strengthen national-level capacity to acquire, analyse, interpret and disseminate appropriate and relevant climate change information. The result of this activity would be the improvement of the mechanisms for climate monitoring and forecasting to provide legitimate and relevant input into major decisions at the national level.

42. Action 1.1.1: Conduct an inventory and capacity needs assessment of relevant scientific and technical institutions and their and potential contributions to the development of a strong climate change monitoring function and climate information management (this includes the entire cycle of data generation, analysis, dissemination and application). This action aims at obtaining a thorough assessment of existing institutions, research centres, academic research units, observatories, meteorological institute, ministries and various technical service organisations that are – or could be – involved, or federated, into a coordinated mechanism / network for climate monitoring and forecasting.

43. Action 1.1.2: Consolidate all climate change data, information and related research through government, scientific institutions, private sector and CSOs. This is to identify available data, information and composition of research as relate to climate change risks in the coastal regions (focusing on coastal floods, SLR, storms rainfalls etc).

44. Action 1.1.3 Determine the best institutional arrangement, such as technical network, for the operationalization of a climate forecasting and monitoring function that is based on collaboration and creates institutional incentives for data and information sharing as needed. This action aims at engaging partners in a future climate monitoring and forecast function in stronger collaboration, based on free flows of information and shared methodologies. At the end of this action, a decision would be expected on how best to manage incoming flows of climate change relevant information, with primary focus on coastal risks.

45. Action 1.1.4. Harmonize data, protocols and methodologies for climate change risk assessments in coastal areas, in order to promote the integration of climate risk consideration in coastal land use and investment decisions. This action will take place through collaboration between institutions involved in climate risk assessments through, for example the creation of a network of technical partners (see 1.1.3).

46. Action 1.1.5: Design a set of indicators for comprehensive Early Warning Systems in coastal zones, particularly using the physical indicators related to coastal flooding and salt content in ground waters (linked to the GTZ-supported Early Warning System efforts). In addition, data forming the basis of this work will be integrated into the government-led Water Information System, SINEAU.

Indicators	Baseline/Targets
1. System of Early Warning includes agreed indicators for coastal flooding (rainfall), SLR and salt content in groundwater.	Baseline: there are no indicators Target: by end of project, a set of indicators are integrated into a national Early Warning System
2. Number of institutions accessing, processing and using the climate change risk related data and information	Baseline: the means of integration of climate change in various sectors and national institutions need to be clarified and expressed into clear procedures. Target: by end of project, all relevant institutions are accessing data
3. A government decision to institutionalise coordination arrangement / technical on climate change risk information	Baseline: even though all consulted institutions recognise the need for

sharing	information sharing and coordination of research there is no agreement on the best form for such coordination, or collaborative networking Target: by end of year 2, there is a formal decision on institutional mechanism (technical network or technical coordination group)

Activity Result 1.2 – Adaptation decision-making support tools are developed, with a particular focus on coastal zone management

This activity result is based on the expressed need for relevant guidance for the integration of climate information and risk assessment results into decision-making. The specific focus on coastal zone challenges (sea level rise and water stress) will determine the scope of climate change risk assessment methods and tools for adaptation decision-making.

47. Action 1.2.1. Introduce GIS-based risk assessment tools for key decision-makers at local and national level. This includes related training in order to produce hazard maps (e.g. floods) and to determine coastal hot-spots or particularly fragile areas.

48. Action 1.2.2. Introduce Shoreline Management Planning (SMP) as planning and decision support tool for coastal regions. APAL and local authorities will be targeted to customise the application and transfer the knowledge from other countries (e.g. UK experience). This will be used for strategic flood and erosion management.

49. Action 1.2.3: Develop a procedure and decision support manual on adaptation in coastal zones, based on Integrated Coastal Zones Management (ICZM) principles, for use by local and regional authorities. This manual would be based on existing information and guidelines, and will seek to update practices and procedures used for land use planning and investments in coastal areas, including existing guidelines such as the Drought guidelines. Its primary target audience is the APAL, given its role in land use planning on the coast.

50. Action 1.2.4. Develop and deliver a cross-sectoral training package for government officials at national and regional levels on climate change adaptation, SMP and ICZM as a framework for coastal adaptation. This programme would be targeted to planning authorities, various ministries and sub-national authorities of coastal regions and supported by the actions 1.2.1 and 1.2.2 above. Key audiences will include national and regional planning authorities, including for example, regional anti-desertification councils and local development committees in coastal areas. It is also linked to the general awareness program (under 5.3.) for government officials at national and regional levels on climate change adaptation and ICZM.

Indicators	Baseline/Targets
4. Number of municipalities and regional authorities in the coastal areas using new coastal adaptation decision-making tools (mapping, GIS, SMP);	Baseline: To be clarified during inception period. Some local authorities have just begun using mapping and decision making tools (such as Djerba) Target: at least 5 municipalities and 3 regional authorities
5. Extent to which regional authorities and APAL decentralized offices are using an integrated approach for costal management and adaptation	Baseline: There is insufficient use of decision-support tools at regional level Target: all regional APAL offices use new procedures

6. Number of people trained on CC adaptation, SMP and ICZM	Baseline: since ICZM is relatively new framework only few staff members at APAL are aware of it. ICZM principles have not been applied in Tunisia Target: at least 100 (50% women)
7. Number of region and/or island with ICZM	Base line : 0 Target: at least one region

Activity Result 1.3 – Scientific and technical capacity is reinforced to support adaptation decision-making in the context of coastal regions

51. The purpose of this activity is to strengthen the technical capacity to make science- and evidence-based decisions in the coastal zones as relate to water, agriculture, land use planning, infrastructure and engineering. The combination of tools, software or information would be introduced to enhance overall technical capacity and coastal management and decision-making practice in Tunisia. The main target institution under this Activity Result is APAL. The delivery of this package of web-based tools and software will be accompanied by appropriate training.

52. Action 1.3.1 Review the applicability and introduce a set of existing coastal risk assessment tools such as Dynamic Vulnerability Assessment (DIVA); Community Vulnerability Assessment (CVAT); Coastal Zone Simulation Model (COSMO). This will include introduction of software as well as the delivery of relevant training for APAL and its main partners. This complements GIS based risk assessment tools developed under 1.2.1. that targets broader constituency;

53. Action 1.3.2: Promote the use of satellite remote sensing technologies and data with spatial hydrological models to support cutting edge water resource planning, monitoring and management in coastal regions that are at risk from sea water intrusions into groundwater reserves. This action will be conducted through demonstration and training.

54. Action 1.3.3: Undertake policy oriented and relevant research in strategic areas of concern for multi-sectoral coastal adaptation. This will include coastal dynamic and sediment accumulation, combined analysis of coastal subsidence and SLR projections, studies of aquifer resources and studies on coastal erosion and flooding.

55. Action 1.3.4: Develop a mechanism for technical and scientific information sharing among coastal stakeholders, building on the climate monitoring function referred to in 1.1.2. This action will also include mechanisms to improve access by universities and the meteorological services to climate-risk assessment methods and data. Collaboration arrangements between government agencies and academia could be developed to ensure free access to technology and information.

Indicators	Baseline/Targets
8. Extent to which APAL and its partner organisations are using risk assessment and coastal planning tools for their coastal management programmes and decisions	Baseline: low application Target: regular use by all APAL offices
9. Number of new research initiatives in policy-relevant research related to coastal and aquifer resources management	Baseline: Although there is some ongoing research, it does not address the specific coastal climate change challenges Target: at least 2 new initiatives in each region
10. Number of academic institutions accessing climate-risk assessment	Baseline: there is insufficient

technology and information	access by academic institutions. Target: at least 5 institutions gain access to new climate-risk assessment information and technology

Output 2 Leadership capacities and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels strengthened

Activity Result 2.1 – Coordination and collaboration between decision-making bodies relevant to adaptation is enhanced

56. The purpose of this activity is to establish clear roles and responsibilities, as well as to empower the various governmental and civil society actors to make climate-sensitive decisions. This is in response to the need for multisectorial platform to steer and coordinate adaptation policies. Due to the cross-sectorial nature of adaptation measures and policy options in the coastal region the leadership role cannot be fully anchored in one single institution. It requires a functional, cross-cutting mechanism for consensus-based adaptation decisions.

57. Action 2.1.1 Perform a National Adaptation Capacity Needs Assessment focussing on individual, institutional and systemic issues, with an emphasis on coastal adaptation capacity needs. This action would provide an overview of mandates, roles and responsibilities as well as potential gaps to address adaptation needs in Tunisia. It will place a focus on institutions that are relevant to coastal zones and be based on existing studies and will use the UNDP's Capacity Assessment methodologies. This also relates to the action 1.1.

58. Action 2.1.2 Update the mandates and statutes of relevant organizations to integrate adaptation specific functions and establish clear roles and responsibilities. Based on the results of the action above, the mandates of key organizations would be upgraded to include climate responses. Institutions concerned include the Ministry of Environment and Sustainable Development (MEDD), in particular through the General Directorate for Environment and Quality of Life (DGEQV), the National Agency for Coastal Protection and Planning (APAL), the National Agency for Environment Protection (ANPE), the Ministry of Agriculture and Water Resources (MARH), the Ministry of Equipment, Housing and Land Use Planning (MEHAT), the Ministry of Tourism, Trade and Handicraft (MTCA), the Ministry of Interior and Local Development, research institutes such as the National Institute for Science and Technology of the Sea (INSTM).

59. Action 2.1.3: Revive and enhance the interministerial dialogue to determine the best option for a national-level steering mechanism on adaptation. This would be undertaken on the basis of internal inter-ministerial discussions, draft terms of reference or objectives for adaptation, as well as ongoing work supported by the GTZ on a National-level Climate Change Strategy. Concrete proposals could be established on the effectiveness of the intervention of the National Commission on Sustainable Development and the feasibility of capacity reinforcement of the National council for combating desertification in order to act as a permanent structure for Climate change adaptation. The result of this process would be an agreed and operational institutional arrangement to steer adaptation decisions in multiple sectors in full alignment with development priorities of the country.

60. Action 2.1.4 Undertake studies towards making recommendations on how to modify legal texts, regulatory instruments or codes in the area of environment and natural resource management (particularly Water Code and Upcoming Environment Code) to take full account of projected climate change risks. This activity would seek to support MEDD and APAL participation in the integration of climate change issues into ongoing legal revision exercises such as the Water Code revisions, or development of new legal texts as relevant.

Indicators	Baseline/Target
1. Existence of a national steering and coordination mechanism on adaptation	Baseline: some coordination exists (National Commission on Sustainable Development) but needs to be formalized and strengthened for adaptation. Target: by end of project
2. Number of policy and investments related decisions taken and influenced by the coordination mechanism on adaptation	Baseline: to be clarified during inception period Target: at least 2
3. Number of key policy, legislative and regulatory documents that integrate an assessment of climate change risks and/or include concrete adaptation measures, reflected in their enforcement mechanisms and implementation budgets	Baseline: some policy documents acknowledge importance of climate change risks, more conceptually, without offering any practical solutions or measures to integrate climate risk management or adaptation measures into the national or sectorial policies. Target: at least 3 key policy or legislative documents fully integrate climate change considerations
4. Number of sectoral institutions mandated to act on climate change risks and implement adaptation options in a way that their respective roles are complementary and reinforce each other	Baseline: Adaptation strategies are established, namely in the sectors of agriculture, health and tourism under the supervision of the ministries in charge but not explicitly included in organisational mandates – to be clarified during inception period and Capacity Assessment Target: at least 5

Output 3: Climate-resilient policies and measures implemented in priority sectors

Activity Result 3.1 Adaptation issues are integrated into National Development and Land Use Planning

61. The purpose of this activity is to undertake steps towards a full integration of climate risks and adaptation options into the National Development Plans, aiming for integration into the 12th and/or 13th plan. The activity will aim to strengthen capacity to integrate the results of existing vulnerability studies into the Plans, as well as to undertake socio-economic analyses of climate impacts. This activity aims at promoting the adoption of broad-level climate-proof development objectives.

62. Action 3.1.1 Develop socio-economic analyses of climate impacts on sectors relevant to coastal regions, in particular: agriculture, water, tourism, transport and infrastructure. This activity will be undertaken in cooperation with the Ministry of Development and International Cooperation in order to demonstrate the effectiveness and efficiency of certain no-regret options, such as water demand management to influence wasteful water consumption by agriculture; improved watershed management, "soft" coastal management measures, such as dune stabilization, coastal nourishment, groundwater conservation, wetland restoration

and preservation, etc. as opposed to engineering solutions and supply-driven water management or "hard", protective and infrastructure-heavy coastal protection practices.

63. Action 3.1.2. Develop and deliver a training package on socio-economic valuation of climate change impacts and CBA analysis of adaptation options. This activity will be undertaken in support of all key Ministries and the Tunisian Institute for Strategic Studies that provides lead technical and policy inputs for NDP development.

64. Action 3.1.3 Determine cost-effective adaptation options for coastal regions, for integration into local Land Use Management Plans and the National Development Plan. Although the study of the impacts of seal level rise on costal areas showed the great impacts of climate change, especially for costal aquifers, costal infrastructure, and beaches, the assessment of socio-economic impacts were insufficient. A more thorough assessment will be developed along with a study of the socio-economic feasibility of adaptation measures. This activity is to be undertaken with the Direction Générale de l'Aménagement du Territoire, MEDD, APAL and MDCI.

Indicator	Baseline/Target
1. Number of dedicated coastal adaptation measures (mainly for coastal adaptation, including the water stress reduction in coastal regions) included into the 12th and / or 13th National Development Plan	Baseline: reactive, infrastructure-heavy adaptation measures are included Target: 5 new measures are included
2. Percent increase in or amount of national budget allocated (mainly through NDP) to coastal adaptation measures	Baseline: APAL is a specialized institution for costal areas protection. Its main mission and its budget cover measures related to adaptation and integrated management of costal areas – Amount to be specified during inception period Target: at least 10% increase.
3. Extent to which Tunisian Institute for Strategic Studies and MDCI use Climate change impact valuation methods in preparation for the 12th and 13th NDP	Baseline: the institutions do not use impact valuation methods Target: Both organizations make full use of new valuation methods

Activity Result 3.2 On-the ground adaptation responses are tested in coastal zones

65. The purpose of this activity is to test various adaptation measures in the coastal areas in order to determine their development benefits as well as their replicability to a broader scale. Various interventions and geographic sites will be selected on the basis of feasibility studies and pre-determined criteria to be agreed by the Project Steering Committee during the inception phase. This activity will be closely linked to activities supported by GTZ under the implementation of sectoral adaptation action plans, and supplemented by activities included under Outputs 4 and 5.

66. Action 3.2.1 Pilot technologies for aquifer recharge using treated waste-water. One of the priority adaptation measures identified through various studies and stakeholder consultations is aquifer recharge with Treated Wastewater (TWW). In coastal areas, aquifers containing potable water can become contaminated with saline water if water is withdrawn faster than it can naturally be replaced. The increasing salinity makes the water unfit for drinking and often also renders it unfit for irrigation. Aquifer recharge with treated wastewater can: (i) restore depleted groundwater levels; (ii) provide a barrier to saline intrusion in coastal zones; (iii) facilitate water storage during times of high water availability. This requires a science-based approach, designed around critical control points (e.g. WHO's hazard analysis critical control points (HACCP) approach and / or other quality control good practices will be applied for this measure, along with

measures to increase the knowledge base about groundwater dynamics. Areas where this activity will be implemented could include: sfax region, cap-bon region.

67. Action 3.2.2 Pilot the implementation of an ICAM/ICZM framework for the development of local development plans (Plan d'Aménagement du Territoire). This could be undertaken in an area targeted by the government for coastal rehabilitation, with the support of APAL, as a means to gather various partners including communities and local authorities, around a new way of thinking about coastal land use and development. Local communities will be mobilized to participate in the planning and decision process.

68. Action 3.2.3 Pilot Coastal rehabilitation measures based on best available technologies and traditional knowledge (dune stabilization, vegetative buffer plantations etc). This includes a short feasibility study based on existing coastal vulnerability knowledge, in order to determine areas and appropriate interventions. Areas where this could be conducted include: Djerba or Kerkenna Islands. Ongoing monitoring would be conducted by the INSTM.

Indicators	Baseline/Target
4. TWW standards updated and enforced for various purposes	Baseline: some TWW standards are available and observed for irrigation. Target: by end of the project HACCP or other control standards designed and approved for TWW use for aquifer recharge, agriculture and tourism
5. Total land area under improved adaptation practices	Baseline: 0 Target: 100 km2 of coastal land directly benefitted from the adaptation measures employed by the project
6. Number of Local Development Plans using ICZM principles	Baseline: ICZM framework has not been established in Tunisia yet. Target: at least 1

Output 4: Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels[2]

Activity Result 4.1 Sustainable national financing mechanisms and sources are explored and introduced

69. The purpose of this activity is to integrate adaptation options and associated budgets into national development plans. This is to move away from a reactive adaptation approach to more proactive and anticipatory approaches to adaptation. This activity seeks to strengthen the ability of the Tunisian government to use the traditional financial mechanisms at its disposal. Under this output the project will help the government to catalyze additional funding resources for priority adaptation actions

70. Action 4.1.1 Develop and deliver a training program on the financial instruments for addressing the cost of adaptation for Tunisian decision-makers in the public and private sectors. This will be undertaken in the framework of the training program and would support activities foreseen in 3.1.1. It would be linked to ongoing studies supported by the World Bank on the costs of Environmental Degradation. Training would be delivered to national level planners in coastal-zone relevant sectors, as well as private sector partners including tourism operators, and NGOs, using a risk management based approach

[2] Analysis of climate change financing mechanisms to facilitate gender responsive climate change investment financing.

71. Action 4.1.2 Revise National Development Plan and national budget lines to incorporate priority, cost-effective adaptation options. This activity would be undertaken as a follow-up to those under 3.1, aiming at the next national budget or 12th development plan. Budgeted measures would be particularly targeting adaptations in coastal regions and can explore leveraging additional funding from the Adaptation Fund or other external sources to complement national dedicated budgets for adaptation.

Indicators	Baseline/Target
1. Percent increase in or amount of national budget allocated to coastal adaptation measures	Baseline: 0 Target: At least 10% increase in adaptation funding from the national budget
2. Number of people trained on financial instruments for adaptation	Baseline : 0 Target: 50

Activity Result 4.2 Innovative financial sources and mechanisms are explored and introduced on a pilot basis

72. The purpose of this activity is to explore and test the applicability for Tunisia of certain innovative or non-traditional mechanisms for generating funding to cover the costs of adaptive measures in coastal areas.

73. Action 4.2.1 Explore the feasibility of and test rainfall index-based insurance schemes in the farming systems of coastal regions (feasibility study and pilot scheme). This would include an overall study on various index-based insurance products for Tunisian agriculture, with a pilot scheme tested in a rain-fed coastal area. Regions in which this could be tested include Cap-Bon and could be conducted with the Insurance industry along with the Union of Agricultural Producers.

74. Action 4.2.2 Explore and test the potential of eco-tourism for coastal zone operators and test mechanisms for tourism-based contributions to adaptation funding (e.g. tourism taxes, voluntary or mandatory contributions to coastal rehabilitation) This activity would include the analysis of in-land eco-tourism potential for Tunisia, as a means of diversifying coastal operators activities and relieving pressures on coastal zones and would be delivered with tourism operator associations.

75. Action 4.2.3 Explore and test the feasibility of using voluntary or mandatory market or fiscal instruments used to bring about financial contributions from the tourism industry to coastal zone management that minimizes the adverse impacts of SLR. Areas where this could be tested include: Kerkennah, Djerba (linked to Marine Protected Areas programme).

Indicators	Baseline/Target
3. amount of revenues from tourism sector dedicated to improved coastal management	Baseline: Some activities are undertaken with private sector support – amount to be specified during inception period Target: at least $100,000K committed by end of project or 20% increase
4. Percent reductions in demand for farmers' compensation as a result of new risk-transfer scheme, particularly during the low rainfall / drought seasons and years	Baseline: to be specified during inception period Target: 20% reduction

Output 5: Knowledge on adjusting national and sub-national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels

Activity Result 5.1 Project results, lessons and good practices are documented and shared

76. This activity includes monitoring and evaluation of project processes, outputs and outcomes, as well as the development of specific information products to be shared with other developing countries (South-South platform) using the Regional Component of the AAP.

77. Action 5.1.1 Produce and disseminate project studies and knowledge products. This relates to knowledge management and project's link with the ALM mechanisms and other knowledge platforms (through its own website); Studies to be published would include "financial incentives to engage tourism industry in coastal adaptation" case study of Tunisia; "Improving coastal aquifer management to address SLR related water stress in coastal regions of Tunisia"; the "white paper" on coastal adaptation; or a "study on indicators for adaptation"

78. Action 5.1.2 Organise an international workshop for lessons and knowledge sharing under the AAP regional component. This activity would respond to the expressed willingness by the Tunisian government to demonstrate leadership in South-South technology and knowledge exchange.

Indicator	Baseline/Target
1: Number of knowledge products produced and widely disseminated	Baseline: 0 Target: at least 5

Activity Result 5.2 Develop and test national adaptation indicators for establishing a comprehensive M&E framework for adaptation to monitor the progress in the framework of the project and beyond

79. The purpose of this activity is to contribute to knowledge on adaptation in the country and specifically in coastal zones so as to complement the scientific capacity developed under activities in Output 1 and to serve as a basis for long-term monitoring of progress on adaptation.

80. Action 5.2.1 Establish a methodology committee under the aegis of the monitoring function established in 1.1.1 and the Observatoire de l'Environnement et du Développement Durable

81. Action 5.2.2 Provide training to the OTEDD and members of the climate monitoring function and network established in 1.1. on the development of indicators for coastal adaptation.

Action 5.2.3 Define a set of targeted adaptation indicators related to coastal regions and perform a baseline assessment to collect all project related data and information.

Indicator	Baseline/Target
2. Existence of an operational methodology committee	Baseline 0 Target: by mid-term
3. Number of scientific institutions participating in methodology committee and engaged in M&E process	Baseline 0 Target: at least 10
4. demonstrated improvements against the baseline parameters	Baseline: n/a Target: at least two surveys from the outset of the project determining the baseline conditions (data) and at the end to show the trend of improvements in adaptive capacity of the coastal

	stakeholders
5. Number of people trained in the development of coastal adaptation indicators	Baseline: 0 Target: at least 25 (50% women)

Action 5.3 General awareness of climate change and adaptation issues is increased

82. This activity is based on recognition that the adoption of many adaptation measures face obstacles due to a general lack of awareness on the part of natural resources users. The purpose of this activity would be to develop a set of key messages designed to address key social groups and to raise awareness of climate change vulnerabilities in Tunisia.

83. Action 5.3.1 Develop a set of targeted key messages for key audiences including: youth, private sector, tourists, water users, parliamentarians.

84. Action 5.3.2 Engage the participation of NGOs and the media for delivery of the awareness program

85. Action 5.3.3. Establish the project related website for information dissemination, advocacy and adaptation public forums

Indicator	Baseline/Target
6. number of media outlets participating in covering climate change adaptation issues as relate to the project scope	Baseline: 0 Target: 5
7. number of comment and discussion postings on the Tunisia AAP website	Baseline: 0 Target: 10 per month

Comparative advantage

86. UNDP benefits from sound working relations with the Ministry of Environment and various environment related partners in the country, built through the implementation of a number of related projects, including support to the development of the Coastal Study which forms the basis of this project, as well as a number of GEF projects in the country. UNDP also has broad technical and regional expertise in the field of adaptation, governance and decentralization in Tunisia, which can be brought to bear in this project.

87. In order to achieve the project outputs, close collaboration will be sought with other international partners, chief among them the GTZ, who is also supporting adaptation initiatives in the country, and the World Bank, who is supporting investments in the coastal area. Advice and support from other partners from the UN system will be sought on an ad hoc basis (for example BCPR for the development of the indicators for the Early Warning System). Gender issues will be mainstreamed at all steps of the project through the interventions of the UNDP-Tunisia gender advisor.

III. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Country Programme Results and Resource Framework: Mobilisation de l'ensemble des partenaires au développementn dans le sens d'un accroissement des ressources en complément des budgets de l'Etat.
Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets: most Environment and Energy Targets under the CPR have been met. This project will seek to address the indicators as indicated in the below table.
Applicable Key Result Area (from 2008-11 Strategic Plan): Promote climate change adaptation
Partnership Strategy
Project title and ID (ATLAS Award ID00058399): Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa – Promoting Resilient Coastal Development in Tunisia **00072542**
Applicable Key Result Area (from 2008-11 Strategic Plan): Promote climate change adaptation

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
			Quality Criteria	Quality Method	Period of verification		
Output 1: *Dynamic, long-term planning mechanisms to manage the inherent uncertainties of climate change introduced* Indicators: 1. 1. System of Early Warning includes agreed indicators for coastal flooding (rainfall), SLR and salt content in groundwater. 2. Number of institutions accessing, processing and using the climate change risk related data and information 3. A government	**Targets** 1.by end of project, a set of indicators are integrated into a national Early Warning System 2.by end of project, all relevant institutions are accessing data 3.by end of year 2, there is a formal decision on an institutional mechanism 4. at least 5 municipalities	Activity Result 1.1 - The climate change forecasting and monitoring function at national level is strengthened Action 1.1.1: Conduct an inventory and capacity needs assessment of relevant scientific and technical institutions and their and potential contributions to the development of a strong climate change monitoring function and climate information management Action 1.1.2 Consolidate all climate change data, information and related research through government, scientific institutions, private sector and CSOs. Action 1.1.3 Determine the best institutional arrangement, such as technical network, for the operationalization of a climate forecasting	1. the indicators should reflect best available technologies and approaches, and generate the agreement of all partners 2. All institutions who may be called to make decisions or research on climate adaptation should have free (or easily accessible) access to information 3. the decision	Annual reports Mid-term evaluation Governmental decrees or decision texts Questionnaires	Annually Once at mid-term At end of project At mid-term	APAL, MEDD, DMN, OTEDD, UNDP (in coordination with GTZ)	*National consultants* *International consultants* *Travel and DSAs* *Workshops and Meetings* *Supplies* *Publications and Printing* *Equipment and rentals*

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
decision to institutionalise coordination arrangement / technical on climate change risk information sharing 4. Number of municipalities and regional authorities in the coastal areas using new coastal adaptation decision-making tools 5. Extent to which regional authorities and APAL decentralized offices are using the ICZM procedure and decision-support manual 6. Number of people trained on CC adaptation, SMP and ICZM 7. Number of regions and/or islands with ICZM 8. Extent to which APAL and its partner organisations are using risk assessment and coastal planning tools for their coastal management programmes and decisions 8. Number of new research initiatives in policy-relevant research related to coastal and aquifer resources management	and 3 regional authorities are using new coastal adaptation tools by end of project 5. all regional APAL offices use new procedures by end of project 6. at least 100 people trained (50% women) 7. at least 1 region 8. regular use by all APAL offices by end of project 9. at least 2 new initiatives in each region 10. at least 5 academic institutions are accessing information	and monitoring function that is based on collaboration and creates institutional incentives for data and information sharing Action 1.1.4. Harmonize data, protocols and methodologies for climate change risk assessments in coastal areas, in order to promote the integration of climate risk consideration in coastal land use and investment decisions. Action 1.1.5: Design a set of indicators for comprehensive Early Warning Systems in coastal zones, particularly using the physical indicators related to coastal flooding and salt content in ground waters (linked to the GTZ-supported Early Warning System efforts). <u>Activity Result 1.2 – Adaptation decision-making support tools are developed, with a particular focus on coastal zone management</u> Action 1.2.1 Introduce GIS-based risk assessment tools for key decision-makers at local and national level Action 1.2.2. Introduce Shoreline Management Planning (SMP) as planning and decision support tool for coastal regions Action 1.2.3: Develop a procedure and decision support manual on adaptation in coastal zones, based on Integrated Coastal Zones Management (ICZM) principles, for use by municipal and regional authorities Action 1.2.4. Develop and deliver a cross-sectoral training package for government	should be taken at the highest possible level 4. as many of the municipalities directly located on the coast 5.research initiatives should be conducted at all levels (universities, institutes, etc…) and be transmitted 6. to access should be free and readily available				***COST: 665,000 US$***

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
9. Number of academic institutions accessing climate-risk assessment technology and information <u>Baseline:</u> 1. There are no indicators 2. the means of integration of climate change in various sectors and national institutions need to be clarified and expressed into clear procedures 3. even though all consulted insitutions recognise the need for information sharing and coordination of research there is no agreement on the best form for such coordination, or collaborative networking 4. To be clarified during inception period. 5. There is insufficient use of decision-support tools at regional level 6. only few staff members at APAL are aware of it. ICZM principles have not been applied in Tunisia 7. 0 8. low application 9. Although there is some ongoing research,		officials at national and regional levels on climate change adaptation, SMP and ICZM as a framework for coastal adaptation <u>Activity Result 1.3 – Scientific and technical capacity is reinforced to support adaptation decision-making in the context of coastal regions</u> Action 1.3.1 Review the applicability and introduce a set of existing coastal risk assessment tools such as Dynamic Vulnerability Assessment (DIVA); Community Vulnerability Assessment (CVAT); Coastal Zone Simulation Model (COSMO) Action 1.3.2 Promote the use of satellite remote sensing technologies and data with spatial hydrological models Action 1.3.3: Undertake policy oriented and relevant research in strategic areas of concern for multi-sectoral coastal adaptation Action 1.3.4: Develop a mechanism for technical and scientific information sharing among coastal stakeholders, building on the climate monitoring function referred to in 1.1.2.					

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
it does not address the specific coastal climate change challenges 10. there is insufficient access by academic institutions .							
Output 2: *Leadership and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels built* <u>Indicators:</u> 1. Existence of a national coordination mechanism on adaptation <u>2.</u> Number of policy and investments related decisions taken and influenced by the coordination mechanism on adaptation 3. Number of key policy, legislative and regulatory documents that integrate an assessment of climate change risks and/or include concrete adaptation measures, reflected in their enforcement mechanisms and implementation budgets 4. Number of sectoral	Targets 1. by end of project 2. at least 2 3. at least 3 key policy or legislative documents fully integrate climate change considerations 4. at least 5	<u>Activity Result 2.1 – Coordination and collaboration between decision-making bodies relevant to adaptation is enhanced</u> Action 2.1.1 Perform a National Adaptation Capacity Needs Assessment focussing on individual, institutional and systemic issues, with an emphasis on coastal adaptation capacity needs Action 2.1.2 Update the mandates and statutes of relevant organizations to integrate adaptation specific functions and establish clear roles and responsibilities Action 2.1.3: Engage an interministerial dialogue to determine the best option for a national-level steering mechanism on adaptation, including costs and benefits Action 2.1.4 Modify legal texts, regulatory instruments or codes in the area of environment and natural resource management (particularly Water Code and Upcoming Environment Code) to take full account of projected climate change risks	*1. National coordination mechanism should be broadly inclusive of all sectors and stakeholders* *2.* *3.* *4.revised mandates should include decisions on costs of new functions*	*Semi-Annual reports* *Publications* *Legal texts (mandates and missions)* *Project reports*	*Every 6 months* *At end of project* *At the end of the project*	*MEDD, MDCI, APAL, DMN, MARH, UNDP*	*National consultants* *International consultants* *Travel and DSAs* *Workshops and Meetings* *Publications and Printing* **COST: 160,000 US$**

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
institutions mandated to act on climate change risks and implement adaptation options in a way that their respective roles are complementary and reinforce each other Baseline: 1. some coordination exists (National Commission on Sustainable Development) but needs to be formalized and strengthened for adaptation 2. to be clarified during inception period 3. some policy documents acknowledge importance of climate change risks, more conceptually, without offiering any practical solutions or measures to integrate climate risk management or adaptation measures into the natioanal or sectorial policies 4. Adaptation strategies are established, namely in the setors of agriculture, health and tourism under the supervision of the ministries in charge but not explicitly included in organisational mandates							
Output 3: *Climate-*	**Targets**	Activity Result 3.1 Adaptation issues are	*1. newly*	*Local*	*At the end of the*	*MDCI, MEDD,*	*National*

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
resilient policies and measures implemented in priority sectors Indicators: 1. Number of dedicated coastal adaptation measures included into the 12th and / or 13th National Development Plan 2. Percent increase in or amount of national budget allocated to coastal adaptation measures 3. Extent to which Tunisian Institute for Strategic Studies and MDCI use Climate change impact valuation methods in preparation for the 13th NDP 4. TWW standards updated and enforced 5. Total land area under improved adaptation practices 6. Number of Local Development Plans using ICZM framework Baseline: 1. reactive, infrastructure-heavy adaptation measures are included 2. some institutional budgets – Amount to be	1. 5 new measures are included 2. at least 10% increase 3. MDCI and ITES make full use of new valuation methods 4. by end of the project HACCP or other control standards designed and approved for TWW use for aquifer recharge, agriculture and tourism 5. 100 km2 of coastal land directly benefitting from the adaptation measures employed by the project 6. at least 1	<u>integrated into National Development and Land Use Planning</u> Action 3.1.1 Develop socio-economic analyses of climate impacts on sectors relevant to coastal regions, in particular: agriculture, water, tourism, transport and infrastructure Action 3.1.2. Develop and deliver a training package on socio-economic valuation of climate change impacts and CBA analysis of adaptation options Action 3.1.3 Determine cost-effective adaptation options for coastal regions, for integration into local Land Use Management Plans and the National Development Plan <u>Activity Result 3.2 On-the ground adaptation responses are tested in coastal zones</u> Action 3.2.1 Pilot technologies for aquifer recharge using treated waste-water. Action 3.2.2 Pilot the implementation of an ICAM/ICZM framework for the development of local development plans (Plan d'Aménagement du Territoire). Action 3.2.3 Pilot Coastal rehabilitation measures based on best available technologies and traditional knowledge (dune stabilization, vegetative buffer plantations etc…).	*introduced measures should be articulated according to a climate change rationale* *2.* *3.* *4.* *5. Measures implemented should be based on participatory assessments and engage local participation (including Environmental Impact Assessments)* *6. Local development plans should be developed with full community participation*	*Development Plans* *13th Development Plan* *Sectoral studies and published standards and guidelines* *National Budget*	*project*	*APAL, Ministry of Equipment, Local Communities and municipalities*	*consultants* *International consultants* *Consultants-Companies* *Travel and DSAs* *Workshops and Meetings* *Supplies* *Publications and Printing* *Equipment and rentals* **COST: 1,580,000 US$**

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
specified during inception period 3. the institutions do not use impact valuation methods 4. TWW standards are available and observed for irrigation. 5. 0 6. 0							
Output 4: *Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels* Indicators: 1. Percent increase in or amount of national budget allocated to coastal adaptation measures 2. Number of people trained on financial instruments for adaptation 3. amount of revenues from tourism sector dedicated to improved coastal management 4. Percent reductions in demand for farmers' compensation as a result of new risk-transfer scheme, particularly during the low rainfall / drought seasons and years **Baseline**	Targets 1. 10% increase 2. at least 50 (50% women) 3. 100,000K by end of project or 20% increase 4. 20% reduction	Activity Result 4.1 Sustainable national financing mechanisms and sources are explored and introduced Action 4.1.1 Develop and deliver a training program on the financial instruments for addressing the cost of adaptation for Tunisian decision-makers in the public and private sectors Action 4.1.2 Revise National Development Plan and national budget lines to incorporate priority, cost-effective adaptation options Activity Result 4.2 Innovative financial sources and mechanisms are explored and introduced on a pilot basis Action 4.2.1 Explore the feasibility of and test rainfall index-based insurance schemes in the farming systems of coastal regions (feasibility study and pilot scheme). Action 4.2.2 Explore and test the potential of eco-tourism for coastal zone operators and test mechanisms for tourism-based contributions to adaptation funding (e.g. tourism taxes, voluntary or mandatory contributions to coastal rehabilitation Action 4.2.3 Explore and test the	*1.* *2.* *3. revenues generated from tourism sector should lead to alleviating pressures on the coast and be voluntary*	*National Budget* *Census of voluntary tour operators* *Annual financial reports* Questionnaires and surveys	*Annually*	*Minitry of Tourism, MEDD, MDCI, Insurance companies, agricultural producers and local communities, UNDP*	*National consultants* *International consultants* *Travel and DSAs* *Workshops and Meetings* *Supplies* **COST: 315,000 US$**

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
1. 0 2. 0 3. amount to be specified during inception period 4. to be specified during inception period		feasibility of using voluntary or mandatory market or fiscal instruments used to bring about financial contributions from the tourism industry to coastal zone management that minimizes the adverse impacts of SLR					
Output 5: *Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels* <u>Indicators:</u> 1: Number of knowledge products produced and widely disseminated 2. Existence of an operational methodology committee 3. Number of scientific institutions participating in methodology committee and engaged in M&E process 4. Demonstrated improvements against the baseline parameters 5. Number of people trained in the development of coastal indicators 6. number of media outlets participating in covering climate change	**Targets** 1. at least 5 knowledge products 2. By mid-term 3. at least 10 4. at least two surveys from the outset of the project determining the baseline conditions (data) and at the end to show the trend of improvements in adaptive capacity of the coastal stakeholders 5. at least 25 (50% women) 6. at least 4 media outlets 7. at least 10 per month	<u>Activity Result 5.1 Project results, lessons</u> and good practices are documented and <u>shared</u> Action 5.1.1 Publish and disseminate project studies and knowledge products. This relates to knowledge management and project's link with the ALM mechanisms and other knowledge platforms Action 5.1.2 Organise an international workshop for lessons and knowledge sharing under the AAP regional component <u>Activity Result 5.2 Develop and test national adaptation indicators for establishing a comprehensive M&E framework for adaptation to monitor the progress in the framework of the project and beyond</u> Action 5.2.1 Establish a methodology committee under the aegis of the monitoring function established in 1.1.1 and the Observatoire de l'Environnement et du Développement Durable Action 5.2.2 Provide training to the OTEDD and members of the climate monitoring function and network established in 1.1. on the development of	*1. knowledge products should be relevant to current policy issues, be produced in a timely manner, and disseminated using all available means* *2.* *3.* *4.*	*Publications and reports* *Annual project reports* *Monthly website monitoring* *Articles and media reports*	*Annually* *Monthly* *Monthtly*	*MEDD, APAL, Media, UNDP*	National Consultants Communications services Workshops and meetings Supplies Publications and printing **COST: 255,000 US$**

INTENDED OUTPUTS	OUTPUT TARGETS	INDICATIVE ACTIVITIES	MEANS OF VERIFICATION			RESPONSIBLE PARTIES	INPUTS
adaptation issues as relate to the project scope 7. number of comment and discussion postings on the Tunisia AAP website **Baseline** 1. 0 2. 0 3. 0 4. 0 5. 0 6. 0 7. 0		indicators for coastal adaptation. Action 5.2.3 Define a set of targeted adaptation indicators related to coastal regions and perform a baseline assessment to collect all project related data and information. **Action 5.3 General awareness of climate change and adaptation issues is increased** Action 5.3.1 Develop a set of targeted key messages for key audiences including: parliamentarians, youth, private sector, tourists, water users Action 5.3.2 Engage the participation of NGOs and the media for delivery of the awareness program Action 5.3.3. Establish the project related website for information dissemination, advocacy and adaptation public forums					
						TOTAL	**2,975,000**

IV. ANNUAL WORK PLAN

Year: 2010-2011

EXPECTED OUTPUTS			PLANNED ACTIVITIES	TIMEFRAME								RESPONSIBLE PARTY	PLANNED BUDGET				
indicators	*baseline*	*targets*	*List activity results and associated actions*	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8		Funding Source	Budget Description	Amount		
Output 1: ***Dynamic, long-term planning mechanisms to manage the inherent uncertainties of climate change introduced***															**year 1**	**year 2**	**total**
1. System of Early Warning includes agreed indicators for coastal flooding (rainfall), SLR and salt content in groundwater.	1. There are no indicators	1.by end of project, a set of indicators are integrated into a national Early Warning System	***Activity Result 1.1 - The climate change forecasting and monitoring function at national level is strengthened***														
2. Number of institutions accessing, processing and using the climate change risk related data and information	2. the means of integration of climate change in various sectors and national institutions need to be clarified and expressed into clear procedures	2.by end of project, all relevant institutions are accessing data	Action 1.1.1 Conduct an inventory of relevant scientific and technical institutions and their potential contributions to the development of a strong climate change monitoring function and information management									APAL, MEDD, DMN, OTEDD, UNDP(in coordination with GTZ)	AAP	National Consultants	35,000	30,000	65,000

3. A government decision to institutionalise coordination arrangement / technical on climate change risk information sharing	3. even though all consulted institutions recognise the need for information sharing and coordination of research there is no agreement on the best form for such coordination, or collaborative networking	3.by end of year 2, there is a formal decision on an institutional mechanism	Action 1.1.2: Consolidate all climate change data, information and related research through government, scientific institutions, private sector and CSOs.											Workshops and Meetings	20,000	0	20,000
4. Number of municipalities and regional authorities in the coastal areas using new coastal adaptation decision-making tools	4. To be clarified during inception period.	4. at least 5 municipalities and 3 regional authorities are using new coastal adaptation tools by end of project	Action 1.1.3 Determine the best institutional arrangement for the operationalization of a climate forecasting and monitoring function that is based on collaboration and creates institutional incentives for data and information sharing											Training materials	15,000	0	15,000
5. Extent to which regional authorities and APAL decentralized offices are using the ICZM procedure and decision-support manual	5. There is insufficient use of decision-support tools at regional level	5. all regional APAL offices use new procedures by end of project	Action 1.1.4. Harmonize data, protocols and methodologies for climate change risk assessments in coastal areas, in order to promote the integration of climate risk consideration in coastal land use and investment decisions.											supplies	15,000	15,000	30,000

6. Number of people trained on CC adaptation, SMP and ICZM	6. Only few staff members at APAL are aware of it. ICZM principles have not been applied in Tunisia	6. at least 100 people trained (50% women)	Action 1.1.5: Design a set of indicators for comprehensive Early Warning Systems in coastal zones, particularly using the physical indicators related to coastal flooding and salt content in ground waters (linked to the GTZ-supported Early Warning System efforts).												international consultants	15,000	15,000	30,000
															travel and DSAs	5,000	5,000	10,000
															TOTAL AR 1.1	**105,000**	**65,000**	**170,000**
7. Number of regions and/or islands with ICZM	7. 0	7. at least 1 region	***Activity Result 1.2 – Adaptation decision-making support tools are developed, with a particular focus on coastal zone management***															
8. Extent to which APAL and its partner organisations are using risk assessment and coastal planning tools for their coastal management programmes and decisions	8. low application	8. regular use by all APAL offices by end of project	Action 1.2.1 Introduce GIS-based risk assessment tools for key decision-makers at local and national level												National Consultants	35,000	0	35,000
8. Number of new research initiatives in policy-relevant research related to coastal and aquifer resources management	9. Although there is some ongoing research, it does not address the specific coastal climate change challenges	9. at least 2 new initiatives in each region	Action 1.2.2. Introduce Shoreline Management Planning (SMP) as planning and decision support tool for coastal regions												International Consultants	55,000	0	55,000

9. Number of academic institutions accessing climate-risk assessment technology and information	10. There is insufficient access by academic institutions.	10. at least 5 academic institutions are accessing information	Action 1.2.3: Develop a procedure and decision support manual on adaptation in coastal zones, based on Integrated Coastal Zones Management (ICZM) principles, for use by municipal and regional authorities											workshops and Meetings	7,500	7,500	15,000
			Action 1.2.4. Develop and deliver a cross-sectoral training package for government officials at national and regional levels on climate change adaptation, SMP and ICZM as a framework for coastal adaptation											supplies	25,000	15,000	40,000
														travel and DSAs publications and printing	10,000 15,000	10,000 15,000	20,000 30,000
														TOTAL AR 1.2	**147,500**	**47,500**	**195,000**
		-	***Activity Result 1.3 – Scientific and technical capacity is reinforced to support adaptation decision-making in the context of coastal regions***														
			Action 1.3.1 Review the applicability and introduce a set of existing coastal risk assessment tools such as Dynamic Vulnerability Assessment (DIVA); Community Vulnerability Assessment											National Consultants	25,000	50,000	75,000

			(CVAT); Coastal Zone Simulation Model (COSMO)														
			Action 1.3.2 Promote the use of satellite remote sensing technologies and data with spatial hydrological models												International consultants	10,000	10,000	20,000
		-	Action 1.3.4: Promote policy oriented and relevant research in strategic areas of concern for multi-sectoral coastal adaptation												workshops and meetings	15,000	20,000	35,000
			Action 1.3.5: Develop a mechanism for technical and scientific information sharing among coastal stakeholders, building on the climate monitoring function referred to in 1.1.2.												supplies	30,000	30,000	60,000
															travel and DSAs	5,000	5,000	10,000
															equipment and rentals	50,000	50,000	100,000
															TOTAL AR 1.3	**135,000**	**165,000**	**300,000**
															total output 1	**387,500**	**277,500**	**665,000**

Output 2: Leadership and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels built																	
1. Existence of a national coordination mechanism on adaptation	1. some coordination exists (National Commission on Sustainable Development) but needs to be formalized and strengthened for adaptation	1. by end of project	***Activity Result 2.1 – Coordination and collaboration between decision-making bodies relevant to adaptation is enhanced***														
2. Number of policy and investments related decisions taken and influenced by the coordination mechanism on adaptation	2. to be clarified during inception period	2. at least 2	Action 2.1.1 Perform a National Adaptation Capacity Needs Assessment focussing on individual, institutional and systemic issues, with an emphasis on coastal adaptation capacity needs											aap	national consultants	30,000	15,000	45,000
3. Number of key policy, legislative and regulatory documents that integrate an assessment of climate change risks and/or include concrete adaptation measures, reflected in their enforcement mechanisms and implementation budgets	3. some policy documents acknowledge importance of climate change risks, more conceptually, without offering any practical solutions or measures to integrate climate risk management or adaptation measures into the national or sectorial	3. at least 3 key policy or legislative documents fully integrate climate change considerations	Action 2.1.2 Update the mandates and statutes of relevant organizations to integrate adaptation specific functions and establish clear roles and responsibilities												international consultants	25,000	25,000	50,000

	policies																
4. Number of sectoral institutions mandated to act on climate change risks and implement adaptation options in a way that their respective roles are complementary and reinforce each other	4. Adaptation strategies are established, namely in the sectors of agriculture, health and tourism under the supervision of the ministries in charge but not explicitly included in organisational mandates	4. at least 5	Action 2.1.3: Engage an interministerial dialogue to determine the best option for a national-level steering mechanism on adaptation, including costs and benefits											workshops and meetings	25,000	20,000	45,000
			Action 2.1.4 Modify legal texts, regulatory instruments or codes in the area of environment and natural resource management (particularly Water Code and Upcoming Environment Code) to take full account of											travel and DSAs	5,000	5,000	10,000

			projected climate change risks														
														publications and printing	0	10,000	10,000
														TOTAL AR 2.1	**85,000**	**75,000**	**160,000**
														total output 2	**85,000**	**75,000**	**160,000**

Output 3: ***Climate-resilient policies and measures implemented in priority sectors***																
1. Number of dedicated coastal adaptation measures included into the 12th and / or 13th National Development Plan	1. reactive, infrastructure-heavy adaptation measures are included	1. 5 new measures are included	***Activity Result 3.1 Adaptation issues are integrated into National Development and Land Use Planning***													
2. Percent increase in or amount of national budget allocated to coastal adaptation measures	2. some institutional budgets – Amount to be specified during inception period	2. at least 10% increase	Action 3.1.1 Develop socio-economic analyses of climate impacts on sectors relevant to coastal regions, in particular: agriculture, water, tourism, transport and infrastructure											AAP	national consultants	40,000	50,000	90,000
3. Extent to which Tunisian Institute for Strategic Studies and MDCI use Climate change impact valuation methods in preparation for the 13th NDP	3. the institutions do not use impact valuation methods	3. MDCI and ITES make full use of new valuation methods	Action 3.1.2. Develop and deliver a training package on socio-economic valuation of climate change impacts and CBA analysis of adaptation options												international consultants	25,000	20,000	45,000
4. TWW standards updated and enforced	4. TWW standards are available and observed for irrigation.	4. by end of the project HACCP or other control standards designed and approved for TWW use for aquifer recharge, agriculture and tourism	Action 3.1.3 Determine cost-effective adaptation options for coastal regions, for integration into local Land Use Management Plans and the National Development Plan												training workshops	30,000	30,000	60,000
															workshops and meetings	0	20,000	20,000

														travel and DSAs	10,000	10,000	20,000
														TOTAL AR 3.1	**105,000**	**130,000**	**235,000**
5. Total land area under improved adaptation practices	5. 0	5. XXkm2 of coastal land directly benefitting from the adaptation measures employed by the project	***Activity Result 3.2 On-the ground adaptation responses are tested in coastal zones***														
6. Number of Local Development Plans using ICZM framework	6. 0	6. at least 1	Action 3.2.1 Pilot technologies for aquifer recharge using treated waste-water.											equipment and rentals	150,000	250,000	400,000
			Action 3.2.2 Pilot the implementation of an ICAM/ICZM framework for the development of local development plans (Plan d'Aménagement du Territoire).											consultants - companies	250,000	350,000	600,000
			Action 3.2.3 Pilot Coastal rehabilitation measures based on best available technologies and traditional knowledge (dune stabilization, vegetative buffer plantations etc…).											national consultants	125,000	75,000	200,000
														international consultants	75,000	50,000	125,000
														travel and Dsas	10,000	10,000	20,000
														TOTAL AR 3.2	**610,000**	**735,000**	**1,345,000**
														total output 3	**715,000**	**865,000**	**1,580,000**

Output 4: ***Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels***																
1. Percent increase in or amount of national budget allocated to coastal adaptation measures	1. 0	1. 10% increase	***Activity Result 4.1 Sustainable national financing mechanisms and sources are explored and introduced***													
2. Number of people trained on financial instruments for adaptation	2. 0	2. at least 50 (50% women)	Action 4.1.1 Develop and deliver a training program on the financial instruments for addressing the cost of adaptation for Tunisian decision-makers in the public and private sectors											workshops and meetings	15,000	0	15,000
3. amount of revenues from tourism sector dedicated to improved coastal management	3. amount to be specified during inception period	3. 100,000K by end of project or 20% increase	Action 4.1.2 Revise National Development Plan and national budget lines to incorporate priority, cost-effective adaptation options											international consultants	15,000	0	15,000
														national consultants	25,000	50,000	75,000
														TOTAL AR 4.1	**55,000**	**50,000**	**105,000**

4. Percent reductions in demand for farmers' compensation as a result of new risk-transfer scheme, particularly during the low rainfall / drought seasons and years	4. to be specified during inception period	4. 20% reduction	***Activity Result 4.2 Innovative financial sources and mechanisms are explored and introduced on a pilot basis***														
			Action 4.2.1 Explore the feasibility of and test rainfall index-based insurance schemes in the farming systems of coastal regions (feasibility study and pilot scheme).												international consultants	30,000	20,000	50,000
			Action 4.2.2 Explore and test the potential of eco-tourism for coastal zone operators and test mechanisms for tourism-based contributions to adaptation funding (e.g. tourism taxes, voluntary or mandatory contributions to coastal rehabilitation												national consultants	60,000	50,000	110,000
			Action 4.2.3 Explore and test the feasibility of using voluntary or mandatory market or fiscal instruments used to bring about financial contributions from the tourism												travel and DSAs	10,000	10,000	20,000

			industry to coastal zone management that minimizes the adverse impacts of SLR														
														supplies	15,000	15,000	30,000
														TOTAL AR 4.2	**115,000**	**95,000**	**210,000**
														total output 4	**170,000**	**145,000**	**315,000**

Output 5: ***Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels***																	
1: Number of knowledge products produced and widely disseminated	1. 0	1. at least 5 knowledge products	***Activity Result 5.1 Project results, lessons and good practices are documented and shared***														
2. Existence of an operational methodology committee	2. 0	2. By mid-term	Action 5.1.1 Publish and disseminate project studies and knowledge products. This relates to knowledge management and project's link with the ALM mechanisms and other knowledge platforms											supplies	10,000	10,000	20,000
3. Number of scientific institutions participating in methodology committee and engaged in M&E process	3. 0	3. at least 10	Action 5.1.2 Organise an international workshop for lessons and knowledge sharing under the AAP regional component											publications and printing	50,000	20,000	70,000
														workshops and meetings	**0**	25,000	25,000
														TOTAL AR 5.1	**60,000**	**55,000**	**115,000**

4. Demonstrated improvements against the baseline parameters	4. 0	4. at least two surveys from the outset of the project determining the baseline conditions (data) and at the end to show the trend of improvements in adaptive capacity of the coastal stakeholders	***Activity Result 5.2 Develop and test national adaptation indicators for establishing a comprehensive M&E framework for adaptation to monitor the progress in the framework of the project and beyond***														
5. Number of people trained in the development of coastal indicators	5. 0	5. at least 25 (50% women)	Action 5.2.1 Establish a methodology committee under the aegis of the monitoring function established in 1.1.1 and the Observatoire de l'Environnement et du Développement Durable											national consultants	10,000	20,000	30,000
6. number of media outlets participating in covering climate change adaptation issues as relate to the project scope	6. 0	6. at least 4 media outlets	Action 5.2.2 Define a set of targeted adaptation indicators related to coastal regions and perform a baseline assessment to collect all project related data and information											communications services	5,000	0	5,000
														workshops and meetings	10,000	10,000	20,000
														TOTAL AR 5.2	**25,000**	**30,000**	**55,000**
7. number of comment and discussion postings on the Tunisia AAP website	7. 0	7. at least 10 per month	***Activity Result 5.3 General awareness of climate change and adaptation issues is increased***														

			Action 5.3.1 Develop a set of targeted key messages for key audiences including: youth, private sector, tourists, water users											national consultants	20,000	20,000	40,000
			Action 5.3.2 Engage the participation of NGOs and the media for delivery of the awareness program											communications services	15,000	10,000	25,000
			Action 5.3.3. Establish the project related website for information dissemination, advocacy and public forums											supplies	10,000	10,000	20,000
														TOTAL AR 5.3	**45,000**	**40,000**	**85,000**
														total output 5	**130,000**	**125,000**	**255,000**
														total all outputs	**1,487,500**	**1,487,500**	**2,975,000**

V. MANAGEMENT ARRANGEMENTS

The project management arrangements are intended to promote cooperation among the various sectors of the government administration, as well as with civil society and private sector. It is expected that various organizations and institutions will take on responsibility for clearly determined parts of the project, allowing for sufficient autonomy but coordinated around a common strategy.

Coordination among the various project partners will also go beyond the strict framework of the project to encompass various ongoing or planned initiatives in related areas, such as the GTZ-supported Adaptation Programme, World Bank support to Water Investment Programme, European Union, etc…

1. Leader Institution:

The **leader institution** will be le *Ministère de l'Environnement et du Développement Durable (MEDD),* more specifically the Direction Générale de de l'Environnement et de la Qualité de la Vie (DGEQV). It will be responsible for technical supervision and will play a key role for the coordination between the different stakeholders. MEDD- DGEQV will act as Secretariat and co-chair of the Project Board.

2. Executing Agency:

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. It will be responsible for the execution of the project activities. It will ensure, in close collaboration with UNDP Tunisia and MEDD, 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 side of the project (more details about timing reporting will be mentioned in the section VI).

The executing agency 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 Observatoire de l'Environnement et du Développement Durable (OTEDD), the Institut National de Météorologie (INM), as well as regional and municipal governments in pilot sites, and non-governmental partners.

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. This will be more detailed in a Letter of Agreement between the Government of Tunisia and UNDP Tunisia (Annexe 5) that will be part f the project document once signed by both parties.

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) cleared by the project director.

The executing Agency (APAL) will have a bank account for the project and in consultation with UNDP some activities will be executed through Advance, based on the annual work plan. UNDP will transfer funds according to UNDP rules and regulations. New transfers of funds are made once APAL provides technical and financial

reports for the previous transfer. Once 80% of the previous advance has been used, APAL may request replenishment.

Finally, a project director will be nominated by the Minister of Environment and Sustainable development further to the signature of the project document. The project director is responsible for approving annual work plans, approving budget revisions, and for making technical decisions for the project. Complete terms of reference outlining the responsibility of the Project Director will be communicated to the Project Director and Ministry of Environment and Sustainable Development.

3. **Project Board**:

Project Board composition will be as follows:

The Minister of Environment and Sustainable Development will co-chair the board with the UNDP Tunisia Resident Representative.

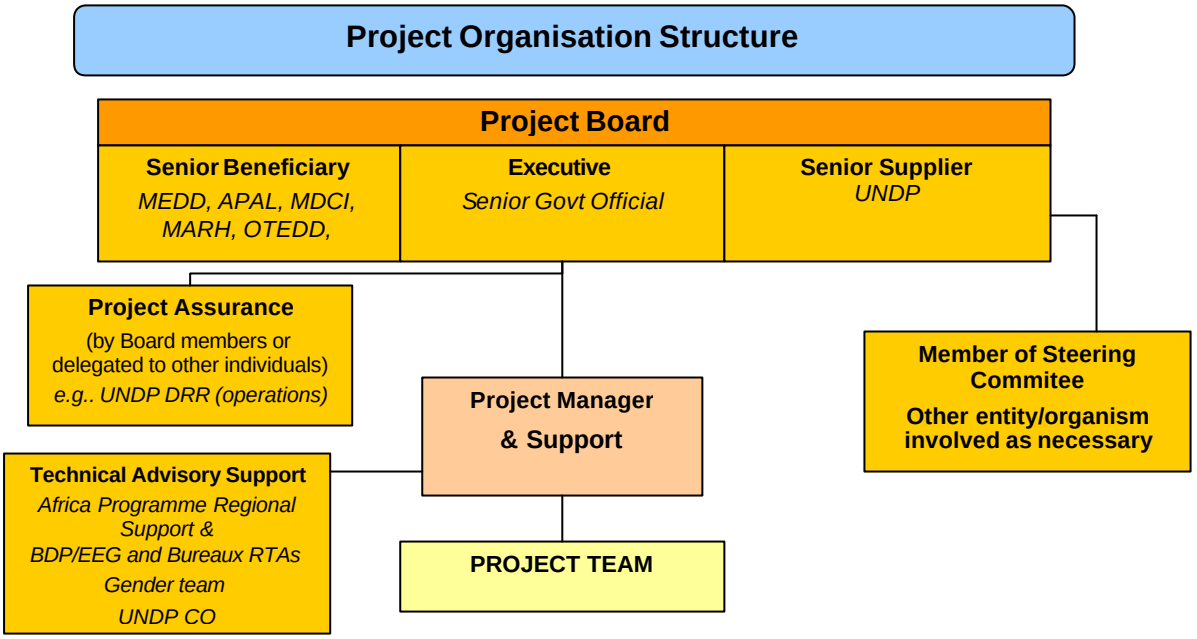
Permanent Members

Ministère de l'Environnement et du Développement Durable
Ministère du Développement et de la Coopération Internationale
Agence de Protection et d'Aménagement du Littoral
UNDP Tunisia
Ministère de l'Agriculture et des Ressources Hydriques
Ministère des Affaires Etrangères
Observatoire Tunisien de l'Environnement et du Développement Durable
L'Agence Nationale de Protection de l'Environnement;
Le Ministère de l'Equipement, de l'Habitat et de l'Aménagement du Territoire
Le Ministère du Tourisme et de l'Artisanat
L'institut National de Météorologie
L'Institut Tunisien des Études Stratégiques
Ministère de l'intérieur et Développement Local
L'Institut National des Sciences et Technologies de la Mer
Project team

Other Stakeholders

L'Union Tunisienne de l'Agriculture et de la Pêche (UTAP)
L'association des opérateurs de tourisme
L'Union Tunisienne de l'Industrie, Commerce et de l'Artisanat (UTICA)
Les ONG – Changement Climatique et Développement Durable; Association des Géographes; Alliance Femmes et Environnement
La GTZ-Tunisie (observer)

Terms of reference for the Project Board are included in Annex 4 and will be further refined during the inception period.



VI. MONITORING FRAMEWORK AND EVALUATION

Global/Regional-Level

This national project forms part of a selected number of national projects supported by UNDP under a targeted program of support, entitled" the Africa Adaptation Program". In this regard, monitoring will be undertaken within the broader context of learning and creating a platform for documenting and creating a platform for experience sharing, etc.

National-Level

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the Programme will be monitored at the national levels through the following:

Within the annual cycle

- On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below (to come).
- An Issue Log shall be activated in Atlas and updated by the Programme Manager/National Project Managers to facilitate tracking and response of potential problems or requests for change.
- Based on the initial risk analysis submitted, a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Project Progress Report (PPR) shall be submitted by the Programme Manager to the Project Board and the National Project Managers to the National Project Boards through Project Assurance, using the standard UNDP report format.
- A Project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project.
- A Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events.
- Project monitoring will be conducted using the indicators agreed for each Activity Result.
- A mid-term and a final evaluation will be conducted, focussing on impact indicators as defined

LEARNING AND KNOWLEDGE SHARING

Results from the project will be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition:

i. The project will participate, as relevant and appropriate, in UNDP-GEF sponsored networks, organized for senior personnel working on projects that share common characteristics. The **Adaptation Learning Mechanism (ALM)** will function as key electronic platform to capture project learning and adaptation impacts generated by the project. The ALM lessons learned template (to be made available by RTA) will be adapted for use by the project. To support this goal, adaptation-related activities from the project will contribute knowledge to the ALM, such as the following:

- Best practices in integrating adaptation into national and local development policy, and project design and implementation mechanisms.
- Lessons learned on removing the most common barriers to adaptation, with special attention to the roles of local partners, international partners, UNDP, and GEF in designing and implementing projects
- The conditions for success (or failure), including replication and scaling up.

ii. 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.

iii. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identification and analysis of lessons learned is an ongoing process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP-GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities.

Annually

- *Annual Review Report.* An Annual Review Report shall be prepared by the Programme Manager and shared with the Project Board and the National Project Managers and shared with the National Project Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the Quarterly Progress Report (QPR) covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.
- *Annual Project Review.* Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. The national review is driven by the Project Board and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcome(s). The regional review is driven by the Project Board.

Quality Management for Project Activity Results

Replicate the table for each activity result of the AWP to provide information on monitoring actions based on quality criteria. To be completed during the process "Defining a Project" if the information is available. This table shall be further refined during the process "Initiating a Project".

OUTPUT 1: *Dynamic, long-term planning mechanisms to manage the inherent uncertainties of climate change introduced*		
Activity Result 1.1 **(Atlas Activity ID)**	**The climate change forecasting and monitoring function at national level is strengthened**	Start Date: YR 1 End Date: YR2
Purpose	*This activity result is based on the recognition that the main barrier to adequate integration of climate information into decision-making in Tunisia is the lack of coordination, analysis*	

	and synthesis of available information. The activity would therefore aim to strengthen national-level capacity to acquire, analyse, interpret and disseminate appropriate and relevant climate change information. The result of this activity would be the operationalization of a mechanism for climate monitoring and forecast that provides legitimate and relevant input into major decisions at the national level.	
Description	Action 1.1.1: Conduct an inventory and capacity needs assessment of relevant scientific and technical institutions and their and potential contributions to the development of a strong climate change monitoring function and climate information management Action 1.1.2 Determine the best institutional arrangement for the operationalization of a climate forecasting and monitoring function that is based on collaboration and creates institutional incentives for data and information sharing Action 1.1.3 Determine the best institutional arrangement, such as technical network, for the operationalization of a climate forecasting and monitoring function that is based on collaboration and creates institutional incentives for data and information sharing Action 1.1.4. Harmonize data, protocols and methodologies for climate change risk assessments in coastal areas, in order to promote the integration of climate risk consideration in coastal land use and investment decisions. Action 1.1.5: Design a set of indicators for comprehensive Early Warning Systems in coastal zones, particularly using the physical indicators related to coastal flooding and salt content in ground waters (linked to the GTZ-supported Early Warning System efforts).	
Activity Result 1.2 **(Atlas Activity ID)**	**Adaptation decision-making support tools are developed, with a particular focus on coastal zone management**	Start Date: YR 1 End Date: YR 2
	This activity result is based on the expressed need for relevant guidance for the integration of climate information and risk assessment results into decision-making. The specific focus on coastal zone challenges (sea level rise and water stress) will determine the scope of climate change risk assessment methods and tools for adaptation decision-making	
	Action 1.2.1 Introduce GIS-based risk assessment tools for key decision-makers at local and national level Action 1.2.2. Introduce Shoreline Management Planning (SMP) as planning and decision support tool for coastal regions Action 1.2.3: Develop a procedure and decision support manual on adaptation in coastal zones, based on Integrated Coastal Zones Management (ICZM) principles, for use by municipal and regional authorities Action 1.2.4. Develop and deliver a cross-sectoral training package for government officials at national and regional levels on climate change adaptation, SMP and ICZM as a framework for coastal adaptation	
Activity Result 1.3 **(Atlas Activity ID)**	**Scientific and technical capacity is reinforced to support adaptation decision-making in the context of coastal regions**	Start Date: Yr 1 End Date: Yr 2
	The purpose of this activity is to strengthen the technical capacity to make science- and evidence-based decisions in the coastal zones as relate to water, agriculture, land use planning, infrastructure and engineering. The combination of tools, software or information would be introduced to enhance overall technical capacity and coastlal management and decision-making practice in Tunisia. The main target institution under this Activity Result is APAL. The delivery of this package of web-based tools and software will be accompanied by	

	appropriate training.
	Action 1.3.1 Review the applicability and introduce a set of existing coastal risk assessment tools such as Dynamic Vulnerability Assessment (DIVA); Community Vulnerability Assessment (CVAT); Coastal Zone Simulation Model (COSMO) Action 1.3.2 Promote the use of satellite remote sensing technologies and data with spatial hydrological models Action 1.3.3: Undertake policy oriented and relevant research in strategic areas of concern for multi-sectoral coastal adaptation Action 1.3.4: Develop a mechanism for technical and scientific information sharing among coastal stakeholders, building on the climate monitoring function referred to in 1.1.2.

Quality Criteria - Indicators *how/with what indicators the quality of the activity result will be measured?*	**Quality Method** *Means of verification. what method will be used to determine if quality criteria has been met?*	**Date of Assessment** *When will the assessment of quality be performed?*
1.Existence of a set of agreed indicators for coastal flooding, SLR and salt content in groundwater 2. Number of institutions accessing, processing and using the climate change risk related data and information 3. Existence of a government decision to institutionalize coordination arrangement on climate change risk information sharing 4. Number of municipalities and regional authorities in the coastal areas using new coastal adaptation decision-making tools 5. Extent to which regional authorities and APAL decentralized offices are using the ICZM procedure and decision-support manual 6. Number of people trained 7. Extent to which APAL and its partner organisations are using risk assessment and coastal planning tools for their coastal management programmes and decisions 8. Number of new research initiatives in policy-relevant research related to coastal and aquifer resources management 9. Number of academic institutions accessing climate-risk assessment technology and information	Annual reports Mid-term evaluation Governmental decrees or decision texts Questionnaires	Annually Once at mid-term At end of project At mid-term

OUTPUT 2: *Leadership and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels built*		
Activity Result 2.1 (Atlas Activity	**Coordination and collaboration between decision-making bodies relevant to adaptation is enhanced**	Start Date: Yr 1 End Date: Yr 2

ID)		
Purpose	*The purpose of this activity is to establish clear roles and responsibilities, as well as to empower the various governmental and civil society actors to make climate-sensitive decisions. This is in response to the need for multisectoral platform to steer and coordinate adaptation policies. Due to the cross-sectoral nature of adaptation measures and policy options in the coastal region the leadership role cannot be fully anchored in one single institution. It requires a functional, cross-cutting mechanism for consensus-based adaptation decisions*	
Description	Action 2.1.1 Perform a National Adaptation Capacity Needs Assessment focussing on individual, institutional and systemic issues, with an emphasis on coastal adaptation capacity needs Action 2.1.2 Update the mandates and statutes of relevant organizations to integrate adaptation specific functions and establish clear roles and responsibilities Action 2.1.3: Engage an interministerial dialogue to determine the best option for a national-level steering mechanism on adaptation, including costs and benefits Action 2.1.4 Modify legal texts, regulatory instruments or codes in the area of environment and natural resource management (particularly Water Code and Upcoming Environment Code) to take full account of projected climate change risks	
Activity Result 2.2	**Coordination and collaboration between decision-making bodies relevant to adaptation is enhanced**	
Purpose	*The purpose of this activity is to establish clear roles and responsibilities, as well as to empower the various governmental and civil society actors to make climate-sensitive decisions. It is in response to the recognition that a main institutional barrier to adaptation in general - and in coastal zones in particular- is at present a lack of coordination among the various national and regional institutions. A result of this activity would be increased clarity on responsibilities and accountabilities among key ministries for adaptation decision-making, as well as a mechanism for taking coordinated decisions.*	
Description	Action 2.1.1 Perform a National Adaptation Capacity Needs Assessment focussing on individual, institutional and systemic issues, with an emphasis on coastal adaptation capacity needs Action 2.1.2 Update the mandates and statutes of relevant organizations to integrate adaptation specific functions and establish clear roles and responsibilities. Action 2.1.3: Engage in interministerial dialogue to determine the best option for a national-level steering mechanism on adaptation. Action 2.1.4 Modify legal texts, regulatory instruments or codes in the area of environment and natural resource management (particularly Water Code and Upcoming Environment Code) to take full account of projected climate change risks.	

Quality Criteria -Indicators *how/with what indicators the quality of the activity result will be measured?*	**Quality Method** *Means of verification. what method will be used to determine if quality criteria has been met?*	**Date of Assessment** *When will the assessment of quality be performed?*
1. Existence of a national coordination mechanism on adaptation 2. Number of policy and investments related decisions taken and influenced by the coordination mechanism on adaptation 3. Number of key policy, legislative and regulatory documents that	*Semi-Annual reports* *Publications* *Legal texts (mandates and missions)* *Project reports*	*Every 6 months* *At end of project* *At the end of the project*

integrate an assessment of climate change risks and/or include concrete adaptation measures, reflected in their enforcement mechanisms and implementation budgets 4. Number of sectoral institutions mandated to act on climate change risks and implement adaptation options in a way that their respective roles are complementary and reinforce each other		

OUTPUT 3: Climate-resilient policies and measures implemented in priority sectors		
Activity Result 3.1 **(Atlas Activity ID)**	**Adaptation issues are integrated into National Development and Land Use Planning**	Start Date: Yr 1 End Date: Yr2
Purpose	*The purpose of this activity is to undertake steps towards a full integration of climate risks and adaptation options into the National Development Plans, aiming for integration into the 12th and/or 13th plan. The activity will aim to strengthen capacity to integrate the results of existing vulnerability studies into the Plans, as well as to undertake socio-economic analyses of climate impacts. This activity aims at promoting the adoption of broad-level climate-proof development objectives*	
Description	Action 3.1.1 Develop socio-economic analyses of climate impacts on sectors relevant to coastal regions, in particular: agriculture, water, tourism, transport and infrastructure. Action 3.1.2. Develop and deliver a training package on socio-economic valuation of climate change impacts and CBA analysis of adaptation options Action 3.1.3 Determine cost-effective adaptation options for coastal regions, for integration into local Land Use Management Plans and the National Development Plan.	
Activity Result 3.2	**On-the ground adaptation responses are tested in coastal zones**	*Start Date: Yr 1* *End Date: Yr 2*
Purpose	*The purpose of this activity is to test various adaptation measures in the coastal areas in order to determine their development benefits as well as their replicability to a broader scale. Various interventions and geographic sites will be selected on the basis of feasibility studies and pre-determined criteria to be agreed by the Project Steering Committee during the inception phase. This activity will be closely linked to activities supported by GTZ under the implementation of sectoral adaptation action plans, and supplemented by activities included under Outputs 4 and 5*	
Description	Action 3.2.1 Pilot technologies for aquifer recharge using treated waste-water. Action 3.2.2 Pilot the implementation of an ICAM/ICZM framework for the development of local development plans (Plan d'Aménagement du Territoire). Action 3.2.3 Pilot Coastal rehabilitation measures based on best available technologies and traditional knowledge (dune stabilization, vegetative buffer plantations etc…).	

Quality Criteria *how/with what indicators the quality of the activity result will be measured?*	**Quality Method** *Means of verification. what method will be used to determine if quality criteria has been met?*	**Date of Assessment** *When will the assessment of quality be performed?*
1. Number of dedicated coastal adaptation measures included into	*Local Development Plans*	*At the end of the project*

the 12th and / or 13th National Development Plan 2. Percent increase in or amount of national budget allocated to coastal adaptation measures 3. Extent to which Tunisian Institute for Strategic Studies and MDCI use Climate change impact valuation methods in preparation for the 13th NDP 4. Existence of updated and enforced TWW standards 5. Surface of land under improved adaptation practices 6. Number of Local Development Plans using ICZM Principles	*13th Development Plan* *Sectoral studies and published standards and guidelines* *National Budget*	

OUTPUT 4: *Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels*		
Activity Result 4.1 **(Atlas Activity ID)**	**Sustainable national financing mechanisms and sources are explored and introduced**	Start Date: Yr 2 End Date: Yr 2
Purpose	*The purpose of this activity is to integrate adaptation options and associated budgets into national development plans. This is to move away from a reactive adaptation approach to more proactive and anticipatory approaches to adaptation. This activity seeks to strengthen the ability of the Tunisian government to use the traditional financial mechanisms at its disposal. Under this output the project will help the government to catalyze additional funding resources for priority adaptation actions*	
Description	Action 4.1.1 Develop and deliver a training program on the financial instruments for addressing the cost of adaptation for Tunisian decision-makers in the public and private sectors Action 4.1.2 Revise National Development Plan and national budget lines to incorporate priority, cost-effective adaptation options	
Activity Result 4.2	**Innovative financial sources and mechanisms are explored and introduced on a pilot basis**	Start Date: Yr 2 End Date: Yr 2
Purpose	*The purpose of this activity is to explore and test the applicability for Tunisia of certain innovative or non-traditional mechanisms for generating funding to cover the costs of adaptive measures in coastal areas.*	
Description	Action 4.2.1 Explore the feasibility of and test rainfall index-based insurance schemes in the farming systems of coastal regions (feasibility study and pilot scheme). Action 4.2.2 Explore and test the potential of eco-tourism for coastal zone operators and test mechanisms for tourism-based contributions to adaptation funding (e.g. tourism taxes, voluntary or mandatory contributions to coastal rehabilitation Action 4.2.3 Explore and test the feasibility of using voluntary or mandatory market or fiscal instruments used to bring about financial contributions from the tourism industry to coastal zone management that minimizes the adverse impacts of SLR	

Quality Criteria *how/with what indicators the quality of the activity result will be measured?*	**Quality Method** *Means of verification. what method will be used to determine if quality criteria has been met?*	**Date of Assessment** *When will the assessment of quality be performed?*
1. Percent increase in or amount	National Budget	Annually

of national budget allocated to coastal adaptation measures 2. Number of people trained on financial instruments for adaptation 3. amount of revenues from tourism sector dedicated to improved coastal management 4. Percent reductions in demand for farmers' compensation as a result of new risk-transfer scheme, particularly during the low rainfall / drought seasons and years	Census of voluntary tour operators Annual financial reports Questionnaires and surveys	

OUTPUT 5: *Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels*		
Activity Result 5.1 **(Atlas Activity ID)**	***Project results, lessons and good practices are documented and shared***	Start Date: Yr 1 End Date: Yr 2
Purpose	*This activity includes monitoring and evaluation of project processes, outputs and outcomes, as well as the development of specific information products to be shared with other developing countries (South-South platform) using the Regional Component of the AAP.*	
Description	Action 5.1.1 Publish and disseminate project studies and knowledge products Action 5.1.2 Organise an international workshop for lessons and knowledge sharing under the AAP regional component	
Activity Result 5.2	**Develop and test national adaptation indicators for establishing a comprehensive M&E framework for adaptation to monitor the progress in the framework of the project and beyond**	Start Date: Yr 2 End Date: Yr 2
Purpose	*The purpose of this activity is to contribute to knowledge on adaptation in the country and specifically in coastal zones so as to complement the scientific capacity developed under activities in Output 1 and to serve as a basis for long-term monitoring of progress on adaptation*.	
Description	Action 5.2.1 Establish a methodology committee under the aegis of the monitoring function established in 1.1.1 and the Observatoire de l'Environnement et du Développement Durable Action 5.2.2 Provide training to the OTEDD and members of the climate monitoring function and network established in 1.1. on the development of indicators for coastal adaptation. Action 5.2.3 Define a set of targeted adaptation indicators related to coastal regions and perform a baseline assessment to collect all project related data and information.	
Activity Result 5.3	**General awareness of climate change and adaptation issues is increased**	Start Date: Yr 1 End Date: yr 2
Purpose	*This activity is based on a recognition that the adoption of many adaptation measures face obstacles due to a general lack of awareness on the part of natural resources*	

	users. The purpose of this activity would be to develop a set of key messages designed to address key social groups and to raise awareness of climate change vulnerabilities in Tunisia.
Description	Action 5.3.1 Develop a set of targeted key messages for key audiences including: parliamentarians, youth, private sector, tourists, water users Action 5.3.2 Engage the participation of NGOs and the media for delivery of the awareness program Action 5.3.3. Establish the project related website for information dissemination, advocacy and adaptation public forums

Quality Criteria *how/with what indicators the quality of the activity result will be measured?*	**Quality Method** *Means of verification. what method will be used to determine if quality criteria has been met?*	**Date of Assessment** *When will the assessment of quality be performed?*
1: Number of knowledge products produced and widely disseminated	*Publications and reports*	*Annually*
2. Existence of an operational methodology committee	*Annual project reports*	
3. Number of scientific institutions participating in methodology committee and engaged in M&E process	*Monthly website monitoring*	*Monthly*
4. number of media outlets participating in covering climate change adaptation issues as relate to the project scope	*Articles and media reports*	*monthtly*
5. number of comment and discussion postings on the Tunisia AAP website		
6. number of people trained in development of coastal adaptation indicators		

VII. LEGAL CONTEXT

This project document shall be the instrument referred to as such in the Article I of the Standard Basic Assistance Agreement (SBAA) beteewn the Government of Tunisia and the United Nationas Development Programme, signed by the parties on April 25, 1987. The host country implementing agency shall, for the purpose of the SBAA , refer to the government co-operating agency described in that Agreement.

Special Clauses.

1. The value of the payment, if made in a currency other than United States dollars, shall be determined by applying the United Nations operational rate of exchange in effect on the date of payment. Should there be a change in the United Nations operational rate of exchange prior to the full utilization by the UNDP of the payment, the value of the balance of funds still held at that time will be adjusted accordingly. If, in such a case, a loss in the value of the balance of funds is recorded, UNDP shall inform the Government with a view to determining whether any further financing could be provided by the Government. Should such further

financing not be available, the assistance to be provided to the project may be reduced, suspended or terminated by UNDP.

2. Any interest income attributable to the contribution shall be credited to UNDP Account and shall be utilized in accordance with established UNDP procedures.

   In accordance with the decisions and directives of UNDP's Executive Board:

   The contribution shall be charged:

   (a) [7%] cost recovery for the provision of general management support (GMS) by UNDP headquarters and country office.

   (b) Direct cost for implementation support services (ISS) provided by UNDP and/or an executing entity/implementing partner. The ISS are defined through the Universal Price List provided by HQ. Ax explicit letter of agreement concerning the different support services to be provided by UNDP Tunisia will be signed and attached to this project documents.

3. Ownership of equipment, supplies and other properties financed from the contribution shall vest in UNDP. Matters relating to the transfer of ownership by UNDP shall be determined in accordance with the relevant policies and procedures of UNDP.

ANNEXES

1. Summary of Coastal Vulnerability
2. Risk Log
3. Ongoing relevant projects.
4. Terms of Reference: TOR for key project personnel
5. Letter of Agreement for UNDP service supply

Le littoral tunisien face à l'élévation accélérée du niveau de la mer

Les données contenues dans la présente annexe sont extraites pfincipalement de deux études. La première étude intitulée « étude sur la délimitation du domaine public maritime en prévision d'une élévation accélérée du niveau de la mer en Tunisie », a été réalisée par le bureau d'étude «Ingénierie de l'hydraulique, de l'équipement et de l'environnement » en 2003 sur un fonds GEF-PNUD, L'objectif de cette étude était d'essayer de comprendre les modifications qui pourraient résulter d'une Elévation Accélérée du Niveau de la Mer (EANM), et surtout l'impact sur le Domaine public Maritime en considérant le scénario le plus défavorable de l'IPCC à savoir une élévation du niveau moyen de mer de 55 cm durant le siècle prochain.

La deuxième étude portant sur de « la vulnérabilité environnementale et socio-économique du littoral tunisien face à une élévation accélérée du niveau de la mer due aux changements climatiques et identification d'une stratégie d'adaptation ». a été financé par le GEF/PNUD. Elle a été réalisée par le même bureau d'étude, en janvier 2008 et elle renferme plusieurs mesures les unes d'ordre technique et les autres d'ordre institutionnel et réglementaire ainsi que des pistes pour le financement du plan d'action. Ce rapport traite certaines actions visant les infrastructures situées près du littoral, notamment les infrastructures.

1. Définition du domaine public maritime (DPM)

Le Domaine Public Maritime – DPM est défini dans la législation tunisienne par des textes réglementaires qui définissent les étendues de cet espace ainsi que les procédures de sa gestion. La Loi n°95-73 du 24 Juillet 1995 stipule toutes les dispositions relatives à la gestion du Domaine Public Maritime DPM. Le chapitre 1 de cette loi définit le Domaine Public Maritime (DPM) qui se compose du Domaine Public Maritime Naturel et Domaine Public Maritime Artificiel.

Afin de concrétiser une prise de conscience que ces espaces constituant indéniablement un tout homogène, tant sur le plan environnemental que sur le plan socio-économique, cette loi a étendu la consistance du DPM par rapport aux anciens textes beylicaux (décrets-lois de 1985 et 1987).

Cette extension du DPM du côté terre assure, d'une part, la conservation de ces espaces littoraux les plus vulnérables et, d'autre part, la prévention des risques d'érosion et de submersion du littoral.

Le code de l'urbanisme promulgué le 15 Août 1979 régit l'organisation spatiale des villes et les opérations d'aménagement.

La loi N° 94-122 du 28 Novembre 1994 portant promulgation du code de l'aménagement du territoire et de l'urbanisme et notamment son article 25 stipule les règlements spéciaux d'aménagement sur le littoral :

- En l'absence d'un plan d'aménagement approuvé, il est interdit de construire à une distance inférieure à cent mètres à partir du domaine public maritime. Cette distance peut être augmentée dans les zones menacées d'érosion maritime et chaque fois que la nécessité de protection du littoral l'impose ;
- Dans les zones couvertes par un plan d'aménagement, est fonction de la situation particulière de chaque zone, mais elle ne peut en aucun cas être inférieure à vingt cinq mètres du DPM

La délimitation du Domaine Public Maritime constitue l'une des actions principales réalisées pour le littoral tunisien. Les procédures de délimitation ont démarré en 1987 et elles sont presque achevées.

2. Contexte naturel géomorphologique

Au niveau géomorphologique, le littoral tunisien se caractérise par une richesse indéniable. Il est cependant possible d'y distinguer deux grands domaines, à savoir la façade septentrionale d'une part, et la façade orientale d'autre part, respectivement ouvertes sur le bassin occidental et sur le bassin oriental de la Méditerranée.

La façade septentrionale, directement exposée aux vents forts, souvent bordée par des versants pentus, intéressée par un réseau hydrographique dense et baignée par des eaux profondes, se distingue par son caractère accidenté et montre la morphologie la plus variée de l'ensemble du littoral tunisien. Les falaises et les rivages rocheux, mais aussi les plages et les champs dunaires qui leurs sont associés sont les éléments qui marquent le plus le paysage.

La façade orientale se distingue, par contre, par la faiblesse de sa topographie et de sa bathymétrie. Les terres qui la bordent correspondent très souvent à des plaines très basses dont les altitudes descendent jusqu'à 1 à 2m et parfois jusqu'à quelques décimètres seulement à l'approche du rivage. Ce dernier montre toutefois des modelés assez variés. Là où une topographie de collines ou de plateaux arrive jusqu'à la mer, la place est donnée à un paysage de falaises. Sur le front des plaines, terres humides du type sebkhas, chotts et marais maritimes sont majoritaires. Ces derniers sont favorisés par le phénomène de la marée qui prend de limportance dans le golfe de Gabès. Les plages ne sont, par leur extension, importantes que dans quatre sites principaux : autour de l'embouchure de Oued Chaffar, entre l'embouchure de Oued El Melah et la ville de Gabès, dans la partie orientale de l'île de Jerba et dans la façade nord-orientale de la presqu'île de Zarzis.

La cartographie et les mesures effectuées sur l'ensemble du littoral en utilisant différentes générations de cartes topographiques ont permis de dégager un linéaire total de 1670km composé de :

- Falaises (390km);
- Côtes rocheuses basses (263km);
- Plages bordées par des dunes importantes (239km);
- Plages sans dunes importantes (273km);
- Côtes basses meubles (505km).

La décomposition de ce linéaire selon les grandes divisions du littoral tunisien est présentée dans le tableau synthétique suivant :

Tableau récapitulatif des différentes morphologies du rivage selon les grandes divisions du littoral tunisien

Forme côtière	Linéaire total Km	Répartition par tronçon littoral Km	
Falaises	390	• Façade nord • Golfe de Tunis • Façade orientale nord • Façade orientale sud • Kerkena • Jerba	170 106 36 50 22 6
Côtes rocheuses basses	263	• Façade nord • Golfe de Tunis • Façade orientale nord • Façade orientale sud • Kerkena • Jerba	- 1 30 104 65 63
Plages sableuses (sans dunes littorales importantes)	273	• Façade nord • Golfe de Tunis • Façade orientale nord • Façade orientale sud • Kerkena • Jerba	60 60 99 34 5 15
Côtes basses meubles	505	• Façade nord • Golfe de Tunis • Façade orientale nord • Façade orientale sud • Kerkena • Jerba	59 30 19 288 78 31
Plages bordées par des dunes littorales étendues	239	• Façade nord • Golfe de Tunis • Façade orientale nord • Façade orientale sud • Kerkena • Jerba	46 55 90 20 4 24
Total	1670		1670

3. Caractéristiques des écosystèmes humides sur le littoral

Du fait de son linéaire côtier important, la Tunisie est relativement riche en milieux humides se répartissant sur un grand nombre d'écotopes distincts tels que les lagunes, les marais côtiers, les étangs de taille très variable permanents ou temporaires, les sebkhas côtières, les sebkhas continentales, les chotts, les estrans etc.

En excluant la plus grande partie du chott el Jerid, les marais côtiers, les plaines inondables, les barrages et les sebkhas satellites des mers de Bou Grara et des Bibans, on a une surface totale d'environ 400 000 ha de zones humides.

Les lagunes côtières.

Elles sont essentiellement représentées par des lagunes qui occupent depuis le nord jusqu'au sud du pays une superficie globale d'environ 110 000 ha. Les lagunes les plus importantes du nord au sud sont :

- Le lac Ichkeul ;
- Le lac de Bizerte ;
- Le lac de Ghar El Melh ;
- Le lac nord de Tunis ;
- Le lac sud de Tunis ;
- Lac de Khnis
- Le lac (ou la mer) de Boughrara ;
- Le lac (ou la mer) El Biban.

Ces écosystèmes lagunaires offrent une grande variété de biotopes liée :

- à leur position géographique qui les place dans des zones de climat méditerranéen humide à aride ;
- à une surface plus ou moins importante (entre 250 ha -lac de Khniss et 50 000 ha, mer de Boughrara)
- à une profondeur moyenne plus ou moins importante (entre 1 m, lac sud de Ghar El Melh, et 5 m, lac de Bizerte, mer de Boughrara ;
- à une ouverture sur la mer plus ou moins large (" oued Tinja " large d'une dizaine de mètres pour le lac Ichkeul, passe de plus d'1 km pour la mer de Boughrara et la mer des Bibans)
- à une pression anthropique très forte (lac de Tunis) ou, au contraire, quasi nulle tout au moins jusqu'aujourd'hui (mer des Bibans).

Les sebkhas côtières

Le deuxième type de zones humides littorales sont les sebkhas côtières dont les plus importantes sont :

- La sebkha Ariana ;
- La sebkha Soliman (PM hectares) ;
- La Sebkha Khelibia (PM hectares) ;
- La Sebkha Korba (PM hectares) ;
- La Sebkha Sidi Khlifa (PM hectares) ;
- La Sebkha Ben Ghayada (PM hectares) ;
- Etc.

De superficies très variables les sebkhas forment une bande quasi continue, partant du flanc est du cap Bon jusqu'à la frontière tuniso-libyenne.

Parallèles à la côte dans le cap Bon avec une largeur de quelques centaines de mètres, elles sont, par contre, de surface de plus en plus importante au fur et à mesure que l'on va vers le sud.

4. Aménagement du territoire sur le littoral

Sur la côte s'étendent de grandes agglomérations à risque: Bizerte, Tunis, Sousse, Sfax et Gabès. Ces villes renferment parmi les espaces situés entre 0 et 2 m:

- 100 % des chemins de fer ;
- 94 % des terrains à vocation industrielle,

- 87 % des salines ;
- l'infrastructure portuaire la plus importante,
- 70 % des quartiers urbains,
- 61 % des résidences,
- 33% des terrains touristiques,
- 23 % des plages,
- 69 % des ouvrages de défense de la côte.

Tunis et surtout Sfax sont largement développées sur des terrains très bas, meubles et soumis à des phénomènes d'affaissement. Elles ont de ce fait les conditions les plus précaires et apparaissent comme les plus menacées. On y trouve parmi les espaces et aménagements compris entre 0 et 2 m :

- 96 % des espaces résidentiels,
- 68 % des quartiers urbains,
- 38,8 % des terrains à vocation militaire ou industrielle,
- plus de 80 % des salines.

Etant donnée que la plus part des grandes villes tunisiennes soient sur le littoral et qu'elles abritent plus de 70% de la population du pays, une nouvelle stratégie a été suivie par la Tunisie pour exploiter une partie des zones humides comme extension aux plans d'aménagement urbain. Ces projets visent deux objectifs ;

- Dépolluer le milieu des sources de nuisance qui l'affectent ;
- Aménager les berges de ces milieux pour le profit de l'urbanisation.

Ainsi des projets ont démarré dès les années 90 par l'aménagement des berges du lac nord et continuent actuellement pour quelques sebkhas.

5. Indices observés témoignant une élévation du niveau de la mer sur le littoral tunisien

Les observations faites sur la situation du niveau de la mer, dans laquelle se trouvent aujourd'hui les vestiges archéologiques, ont permis de mettre en évidence que l'élévation du niveau marin enregistrée au cours des temps historiques a été à l'origine de modifications, parfois importantes, dans la position du rivage et dans la morphologie de la côte. Des espaces continentaux ont été perdus par érosion ou par submersion, au profit de la mer. Des terres ont connu une dégradation par salinisation. Avec l'EANM, une telle évolution doit continuer, sans doute en s'accélérant.

De même les mesures marée-graphiques faites durant le dernier siècle ont montré une élévation significative du niveau marin.

Les causes de l'augmentation du niveau de la mer à l'échelle historique sont multiples :

- l'activité anthropique sur le littoral (urbanisation, déforestation, activité balnéaires, etc.);
- l'enfoncement relatif de la croûte terrestre (mouvements géologiques, subsidences, etc.);
- une tendance naturelle à long terme (transport solides, réaction naturelle mer-littoral, etc.);
- l'augmentation globale du volume de l'océan (pour cause d'augmentation de la T° atmosphérique entraînant une fonte partielle des glaciers).

Les côtes de Tunisie renferment également les indices d'une élévation du niveau marin au cours du vingtième siècle. L'exemple de Sfax est particulièrement significatif. De fait, l'analyse des enregistrements marégraphiques fournis par le port de Sfax, depuis le début du vingtième siècle, indique que la remontée marine est bien en cours. Mais ici, elle s'est faite à une vitesse 3 à 4 fois plus rapide que la moyenne mondiale évaluée à 1,5 à 2mm/an. Cette situation doit s'expliquer surtout par l'affaissement actif du terrain de la côte sfaxienne et confirme, en fait, l'importance du rôle qui revient à la subsidence dans l'évolution historique de l'ensemble de la partie nord du golfe de Gabès.

Différentes publications rapportent que plusieurs segments des côtes tunisiennes sont en train de subir des formes de dégradation par salinisation et engorgement par l'eau du sol. Les indices variés sont dus à des aménagements relativement récents :

- *des constructions* fortement dégradées par des phénomènes d'humidité. C'est le cas de différentes habitations de front de mer comme sur la côte de la ville de Sfax. Jerba6, sur la côte sud de la ville de Sousse, et surtout sur la côte de l'archipel des Kerkena (Sidi Ammar, Sidi Messaoud, ...).
- *des arbres morts* ou agonisant au milieu de terres parfois devenues impropres à l'agriculture. Des exemples ont été cités dans le fond dans le voisinage de la sebkha Ariana, du golfe de Hammamet et surtout dans l'archipel des Kerkena.

Une des explications de cette situation pourrait être recherchée fondamentalement dans des phénomènes d'intrusion des eaux marines et un relèvement du toit de la nappe phréatique suite à une variation positive du niveau marin. Mais, encore une fois, ces formes de dégradation sont les plus nets dans les terrains soumis à des phénomènes de subsidence.

L'archipel des Kerkena vient en tête. Certains des marabouts qui ponctuent sa côte appartiennent de nos jours à des terrains régulièrement inondés et impraticables pendant une bonne partie de l'année…

De vieux habitants, hommes et femmes, natifs de l'archipel, confirment cette tendance et savent bien que leur archipel est exposé à une double menace: l'avance de la mer et l'extension des sebkhas. Ces deux phénomènes sont intimement liés l'un à l'autre

6. Les risques liées à une EANM

Avec une façade côtière s'étalant sur environ 1 300 km, les zones côtières abritent la plus grande partie des grandes villes tunisiennes et plus de 70% de la population du pays.

Le littoral est généralement présenté par un découpage faisant distinguer la côte septentrionale allant de Tabarka à Bizerte, le grand golfe de Tunis allant de Bizerte à la péninsule nord du Cap Bon, la golfe d'Hammamet allant de Kelibia à Chebba et enfin le tronçon littoral sud du golfe de Gabès allant de la Chebba aux frontières Libyennes.

Ces côtes sont tout particulièrement vulnérables à l'impact de la remontée du niveau de la mer. Cet impact est d'autant plus critique sur les côtes que sur certains secteurs se rapportant au patrimoine naturel et économique.

En plus du linéaire côtier continental, la Tunisie compte plus d'une cinquantaine d'aires insulaires. les îles les plus concernées par une élévation du niveau de la mer sont Kerkna, les Kuriades et l'île de Jerba.

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D'une façon générale, les principaux risques étant constitués par l'érosion, la salinisation et les phénomènes de submersion, la vulnérabilité est d'autant plus grande que les terres qui bordent la mer sont basses et constituées de matériaux tendres et perméables. Elle doit atteindre ses niveaux les plus élevés dans les terres humides comme les sebkhas et les marais maritimes ainsi que dans les îles très basses, espaces auxquels a été consacrée une place à part dans cette étude. Les plages sont également vulnérables surtout celles dépourvues de dunes importantes et encore plus celles qui sont déjà en cours d'érosion et/ou qui ont été affaiblies par des travaux d'aménagement. Les autres formes comme les côtes rocheuses et les falaises seront moins touchées mais elles ne manquent pas de vulnérabilité. Ceci est vrai surtout pour les falaises façonnées dans des formations géologiques tendres.

6.1- Une vulnérabilité par l'érosion

L'érosion marine constitue, déjà de nos jours, un sérieux problème dans bien des segments du littoral tunisien. Une élévation du niveau de la mer peut s'accompagner de son aggravation et son accélération. Ceci sera observé dans les différents types de côtes mais c'est dans les rivages bas et jouxtés par des aménagements importants que la situation risque de se compliquer.

Les falaises et les côtes rocheuses basses: Ces formes qu'on rencontre dans différentes parties du littoral tunisien et plus particulièrement sur la façade nord, sont, dans l'ensemble les moins vulnérables à une variation positive du niveau marin.

Les plages sableuses : Les plages figurent parmi les formes les plus sensibles à une élévation du niveau de la mer. Celles qui seraient les plus vulnérables appartiennent aux secteurs déjà fortement aménagés ainsi que celles qui vivent un déficit important au niveau de leur budget sédimentaire et celles qui ne sont pas relayées par des constructions dunaires importantes.

Une élévation du niveau marin s'accompagnera d'une exacerbation du recul des rivages en cours d'érosion et pourrait déclencher une érosion dans d'autres secteurs. Mais, les altitudes étant très faibles, ce sont surtout des phénomènes de salinisation des terres et de submersion qui doivent retenir le plus l'attention.

6.2 -Une vulnérabilité par la salinisation et la submersion

Les terres basses à risque de salinisation ou même de submersion, avec une élévation du niveau marin, s'étendent sur de grandes superficies. Elles occupent parfois le front de plaines alluviales ; mais les plus fréquentes correspondent à des terres humides du type sebkhas, chotts et marais maritimes et occupent assez souvent les bordures des lagunes.

Avec une EANM, on doit s'attendre à ce que les sebkhas deviennent, après l'érosion ou le tronçonnage du cordon littoral qui les isole de la mer, plus fréquemment inondées. Elles verraient leurs parties les plus basses et les plus proches de la mer évoluer vers des plans d'eau permanents et acquérir les caractéristiques des milieux lagunaires. Ceci est d'autant plus plausible que plusieurs d'entre elles sont déjà, avec le niveau actuel, largement envahies par les eaux marines qui les atteignent, à l'occasion de la saison des tempêtes. D'après les premières estimations, les espaces qui risquent d'être annexés à la mer sont importants. Dans le seul fond du golfe de Hammamet par exemple, ils sont estimés à quelque 4500ha (1900 ha pour la Sebkha de Khlifa, 1400 hectares pour la sebkha de Halk El Menjel et 1200ha pour la sebkha de Skanès).

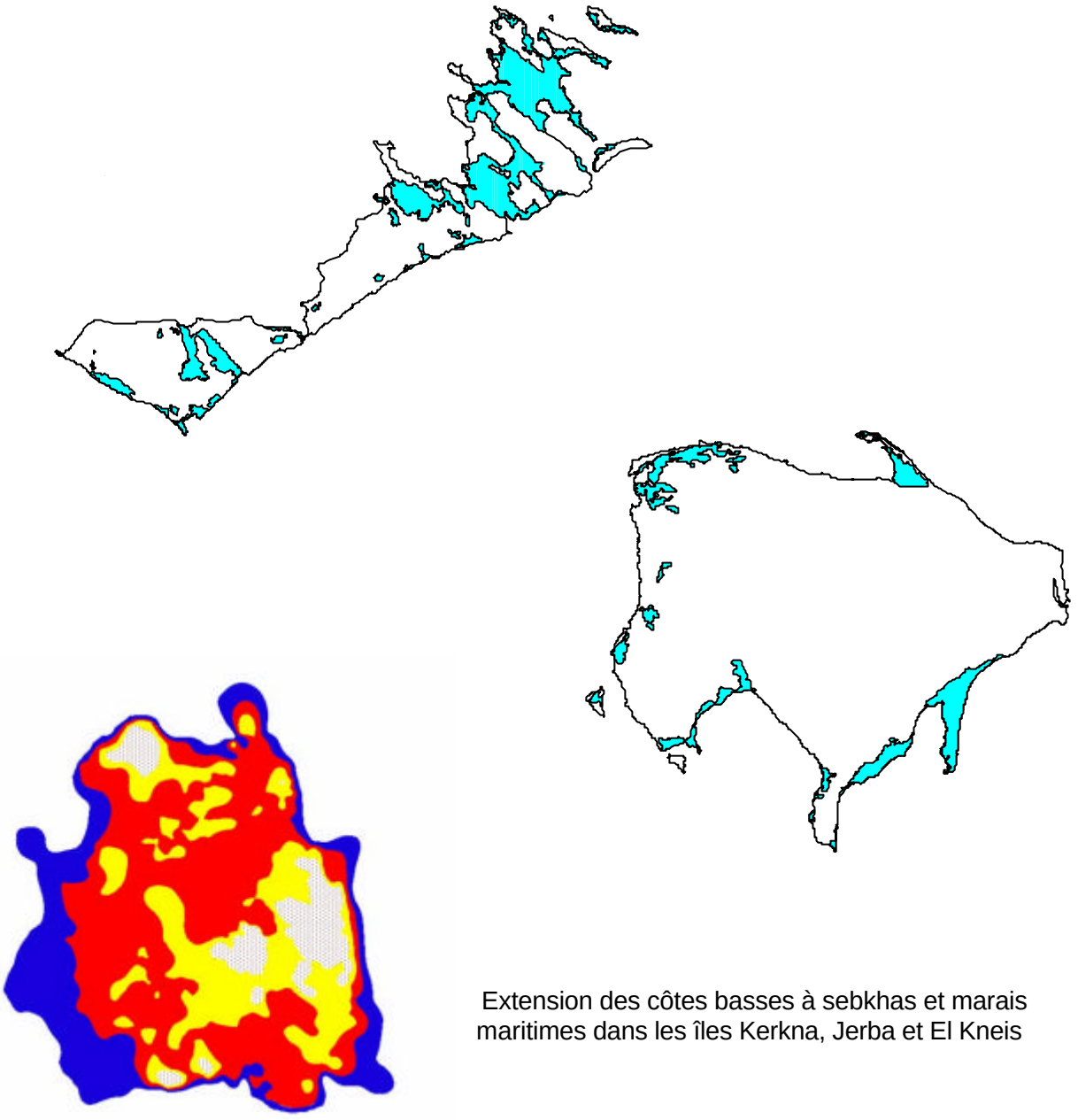
6.3- La remarquable vulnérabilité des îles de la façade orientale

Si les îles de la façade septentrionale ont, à part le petit îlot de Chekli dans la lagune de Tunis, une topographie accidentée et des rivages à falaises souvent taillées dans des roches résistantes, celles de la façade orientale sont toujours basses, voire très basses, et se caractérisent, dans bien des cas, par des rivages meubles ou évoluant dans des matériaux tendres. Aussi leur vulnérabilité apparaît-elle à la fois à travers le risque d'érosion, la salinisation des terres et la submersion. En fait, la situation variera en fonction du comportement du sol côtier ainsi que des formes d'aménagement.

A Jerba par exemple, c'est plutôt le risque de l'érosion, surtout dans les rivages sableux, qui doit poser les problèmes les plus épineux. Ces rivages sont en effet bordés par une lourde infrastructure hôtelière. Dans les Kerkna, par contre, c'est surtout le risque de submersion qui doit venir en tête. Car, la topographie est particulièrement écrasée et le sol connaît un affaissement assez actif. Les

calculs indiquent qu'avec une élévation marine de 50cm, cet archipel perdrait 4500ha ce qui représente environ 30% de sa surface totale évaluée à 15200ha.

En fait, les risques sont les plus graves dans les îles qui, en plus de leurs rivages meubles et leur topographie très basse, sont peu étendues. C'est le cas dans les îles Kuriates et Kneiss.



Extension des côtes basses à sebkhas et marais maritimes dans les îles Kerkna, Jerba et El Kneis

Au total, il apparaît que les côtes tunisiennes montrent, par leur évolution géomorphologique actuelle, différentes formes de faiblesse. Une élévation du niveau marin d'une cinquantaine de centimètres pourrait compromettre différents espaces. Le niveau de vulnérabilité est le plus grand dans les côtes basses meubles. Les dégâts les plus lourds sont à attendre dans les rivages fortement anthropisés.

7. Evolution avec l'EANM

7.1 Le milieu marin

Pour *la zone nord* les impacts de l'EANM, vont se manifester au niveau des biocénoses qui vont subir des effets conjugués d'immersion (profondeur) et du faible éclairement, les formations biogène littorales peuvent se dégradé (les trottoirs à vermets,…), les herbiers sur roches et limites inférieures et supérieures vont se déplacer, en ayant comme contrainte la fiabilité ou non du substrat a conquérir.

Cependant d'une façon globale la biodiversité de la zone ne sera affectée ; la pollution limitée et les effluents anthropisé resteront limité à quelques rivages ou les eaux seront partiellement eutrophisées.

Dans *le golfe de Tunis*, les impacts de l'EANM, vont se manifester en premier au niveau des rivages avec d'avantages de zones submergés, quant aux biocénoses, celles lttorales continueront a être déstabilisées par le transit littoral et la fréquentation des plages, alors que celles du large n'en subissent que l'atténuation de l'éclairement ; la biodiversité du golfe sera légèrement affecté en terme de répartition, maintenue en terme de bilan. La pollution du golfe sera d'ordre urbain, avec une eutrophisation des eaux conséquente aux apports des oueds d'une par et des émissaires des STEP d'autre part.

Pour le *golfe d'Hammamet* les impacts de l'EANM, sera observé au niveau des trait des cotes ou les lagunes littorales peuvent se transformer en «baies » plus ou moins ouvertes, la frange littorale sableuse (zone de déferlement) ne subira pas d'effets en terme de biocénose déjà très limité, par contre un peu plus au large les herbiers de posidonies et les pelouses à cymodocées pourront bien remontés en raison de commodité du substrat. La biodiversité du golfe de Hammamet ne sera pas affectée en dehors d'éventuels effets secondaires de la pêche.

Dans *le golfe de Gabès* les impacts de l'EANM affecteront la biocénoses littorales (biocénoses de l'estran) qui va subir les effets du décalage des limites du marnage, les espèces vont remonter ou redescendre a la conquête des nouveaux biotopes, la nature et le texture de substrats sera cruciales pour ces nouvelles implantations. Dans la zone centrale du golfe de Gabes les littoraux pollués défavorisent toute redistribution des biocénoses ; la biodiversité dans le golfe de Gabes continue à subir les effets récurrents de la pollution et de la pêche, abstraction faite de la zone sud-est du golfe ou l'équilibre biocénotique sera maintenu. Quant à la qualité des eaux, et tenant comptes des mesures en cours pour la maîtrise des rejets industriels notamment ceux du phosphogypses, les seuls effets seront liés aux phénomènes d'eutrophisation qui seront soutenues par les rejets urbains, portuaires, touristiques et aquacoles, peu ou pas contrôlées.

7.2 Les zones humides littorales

L'Ichkeul : L'extension de la superficie du lac et l'augmentation de la colonne d'eau se traduiront par un effet bénéfique au niveau de la flore ichthyque en favorisant les paramètres de recrutement pour les espèces euryhalines, cependant même si les marais de Joumine et de Sejnane vont s'étendre la salinisation probable ne jouera pas en faveur d la flore et de l'habitat d'accueil des l'avifaune migrante ; la valeur patrimoniale du Parc National de l'Ichkeul sera certainement affectée. La productivité du lac restera plutôt en rapport avec les successions années humides – années sèches car le flux sortant (assuré par les eaux pluviales) est vital pour le recrutement des poissons et essentiel pour tamponner la salinité estivale du lac. D'ailleurs l'avifaune, l'une des composantes écologiques principales du lac Ichkeul, sera aussi sujette à l'adoucissement cyclique des marais plutôt que de leurs extensions. Quant à la fréquentation du parc nous supposons qu'elle ne sera pas affectée.

Le *lac de Ghar El Melh* sera certainement bénéficiaire de l'EANM, l'extension probable de l'ordre de 2000ha représentera une extension directe du plan d'eau et la position de ce milieu en première ligne vont favoriser le rendement halieutique. Ainsi avec la productivité actuelle de 29kg/ha la production de pêche atteindra les 145 Tonnes soit une progression de 76%.Le port de pêche lagunaire sera plus actifs et plus accessible, une répercussion sur l'emplois sera aussi conséquente soit environ.

Le delta de la Mejerdah : Les terres très basses potentiellement submersible forment une bande quasi continue jusqu'à Raoued couvrent une superficie de quelque 2600ha, avec la réduction des apport solides (transit littoral), ces nouveaux milieux évolueront a moyen terme en lagune équilibrée,

cependant avec une profondeur inférieure à 1m nous supposons que l'aspect halieutique reste limité, une productivité sera estimée au minimum lagunaire soit 7kg/ha ; ce milieu pourront alors contribuer à une production de 18 tonnes par an moyennant la pêche au filets droits ou de pêcheries fixes. Le port de Kalaat El Andalous, pourra devenir prospère et plus accessible, la population maritime pourra doublé d'effectif, en se basant sur la flottille non motorisée à Kalaat El Andalous nous estimons cette progression de 45marins pêcheurs et 18 unités dans cette future lagune ; cette lagune de part sa position englobant le lit de la Mejerdah pourra être très favorable au recrutement des anguilles qui représentent l'espèce la plus lucratives.

Sebkha Slimène : De surface actuelle de 220 hectares, elle se transformera en lagune de 270 hectares entourée de 450 hectares de zones humides basses ; la richesse halieutique sera comparable à celle de Ghar El Melh tenant compte des caractéristiques du milieu, la productivité projetée est de 25kg/ha soit environ7 tonnes par an, avec une implantation effective d'une pêche lagunaire pérenne et par suite d'une communauté de pêcheur.

Sebkha Hammam Laghzaz : De surface actuelle de 90 hectares elle se transformera en une lagune de 50 hectares entourée d'une zone humide de 60 hectares. Cette sebkha littorale aura tendance à la lagunarisation mais les superficie limité, ce qui lui confère une développement d'activité halieutique semblable à celui des lagunes de faible productivité, soit 7kg/ha, la production escomptée ne dépassera pas les 0,3 tonnes.

Le chapelet du CapBon : De surfaces actuelles de l'ordre de 460 hectares, plus de 10 sebkhas se transformeront en lagunes de 730 hectares entourées des zones basses humides de 730 hectares. L'ensemble de ces sebkhas constituera une chaîne lagunaire plus ou moins en rapport avec des oueds favorisant le recrutement des poissons, leur productivité halieutique pourra être estimée à une moyenne de 7kg/ha, soit une production annuelle probable de 5 tonnes. D'autre part vue l'extension Est – Ouest des ce milieux ce sont des petites agglomération des pêche qui vont s'établir sans lien avec le port côtier de Beni Khiar.

Sidi Khlifa et Hal El Menzel : Les espaces qui risquent d'être annexés à la mer s'étendent sur quelques 1900 ha au niveau de la Sebkha Sidi Khlifa. Une partie de la sebkha de Halk El Menjel de 1400 hectares se transformera en lagune permanente ; La biocénose plutôt saline sera transformée en biocénose lagunaire euryhaline et eurytherme la biodiversité sera plus riche et variée, l'eutrophisation sera dépendante des activités humaines environnantes. Dans cet ensemble de sebkhas celle de Sidi Khlifa restera peu productive car peu profonde et plutôt stagnante, par contre le 1400 ha de celle de Halk El Menjel formeront une véritable lagune de productivité semblable à celle de Ghar El Melh soit 25kg/ha, ainsi nous pouvons estimer sa production à 35 tonnes par an dont les anguilles, les muges, loup et dorades ; la proximité de cette lagune aux implantations aquacoles pourrait être bénéfique pour les recyclage des eaux de rejet.

Lac de Monastir : La lagune de Khniss déjà altérée (du point de vue morphologique) sera intégrée dans le contexte de la baie de Monastir (entre le cap Monastir et la presqu'île de Ras Dimes), l'hydrodynamisme littoral sera amélioré avec l'évolution de la tranche d'eau, l'eutrophisation sera plus diffuse. L'EANM contribue efficacement à l'amélioration de la qualité des eaux. La biocénose littorale, désormais de la lagune, sera plutôt rétablie favorisé par le volume des échanges avec la mer.

Les marais du golfe de Gabès : Ce seront surtout les sebkhas qui vont absorbés cette évolution, avec transformation en «chott » ou les saturations en sel seront plus perceptibles. D'autres parts les estuaires des oueds (Akarit, El Meleh, Demna, Sourrak, Echaaba etc.) seront transformés en petites « criques » ou lagunes jouant le rôle des frayères en absence de pollution. Sur le plan quantitatifs les superficie productives « estuaires » resteront limités (environ 50ha pour l'ensemble) mais la productivité pourrait être élevé. Quant aux sebkhas et chott une exploitation éventuelle pour l'élevage

de crevette pourra être envisagée. L'affectation de l'estran perturbera l'équilibre de mollusques notamment les bivalves fouisseurs (dont les palourdes).

Les Kerkena : L'archipel se transformera en un grand nombre d'îlots. La superficie qui sera gagnée par la mer peut être évaluée à environ 4500 hectares ce qui représente environ 30% de la surface totale de Kerkena 15 200 hectares, dans ce contexte on assise à une transposition des pêcheries, la pêche traditionnelle sera plus démunie, la pêche côtière motorisées sera bénéficière, Mise à part l'impact économique pur, l'effet social dans le secteur de la pêche reste assez limité du fait que les Kerkeniens possèdent une grande aptitude d'adaptation aux différentes techniques de pêche.

Les marais d'ElKneis : Une surface de l'ordre de 400 hectares de l'île El Bessila sera submergée par la mer et quelques îlots ne dépassant pas les 150 hectares. Dans ce milieu la marinisation affectera des îlots d'importance ornithologique considérable, mais restera sans effets sur l'activité des pêches dans cette a marnage prononcé, la production de palourde, en pêche à pieds pourra se développer.

Jerba : Les terres humides classées dans la catégorie des terres submersibles ont une superficie de l'ordre de 3 400 hectares. Elles correspondent en fait aux principaux schorres et aux sebkhas les plus basses essentiellement celles de Ras Errmal, Lella Hadria et Bin El Ouediane, les submersions prévues favoriseront les pêcheries maritimes et l'amélioration de la qualité des eaux côtières, la pêcheries à Cherfias, en déclin à Jerba, aurons plus de milieux favorables.

8. Les ressources naturelles

8.1 Les ressources littorales traitées sont les ressources en eau et les ressources halieutiques.

Les ressources en eaux littorales

Etat actuel : Les nappes littorales occupent un pourcentage important de l'ensemble des nappes phréatiques de la Tunisie. Elles fournissent à peu près la moitié de l'eau provenant de l'ensemble des nappes peu profondes. Il s'agit souvent de petites entités hydrogéologiques mais qui ont joué et jouent encore un rôle important dans l'approvisionnement en eau des régions littorales notamment celles de la frange orientale où la demande en eau est importante et où le climat est dominé par l'aridité.

Ces aquifères côtiers soufrent aujourd'hui de la forte pression anthropique qui se traduit par la surexploitation et la dégradation de la qualité des eaux de ces nappes.

La rareté relative des ressources en eau sur le littoral, leur fragilité et leur inégale répartition font naître un risque majeur de pénurie, qui, en dépit de toutes les tentatives pour accroître l'offre, semble inéluctable. En dépit de tout cela, l'accélération de la hausse des niveaux de la mer est en train de mettre en danger ces ressources fragiles malgré des décennies d'efforts de maîtrise consacrés à la mise au point de techniques et à la réalisation d'aménagements visant à améliorer la disponibilité de l'eau.

Malgré ces efforts de maîtrise consacrés à la mise au point de techniques et à la réalisation d'aménagements visant à améliorer la disponibilité de l'eau (ou à réduire ses effets néfastes), cette dernière demeure une limite contraignante pour le développement des activités humaines,. Comme beaucoup d'autres ressources considérées comme renouvelables, l'eau est au cœur des interactions entre nature et société.

En effet, les ressources phréatiques côtières déjà limitées et largement exploitées pour répondre à la croissance des besoins impose le recours accru aux ressources dites non conventionnelles. Ceci crée une situation de concurrence entre usages sectoriels et une marchandisation croissante sinon galopante des ressources. Dans ce contexte, les politiques de l'eau vont connaître certaines

inflexions les obligeant à mettre en place une nouvelle stratégie nationale de mobilisation et d'économie de la ressource qu'il faille entreprendre le plus vite possible.

Ceci entre dans ce que l'on appelle « une politique d'adaptation » qui est le réajustement obligatoire dans les systèmes économiques, sociaux ou écologiques, réponse à ce stimuli climatique actuel ou futur et à ses effets et impacts. Cela implique des changements dans les processus, pratiques ou structures, pour modérer les dommages potentiels associés aux changements climatiques et surtout à l'altération des sources côtières par l'intrusion marine. Cela implique aussi des réglages pour réduire la vulnérabilité des communautés, des régions et des activités sur le littoral affecté. Cette adaptation a deux rôles importants simultanés : l'estimation des impacts et des vulnérabilités, et le développement de réponses à ces impacts en créant de nouvelles valeurs environnementales, économiques, sociales et culturelles importantes.

Vulnérabilité : L'élévation accélérée du niveau de la mer dans le cadre des Changements Climatiques, et en absence de mesures efficaces d'adaptation, aura comme conséquence de la dégradation de ces aquifères côtiers. La dégradation des nappes phréatiques littorales aura des conséquences indirectes sur les nappes profondes. Les exploitants, face à la dégradation des nappes phréatiques, vont se rabattre sur les nappes profondes pour satisfaire leurs besoins en eau. Ce qui augmentera la pression anthropique sur ces nappes.

L'élévation accélérée du niveau de la mer découlant des Changements Climatiques affectera inéluctablement les ressources en eau du domaine côtier et particulièrement les nappes phréatiques. Toutes les nappes littorales sont menacées, mais à des degrés plus ou moins marqués, par l'intrusion d'eau marine. La vulnérabilité de ces nappes à l'EANM est accentuée par le fait que ces dernières se situent dans un domaine de forte concentration de la population et d'activités économiques grandes consommatrices d'eau et qu'elles se trouvent aujourd'hui fragilisées par la forte pression anthropique.

Le grand nombre de nappes littorales à bilan d'exploitation négatif témoigne de cette forte pression. La plupart de ces nappes se situent en outre dans des régions pauvres en eau, mais dont les besoins sont importants. Certaines nappes de la Tunisie orientale montrent déjà une salinité qui augmente en direction du littoral. Ceci peut être un indicateur de l'existence d'un «biseau salé» au niveau de ces nappes. Le risque de la dégradation des nappes phréatiques suite à l'élévation accélérée du niveau de la mer concerne tous les gouvernorats côtiers. Ce risque est particulièrement marqué pour les nappes de l'Ariana, de la plaine d'El Haouaria, de la côte orientale, de Grombalia, de toutes les nappes du Sahel (Bouficha, El Kheïrat, Oued Laya, Hergla, Chott Meriem, synclinal Msaken), et celles de Sfax et Gabès. La superficie fortement vulnérable des nappes côtières à l'EANM est très importante, elle est de 500 ha pour la nappe de Grombalia, 6600 ha pour celle de la côte orientale et de 36000 ha pour les deux nappes de Gabès.

L'intrusion marine dans les nappes phréatiques est l'un des impacts les plus inquiétants. Cette intrusion menace directement et à court terme des aquifères d'eau douce qui sont une ressource pour les besoins domestiques et pour l'irrigation agricole. Elle affectera la qualité et de ce fait la quantité de l'eau disponible. La perte du potentiel en eau des nappes phréatiques littorales suite à l'intrusion marine se situera autour de 53 % du potentiel hydrique actuel de ces nappes.

Ceci aura forcement des impacts négatifs sur le plan socio-économique.

- Le secteur agricole sera le premier secteur affecté par la dégradation de ces nappes. Un traitement pour produire l'eau douce potable est techniquement toujours possible, mais l'utilisation de la nappe pour l'irrigation est irrémédiablement condamnée. Il est à noter qu'une grande partie des produits alimentaires est produite dans les zones côtières. La dégradation des ressources hydriques littorales menace cette production.
- La plupart des grandes villes sont situées le long des côtes et sont très vulnérables à la détérioration de la ressource en eau. Une dégradation de cette ressource aura des conséquences négatives sur la population ainsi que sur l'économie de ces régions

côtières. En outre, les problèmes de l'agriculture conduiront à la migration interne de la population vers les centres urbains. Les conditions de vie de la population littorale, l'essor de l'urbanisation et la croissance du secteur touristique sur le littoral seront touchés.

- ❖ L'EANM désorganisera en plus les systèmes d'assainissement, de drainage des eaux de pluie et d'évacuation des eaux usées. Ce qui aura également des répercussions sur la santé publique
- ❖ Dans ce contexte, et en absence d'une stratégie d'adaptation efficace, l'eau deviendra un facteur limitant pour le développement des activités humaines
- ❖ La dégradation des ressources phréatiques côtières (ressources modestes et déjà largement exploitées) imposera le recours accru aux ressources profondes qui souffriront à leur tour de la pression anthropique.

8.2 Les ressources halieutiques et l'aquaculture

Etat actuel

La pêche : à l'instar des autres pays méditerranéens, les progrès technologiques et le développement des techniques des pêches en Tunisie ont contribué à affaiblir les stocks des ressources halieutiques. Les grands chalutiers, pour être plus rentables, doivent augmenter l'effort de pêche et réaliser des captures importantes. Actuellement, 10750 unités de pêche dont *416 pêchant* au chalut opèrent sur les côtes tunisiennes. La moitié de cet effectif travaille dans le golfe de Gabès. Ce dernier a été très affecté par cette concentration des unités. Le résultat fût que dans certaines zones, l'effort de pêche optimal se trouve dépassé de plus de 30% et les rendements de la pêche ainsi que la rentabilité des navires ont énormément régressé. Aussi, la biodiversité a diminué. Le couvert végétal notamment en ce qui concerne les herbiers de posidonies, qui formaient un paysage continu au niveau des profondeurs allant jusqu'à 30 m, est rare de nos jours. De nombreux facteurs sont à l'origine de l'appauvrissement des stocks halieutiques (102.000 tonnes produites en l'an 1988, 84 000 en 1996, 95 000 tonnes en 2000 et 108 000 en 2005) et de la diminution de la biodiversité dont l'intensification de l'effort de pêche, le non-respect des zones et des périodes de pêche réglementées par les textes et l'utilisation des engins prohibés.

Vulnérabilité à l'EANM

La pêche : Les ressources halieutiques seront affecté dans le sens global en tant qu'élément de la biodiversité marine, le remaniement trophique et spatial des stocks halieutiques se traduira par des déclins au niveau des pêcheries traditionnelles côtières (actuellement en difficultés); certaines pêcheries du large pourront prospérés. L'impact pourra aussi être figuré par les variations progressives de la composition des captures cas probable de dominance d'espèces exotiques (à caractère tropicale) par rapport aux espèces locales. Dans les lagunes, ou l'activité halieutique est pérenne, l'impact de l'EANM, sera plutôt positif, sachant qu'il va favoriser le recrutement et les migrations trophiques des poissons, la productivité des lagunes évoluera positivement. Sur le plan économique deux aspects doivent être mis en exergue :

- ❖ L'accessibilité aux nouvelles pêcheries (issus des remaniements trophique et des habitats), qui plus difficile certainement plus lointaines, avec tout ce qui en suit en terme de techniques et surtout des frais notamment le carburant. La variation de la composition des captures qui sera traduite directement par une variation de la valeur marchande, les espèces exotiques favorisées par le réchauffement climatique, possèdent des valeurs marchandes moins compétitives que celles locales.

Pour les lagunes l'exploitation sera plus rentables le rendement à l'hectare sera plus élevé.

9. Les infrastructures littorales

9.1 Les infrastructures portuaires et de protection côtière

Deux types d'infrastructures ont été considérés à savoir : Les ouvrages de protection côtière et les ouvrages portuaires.

Les ouvrages de protection côtière. Ils se répartissent entre murs ou voiles de soutènement, brise-lames isolés en mer, digues à talus de protection en enrochements ou épis de protection. Il est relevé environ 1.4 % de linéaire de côtes protégées par rapport au linéaire total du littoral, dont les digues à talus de protection en enrochements représentent la majeure partie (environ 55 ? du linéaire total). La protection par des digues à talus en enrochements constitue une défense de côte longitudinale qui est due à des impacts directs sous l'effet de l'action de la mer ou indirects par le biais d'autres aménagements portuaires riverains. La protection par des brise-lames isolés en mer représente 25 % du linéaire total dont 60 % se situent dans les plages Nord et Sud de Tunis, site jugé très vulnérable ; ces ouvrages sont coûteux et nécessitent l'assurance d'un entretien préventif et d'un contrôle continue. Il en est de même pour les épis de protection contre l'érosion marine des côtes et qui sont dus principalement à l'aménagement des ports adjacents.

Les ouvrages portuaires : La Tunisie dispose de plusieurs ports et site abri de pêche (22 ports côtiers ,10 ports de pêche profonde et 9 site abri de pêche), de 6 ports de commerce et de quelques ports plaisance, répartis sur le littoral. Bien que le nombre des ports de commerce représente environ 15% de celui des ports de pêche, ces premiers disposent d'une infrastructure et superstructure plus importante que ces derniers. De ce fait, les conséquences de l'EANM entraînent des retombées économiques plus importantes et par conséquent des coûts de pertes économiques notables qui risquent de s'ajouter à des coûts de gestion et de maintenance qui sont difficiles à prendre en charge. La majorité de ces ports sont protégés par des digues à talus en blocs d'enrochements ou par des blocs artificiels (Accropodes, tétrapodes, etc..). Ces digues à talus représentent des ouvrages souples et qui sont très vulnérables à toute EANM qui engendre un accroissement d'énergie de la houle et possibilité de submersion de ces ouvrages, et par conséquent, ils risquent d'être endommagés et déstabilisés.

La vulnérabilité est axée principalement sur le Golfe de Tunis qui a été considéré très vulnérable, le Golfe de Hammamet moyennement vulnérable, le Golfe de Gabès et l'extrême Sud peu vulnérable. Cependant, L'île de Kerkena est jugée très vulnérable par comparaison à l'île de Djerba.

Par ailleurs, il a été conclu que la vulnérabilité du littoral tunisien est une fonction indissociable des aménagements maritimes existants et dont leurs impacts sont certain et en cas d'une EANM leurs ampleurs risquent d'être aisément accentués.

En effet, et d'après l'analyse de l'état actuel des ouvrages portuaires, il s'avère des problèmes divers occultés par les différents ports (Sédimentation, déstabilisation, agitation, etc ..). Toute EANM ne fait qu'aggraver la situation et porte atteinte à la sécurité des installations et des bateaux ou navires qui sont abrités dans l'enceinte du Port.

La vulnérabilité des ouvrages portuaires peut se subdiviser en trois catégories principales à savoir :

- Les problèmes d'érosion du littoral et de sédimentation dans les ports ;
- Les problèmes liés à l'accès des bateaux ou navires aux Ports et à l'agitation dans les bassins et la passe d'entrée;
- Les problèmes liés à la stabilité des ouvrages de protection.

La ville de Sfax: Une grande partie de la zone humide de Thyna, qui s'étend sur quelques *1500 hectares*, sera en grande partie annexée à la mer. Elle aura aussi une extension au dépend de la

zone urbaine de Tyna et de Sfax Sud. L'impact important est l'action sur l'activité de production du sel de l'usine de fabrication de sel COTUSAL, concessionnaire principal de l'ensemble de la zone humide de Thyna. Les zones les plus vulnérables se situent au nord de Taparoura et juste au sud du port de pêche. Dans ces zones on assistera à une submersion partielles des zones basses (*1200 hectares*) et par suite à une perturbation du système d'assainissement de ces zones et en particulier :

- Les stations de pompage des zones côtières qui seront éventuellement submergée et l'entrée des eaux de mer dans leurs bâches d'aspiration;
- Les conduites de refoulements ;

Les deux stations d'épuration Sfax nord et Sfax Sud par l'entrée éventuelle des eaux mer salées dans leurs procédés d'épuration.

VULNERABILITE SOCIO-ECONOMIQUE

Les impacts sont de deux natures : les effets socio-économiques directes et les coûts de dégradation environnementale qui traduisent les effets indirectes de la détérioration progressive des écosystèmes.

10.1 Les impacts directs

L'impact socio-économique de l'élévation accélérée du niveau de la mer due aux changements climatiques est approché à travers ses effets directs sur l'infrastructure de base et les principaux secteurs d'activités économiques concernés, l'agriculture, le tourisme et l'artisanat.

Les effets directs considérés sont approchés à travers d'une part, la perte du potentiel productif des secteurs concernés et d'autre part, la variation des productivités des principaux actifs naturels étudiés, l'eau, le sol et la plage.

De plus, les effets pris en ligne de compte, hormis les aquifères pouvant être pollués par l'eau de mer, sont estimés sur une bande littorale de 1,5 km de largeur.

Ainsi, les impacts socio-économiques directs sont composés de trois catégories.

10.1.1 Pertes en capital économique productif

La première concerne la perte en capital productif mis en place. Ce dernier peut être à son tour décliné en plusieurs sous composantes :

- Capacité de production agricole
- Végétation naturelle
- Ressources hydriques souterraines
- Zone d'habitat
- Infrastructure hôtelière
- Infrastructure de base

L'appréciation de la perte

Pertes annuelles de production

La deuxième catégorie d'impacts concerne les pertes annuelles de production, essentiellement dans trois secteurs d'activités : l'agriculture, la pêche et le tourisme.

Les simulations effectuées permettent d'évaluer la perte de production annuelle à environ 180 MDT, ce qui représente autour de 0,5% du PIB de 2006.

Impacts sur l'emploi

La troisième catégorie d'impacts, consécutives à la perte de production, est la variation de l'emploi. On estime à environ 35000 les emplois perdus sous l'effet de l'EANM, soit environ 1% de la population active

Le coût de la dégradation environnementale

A la valeur des pertes économiques directes susmentionnées, il faudra ajouter le coût de dégradation environnementale occasionnée par les effets physiques de l'EANM sur le littoral, les ressources en eau et sur le sol et la végétation.

Ce coût a été estimé en se basant sur les résultats de l'étude réalisée par la Banque Mondiale en 2004 sur les coûts de dégradation de l'environnement en Tunisie[3]. Les coûts de dégradation environnementale annuels dus à l'EANM sont estimés à prés *de 0,13% du PIB*,

Synthèse des impacts

Les coûts de dégradation environnementale viennent s'ajouter à la valeur des pertes économiques directes précédemment estimée (0,5% du PIB par an). Le tableau suivant présente la synthèse les coûts économiques et environnementaux liés aux effets physiques de l'EANM :

Activités affectées	Montant en millions DT	% PIB
Pertes économiques	181	0,5%
Agriculture et pêche	80	0,2%
Tourisme	102	0,3%
Coûts environnementaux	47	0,13%
Total	228	0,63%

Ainsi, l'ensemble des impacts de l'élévation accélérée du niveau de la mer peut être estimé à environ 0,63% du PIB par an. Cela peut affecter sensiblement les objectifs projetés par l'Etat en terme de taux de croissance économique annuel en le freinant d'environ0,6%.

ANNEX 2. RISK LOG

Project Title: Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa – Promoting Resilient Coastal Development in Tunisia	**Award ID: 00058399**	**Date: 4th of December 2009**

#	Description	Date Identified	Type	Impact & Probability (1-5)	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Update	Status
1	Institutional Arrangements: multiplicity of partners may make the project overly complex and cause delays		organizational	P = 3 I = 3	Clear roles and responsibilities will be developed at the outset of the project	*MEDD* *APAL*			
2	Commitment: multiple ongoing initiatives in adaptation field may create additional burdens on executing agency		Institutional	P = 2 I = 2	Coordination with other ongoing projects will be actively sought	MEDD APAL			
3	Strategic partnerships may fail to deliver results		Strategic	P = 2 I = 3	An active interministerial engagement strategy will be developed for coordination and synergy	MEDD APAL			
4	Technical: there may be delays or technical difficulties in implementing pilot activities on the ground		Technical	P = 1 I = 5	Comprehensive feasibility and impact studies will be conducted prior to identifying and implementing pilot activities	MEDD APAL			

ANNEX 3 – ONGOING RELEVANT PROJECTS

The following provides an overview of ongoing projects implemented through UNDP in other countries, and relevant projects and programmes implemented in Tunisia.

1. UNDP National Projects

Food Security

Sudan	Building Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change (UNDP)
Ethiopia, Mozambique, Zimbabwe	Coping with Drought and Climate Change - Develop and Pilot a Range of Coping Mechanisms for Reducing the Vulnerability of Farmers and Pastoralists to Future Climate Shocks (UNDP)
Niger	Building Resilience and Adaptive Capacity of the Agriculture Sector to Climate Change (UNDP)
Eritrea	Adapting Livestock Management to Climate Change in the North Western Lowlands of Eritrea - Enhance Adaptive Capacity of Livestock Production Systems in the Kerkebet area (UNDP)
Malawi	Climate Adaptation for Rural Livelihoods and Agriculture (African Development Bank)
Zambia	Adaptation to the Effects of Drought and Climate Change in Agro-ecological Zone 1 and 2 (UNDP)
Benin	Integrated Adaptation Programme to Combat the Effects of Climate Change on Agricultural Production and Food Security in Benin (UNDP)

Water

Sudan	Building Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change (UNDP)
Cape Verde	Building Resilience in the Agriculture and Water Sectors to the Adverse Impacts of Climate Change (UNDP)
Mauritania	Reducing Vulnerability of Arid Oasian Zones to Climate Change and Variability through Improved Watershed Management (UNEP)

Health

Kenya (and other non African countries)	Piloting Climate Change Adaptation to Protect Human Health (WHO,UNDP)

Disaster Risk Management

Mozambique	Integrating Adaptation to Climate Change within Disaster Risk Management Systems in the Búzi River Catchment Area and other regions of Southern Africa (GTZ)
Southern and Eastern Africa	Workshops on Adaptation and National Adaptation Programmes of Action (NAPAs) in Southern and Eastern Africa (UNEP)
Malawi, Lesotho, Burundi	Enhancing National and Local Capacity in Disaster Risk Reduction (UNDP Bureau for Crisis Prevention and Recovery (BCPR))
Ghana, Algeria, South Africa, Tanzania ,	Mainstreaming Disaster Risk Reduction in the Management of Urban Planning and Governance in Africa through the African Urban Risk Analysis Network (UNDP BCPR, IIED)

Kenya, Senegal	
DRC , Rwanda	Inter-agency Cooperation for Disaster Reduction in the Goma North Kive area DRC (UNDP BCPR)
Mozambique	Strengthening Local Risk Management and Mainstreaming Disaster Risk Reduction (UNDP BCPR)
Swaziland	Strengthening National and Local Resilience to Disaster Risks in Swaziland (UNDP BCPR)
Madagascar	Strengthening the Implementation of the National Disaster Risk Management (DRM) Strategy in Madagascar (UNDP BCPR)
Niger	Recovery Support and Long-term Development to Deal with the Humanitarian Crisis in Niger (UNDP BCPR)

Coastal Development

Senegal, Gambia, Mauritania, Guinea-Bissau , Cape Verde	West African Shorelines - Develop Effective Coping Mechanisms for Reducing Impact of Climate Change Induced Coastal Erosion (UNDP)
Guinea	Increased Resilience and Adaptation to Adverse Impacts of Climate Change in Guinea's Vulnerable Coastal Zones (UNDP)

Financing

Throughout Africa	Financing Framework for Meeting MDG Targets and Supporting Public Finance Frameworks to Integrate Adaptation Costs (UNDP Poverty Group)
Throughout Africa	Capacity Development Projects: Assessing and Developing Policy Options for Addressing Climate Change (UNDP)

Cross-cutting

Niger, Morocco	Community-based Adaptation: Enhance Resiliency of Communities and/or the Ecosystems to Climate Change Impacts (UNDP)
Kenya	Coping with Drought and Climate Change (Kenya Adaptation to Climate Change in Arid Lands (KACCAL)/WB)
Morocco, Madagascar, South Africa, Etheopia, Uganda, Zambia, Zimbabwe, Malawi, Tanzania, Kenya, Benin, Burkina Faso, Cameroon, Central African Republic, DRC, Nigeria, Senegal	Climate Change Adaptation in Africa – Research and Capacity Development Program (DFID/ The International Development Research Centre (IDRC))
Mozambique, Rwanda, Kenya	Adaptation to Climate Change in Eastern and Southern Africa – Capacity Development, Institutional Strengthening, Mainstreaming (UNEP/Norway)
Nigeria, Ghana, Niger, Mali, Tunisia, Malawi,	Advancing Capacity to Support Climate Change Adaptation – Mainstreaming into Poverty Reduction Strategies (UNITAR/NGOs)

Kenya, Tanzania, Ghana, Burkina Faso, Cameroon, Ethiopia, South Africa	
Senegal, Burkina Faso, Tanzania, Uganda	Climate Change and Development – Adapting by Reducing Vulnerability – Mainstreaming Climate Change Adaptation into Development Decision-making
Cape Verde	Mainstreaming Climate Change Risks into National Development Policies and UNDP Development Assistance
Tunisia	Climate Protection Programme for Developing Countries – Mainstreaming Climate into Development Activities (GTZ)
Burkina Faso	Strengthening Adaptation Capacities and Reducing the Vulnerability to Climate Change (African Development Bank, UNDP)
Burundi	Enhancing Climate Risk Management and Adaptation (African Development Bank/UNDP)
Mozambique, Tanzania , Zambia	Climate Change and Development: Recognizing the Role of Forest and Water Resources in the Climate Change Adaptation (Government of Finland, IUCN)
Kenya, Mali, Mauritania, Mozambique, Rwanda, Tanzania, Uganda	Poverty Environment Initiative (PEI) : mainstreaming poverty-environment linkages (UNDP,UNEP)
Cape Verde, Malawi	Integrating climate change risks into national development processes (UNDP)
Throughout Africa	Climate for Development in Africa Programme (UN Economic Commission for Africa (ECA))
Throughout Africa	Quantification of costs and benefits of adaptation (DFID)

2. Relevant projects in Tunisia

Title	Summary	Partners	Duration	Budget
Le projet régional (MED/MAP- UNESCO) mise en oeuvre de stratégies pour la protection environnementale des ressources hydriques et des aquifères côtiers du bassin méditerranéen	La réalisation des activités du projet MED/MAP à l'échelle régionale et nationale a eu lieu au cours de l'année 2007 et se poursuivront jusqu'en 2012. Le projet regroupe 13 pays méditerranéens et inclut des expériences pilotes menées actuellement dans 5 pays méditerranéens dont la Tunisie.	UNESCO	2007-2012	US$
National Strategy for Climate Change	The project supported by GTZ has completed the development of sectoral adaptation strategies for Agriculture and is working towards strategies for Tourism and Health. The project is also supporting the development of an Early Warning System, a study of legislative and regularly frameworks related to climate change, as well as providing support for the establishment of a national platform on climate change mitigation and adaptation.	GTZ	2007-2011	
Second Water Investment Program	The objectives of the Second Water Sector Investment Project are to promote more efficient management and operation of selected public irrigation schemes by	World Bank, Ministère de l'Agriculture	2009-2015	162.5 million US$ (multiple donors)

	participating farmers; to improve access and consumption of drinking water for rural households in communities; and to assist Ministry of Agriculture and Water Resources, Ministry of Environment and Sustainable Development, and other stakeholders to make better decisions relating to integrated water resources management in Tunisia. The project has 5 components: (1) irrigation management: activities include creation of new irrigation schemes, rehabilitation and modernization of schemes, drainage, minor works and analytical and capacity building activities for the central government, regional agencies and farmer organizations; (2) Rural water supply: activities include developing new water supply systems and testing alternative service provision arrangements in remote areas and capacity building for community organizations; (3) groundwater management: activities include investigating groundwater resources, developing water resources monitoring networks, supporting communities in managing aquifers, developing an integrated information system and pilot participatory aquifer management in two areas; (4) environmental protection: activities include installation of soil and water quality monitoring systems, conduct of awareness-raising campaigns to support use of treated wastewater in agriculture, and training on environmental protection; and (5) institutional strengthening and capacity-building: activities include training, monitoring, four research activities and development of a forward-looking strategy to manage water in 2050			
Projet de rehabilitation côtière (Gamarth-Carthage)	?	Gouvernement de Tunisie – Ministère de l'équipement ?	?	?
Small Grants Programme	Sustainable fisheries in kerkennah WWF-Tunisia project?	UNEP- GEF		
Water Saving Agriculture Project in Southern Oasis Area		JICA	closed	
Study on Integrated Basin Management of the Medjerda River	The development study of integrated water resource development and management was dedicated to devising a master plan that incorporated environmental protection measures for the Medjerda River Basin. The final output is a comprehensive master plan for flood control on the Medjerda River that consists of "structural" and "non-structural" measures to prevent flood disaster	JICA	2006-2008	

ANNEX 4: TERMS OF REFERENCE FOR KEY PROJECT PERSONNEL

Project Manager

- Plan the activities of the project and monitor progress against the initial quality criteria.
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications;
- Monitor events as determined in the Project Monitoring Schedule Plan, and update the plan as required;

- Manage requests for the provision of financial resources by UNDP, using advance of funds, direct payments, or reimbursement using the FACE (Fund Authorization and Certificate of Expenditures);
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports;
- Responsible for preparing and submitting financial reports to UNDP on a quarterly basis;
- Manage and monitor the project risks initially identified, submit new risks to the Project Board for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log;
- Be responsible for managing issues and requests for change by maintaining an Issues Log;
- Prepare the Project Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the Project Board and Project Assurance;
- Prepare the Annual review Report, and submit the report to the Project Board and the Outcome Board;
- Prepare the AWP for the following year, as well as Quarterly Plans if required;
- Update the Atlas Project Management module if external access is made available.

Project Board

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the Project Manager;
- Provide guidance and agree on possible countermeasures/management actions to address specific risks;
- Agree on Project Manager's tolerances as required;
- Review the Project Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Combined Delivery Reports (CDR) prior to certification by the Implementing Partner;
- Appraise the Project Annual Review Report, make recommendations for the next AWP, and inform the Outcome Board about the results of the review.
- Provide ad-hoc direction and advice for exception situations when project manager's tolerances are exceeded;
- Assess and decide on project changes through revisions;

Senior Supplier: Usually a **UNDP representative** is the Senior Supplier, representing the interests of the parties concerned which provide funding and/or technical expertise to the project. He/she will provide guidance regarding technical feasibility and support to the project.

Executive: Represents project ownership and chairs the Project Board. Usually, this is the relevant government nominated official (usually Secretary of a relevant Ministry and directly involved in project execution.

Direct Beneficiaries: Representatives of other Agencies Involved with Project Implementation

Project Assurance

- Ensure that funds are made available to the project;
- Ensure that risks and issues are properly managed, and that the logs in Atlas are regularly updated;
- Ensure that critical project information is monitored and updated in Atlas, using the Activity Quality Assessment page in particular;
- Ensure that Project Progress Reports are prepared and submitted on time, and according to standards in terms of format and content quality;

- Ensure that financial reports are submitted to UNDP on time, and that CDRs are prepared and submitted to the Project Board;
- Perform oversight activities, such as periodic monitoring visits and “spot checks”.
- Ensure that the Project Data Quality Dashboard remains “green”

Project Support

- Set up and maintain project files
- Collect project related information data
- Update plans
- Administer Project Board meetings
- Administer project revision control
- Establish document control procedures
- Compile, copy and distribute all project reports
- Assist in the financial management tasks under the responsibility of the Project Manager
- Provide support in the use of Atlas for monitoring and reporting
- Review technical reports
- Monitor technical activities carried out by responsible parties

UNDP Programme Manager (UNDP Resident Representative or delegated authority):

- Approve and sign the Annual Work Plan for the following year;
- Approve budget for the first year in Atlas.

Executing Partner (authorised personnel with delegated authority)**:**

- Approve and sign the Annual Work Plan (AWP) for the following year;
- Approve and sign the Combined Delivery Report (CDR) at the end of the year.

Sign the Financial Report (FR) or the Funding Authorization and Certificate of Expenditures (FACE)

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STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

HE the Minister of Environment and Sustainable Development, M. Nadhir Hamada,

1. Reference is made to consultations between officials of the Government of *Tunsia* (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. Nadhir Hamada
Minister of Environment and Sustainable Development
Tunisia

_____

Signed on behalf of UNDP

Dr Mohammed Belhocine
Resident Representative
UNDP Tunisia

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between [*insert name of Designated institution*], 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 [Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa – Promoting Resilient Coastal Development in Tunisia – ID 00072542], "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.

3. Support services to be provided:

SERVICES D'APPUI (DESCRIPTION)	ÉCHEANCIER POUR LA FOURNITURE DES SERVICES D'APPUI
1. Prendre en charge le processus de recrutement d'expert nationaux et internationaux (AO, dépouillement, identification, et établissement et signature de contrats de consultants)	Le processus se déclenche immédiatement après la réception de la demande de service.
2. Faire les réservations de billets d'avion et/ou d'hôtel avec la préparation des frais de DSA en cas de mission dans le cadre des projets de coopération avec le PNUD	- Le PNUD doit recevoir la demande de service minimum **5 jours ouvrables** avant le départ de la personne en question pour pouvoir assurer que le DSA soit prêt à temps - La réservation du billet est assurée dés réception de la demande de service
3. Prendre en charge le processus d'acquisition d'équipements et fournitures avec tout ce qui en découle comme franchise	Le processus se déclenche immédiatement après la réception de la demande de service.

4. Description of functions and responsibilities of the parties involved:

- Le directeur de projet enverra une demande de service d'appui signée chaque fois qu'il y a nécessité au PNUD en expliquant le service demandé et en mentionnant un budget estimatif tout en tenant en compte le plan d'action annuel. La demande de service doit être accompagnée par :

  - Des termes de référence en cas de recrutement d'expert ou d'acquisition de matériel ; ou
  - De l'invitation au nom de la personne concernée en cas de réservation de billet d'avion et de préparation de DSA

- Le PNUD de son côté, entame le processus d'appel d'offre/ acquisition/ réservation dés la réception de la demande de service et dés vérification de la disponibilité de fonds sur le projet en question. Les échéanciers correspondants sont sus mentionnés dans le tableau.