



CONCEPT NOTE PROPOSAL FOR SINGLE COUNTRY

PART I: PROJECT INFORMATION

Title of Project: Strengthening adaptive capacity and livelihood security in the most vulnerable oases of the Governate of Tozeur

Country: Tunisia

Thematic Focal Area: Multi-sector projects

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: World Food Programme

Executing Entities: Ministry of Environment

Amount of Financing Requested: 9 999 469 (in U.S Dollars Equivalent)

Project Formulation Grant Request (available to NIEs only): Yes No

Amount of Requested financing for PFG: 0 USD (in U.S Dollars Equivalent)

Letter of Endorsement (LOE) signed: Yes No

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: <https://www.adaptation-fund.org/apply-funding/designated-authorities>

Stage of Submission:

- This concept has been submitted before
- This is the first submission ever of the concept proposal

In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

Please note that concept note documents should not exceed 50 pages, including annexes.

Project/Programme Background and Context:

General context

Geography

Tunisia is a North African Country situated along the southern shore of the Mediterranean Sea. It is the smallest country in North Africa occupies an area of approximately 164 000 km², sharing land borders with Algeria to the west and Libya to the southeast (Figure 1¹). It has an elongated shape, oriented from North to South, and can be considered to have several distinct geographic zones. These include a mountainous northern zone, a semi-arid central plateau that dominates the western portion of the country and a low-lying fertile coastal zone that abuts the Mediterranean in the east of the country. A further geographic region of Tunisia is its arid southern zone that extends into the Northern Sahara and comprises the bulk of the country's area.

Demographic and socioeconomic indicators

Tunisia has a population of approximately ~11.8 million people² and has been governed as a unitary presidential republic following a constitutional referendum in 2022. The political structure is highly centralised, although the country is divided into 24 governorates that hold regional authority. These governorates are further divided into 264 delegations comprised of multiple municipalities. The southwestern governorates are far larger than those in the north and east and have far lower population densities even though they constitute the bulk of the country. For example, these three governorates make up almost 40% of the country by area, but only comprise ~3.5% of the total population³. This is primarily as a result of climatic factors, limited economic development and a more recent trend of outward migration.

Tunisia's population of approximately 11.8 million people is unequally distributed across the country as a result of both climactic and geographic factors. Over 80% of the population resides in the eastern and northern coastal zone alone. Conversely the southern, Saharan areas of the country are sparsely populated as a result of high aridity, water scarcity and limited economic opportunities. The population is also highly urbanized and over 70% of population currently reside in cities or other urban centres⁴. For example, over 70% of Tozeur's population lives in urban areas, despite the governate having both the lowest absolute population (107,912) and 3rd lowest population density



Figure 1. Political Map of Tunisia demonstrating governorates and major urban centres

¹ Nations Online. (2023). *Political map of Tunisia*. [Online]. Available: <https://www.nationsonline.org/oneWorld/map/tunisia-political-map.htm>

² National Institute of Statistics. (2021). Tunisia Socioeconomic Database. [Online]. Available: <http://census.ins.tn/en/recensement>

³ National Institute of Statistics. (2014). Tunisia Population and Housing Census 2014. [Online]. Available: <https://www.ins.tn/en/enquetes/census-2014>

⁴ United Nations Population Division. World Urbanization Prospects: 2018 Revision.

(~23/km²) of all Tunisia's governorates. This trend in Tozeur is largely as a result of limited water availability and helps demonstrate the critical importance of reliable access to water in the region.

The country can be described as falling into the lower-middle income band, with a per capita GDP of ~\$3800 and an HDI of 0.731, ranking it 97 out of 191 countries⁵. It has a Gini coefficient of 33, indicating relatively low levels of inequality. The country had a GDP of \$46 billion in 2021 and has recorded limited economic growth since 2011, with an average growth rate of 1.9% between 2011 and 2019⁶. This poor economic performance, which is associated with the political shift to a democratic state, was exacerbated by the onset of CoViD-19 and the World Bank projects limited growth prospects up until 2030⁷. Tunisia has a fairly diversified mixed economy with major sectoral contributions coming from services (~64%), manufacturing (~26%) and agriculture (~10%). Although agriculture only generates one tenth of GDP occupies more than a 25% of the country's total area and accounts for almost 80% of national water usage⁸. However, agriculture is also a critical sector for food security, provides jobs for ~14% of the population and is seen to be a particularly important contributor to employment in rural areas where there are few other economic opportunities^{9,10}. Tourism is another notable contributor to employment across Tunisia and provides ~6% of employment opportunities and ~14% of GDP. It is critical source of employment in rural areas and equally important for its contribution to national food security¹¹. Tourism is another notable contributor to employment across Tunisia and provides ~6% of employment opportunities and ~14% of GDP.

The country has numerous development challenges, including high levels of unemployment, poverty, gender disparities, internal migration, and poor economic growth. Poverty, as a result of limited economic opportunities is relatively widespread and fluctuates but has remained relatively stable at ~15% since 2015¹².

Migration is a further notable socioeconomic trend in Tunisia. This is particularly apparent in the more sparsely populated southern regions. These areas have seen a constant trend of internal outward migration since the 1970s, which is often linked to a search for improved economic prospects¹³. This trend is particularly noticeable amongst men and youths and has impacted the sex-ratio of the governorate, resulting in a higher proportion of women and women-headed households¹⁴.

Gender disparities are another development concern in the country. It has a gender gap index score of 0.64 points and ranks 120 out of 146 countries worldwide¹⁵. While the country scores well compared to other North African nations and has made significant gains to close the gender gap in certain areas, such as health and education, gender inequalities remain widespread in other areas, including political representation and representation in the job market, i.e., economic opportunities¹⁶.

⁵ Country Insights. 2022. United Nations Development Programme

⁶ Climate Risk Profile: Tunisia (2021): The World Bank Group.

⁷ Climate Risk Profile: Tunisia. 2021. The World Bank Group.

⁸ FAO: Water efficiency, productivity and sustainability in the MENA regions (WEPS-NENA).

Available at: <https://www.fao.org/in-action/water-efficiency-nena/countries/tunisia/en/>

⁹ Government of Tunisia. (2019). *Tunisia's Third National Communication as part of the United Nations Framework Convention on Climate Change*. [Online]. Available: <https://unfccc.int/sites/default/files/resource/Synthese%20Ang%20Finalise%20Tunisia.pdf>

¹⁰ Food and Agriculture Organization of the United Nations (FAO). (2017). Tunisia Country Fact Sheet on Food and Agriculture Policy Trends. [Online]. Available: <https://www.fao.org/agrifood-economics/publications/detail/en/c/1132139/>

¹¹ Government of Tunisia. (2019). *Tunisia's Third National Communication as part of the United Nations Framework Convention on Climate Change*. [Online]. Available: <https://unfccc.int/sites/default/files/resource/Synthese%20Ang%20Finalise%20Tunisia.pdf>

¹² Carnegie Endowment for International Peace. (2021). *Tunisia Facing Increasing Poverty and Regional Inequalities*. [Online]. Available: <https://carnegieendowment.org/sada/85654>.

¹³ Zuccotti, C.V., Geddes, A., Bacchi, A., Nori, M., and Stojanov, R. (2018). *Drivers and patterns of rural youth migration and its impact on food security and rural livelihoods in Tunisia*. Technical Report: Food and Agriculture Organization of the United Nations (FAO), Migration Policy Centre. [Online]. Available: <https://cadmus.eui.eu/handle/1814/53724>

¹⁴ Atlas from the Governorate of Tozeur. 2013. Tunisian Republic.

¹⁵ United Nations Development Programme. (2023). *Human Development Insights*. [Online]. Available: <https://hdr.undp.org/data-center/country-insights#/ranks>

¹⁶ UN Women. (2023). *Tunisia Country Snapshot*. [Online]. Available: <https://data.unwomen.org/arab-states/country/tunisia>

Institutional landscape

As previously described, Tunisia is a unitary presidential republic following a constitutional referendum in 2022. This means the country's administrative systems are highly centralised. Governorates, which represent sub-national administrative zones are managed by governors who are appointed by the central authority, while municipal councillors and mayors are directly elected by local populations. This two-tiered structure concentrates power in the hands of the central authority and its appointed representatives, while devolving day-to-day administrative activities to locally elected representatives.

In the context of climate change, the government of Tunisia has been progressive in its approach to relevant issues, particularly when compared with its neighbouring countries. The 2014 constitution enshrines several environmental principles and enables increased citizen participation in decision-making processes for relevant social, economic and environmental issues. The country is a signatory to several frameworks on climate change and includes climate change considerations in many of its strategic policy documents.

The National Coordination Unit on Climate Change (UGPO) within the Ministry of Environment is the government entity with the mandate to coordinate climate change and adaptation. However, several other ministries and specialized agencies are in charge of climate-sensitive sectors and adaptation measures within these sectors, in particular, the Ministry of Agriculture — which is also in charge of water resources — the Ministry of Tourism, the Ministry of Health, as well as the Agency for Coastal Protection and Planning. To-date, adaptation planning and action in Tunisia has been primarily accomplished through a sectoral approach. Until recently one of the main challenges for addressing climate change was the absence of a cross-sectoral steering and coordinating body of climate policy and planning¹⁷.

Regarding the effectiveness of Tunisia's overall institutional arrangements, the World Bank Group's worldwide governance indicators¹⁸ suggest that the country's governance performance is moderately effective overall, with its best performance occurring in the rule of law indicator. The most recent data for Tunisia show that in 2021, the country's percentile rank¹⁹ for government effectiveness was 45.67; for regulatory quality it was 38.46; and for rule of law the percentile ranking for Tunisia was 54.81. Figure 2 shows a time-series trend for the abovementioned indicators between 1996 and 2021, highlighting the consistent improvement in Tunisia's performance for the rule of law indicator. Conversely, the effectiveness of Tunisia's government and regulatory quality have both declined steadily since 1996, with both indicators well below the 50th percentile globally. The scenario described above highlights the country's needs with regard to improved governance and technical capacity development to ensure more effective governance across sectors.

¹⁷ United Nations Development Programme. 2021. *Green Climate Fund Readiness Proposal with UNDP for the Republic of Tunisia*. [Online]. Available: <https://www.greencimate.fund/document/national-adaptation-plan-advancing-risk-informed-development-and-land-use-planning-tunisia>

¹⁸ This evaluation is determined by considering: i) government effectiveness; ii) regulatory quality; and iii) rule of law.

¹⁹ Percentile rank (0-100) indicates the rank of country relative to all countries in the world. A ranking of 0 corresponds to the lowest rank and 100 is indicative of the highest rank.



Figure 2. Analysis of Tunisia's governance effectiveness between 1996 and 2021²⁰

Climate baseline/background

Tunisia is classified as an arid country with hot dry summers and wetter, cooler winters. Data from the World Bank Group's Climate Change Knowledge Portal indicates it has a mean annual temperature of 19.4°C with summer and winter mean temperatures of 28°C and 10°C respectively²¹. On the whole the country receives an average of 263mm of rainfall annually, with the bulk of this occurring in the wetter winter months²² (September – April, Figure 3).

Although Tunisia is classified as an arid country, its climate demonstrates as much regional diversity as its geography. The proximity of the country to the Mediterranean Sea, combined with its specific topography results in five distinct climate zones (Table 1) that roughly overlay its geographic regions.

Table 1. Overview of Tunisia's climatic zones

Climate zone	Description
Northern mountainous region	Characterized by a Mediterranean climate with warm summers of up to 22°C and cool wet winters. Annual average precipitation often exceeds 700mm.
Central plateau	Dominates the west of the country and is predominately arid with mean annual temperatures of 18°C. Average annual precipitation in this area often exceeds 200mm.
Eastern low-lying coastal zone	An arid steppe climate with mean temperatures exceeding 18°C but significantly more rainfall when compared with the rest of the country. Average precipitation is variable in this region but generally greater than 200mm and less than 400mm per annum.
Cold arid desert	Low levels of rainfall and temperatures seldom exceed 18°C. Average annual rainfall here is less than 100mm, much like the rest of the south.
Hot arid desert	Covers much of the southern extent of Tunisia. This area extends into the northern Sahara, receives less than 100 mm of precipitation annual

²⁰ Data source: World Bank Group. (2022). *Worldwide Governance Indicators*. [Online]. Available: <https://info.worldbank.org/governance/wgi/>

²¹ World Bank Group. (2021). *Climate Risk Country Profile: Tunisia*. [Online]. Available: https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf

²² *Ibid.*

Climate zone	Description
	and experiences the highest temperatures in the country with temperatures routinely exceeding 35°C in the summer months.

Tozeur falls into the southern climate zone within Tunisia. It has a mean annual temperature of 22°C with cool winters and hot summers, where temperatures routinely exceed 35°C. The wind speed fluctuates throughout the year, with average lows of 7.2 km/h in the winter and highs of 18.2 km/h in mid-summer. Despite receiving higher than average rainfall for the Saharan region, mean precipitation is limited to 96mm annually. The bulk of this rainfall occurs during the cooler winter months, however, even the wettest months are dry, and precipitation seldom exceeds 15mm per month²³.

Climate trends

Historical climate data for Tunisia is available from 1901 and demonstrates that the region experiences significant inter-annual variability. Despite this variability there are several clear trends in precipitation and temperature. Overall, the data indicates that the first half of the 20th century was relatively stable in terms of climate, with more significant changes having occurred over the last 30 years²⁴.

Precipitation

Tunisia receives mean annual precipitation of 263.5mm, with significant inter-annual variability²⁵ (Figure 3). There are also great regional differences in annual precipitation and the southwestern areas of the country are exceptionally dry. In these regions average rainfall seldom exceeds 100mm annually^{26,27}.

Observed changes to Tunisia's precipitation patterns have been few and include a more recent decreasing trend over the last 30 years. During this period annual precipitation has declined by 3%

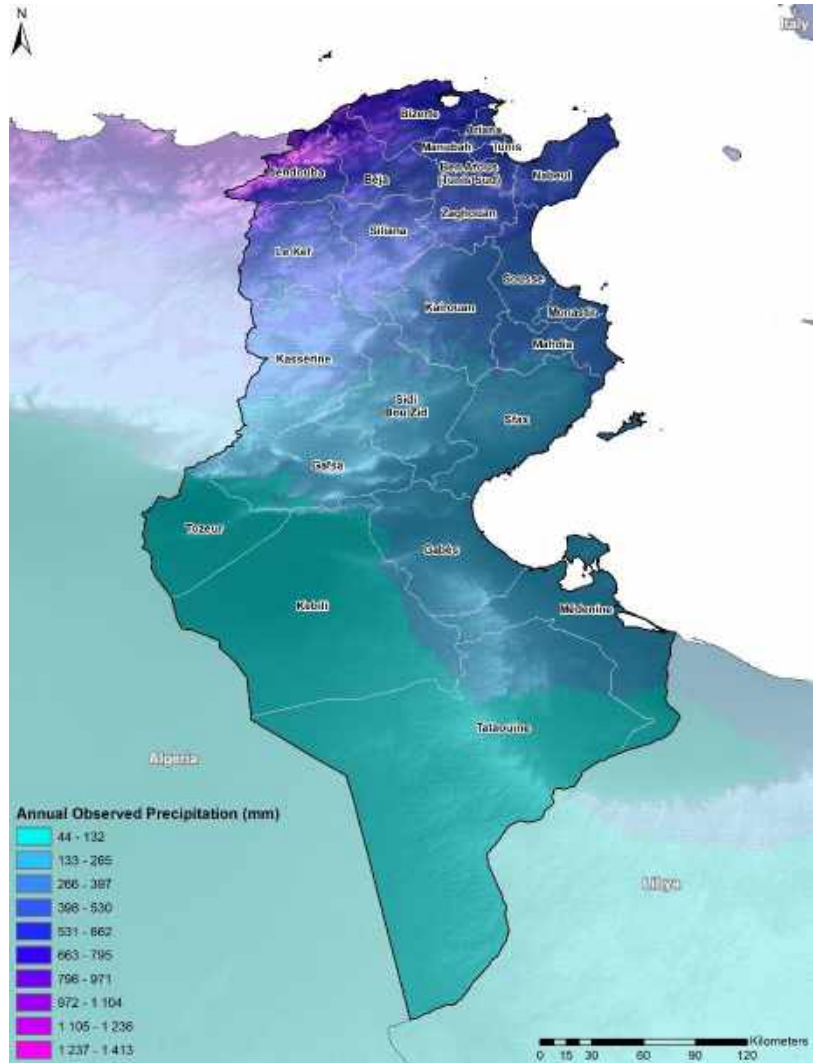


Figure 3. Annual observed precipitation in Tunisia

²³ Climate Data.Org

²⁴ World Bank Group. (2021). Climate Risk Country Profile: Tunisia. [Online]. Available:

https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ United States Agency for International Development (USAID). (2015). Climate Change Information Factsheet: Tunisia. [Online].

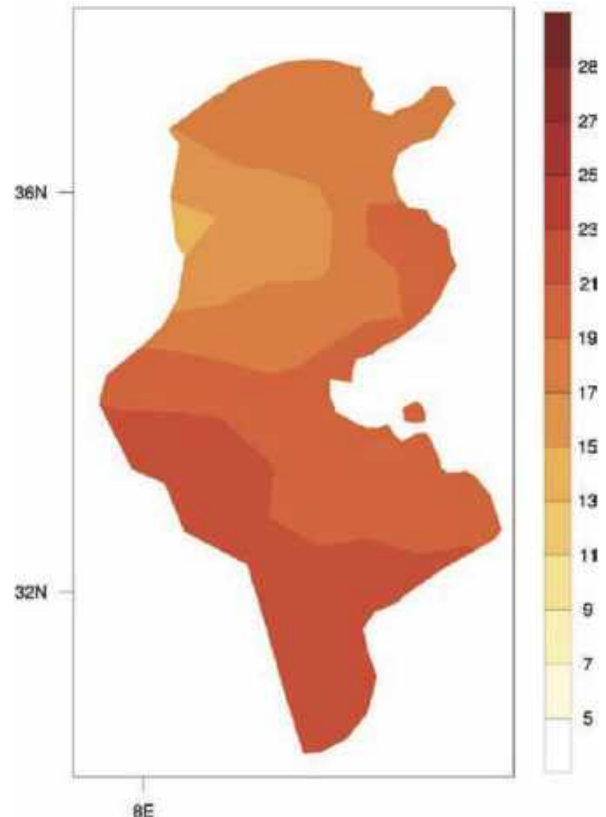
Available: https://www.climatelinks.org/sites/default/files/asset/document/Tunisia%20Climate%20Info%20Fact%20Sheet_FINAL.pdf

across the country. This trend has been accompanied by an increase in dry spells and reduction in water availability, particularly in the southern regions. A further notable trend has been an increase in flash floods brought about by increased prevalence of intense precipitation in the northern region²⁸.

Temperature

As with the Tunisia's precipitation patterns, temperature demonstrates great regional variability. There is an increasing temperature gradient from the north to south, with the lowest temperatures recorded in the Northeast, as a result of both the greater mean elevation and proximity to the Mediterranean Sea ().

Observed changes to Tunisia's mean temperatures were relatively minor in the first half of the 20th century. However, significant increases have been observed in the last 30 years, with the temperature increasing at a rate of approximately 0.4°C per decade. Overall mean annual temperatures have increased by 1.4°C since 1901 for the country as a whole, with some regions experiencing far greater increases. For example, the northern areas of Tunisia have experienced increases of approximately 2°C with more notable increases in the summer months²⁹.



Observed subnational trends

Downscaled climate analyses have been undertaken for the region of Tozeur, covering the period 1990 – 2021. These observations indicate a notable increase in mean maximum temperatures (~1°C). This is an increasing and sustained trend for all the delegations of Tozeur. Precipitation has also been observed to be constantly decreasing, but decreases are more pronounced in some delegations. This is the case for Tameghza and Dguech, for example, which have observed average decreases of ~7mm and ~5mm respectively. Drought has increased significantly in recent years and has been more pronounced during the years when rainfall disturbances were strongest (between 2000-2010). Cold and hot spells have both demonstrated a notable trend, with cold spells decreasing and hot spells increasing currently³⁰. Additionally for the observed time series, the climatic water balance is strongly negative in all the Delegations of the Governorate of Tozeur, which can be attributed to high temperatures for most of the year combined with low precipitation and exacerbated by low soil cover rates, even in the modern oases³¹.

National climate projections

Climate projections for Tunisia, like elsewhere, come with some degree of uncertainty. While the accuracy of the climate models may be variable certain trends, including increased variability and an

²⁸ World Bank Group. (2021). Climate Risk Country Profile: Tunisia. [Online]. Available: https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf

²⁹ World Bank Group. (2021). Climate Risk Country Profile: Tunisia. [Online]. Available: https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf.

³⁰ Acterra Consulting. (2022). *Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur*. (Unpublished).

³¹ *Ibid.*

increase in the likelihood, intensity and duration of extreme events is broadly acknowledged across all scenarios.

At a national level, projections for precipitation indicate a decreasing trend overall of between 4.1% and 6.7% by 2050, with some inter-regional variability predicted³². Minor increases are projected in the north and east of the country and minor decreases projected in the south. The overall decreases, when paired with the inherent interannual variability of the region means that the likelihood and duration of droughts are expected to increase which will exacerbate existing water stress.

Under climate change conditions, temperatures are projected to increase across North Africa for all models³³. This includes likely increases of mean and maximum temperatures of 1,3°C by 2040, 2,3°C by 2060, 3,3°C by 2080 and 4,6°C by 2100³⁴. These shifts are likely to coincide with an increase in the likelihood, intensity, and duration of heatwaves, with an additional 78 extremely hot days per year projected by 2080. Cold spells and cold nights are also projected to decline. A further localized projection is the formation of a hotspot on the southwestern border of Tunisia and Algeria, where temperatures could increase as much as 5.3°C by 2050³⁵.

Projected subnational trends

The Governate of Tozeur, much like the rest of Southern Tunisia, is likely to be subject to the changes described above, which include decreasing and irregular precipitation, increasing temperature and an increase in the likelihood, intensity and duration of heat waves and droughts. These projections are likely to contribute to increased water stress across the governate. Downscaled projections for the for the area support this trend and indicate a decrease in annual precipitation by 14 to 22 mm respectively by 2050 compared to the period 1980-2010, which represents a ~20% reduction overall. Additionally, the most significant increases in mean annual temperature are expected in the south of the territory, where the Delegation of Tozeur and its oasis ecosystems are located, with a maximum increase that could reach +2°C in 2050 in a high emission scenario³⁶. A further localized projection is the formation of a hotspot in Tozeur on the southwestern border of Tunisia and Algeria, where temperatures could increase as much as 5.3°C by 2050³⁷.

Climate impacts and vulnerability

Tunisia has a high baseline vulnerability as a result of numerous development, geographic and climate factors. It is a lower-middle income country that is contending with numerous development challenges. The region is also subject to a range of natural disasters, including flooding, sandstorms, and earthquakes. Its southern areas are extremely arid and extend into the northern Sahara, meaning there is low annual rainfall. The region also experiences high interannual variability in its precipitation patterns, resulting in frequent drought periods.

Under current climate change conditions there are numerous impacts which are likely to severely impact the country. These include decreased precipitation, increased temperatures, sea-level rise (SLR) and an attendant increase in the impact of storm surges. SLR and storm surges will have major impacts in the economically critical coastal Sahel zone by affecting tourism and accelerating salinization, which will impact agricultural productivity in the region. In the northern areas rainfall is

³² United States Agency for International Development (USAID). (2015). Climate Change Information Factsheet: Tunisia. [Online]. Available: https://www.climate-links.org/sites/default/files/asset/document/Tunisia%20Climate%20Info%20Fact%20Sheet_FINAL.pdf

³³ Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report

³⁴ World Bank Group. (2021). Climate Risk Country Profile: Tunisia. [Online]. Available:

https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf

³⁵ Verner, D. (2013). *Tunisia in a Changing Climate. Assessment and Actions for Increased Resilience and Development*. The World Bank, Washington, DC. [Online]. Available: <http://hdl.handle.net/10986/13114>

³⁶ Agence Française de Développement (AFD). Report on the assessment of vulnerabilities and risks to climate change in the traditional oases of the Governate of Tozeur, ACTERRA Project AFD DCP-2017-060 MS-18/CZZ2152

³⁷ Verner, D. (2013). *Tunisia in a Changing Climate. Assessment and Actions for Increased Resilience and Development*. The World Bank, Washington, DC. [Online]. Available: <http://hdl.handle.net/10986/13114>

projected to increase, resulting in increased erosion and a higher likelihood of flash flooding³⁸.

Increased temperatures across the country and an associated increase in the number of hot days will result in significant impacts for human and animal health, agriculture water resources and ecosystems³⁹. Additionally, the overall water balance for the country is expected to decrease due to longer periods between water recharge for shallow aquifers and will result in greater reliance on non-renewable deep (fossil water) aquifers, particularly in the south of the country.

SLR and storm surges will have major impacts in the economically critical coastal Sahel zone by affecting tourism and accelerating salinization, which will impact agricultural productivity in the region. In the northern areas rainfall is projected to increase, resulting in increased erosion and a higher likelihood of flash flooding⁴⁰.

In the southern areas, already common droughts are projected to become more frequent, reducing soil humidity, accelerating desertification, negatively impacting agricultural productivity and placing further pressure on limited groundwater resources⁴¹. Oases are likely to be acutely affected by these impacts, as is identified in Tunisia's Updated National Communication to the UNFCCC. Oases have been included as a strategic priority in Tunisia's NBSAP as a result of their extreme vulnerability. These ecosystems are of particular concern given their socio-economic importance in otherwise arid and marginal areas. The combination of all of these climate impacts is likely to lead to a range of consequential socioeconomic impacts, including reduced food security and economic development, fewer livelihood opportunities and an increase in conflict over already scarce resources.

Oasis ecosystems

Oases are unique natural landscapes found in the arid regions of Tunisia and are of particular importance in the southern Saharan region⁴². One of the defining features of oases is the presence of water, which is crucial for sustaining these unique ecosystems. This water is typically derived from underground sources, such as natural springs or groundwater reservoirs. Another interesting characteristic of oases is their generation of a localised microclimate, known as the *oasis effect* through the evaporation and evapotranspiration of water. This makes oases highly sought after ecosystems and enables a range of organisms to survive in areas that would otherwise be uninhabitable.

Tunisian oases support a diverse range of plant and animal species, including date palms (*Phoenix dactylifera*), which are an iconic and economically important crop in the region. Other common plant species found in oases include olive trees, fig trees, pomegranates, citrus trees, and various shrubs and grasses. The oases also provide habitats for a variety of wildlife, including birds, reptiles, small mammals, and insects.

In Tunisia oases can either be traditional (natural) or modern (anthropogenic), but the biophysical characteristics of both are near enough as to be identical. Traditional oases represent unique forms of adaptation to extreme environmental conditions, developed through the centuries by local farmers to support their livelihood, combining different crops (date palms, fruit trees, vegetables, and fodder) with livestock breeding⁴³. Tozeur has both types of oases, which are either fed by underground rivers

³⁸ United States Agency for International Development (USAID). (2015). Climate Change Information Factsheet: Tunisia. [Online]. Available: https://www.climatelinks.org/sites/default/files/asset/document/Tunisia%20Climate%20Info%20Fact%20Sheet_FINAL.pdf

³⁹ United States Agency for International Development (USAID). (2015). Climate Change Information Factsheet: Tunisia. [Online]. Available: https://www.climatelinks.org/sites/default/files/asset/document/Tunisia%20Climate%20Info%20Fact%20Sheet_FINAL.pdf

⁴¹ 81% of the national annual water potential is utilized under current conditions.

⁴² Peano, C., Caron, S., Mahfoudhi, M., Zammel, K., Zaidi, H., and Sottile, F. (2021). A Participatory Agrobiodiversity Conservation Approach in the Oases: Community Actions for the Promotion of Sustainable Development in Fragile Areas. *Diversity* 2021, 13, 253. [Online]. Available: <https://doi.org/10.3390/d13060253>

⁴³ Santoro, A. (2023). Traditional oases in Northern Africa as multifunctional agroforestry systems: a systematic literature review of the provided Ecosystem Services and of the main vulnerabilities. *Agroforest Systems* 97, 81–96. [Online]. Available <https://doi.org/10.1007/s10457-022-00789-w>

originating in the Atlas Mountains (natural), or via groundwater extracted from deep non-renewable aquifers (modern). Human populations across Tozeur are reliant on the water resources afforded by oases, and local populations are intrinsically connected to these unique ecosystems through long-standing economic dependencies and deeply embedded cultural ties. Tunisian oases provide valuable ecosystems goods and services that generate for heritage, agricultural, tourism, cultural, historical, and environmental benefits.

The soil found in traditional oases is generally described as being anthropomorphised because of centuries of cultivation. This human intervention has shaped the structure and productivity of the oases, leveraging the oasis effect and availability to water to enable the establishment of sustainable agricultural systems in the harsh desert environment. In this regard oases can be considered as engineered agro-ecosystems developed by populations around water points. The governate of Tozeur has 29 traditional oases extending over 3,400 ha, which represent approximately 40% of the total area of oasis-dependent farms in the region.

Degradation of oasis ecosystems

Global rates of the degradation of agrobiodiversity are as high as 75%, according to the Food and Agriculture Organization (FAO) of the United Nations⁴⁴. The degradation of rangelands (including oasis ecosystems) in the central and southern interior regions of Tunisia is mainly the result of decreasing and more-variable rainfall, coupled with the eradication of natural vegetation and subsequent erosion⁴⁵. Additional factors that drive ecological degradation in these ecosystems include but are not limited to overgrazing and the detrimental use of machinery⁴⁶. Furthermore, the high risk of genetic erosion and disappearance is an additional impact on agrobiodiversity that is driven by centuries of agricultural selection and development by farmers⁴⁷. Recent research into the factors that jeopardise ecosystem supply in traditional oases shows that despite their social, economic, and cultural importance, these oases are currently facing multiple socio-environmental threats⁴⁸. Of these, water-related issues — including desertification, drought, salinization, or overexploitation — represent the main threat, followed by decreases in agrobiodiversity, primarily due to the spread of monocultures of commercial date varieties. Oasis ecosystems are also threatened by and by social transformations such as depopulation, traditional knowledge and cultural heritage loss⁴⁹.

An emergent risk being driven by the degradation of oasis ecosystems is the development and spread of wildfires. A growing trend where agricultural and irrigation activities have been abandoned in Tunisian oases is an increase in soil salinity leading to leaching. This scenario creates an enabling environment for the spread of alien invasive plant species (driven by changes in salinity and hydromorphology) which rapidly colonize up to 100% of the soil surface⁵⁰. During the summer, under the effect of high temperatures, this halophilic flora dries out and becomes highly combustible, exposing the oasis ecosystem to the risk of fire. These fires are a frequent phenomenon, the most recent having been observed in July 2022 (Figure 5) in the traditional oasis of Nefta⁵¹. The primary impacts of wildfires on oasis ecosystems include: i) damage to the palm grove and loss of date

⁴⁴ Food and Agriculture Organization (FAO) of the United Nations. (2020). *The State of the World's Biodiversity for Food and Agriculture*. [Online]. Available: <https://www.fao.org/state-of-biodiversity-for-food-agriculture/en/>

⁴⁵ Verner, D. (2013). *Tunisia in a Changing Climate: Assessment and Actions for Increased Resilience and Development*. The World Bank, Washington, DC. [Online]. Available: <http://hdl.handle.net/10986/13114>

⁴⁶ *Ibid.*

⁴⁷ Peano, C., Caron, S., Mahfoudhi, M., Zammel, K., Zaidi, H., and Sottile, F. (2021). A Participatory Agrobiodiversity Conservation Approach in the Oases: Community Actions for the Promotion of Sustainable Development in Fragile Areas. *Diversity* 2021, 13, 253. [Online]. Available: <https://doi.org/10.3390/d13060253>

⁴⁸ Santoro, A. (2023). Traditional oases in Northern Africa as multifunctional agroforestry systems: a systematic literature review of the provided Ecosystem Services and of the main vulnerabilities. *Agroforest Systems* 97, 81–96. [Online]. Available: <https://doi.org/10.1007/s10457-022-00789-w>

⁴⁹ *Ibid.*

⁵⁰ Acterra Consulting. (2022). *Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur*. (Unpublished).

⁵¹ *Ibid.*

production; ii) loss of ecosystem services, including some of the crop's plant genetic resources; iii) loss of mammals, avifauna, reptiles, insects as well as the soil fauna whose ecology is linked to the palm grove; iv) destruction of the spontaneous flora of the oasis microclimate and loss of its ecological role in maintaining the functioning of ecosystems; and v) damage to the economy of the families affected by these fires, and deterioration of their standard of living, as well as the risk of their exodus to other places⁵².



Figure 5. Wildfire in a traditional oasis in the Governorate of Tozeur in 2022⁵³

Agroecology and oases

Agricultural activity is a complex society-nature relationship⁵⁴, particularly in arid areas where water resources are scarce, and communities are climate-vulnerable. Modern commercial and subsistence⁵⁵ agriculturalists face intensifying complexity as social, political, economic, environmental, and technological contexts evolve rapidly⁵⁶. Farmers must increasingly balance conflicting demands on finite resource pools related to increasing food productivity, resilience to climate change and reducing carbon emissions.

The practice of using natural ecosystems for agriculture is known as agroecology, and in the context of Tunisia, oases are vitally important agroecosystems. In the context of an agroecosystem, farmers use the ecosystem services generated by the natural environment to ensure high productivity, using

⁵² Acterra Consulting. (2022). *Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur*. (Unpublished).

⁵³ *Ibid.*

⁵⁴ Gallardo-López, F., Linares-Gabriel, A., and Hernández-Chontal, M.A. (2021). Theoretical and Conceptual Considerations for Analyzing Social Interfaces in Agroecosystems. *Frontiers in Sustainable Food Systems* 5:658438. [Online]. Available: <https://www.frontiersin.org/articles/10.3389/fsufs.2021.658438/full>

⁵⁵ From an economic and livelihoods perspective, farming activity occurs on a continuum ranging from purely commercial to wholly subsistence, with many examples of farmers simultaneously practicing a combination of these modalities, i.e., semi-commercial or semi-subsistence.

⁵⁶ Gallardo-López, F., Linares-Gabriel, A., and Hernández-Chontal, M.A. (2021). Theoretical and Conceptual Considerations for Analyzing Social Interfaces in Agroecosystems. *Frontiers in Sustainable Food Systems* 5:658438. [Online]. Available: <https://www.frontiersin.org/articles/10.3389/fsufs.2021.658438/full>

different types of land and water management practices⁵⁷. Agroecology, while not a new discipline or sub-sector, is gaining popularity for its holistic and sustainable approach to the many challenges that face food systems, livelihoods, and conservation⁵⁸. In addition to their contribution to food security and income generation, oasis agroecosystems play an important socio-cultural role in Tunisia⁵⁹, where activities in and around oases have sustained a traditional way of life for centuries. Similarly, in Morocco, traditional oasis agroecosystems have emerged as critical centres for agrobiodiversity conservation and the preservation of traditional knowledge⁶⁰.

Tozeur Governorate

The Governorate of Tozeur is the county's westernmost governorate with an area of ~5,600km² and a population of ~108,000, which represents approximately 1% of the total population. It is divided into 5 delegations, namely: Tozeur; Nefta; Tameghza; Dguech and Hazoua (Figure 6). The governorate falls into the Northern Saharan region and can be described as having hot desert climate⁶¹. It generally receives less than 100mm of rainfall per annum, resulting in an area that is extremely arid and has a high dependence on the extraction of underground water resources to meet its water requirements.

Geographically the governorate is low lying, relatively flat and almost completely below 100masl. 45% of its area is comprised to two large dry saline lakebeds that form a portion of the low-lying *Chott el Djerid* — the country's largest body of saline water. The dominance of these geographic features on the landscape influence many aspects of the Governorate including the types of economic activities that are practiced, the relative agricultural potential of different areas and notably the population distribution of the governorate as a whole.

Regarding bulk infrastructure in the region, improvements have been noted in recent decades in transportation of people, goods, animals, fodder, and conveyance of water⁶². However, rural transportation infrastructure was seen to have declined during this time period, predominantly as a

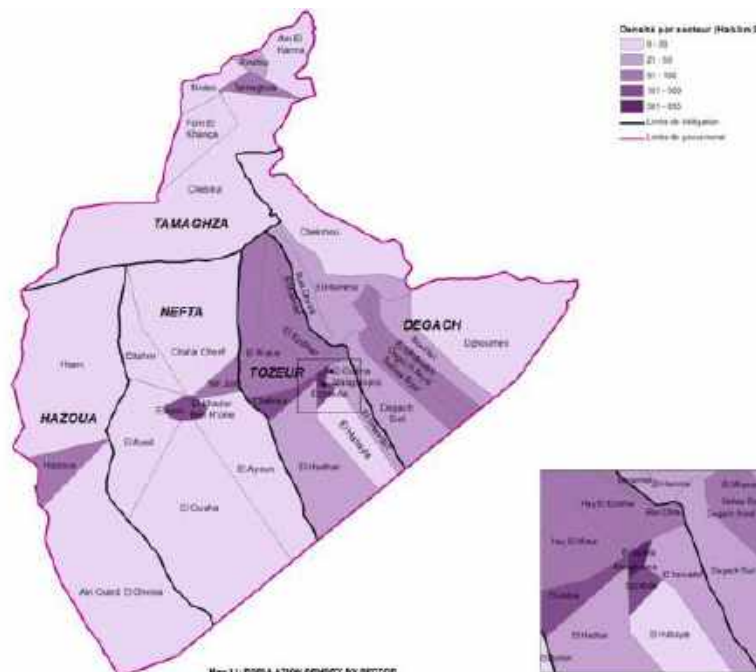


Figure 6. Population density of the Governorate of Tozeur

⁵⁷ Gemmill-Herren, B., Gottwald, F.T., Batello, C., Bezner-Kerr, R., and Hans R. Herren, H.R. (2023). Editorial: Agroecology in policy and Practice. *Frontiers in Sustainable Food Systems* 7:1136305. [Online]. Available: <https://www.frontiersin.org/articles/10.3389/fsufs.2023.1136305/full>

⁵⁸ *Ibid.*

⁵⁹ Santoro, A. (2023). Traditional oases in Northern Africa as multifunctional agroforestry systems: a systematic literature review of the provided Ecosystem Services and of the main vulnerabilities. *Agroforest Systems* 97, 81–96. [Online]. Available: <https://doi.org/10.1007/s10457-022-00789-w>

⁶⁰ Houssni, M. J. Kassout, J., Ouahrani, A. E., Mahroussi, M. E., Kadaoui, E., Sahli, A., Kadiri, M., and Ater, M. (2022). *The Conservation Challenge of Traditional Agroecosystems in Morocco: The Case Study of Six Oases Agroecosystems*. In: Leal Filho, W., Manolas, E. (eds) *Climate Change in the Mediterranean and Middle Eastern Region*. Climate Change Management. Springer, Cham. https://doi.org/10.1007/978-3-030-78566-6_10

⁶¹ World Bank Group. (2021). *Climate Risk Country Profile: Tunisia*. [Online]. Available:

https://climateknowledgeportal.worldbank.org/sites/default/files/2021-04/15727-WB_Tunisia%20Country%20Profile-WEB.pdf.

⁶² Verner, D. (2013). *Tunisia in a Changing Climate: Assessment and Actions for Increased Resilience and Development*. The World Bank, Washington, DC. [Online]. Available: <http://hdl.handle.net/10986/13114>

result of poor maintenance following flood events⁶³.

As a result of Tozeur's inherent aridity the area has a low population density with uneven distribution, much like the Tunisia's other southern regions. Major economic activities in the region are linked to the availability of water, and most inhabitants reside in major towns or aggregate around its oasis ecosystems, which are critical resources for its population. Its economy is centred on agriculture and tourism, with the cultivation and production of dates supporting livelihoods throughout the governorate. In 2016 alone, the 29 oases within Tozeur's five delegations produced almost 20 000 tons of dates (Figure 7). More than half of these (54%) were produced in the delegation of Tozeur (being the largest), with the remaining 46% produced in Déguech and El Hamma el Jerid (15% each), Tamaghza (10%), and Nefta (6%).

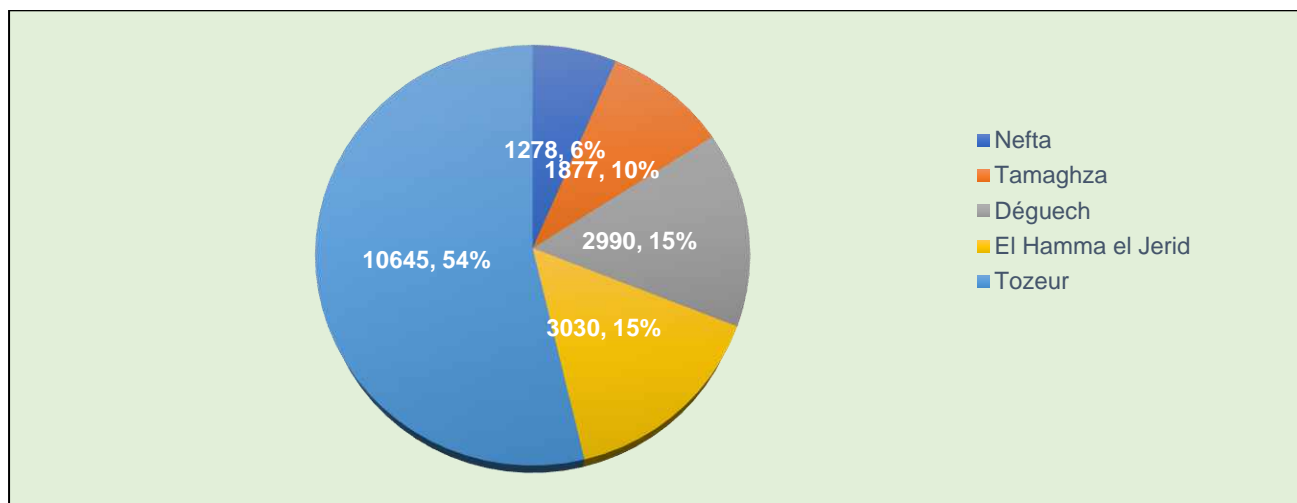


Figure 7. Annual date production (tons) and % contribution to total production in the five delegations of Tozeur Governorate⁶⁴

Southern Tunisia is an area known for its production of the economically important *Deglet nour* date varietal, which accounted for ~82% of date palm cultivars in Nefzaoua region in 2015⁶⁵. The delegations within Tozeur Governorate show a similar dominance of this varietal as shown by Figure 8 where the proportion of *Deglet nour* relative to other date varietals ranged between 48% and 96% in 2016.

⁶³ *Ibid.*

⁶⁴ Data source: Acterra Consulting. (2022). Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur. (Unpublished).

⁶⁵ Hamza, H. *et al.* (2015). Date Palm Status and Perspective in Tunisia. In: Al-Khayri, J., Jain, S., Johnson, D. (eds). *Date Palm Genetic Resources and Utilization*. Springer, Dordrecht. [Online]. Available: https://doi.org/10.1007/978-94-017-9694-1_6

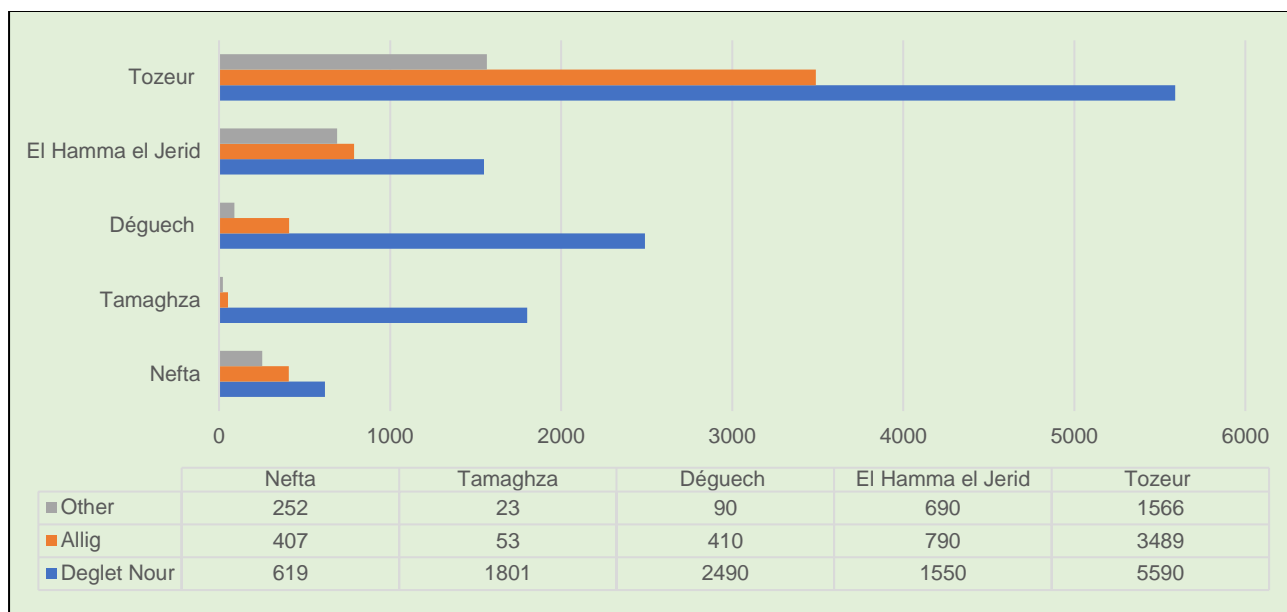


Figure 8. Annual production (tons) of Deglet nour, Allig, and other date varieties in the five delegations⁶⁶

Unemployment

The unemployment rate has increased from 15.4% (2014) to 24.8% in 2019, with the rate for higher education graduates very high (over 26%). Until the end of 2015, the labour market in Tunisia suffered from a structural imbalance that lasted under the effect of the slowdown in economic activity. In all delegations of the Governorate of Tozeur, the unemployment rate is still higher for women than for men. The disparities are even more pronounced for higher education graduates, where the rate of unemployed women graduates is almost double that of men in all the intervention areas.

Migration

The Governorate of Tozeur has a migration deficit that reveals the socio-economic changes and the difficulties of integrating young people into the labour market. The region of Tozeur and the South-West in general is a sparsely populated region that is gradually losing its active elements. Unemployment and underemployment are the two main factors fuelling migratory flows and explain the slowdown in the region's demographic growth. Two delegations out of five have recorded a negative migratory balance, namely Tozeur (-562) and Tameghza (-34). The importance of migratory income and the development of informal oases are replacing the traditional source of agricultural income and constitute the main source of income in the region. The drying up of traditional resources since the early 1960s has raised the question of the region's survival, and a large part of the population has been forced to emigrate, first legally, mainly to France and then to Libya since the early 1970s, in parallel with the closure of Europe and the restriction of emigration to family reunification. This migration is at the origin of the development of an informal economy disconnected from public action, giving rise to a new dominant social category in the face of the regression of the category of farmers and its progressive impoverishment in a region where water has become a commercial product that can only be bought by those who have cash. This category of population invests in two important niches that will ensure its supremacy: land and the construction of housing and commercial premises on the one hand, and agricultural investment and the development of illicit drillings that will lead to the development of new oases that are nowadays the main source of production of *Deglet nour* dates and the development of early fruits, greenhouses and back seasons. The new oases are characterised by illicit access to both land and water: the two

⁶⁶ *Ibid.*

pillars of the region's agricultural economy, taking advantage of the large amount of collective land, or land with unclear status, in the vicinity of the old oases, and the development of illicit wells, in some cases with excessive pumping in a context of insufficient groundwater from the deep aquifer and the exhaustion of traditional sources.

Gender and social inclusion

Climate change impacts in Tunisia are not gender-neutral. Specific inequalities in men and women's access to the assets, opportunities, and decision-making power that would enable them to successfully adapt to new climate conditions and the differential social roles of men and women in Tunisia, particularly in rural areas, result in differential vulnerabilities and adaptive capacity⁶⁷. The drivers of gender-based vulnerability to climate change in Tunisia can be separated into three general areas of inequality: i) access to resources; ii) opportunities for improving existing livelihoods and developing alternative livelihoods; and iii) participation in decision making⁶⁸.

Women's access to land in Tunisia is limited despite being guaranteed by law. Indeed, land is not seen as an asset that can be bought or sold, but is managed according to family and kinship structures, marriage and religious customs and inheritance laws. As a rule, men control land and women only have access to it through their male relatives. This prevents them from using the land more profitably and jeopardizes the growth of rural women's income. Without land and tenure security, a woman can neither access credit nor belong to agricultural associations, especially those dealing with the processing and marketing of products. This obstacle prevents them from accessing funding and enjoying their rights. In some cases, however, women have gained better access to land⁶⁹.

In the Tozeur region, as heads of household increasingly abandon certain oases for lack of profitability or limited financial means, women's contribution to the composition of family income has expanded into new (previously unexplored) areas, including paid work outside the oasis⁷⁰. This type of employment is becoming of major importance, firstly to show their presence in the household but also to contribute to household resources. In addition to the traditional responsibilities of housework and child-rearing, in many household's oasis women must oversee the household budget and manage and certain decision-making. Lifestyles, customs, behaviour, and even economic activities vary greatly. In the urban areas of Tozeur and Nafta, for example, a certain discrimination between agriculture and domestic life is very clear. Women in these areas generally do not work in the fields, as the tasks are considered difficult. In the mountainous areas of Tameghza, where the way of life is semi-rural, women are involved in the work in the lower fields of the oasis (irrigation, hoeing, weeding, harvesting, packaging, conservation of local seeds, processing for family consumption, henna crops, summer crops such as fodder and medicinal plants). Women are also sometimes responsible for the management of the herds, employed as family helpers or as workers in the date packaging workshops; and in the informal and precarious sector, which is characterised by difficult working conditions and the virtual absence of social rights, where, moreover, compliance with sanitary and phytosanitary measures is not systematic⁷¹. Their remuneration varies from 15 to 20 dinars (USD 6.38 USD per day, 2022 rate). In terms of health, women suffer from chronic illnesses, sometimes directly linked to climatic conditions and unsuitable working conditions. This situation very often pushes women into poverty and social exclusion, accentuating their vulnerabilities because they have no resources or alternative solutions to remedy them. Table 2 below summarises the gendered nature of climate change risks and impacts within the Governorate of Tozeur.

⁶⁷ Verner, D. (2013). *Tunisia in a Changing Climate: Assessment and Actions for Increased Resilience and Development*. The World Bank, Washington, DC. [Online]. Available: <http://hdl.handle.net/10986/13114>

⁶⁸ *Ibid.*

⁶⁹ Acterra Consulting. (2022). *Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur*. (Unpublished).

⁷⁰ *Ibid.*

⁷¹ *Ibid.*

Table 2. Overview of gender issues relative to climate change risks and impacts in the Governorate of Tozeur⁷²

Theme	Risks and impacts related to climate change	Gender issues
Living conditions	Agriculture and food insecurity: The irregularity of the rains strongly disrupts the cropping calendar which has consequences on agricultural production (fall in production, or even production reduced to nothing).	Issue: Increased pressure on women's capacities to produce crops, to fulfil their responsibility for food and the health of children within the household. Risks: Deterioration of the economic and health situation through an increase in malnutrition and economic and social inequalities between the sexes.
	Health: Increase in epidemic and endemic risks due to the deterioration of environmental conditions (water quality due to the drying up of springs, floods, etc.). For example, women in Tozeur report that the length of the dry spell leads to persistent coughs.	Issue: Women are considered responsible, within the household, for health care to be provided to the various members of the family and in particular to children and the elderly, the negative impact on the health status of the population has consequences on women's workload and their own health status. Risks: Deterioration in the state of health of the population, especially children (malnutrition, diarrhoea) and increase in health expenditure.
	Accentuation of seasonal and long-lasting migratory phenomena: Migration to nearby municipalities or even to more distant regions to seek temporary work. Men would move to big cities.	Issue: Women's workload (considering that migration primarily concerns men) who must assume their usual workload and replace men for field work. Risks: While the economic migration of men can be a means of diversifying the sources of household income, it often seems to be an additional burden for women who must take on men's activities in addition to their work.
	Diversification of economic activities: The irregularity of harvests due to the vagaries of the weather forces us to diversify activities to secure resources.	Issue: The diversification of activities in addition to agriculture and livestock (handicrafts, trade, mica mines) can certainly be considered as an adaptation strategy, but it also constitutes an additional workload carried out to the detriment of other tasks and/or well-being. Risks: This increase in the workload of women results in a reduction in the time available for the care of children with the risk of deterioration of their state of health (particularly nutritional). They are also exposed to various forms of violence, including exploitation.
Water supply	Water and sanitation: Climate change affects the availability and quality of water,	Issue: Increased pressure on the resource leads to an increase in the workload of women and girls, who are often responsible for collecting water in households. This can reduce their time available for productive and educational activities, as well as their health and well-being. Risks: women's workload increases and their time available for education and other productive activities is reduced.
Access and control of natural resources	Land insecurity: Droughts and episodes of torrential rain contribute to soil degradation (erosion, landslides) and indirectly increase land pressure.	Issue: More difficult access to land for women and young people. The plots available to women are often of poorer quality (quality of land, access to water) and more vulnerable to climate change. Due to land insecurity (women not inheriting land), women do not invest in the plots they use and do not practice adaptation techniques such as soil conservation that would reduce climate risks. Risks: Increase in inequalities and precariousness; Pressure on resources aggravating climate change.

⁷² Ibid.

Theme	Risks and impacts related to climate change	Gender issues
	<p>Degradation of natural resources: Deterioration and more difficult access to certain resources including water, fruits, etc.).</p>	<p>Issue: Increase in the arduous nature of the work and the time required for collection and picking, mostly carried out by women.</p> <p>Risks: Loss of income, sources of food diversification, means of subsistence.</p>

Project area

The proposed project will be implemented in 29 traditional oases within the five delegations of the Governate of Tozeur (Figure 9 and Figure 10). These 29 traditional oases are home to ~7500 farms, i.e., about 40% of the oasis farms of the governorate, producing ~75% of the total amount of dates.

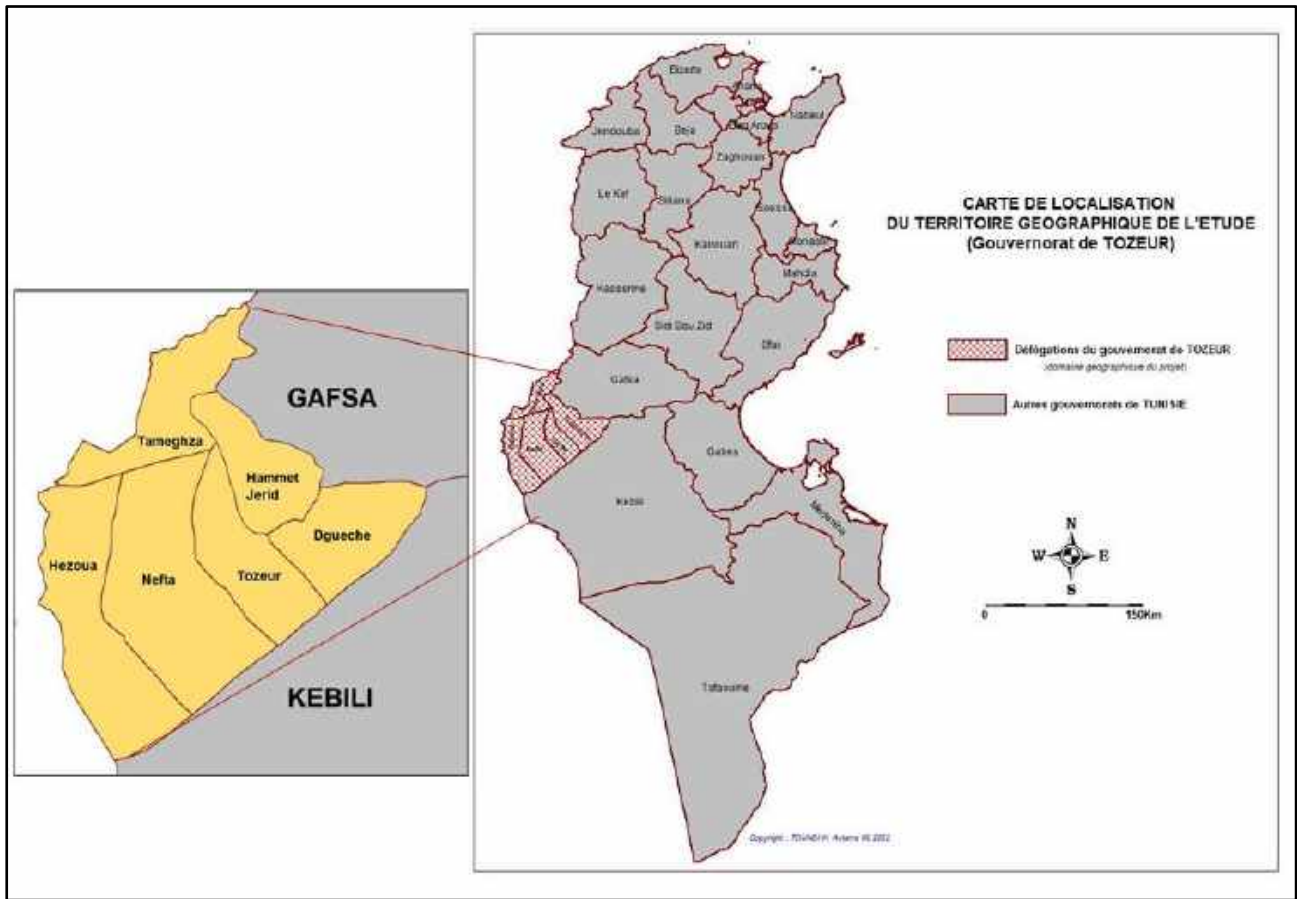


Figure 9. Administrative map of Tunisia showing governorates and delegations

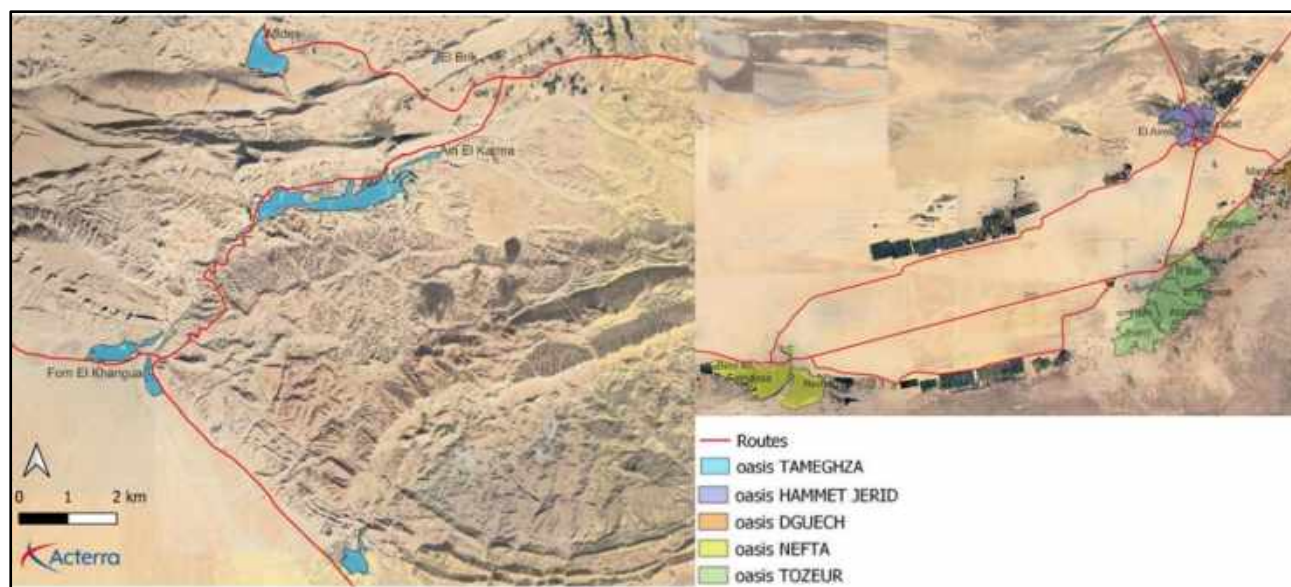


Figure 10. Aerial view of the oases of the Governorate of Tozeur⁷³

The proposed project will be implemented in these 29 oases, covering a total area of ~3500 ha (Table 3). Primary project participants will comprise ~3800 smallholder farmers, i.e., 50% of the total number of farmers in the 29 oases. Direct project beneficiaries consist of all farmers in the project area, approximately 7600 individuals. The project will indirectly confer indirect adaptation benefits on ~110 000 vulnerable people, this being the total population of the five delegations within the Governorate of Tozeur (Table 3).

Table 3. Overview of the proposed project area's geography and demographics

Delegation	Oases	Size (ha)	Participants	Direct beneficiaries	Indirect beneficiaries
Nefta (4 oases)	Fatnassa	280	905	1810	22 575
	Ras El Ain	20			
	Beni Ali	210			
	Remada	352			
Tameghza (6 oases)	Mides	29	461	921	6 631
	Fom Elkhanga	48			
	Chebika	25			
	Tamaghza	87			
	Ain El Karma	88			
	El Brik	3			
Dguech (10 oases)	Ain Rebah	62	1306	2611	22 809
	Sabaa Abar	337			
	Ain Torba	94			
	Zaouiat Al Arab	45			
	Bouhlel	60			
	El Manechi	55			

⁷³ Acterra Consulting. (2022). Report on enhancing nature-based solutions for oasis ecosystems and agrosystems adaptation in the Governorate of Tozeur. (Unpublished).

Delegation	Oases	Size (ha)	Participants	Direct beneficiaries	Indirect beneficiaries
	Mahassen	145			
	Ouled Hmida	50			
	Dghoumes Mountain	9			
	Tazarit Mountain	6			
El Hamma el Jerid (3 oases)	El Erg	123	392	783	7 104
	Ennamlet	120			
	Mouhareb	100			
Tozeur (6 oases)	Abbes	273	738	1475	50 744
	Castilia	74			
	Jhim	43			
	Ouassat	304			
	Rabbat	291			
	Hafir	84			
29 oases	Grand totals	3 417	3800	7600	109 863

Project/Programme Objectives:

To address the risks and challenges described under the background and context section, the proposed project employs an overarching objective and three specific objectives as described below.

General Objective

If cross-sectoral climate change adaptation strategies are mainstreamed into management of oasis agroecosystems and livelihoods of the most vulnerable communities are diversified and strengthened, then vulnerability to the effects of climate change will be reduced because adaptive capacity will be increased in the most vulnerable oases of the Governorate of Tozeur.

Specific objective 1

The proposed project's first specific objective is to strengthen institutional and technical capacity for oasis management.

Specific objective 2

The second specific project objective is to promote the adoption of climate adaptation and livelihood enhancement measures.

Specific objective 3

The final specific project objective is to improve knowledge management and the evidence base for oasis management.

Project/Programme Components and Financing:

Table 4 below and overleaf summarises the proposed project's components, outputs, outcomes, and corresponding budget allocation.

Table 4. Overview of project components, expected outputs, outcomes, and budget

Project Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
Component 1: Strengthening institutional and technical capacity for oasis management	1.1. Climate adaptation services for oases mainstreamed through co-developing a governance mechanism 1.2. Institutional and technical capacity of national and subnational authorities and communities strengthened through cross-sectoral training and CBPP 1.3. Action plans to combat oasis ecosystem degradation implemented	Strengthened governance and technical capacity for climate-adaptive management of oasis ecosystems	3 217 500
Component 2: Enhanced livelihoods for oasis communities through more efficient agrosystems	2.1. Interventions to improve the efficiency of irrigation networks and combat water deficits implemented 2.2. Interventions to intensify sustainable agricultural production of the oasis system implemented 2.3. Fire prevention and protection measures implemented 2.4. Income diversification to enhance livelihood opportunities promoted	Enhanced livelihoods for oasis communities through more efficient ecosystems and agricultural systems	4 244 800
Component 3: Improving knowledge management and the evidence base for oasis management	3.1 Results and evidence for adaptation in oases ecosystems documented 3.2. Knowledge exchange missions on oasis management undertaken 3.3 Awareness-raising campaigns to facilitate cross-sectoral access to knowledge on oasis management implemented	Improved knowledge and evidence on climate change adaptation in oasis ecosystems	879 800
6. Project Execution cost			874 000
7. Total Project Cost			9 216 100
8. Project Cycle Management Fee charged by the Implementing Entity (if applicable)			783 369
Amount of Financing Requested			9 999 469

Projected Calendar:

Milestones	Expected Dates
Start of Project Implementation	January 2025
Mid-term Review (if planned)	June 2027
Project Closing	January 2030
Terminal Evaluation	September 2030

PART II: PROJECT JUSTIFICATION

A. Describe the project/programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

The proposed project comprises three interrelated components: i) strengthening institutional and technical capacity for oasis management; ii) adopting climate adaptation and livelihood enhancement measures; and iii) improving knowledge management and the evidence base for oasis management. The project aims to mainstream cross-sectoral climate change adaptation strategies into oasis management, as well as to diversify and strengthen livelihoods and sources of income of the most vulnerable people. The project's ultimate goal is to reduce vulnerability to the effects of climate change and increase adaptive capacity in the most vulnerable oases of the Governorate of Tozeur. The project theory of change is included as [Annex 1](#) to this Concept Note.

Concerning site selection, the project will be implemented in the 29 traditional oases in Tozeur Governorate. These sites were selected based on their omission from similar projects in the past as well as their vulnerability to the impacts of climate change as described in Part I of this Concept Note.

Component 1: Strengthening institutional and technical capacity for oasis management

The rationale for this component is to build on existing work undertaken by the Ministry of Environment and others to manage the stakeholders involved in oasis management and develop a governance framework to better coordinate the management of oasis ecosystems. Improved coordination is needed between national and subnational government in Tunisia, as well as between sectors, i.e., public, private, civil society, and non-governmental organizations (NGOs). Component 1 comprises one outcome and three outputs, as well as several indicative activities which are described below.

Outcome 1. Strengthened governance and technical capacity for climate-adaptive management of oasis ecosystems

Output 1.1. Climate adaptation services for oases mainstreamed through co-developing a governance mechanism

Project funds will be used under this output to develop a governance framework that adequately integrates climate change adaptation into policies and regulations for oasis management in Tunisia. Alignment with Tunisian legislation and safeguards concerning the economic and social empowerment of women will be ensured through a cross-cutting approach to gender and women's empowerment (GEWE) to guide the mechanism's approach to planning, programming, and budgets.

Indicative activities under this output are:

- Develop the governance mechanism and operationalization plan
- Validate the governance mechanism through consultation and stakeholder engagement

Output 1.2. Institutional and technical capacity of national and subnational authorities and communities strengthened through cross-sectoral training and CBPP

Output 1.2 will utilise two primary methodologies to strengthen institutional capacity for stakeholders mandated to undertake oasis management, including local non-governmental organisations (NGOs) and/or civil society organizations (CSOs): i) cross-sectoral technical training; and ii) community-based participatory planning (CBPP). At the community level, project activities will ensure that stakeholders have adequate knowledge and skills to sustain the benefits of project interventions through CBPP, which will also include the co-development of action plans for 29 oases. For the public sector, institutional capacity development will focus on technical training of national and subnational departments in climate-adaptive management of oasis ecosystems. For the NGO sector, local NGOs and CSOs will be capacitated to undertake improved management of oasis ecosystems in their respective projects, alongside the public and private sectors. Output 1.2's indicative activities include:

- Develop and deliver 16 cross-sectoral training events (4 each year) to project participants, NGOs/CSOs, and government stakeholders on sustainable practices for climate-adaptive oasis ecosystem management
- Implement the CBPP plan and undertake 16 workshops (4 each year) at the community level for the formulation of participatory action plans in 29 oases

Output 1.3. Action plans to combat oasis ecosystem degradation implemented

This output will employ several interventions that support oasis ecosystem function by strengthening technical capacity at the community level to eradicate invasive plant species, improve soil and rangeland health, and reduce erosion,.

Indicative activities under this output are:

- Develop and deliver community-level training and action plans on invasive alien species eradication in 29 oases
- Develop and deliver community-level training and action plans on erosion control techniques for oases and rangelands in 29 oases

Component 2: Adopting climate adaptation and livelihood enhancement measures

Climate change is affecting the ability of oasis agricultural systems and ecosystems (agroecosystems) to provide ecosystem services. To address climate-induced ecosystem degradation and mitigate climate-related risk, the focus of this component of the project is to improve the efficiency of agroecosystems and ecosystem function in the selected traditional oases. Similarly, the activities under this component will target disproportionately-vulnerable groups such as women, youth, and the elderly to promote more climate-resilient livelihood activities at the community level by providing a business incubator and seed funding for community projects and initiatives. Project funds will support one outcome and three outputs under this component.

Outcome 2: Enhanced livelihoods for oasis communities through more efficient agrosystems

Output 2.1. Interventions to improve the efficiency of irrigation networks and combat water deficits implemented

The objective of this output is to implement interventions that address inefficiencies in the use of water for domestic and agricultural purposes. At the planning level, a detailed groundwater analysis will be undertaken to inform the feasibility of recharging aquifers to improve the sustainability of groundwater abstraction. The outcomes of this study will be complemented by the co-design and implementation of water-smart irrigation infrastructure to ensure that abstracted water is used efficiently for agricultural purposes. Specific interventions to improve irrigation efficiency will include but not be limited to pilot projects for the treatment and recycling of drainage water/greywater, as well as treatment and reuse of wastewater. Similarly, project funds will also be used to upgrade and

replace open earthen canals with watertight irrigation pipes. Output 2.1's indicative list of activities is:

- Undertake a detailed groundwater analysis and abstraction feasibility study in the watersheds of 29 oases.
- Design and install water-efficient irrigation infrastructure at 29 oases.

Output 2.2. Interventions to intensify sustainable agricultural production of the oasis system implemented

Low levels of intensification and limited knowledge of good agroecology practices is increasing the vulnerability of climate-sensitive agriculture in Tozeur's traditional oases. Output 2.2 therefore aims to use project funds to raise awareness and develop technical capacity at the community level on sustainable agro-ecology. The proposed activities under this output are:

- Undertake community training and a demonstration programme on agroecology and sustainable agricultural practices in 29 oasis communities.
- Initiate micro-composting and plant disease control projects in 29 oasis communities.
- Implement palm grove rejuvenation 29 oasis communities, including climate-resilient date palm varieties.

Output 2.3. Fire prevention and protection measures implemented

Future climate threats are likely to increase the risk of wildfires in arid areas like oases. To mitigate this risk, project funds will be used under this output to ensure that fire prevention and protection measures are in place in the beneficiary communities. The proposed activity under Output 2.3 is:

- Implement fire prevention and protection measures in 29 oases.

Output 2.4. Income diversification to enhance livelihood opportunities promoted

The diversification of climate-sensitive livelihood activities in traditional oases is an essential aspect of reducing vulnerability to the impacts of climate change at the community level. Project funds will be used to that end under this output to establish a business incubator, prioritising disproportionately-vulnerable groups, to diversify livelihood activities and catalyse income generation in traditional oases. Based on the outcomes of recent stakeholder engagement at the community level, the incubator will include a competitive grant facility that will finance income-generating activities for communities. Activities under this output are proposed as follows:

- Establish a business incubator for micro-projects to diversify local livelihoods opportunities, especially for women.
- Selection and funding of beneficiaries (at least 50% women) through a transparent call for proposals process based on the Operational Guide of the project.

Component 3: Improving knowledge management and the evidence base for oasis management

The final component under the proposed project comprises one outcome and two outputs. The objective of the activities under this component is to support future replication and upscaling of similar projects in Tunisia through knowledge management and learning by targeting national and subnational government, NGOs/CSOs, civil society, and the education sector. Project funds will be used to achieve this goal through building the evidence-base for climate-resilient management of oasis ecosystems through careful documentation of the processes and results of project implementation, and dissemination of these results through knowledge exchange missions, communication material and an information portal.

Outcome 3: Improved knowledge and evidence on climate change adaptation in oasis ecosystems

Output 3.1 Results and evidence for adaptation in oases ecosystems documented

Documenting and recording of both the process and results of project activities is critical to ensuring that good practice examples and lessons learned can be used in future projects in similar contexts. This output supports that objective with the following indicative activities:

- Operationalise the project’s monitoring and evaluation (M&E) plan to monitor implementation progress and collect information on cross-cutting gender and safeguards aspects
- Develop training manuals and guidance for the ecosystem restoration and agricultural intensification activities under Component 2
- Develop an information portal and communication material on lessons learned in combating climate risk in oasis ecosystems

Output 3.2. Good practice and evidence for adaptation-based oasis management disseminated

In addition to the capture and storage of project knowledge and information, it is important to ensure that this knowledge is widely disseminated to facilitate upscaling and replication. This output aims to achieve that objective by convening cross-sectoral knowledge exchange missions and a technical workshop in Tozeur with national and subnational stakeholders from other governorates. A co-designed communication and awareness-raising campaign will ensure that the results of Output 4.1 are appropriately disseminated and will catalyse access to knowledge on oasis management. The following activities are proposed under this output:

- Undertake knowledge exchange missions on oasis management
- Host a national-level workshop in Tozeur to promote replication and upscaling in other regions of Tunisia
- Co-design and implement communication plans and awareness raising campaigns to facilitate cross-sectoral access to knowledge on oasis management

B. Describe how the project/programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project/programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

By implementing tangible climate change interventions, the proposed project will directly benefit ~7 600 vulnerable people (~2000 households) in the Governorate of Tozeur⁷⁴. Strengthened national capacity for knowledge management, awareness-raising and lessons learned from the project regarding climate-resilient livelihoods, improved agricultural output, and strengthened cross-sectoral governance will indirectly benefit the country’s entire population. Moreover, these interventions have been designed to be scaled up and replicated both nationally and across the region. The specific economic, social, and environmental benefits expected from the project are presented below.

Economic benefits

The anticipated direct economic benefits of the project are discussed in detail under Section C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme. , below.

⁷⁴ Direct project beneficiaries include the total number of smallholder farmers in the 29 traditional oases of the Governorate of Tozeur. Indirect project beneficiaries comprise the total population of the five delegations within the Governorate of Tozeur.

Indirectly, the restoration of oasis agroecosystems through project will benefit multiple economic sectors — particularly tourism and agriculture — by supporting healthy ecosystems that in turn provide ecosystem services and support extractive and non-extractive livelihoods such as sustainable/regenerative agriculture and tourism, respectively. More climate-resilient and diversified livelihoods will in turn decrease the reliance of communities in the targeted oases on the state to provide social safety net services. Similarly, the proposed project will improve the ability of participants to generate income.

Social benefits

Social benefits are also expected to accrue to project beneficiaries, particularly in the agricultural sector. The promotion of climate-resilient agriculture and the preservation of traditional agricultural activity is one of the project's key objectives: the actions carried out will contribute to maintaining and improving small-scale agricultural activity, to combating soil degradation and to technical capacity development and skills transfer for climate-resilient agriculture. Regarding livelihoods, the project will support the diversification of livelihoods in traditional oases by funding micro-projects and strengthening value chains. An additional social benefit will be driven by the project's cross-cutting focus on gender and social inclusiveness (GESI) by deploying training programmes focused on women empowerment and more inclusive livelihood practices in traditional oases that will benefit disproportionately-vulnerable groups such as the elderly, youth, and people with disabilities (PWDs).

Environmental benefits

The project is expected to generate numerous environmental benefits, particularly with regard to the preservation of water resources through improved water efficiency, and reduced abstraction but also with regard to the improvement of oasis ecosystem services. The project will support increased agroecosystem function through the management of invasive alien species and erosion, as well as the implementation of fire protection and prevention measures. Additional environmental benefits include: i) the conservation of indigenous plant biodiversity through the eradication of invasive species; ii) improving the pastoral value and productivity of the rangelands around the oases; and iii) protection of avifauna in traditional oasis agroecosystems, particularly breeding pairs. Similarly, the preservation of traditional oases (notably those of Dguech, Tozeur and Nafta), and the maintenance of their ecosystem services will support the protection of the Chott Djérid Ramsar site by preventing downstream siltation.

Gender considerations

The project activities will ensure that all stakeholders (local communities, marginalized groups and women) have equitable access to the benefits of the project. Where barriers have been identified that prevent women and other vulnerable groups from accessing project-derived benefits, mitigation measures for these barriers will be included as part of the Project Management Unit's Procedural Guide. Project implementation will likewise align with WFP's Gender Policy.

During project design, a gender analysis was developed following extensive consultation (refer to Part II, Section H for elaboration on the consultative process undertaken during project development) and participatory planning that facilitated dialogue and ensured that women and other disproportionately-vulnerable groups participated meaningfully in the design of project activities. This includes but is not limited to the proposed business incubator for micro-projects (Output 2.4) to diversify local livelihoods opportunities, prioritising women.

Under Component 3, focusing on knowledge management and learning (KML), the project will ensure a gender mainstreaming approach to KML by using the baseline studies on women's needs in oases in Tozeur to knowledge products that adequately include a gender lens. The project will employ a gender expert to oversee gender-specific project activities, as well as to ensure that gender considerations are integrated throughout the project in an appropriately cross-cutting manner.

Alignment with Adaptation Fund policy

Project interventions have been designed in alignment with several key Adaptation Fund policies, including the Environmental and Social Policy⁷⁵ (ESP), Gender Policy and Action Plan⁷⁶ (GPAP), as well as the Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy⁷⁷. The environmental and social aspects of the project and their continuity with the ESP are elaborated in Part II, Section B of this document. Similarly, the project's alignment with the GPAP is discussed in the previous subheading, as well as Part II, Section E of this Concept Note.

Avoiding or mitigating negative impacts

The following measures will ensure that project activities are implemented in a way that avoids or mitigates negative social or environmental impacts.

- There will be genuine, not just tokenistic, inclusion of community representatives in project design, implementation, and monitoring. This is enabled through WFP's experience in Community-based Participatory Planning (CBPP) exercises.
- Government collaboration and alignment will be enhanced through the integration of project goals with local development plans.
- Technical support will be sought especially in relation to sensitive or specialised services. Examples include gender issues as well as control of alien invasive species, fire prevention and control, and irrigation.
- Grievance and feedback mechanisms will be developed, and communities encouraged to understand and use them.
- During full project formulation stage, an environmental and social risk assessment will be performed, in accordance with the Adaptation Fund's 15 principles.
- There will be activity-level environmental and social screening for the components' activities at project implementation stage.
- Environmental and social risk management plans, commensurate with the risks assessed, will be developed at project formulation stage.
- Planning, implementation and monitoring of necessary mitigation measures will be identified by means of activity-level environmental and social screening.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme. Proposed project interventions have been designed to be cost-effective and efficient to ensure that maximum adaptation benefits are conferred to project beneficiaries.

Overall cost-effectiveness has been assessed by means of a high-level cost-benefit analysis (CBA⁷⁸) for the project to determine the economic impact of the proposed interventions and activities.

Economic impact is determined based on the difference between two scenarios: a counterfactual scenario corresponding to a situation without the implementation of the project (i.e., a 'business as

⁷⁵ Adaptation Fund Board. (2013). *Environmental and Social Policy*. [Online]. Available: <https://www.adaptation-fund.org/wp-content/uploads/2015/09/Environmental-Social-Policy-approved-Nov2013.pdf>

⁷⁶ Adaptation Fund Board. (2021). *Gender Policy and Action Plan of the Adaptation Fund*. [Online]. Available: https://www.adaptation-fund.org/wp-content/uploads/2016/04/OPG-Annex-4_GP-and-GAP_approved-March2021pdf-1.pdf

⁷⁷ Adaptation Fund Board. (2022). *Updated Gender Guidance Document for Implementing Entities on Compliance with the Adaptation Fund Gender Policy*. [Online]. Available: <https://www.adaptation-fund.org/document/updated-gender-guidance-document-for-implementing-entities-on-compliance-with-the-adaptation-fund-gender-policy-2/>

⁷⁸ A key consideration of the CBA approach is that it focuses on economic profitability, rather than a narrower view of financial profitability. An economic profitability lens is concerned with the general well-being and the expected impacts for the community as a whole, as opposed to the financial interests of a few.

usual' or 'baseline' scenario); versus a scenario with the project. The difference between these two scenarios represents the costs and benefits attributable to the project. The objective of the CBA undertaken during the development of this project was therefore to highlight the tangible benefits accrued or losses avoided that are directly attributable to the project, and thus its economic profitability.

To aid comparison, the CBA approach reduces all the data under consideration to a single unit, in this case a monetary unit. This means quantifying, as far as possible, the benefits of the project and translating them into monetary values. Project benefits can include but are not necessarily limited to: i) market benefits⁷⁹; and ii) non-market goods⁸⁰, for which quantification is more complex.

This analysis details, as far as possible, all the costs and benefits associated with project implementation. Source data for the CBA was derived from the consultations and technical deliverables used during development of this project concept, as well as relevant literature to ground the approach in good international practice. A summary of the CBA is shown below.

Concerning the quantitative outputs of the CBA study for the proposed project, the evaluation considers the direct and indirect benefits that will accrue from project implementation. These have been classified into benefits that relate to: i) improved supply of ecosystem goods and services; ii) agricultural production and sustainability; iii) socioeconomic resilience; and iv) water resource management. The economic model was developed for a 30-year projection and employs a discount rate of 5%. The discount rate⁸¹ is used to discount a future stream and calculate its equivalent present value, in this case, the net present value is USD 58 million. The results of the CBA are summarized in Table 5 below, demonstrating a positive cost-benefit ratio.

Table 5. Overview of cost-benefit analysis results for the proposed project

Discount rate	Discounted costs (USD millions)	Discounted profits (USD millions)	Cost/benefit ratio	Net benefits (USD millions)
5.00%	8.54	67.28	7.88	58.74

The project will benefit mainly the environmental and agricultural sectors as these two areas capture 73% and 23% of the quantified benefits, respectively (Figure 11).

⁷⁹ Benefits that pass through an identified financial or economic circuit, as is the case for actions contributing to the non-degradation of agricultural production and the improvement of the resilience of this sector, which will improve the wealth produced during the production process, more commonly known as added value.

⁸⁰ Most ecosystem goods and services — such as drinking water, the production of organic matter in the soil and the services provided by biodiversity — are not traded in markets. Their economic value, i.e., the price people would be willing to pay for them, is not reflected in market prices. The only way to assign monetary values to these services is to use non-market valuation methods.

⁸¹ In the context of climate change adaptation projects, and insofar as the expected benefits are long-term benefits, the discount rate used of 5% corresponds to that recommended by international institutions, notably the IMF.

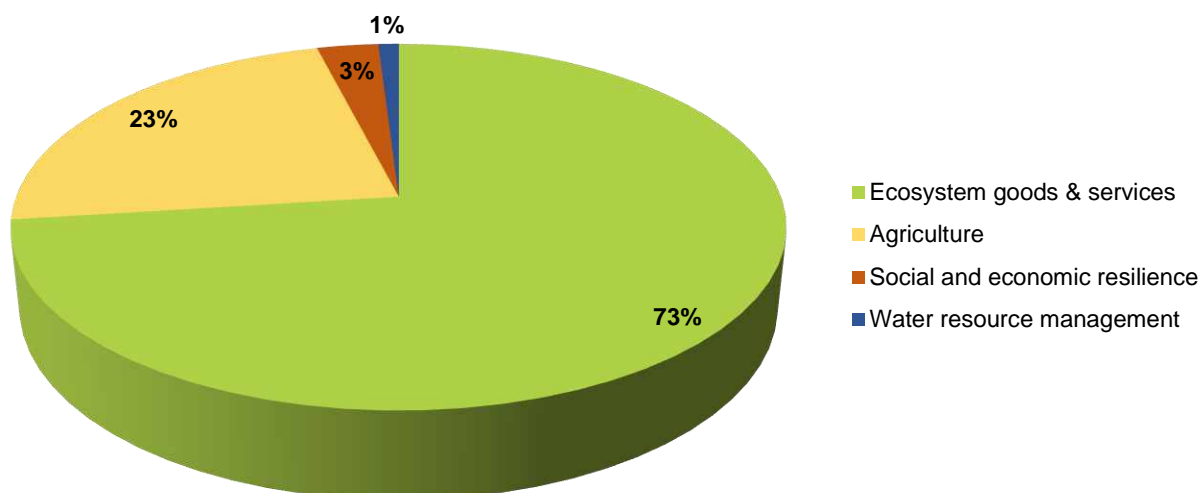


Figure 11. Distribution of estimated project lifecycle benefits by thematic area⁸²

The primary limitation of a CBA approach to demonstrating anticipated project benefits is that it only considers the quantifiable costs and benefits, with assumptions of risk on the value of certain benefits in this case. To compensate for these uncertainties, it is customary to supplement these indicators with a sensitivity study. Sensitivity analysis is used to determine the robustness of an evaluation by examining the extent to which results are affected by changes in assumptions. The sensitivity analysis conducted focuses on the change in earnings and the discount rate. The main results of the sensitivity analysis indicate that, regardless of the changes in parameters, the project remains economically viable from the perspective of the whole community.

D. Describe how the project/programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

The project aligns with several national policies related to climate change adaptation, agriculture, and development in Tunisia. Table 6 presents a summary of how the proposed project aligns with and can contribute to achieving the objectives of national policies, including the National Adaptation Plan (NAP), Nationally Determined Contribution (NDC), as well as the national Strategic Development Plan.

Table 6. Summary of project alignment with selected national policies

Policy	Summary	Project alignment
The National Climate Change Adaptation Plan	These two strategic documents, which are an integral part of Tunisia's climate policy for the 2030, 2050 and 2100 horizons and which deal	The NCCAP includes targeted adaptation measures for oasis ecosystems that are consistent

⁸² Source: ACTERRA Economic Analysis.

Policy	Summary	Project alignment
(NCCAP) 2021-2023	with the adaptation of all the key sectors to the expected effects of climate change, consider the oasis ecosystems and are concerned with their economic, social, and environmental components.	with the proposed project's interventions.
Tunisia's Nationally Determined Contribution (NDC) 2021	Tunisia submitted its first NDC to the UNFCCC in 2015 and updated it in 2021 by increasing its mitigation ambitions to 45% energy efficiency to be achieved by 2030 based on the 2010 level. The NDC includes both mitigation and adaptation actions for an estimated USD 20 billion in international funding needed for its implementation. The list of adaptation measures to be taken includes water resources, agriculture, coastal zones and tourism, in addition to other cross-cutting measures relating to land-use planning, technology transfer and communications/awareness raising. The updated version of the NDC is gender sensitive and has reflected this dimension in almost all the measures envisaged	The proposed project is aligned with several cross-cutting aspects of the NDC, particularly with objectives for the sectors under consideration by the proposed project such as water resources management, resilient farming, and food security.
National Climate Change Strategy for Tunisia (NCCS) 2012	In 2012, Tunisia developed the NCCS, in which it presents the possible future climate scenarios facing the country and the energy, agricultural and water strategies that will be needed for a national climate change adaptation and mitigation strategy. Water management is of great importance in changing farmers' approach to water management and use. The national objective is to encourage farmers to make better use of water, reduce water losses and raise awareness of the importance of water conservation. The NCCS promotes nationally appropriate mitigation measures (NAMAs), with a strong emphasis on employment creation and poverty reduction as a means of adapting to climate change.	The project will be aligned with the NCCS through the promotion of increased water availability, improved water management and awareness among farmers as well as the promotion of alternative livelihoods that help farmers better adapt to climate change.
Strategic Development Plan (SDP) 2016-2020	The Economic and Social Development Plan 2016-2020, drawn up by the Tunisian Ministry of Development, Investment, and International Cooperation, is the country's main development strategy. The PSD defines five pillars: 1) improving good governance, administrative reform and the fight against corruption; 2) accelerating the adoption of crucial reforms to develop a higher value-added economy; 3) developing human capital and promoting social inclusion; 4) reducing regional disparities; and 5) making the green economy a pillar for sustainable development.	The proposed project is aligned with three of the five SDP pillars, namely 3, 4 and 5, through the promotion of basic infrastructure upgrades; capacity building of vulnerable households; promotion of sustainable natural resource management; strengthening of farmers' organisations; and monitoring of groundwater levels and institutional capacity development.
Strategy for the Management and Conservation of Agricultural Land 2017	The strategy has five main objectives: i) protecting and regenerating soils; ii) combating soil erosion; iii) using sustainable soil and water management to protect and add value to agricultural land; iv) using runoff and increasing surface, soil and deep-water storage; v)	The project is aligned with the strategy through its promotion of more efficient irrigation and intensified agricultural production, improved groundwater regeneration, and skills transfer to

Policy	Summary	Project alignment
	contributing to biodiversity conservation and promoting sustainable environmental management for climate change adaptation.	smallholder farmers in oasis agroecosystems.
Sustainable Development Strategy (SDS) 2014-2020	The SDS has been developed by the Ministry of Public Works and Housing. The main objectives outlined are to improve knowledge of the effects of climate change on different natural environments and to increase resilience to climate change by focusing on the integration of climate change adaptation into development planning.	The project is aligned with the SDS through Component 3, which defines a knowledge management and learning (KML) strategy for the project to ensure that replication and upscaling potential is maximised for project interventions that are aligned with sustainability principles.
National Low Carbon and Resilience Strategy (SNBRCC) 2022	This strategy promotes a low-carbon approach to development that is resilient to the effects of climate change for the key sectors of the Tunisian economy. The adaptation objectives and targets identified include the oasis landscapes that are the focus of this project. The eight-pointed resilience star addresses some of the issues facing oasis ecosystems such as water resources, biodiversity, and the energy transition for water extraction	The proposed project may realise mitigation and decarbonisation co-benefits through livelihood diversification and the potential reduction of wildfire-related emissions under Output 2.3.

E. Describe how the project/programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

The proposed project is aligned with the requirements of the Environmental and Social Policy (ESP) of the Adaptation Fund. In addition, as the Multilateral Implementing Entity (MIE) for the project, WFP will ensure that the proposed project is implemented in accordance with the procedures outlined in the ESP, as well as WFP’s internal Environmental and Social Sustainability Frameworks. This includes the requirement that project activities funded by the Adaptation Fund reflect local circumstances and adaptation needs as well as draw upon national actors and capabilities.

Given the small scale of the project’s interventions as well as their focus on strengthening the country’s capacity for improved climate resilience, Environmental Impact Assessments (EIAs) are not expected to be necessary for any of the planned interventions. In addition, the proposed project’s activities are in line with national social norms, including gender equality and equal access to adaptation benefits. Table 7 summarises the main technical and regulatory standards that the project will align with.

Table 7. Summary of applicable national standards and project alignment

Regulation/standard	Summary	Project alignment
Environmental Impact Assessment Decree (No. 91-362 of 1991, amended by Decree 2005)	This decree lists the activities and installations that require environmental impact assessment (EIA) under Tunisian law.	The proposed project has been screened for potential EIA triggers during design and development. No EIA triggers have been identified within the proposed activities, but this will be confirmed during development

Regulation/standard	Summary	Project alignment
		of the full Funding Proposal ⁸³ .
Water Code (1975)	This code is the overarching legislation governing the water sector in Tunisia. It covers aspects such as the sector's organisation, rights to water, the protection of water resources and the penalties that should be applied should its principles be breached. A revised water law has been debated in the Tunisian Parliament; in its current form this law is the comprehensive legislation covering the water sector. It covers aspects such as the organization of the sector, rights to water, protection of water resources and sanctions to be applied in case of violation of its principles. All decrees and ordinances that apply to water and wastewater treatment refer to the Water Code.	The proposed project is compliant with the Water Code, the main objective being to reduce water losses in the agricultural sector, to promote groundwater replenishment and to raise awareness of the importance of sustainable water management, in particular as a means of building resilience to climate change.
Government Decree No. 2016-626 on Equal Opportunities for Women and Men (2016)	The main objective of this decree is to promote the integration of a gender approach in planning, programming, evaluation and budgeting by adopting a participatory and interactive approach between all actors of public structures and associations active in the field. In August 2022, the Council approved the National Plan "Gender and Climate Change" aimed at ensuring women's economic empowerment through new programmes and projects that enshrine the interdependence between social and climate change.	Procedures for implementing project activities will ensure that all stakeholders, including local communities, marginalized groups and women, have equitable access to project benefits. The project will seek to reduce barriers that may prevent these groups from accessing project benefits, such as access to natural resources, participation in decision-making, or access to employment and income generated by the project as defined in the Project Management Unit's Procedural Guide.

F. Describe if there is duplication of project/programme with other funding sources, if any.

Since the 1970s, the traditional oases of the Djérid have been the recipients of several socio-economic development projects. These projects have focused primarily on water resources as a basis for dealing with the degradation of oases and improving agricultural output, particularly of Deglet Nour dates. More recent projects have focused on inclusive, participatory development and towards the agroecosystem oasis concept of oases, which highlights the dual biodiversity and agricultural production functions. A brief inventory of the main projects implemented and/or planned is presented here in order to explore opportunities for synergy with the present climate change adaptation programme and to ensure no duplication.

⁸³ Refer to Part II, Section K for further detail on the project's anticipated environmental and social risks.

Table 8. Summary of past and ongoing projects and alignment with the proposed project

Project	Summary	Synergy with the proposed project
<p>Addressing Climate Change Vulnerabilities and Risks in Vulnerable Coastal Areas of Tunisia (2014)</p> <p>Ministry of Environment, Coastal Protection and Planning Agency (APAL), Government of Tunisia United Nations Development Programme (UNDP) Global Environment Facility (GEF)</p>	<p>The project is designed to address the main national adaptation priority on integrated coastal zone management and takes a three-pronged approach for building long term resilience of the coast. It revises critical national regulations on coastal zoning based on impact scenarios generated by coastal models and develops local adaptation plans for Tunisia's most vulnerable coastal locations.</p>	<p>The proposed project will not be implemented in any coastal areas of Tunisia, so while there is no spatial overlap, many of lessons learned during this GEF project can be integrated into the design stage of the funding proposal. In particular, the GEF project's knowledge management and local adaptation planning aspects.</p>
<p>Hydraulic infrastructure in the oases of southern Tunisia (2019)</p> <p>European Bank for Reconstruction and Development (EBRD) Ministry of Agriculture, Hydraulic Resources and Fisheries</p>	<p>Project to restore and strengthen the resilience of 37 oasis ecosystems and improve access to water resources in the four southern governorates. The Project will improve access to irrigation water for more than 30,000 farmers and their immediate families living in the basin concerned and will bring considerable economic and social benefits.</p>	<p>Large-scale hydraulic and hydro-agricultural infrastructure project. Complementarity and synergy will be achieved in the interweaving of large-scale water infrastructure and community-based climate resilience projects, the actions of which will be lessons learned by the populations for future "climate-smart" good practices in response to climate disruption</p>
<p>Improving the sustainable management of natural resources and promoting the diversification of livelihoods in targeted traditional oases (2020)</p> <p>WAHA Ministry of the Environment Government of Tunisia, GEF World Bank</p>	<p>The project is structured around six priority areas, selected within the framework of a participatory and constructive approach, and capitalises on the results of the various studies carried out on oasis development issues, the achievements of the Sustainable Management of Oasis Ecosystems (GDEO) project and the multi-stakeholder consultations.</p>	<p>The project was completed in 2020 and has several lessons learned that will be taken into account during development of this project.</p>
<p>Integrated rural development in the delegation of Hazoua and Tameghza in the governorate of Tozeur</p> <p>Italian Cooperation</p>	<p>Four components: a) strengthening of participatory local development; b) protection of irrigated areas against silting; c) improvement of agricultural production in irrigated areas; d) diversification of income sources for rural families.</p> <p>Hazoua: The initiative targets 15 irrigated areas, totalling 869 hectares, benefiting around 900 farmers.</p>	<p>This project is mainly implemented in the Delegation of Hazoua which has no traditional oases; however, the activities are relevant as lessons learned for the development of the resilience of the populations in the Governorate (€300,000 micro-credit component being created).</p>

Project	Summary	Synergy with the proposed project
	Tameghza: the agricultural production of three irrigated perimeters of 240 hectares will be reinforced for the benefit of 150 farmers.	
<p>Towards climate-resilient agriculture and livelihoods in Southern Tunisia</p> <p>Green Climate Fund (GCF) Funding Proposal under consideration (2023) FAO Ministry of Agriculture, Hydraulic Resources and Fisheries</p>	<p>The project proposes to provide water-related infrastructure to the Tameghza region of Tozeur, including cisterns, wells, and boreholes for drinking water supply. The project will also develop watersheds through water and soil conservation works and flood risk reduction.</p>	<p>Complementary with the Water Infrastructure in the Oases of Southern Tunisia project, in the sense that the PRAC and PAC (water resources) proposals in Tozeur are climate resilience actions and good practices for the efficient management of the resource at the community level.</p>
<p>Economic, Social and Solidarity Insertion for Resilience in the Governorate of Kairouan (2021)</p> <p>Adaptation Fund Ministry for Agriculture Water Resources and Fisheries (MAWRF) International Fund for Agricultural Development</p>	<p>The goal of the project is to contribute to poverty eradication in the Kairouan region through providing the rural poor the means to adapt to climate change through sustainable environmental management and livelihoods. The project will protect against the negative climate change impacts by simultaneously improving ecosystem functions, promoting sustainable land management (SLM) and protecting rural climate vulnerable livelihoods.</p>	<p>There is complementarity with several of the proposed project's activities and outcomes, without any spatial duplication. Lessons learned will be taken into account during development of this project.</p>

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

Component 3 of the proposed project is dedicated exclusively to knowledge management and learning. The primary objective of this component is to support future replication and upscaling of similar projects in Tunisia through sustainable knowledge management and learning.

Project funds will be used to achieve this goal through building the evidence-base for climate-resilient management of oasis ecosystems through careful documentation of the processes and results of project implementation, and dissemination of these results through knowledge exchange missions, communication material and an information portal.

The activities under this component of the project recognise that project-related knowledge must be co-generated in a bottom-up fashion if the knowledge products are to be authentic and achieve the required impact. The project therefore emphasises a co-development process that closely involves beneficiaries and participants in both the generation and dissemination aspects of knowledge management and learning. In addition, a centralised knowledge management portal will be established under the project to ensure that knowledge and lessons generated through the project are widely accessible, adopted and used beyond the project lifespan.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with

the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

Consultation process and timelines

The proposed project has adopted a consultation process based on inclusive and participatory methods to ensure buy-in and ownership of project interventions at beneficiary level. Between May and November 2022, an intensive, cross-sectoral consultation exercise was undertaken at the community level in the 29 traditional oases of the Governorate of Tozeur (Figure 8). This approach has allowed the project to prioritise the needs of individual oases and select appropriate locations for each intervention, as well as to ground-truth secondary data and generate new primary data to inform project design. Similarly, consultation with government and non-government project partners has been extensively undertaken during the development of the proposed project.

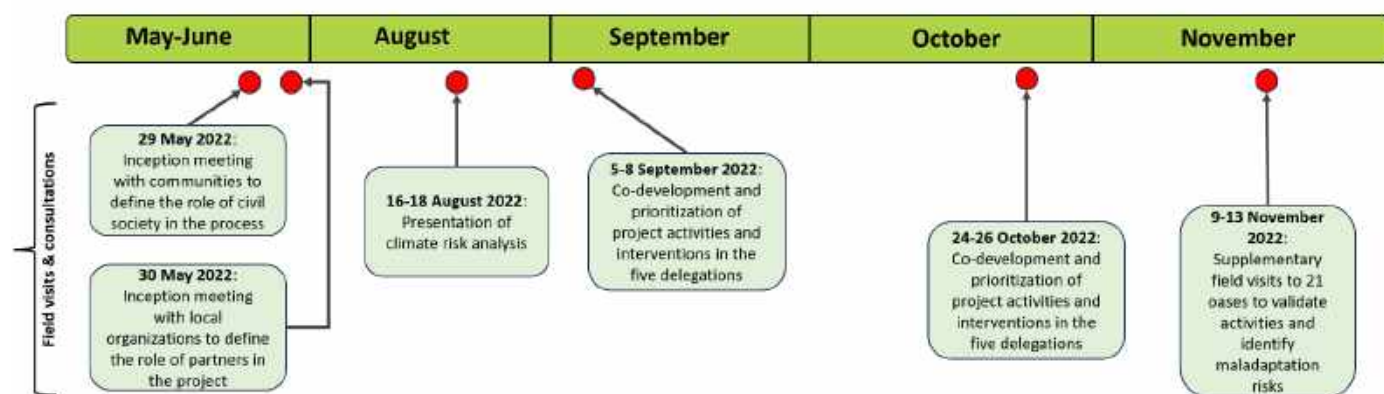


Figure 12. Consultation timeline for the 29 traditional oases of the Governorate of Tozeur

During the co-development workshops in September 2022, a systematic and replicable approach was undertaken when consulting prospective project beneficiaries as shown in Table 9.

Table 9. Summary of consultation workshop components and outcomes

Workshop aspect	Summary of approach and outcomes
Introduction	<ul style="list-style-type: none"> – A discussion to clarify and simplify the concepts, the approach and the results was initiated. It was important that the participants had a clear and concise idea of the challenges of adaptation to climate change in the oases of Tozeur. – Introduction with the presentation of the results of the vulnerability study <i>Assessment of vulnerabilities and risks in the traditional oases of the Governorate of Tozeur</i> – Focus on the evolution of the climate in Tozeur, the impacts of climate change, vulnerability and risk calculation and prioritization of delegations. – Insertion of the exercise in the framework of the national strategy for the sustainable development of oases in Tunisia: a brief presentation of the strategy to explain the articulations and coherence of the exercises. – Debate and exchange: interventions to clarify concepts, present issues, and answer participants' questions – Results: understanding of the mission's mandate, mastery of the impacts of climate change on oases, visualization of impacts, prior adjustments, validation
Analysis	<ul style="list-style-type: none"> – Presentation of climate risks and their impacts: presentation of risk chains – Risk ranking according to the sectors analysed: degradation of water resources, degradation of natural ecosystems, reduction of the productive sector; Impacts on social issues and gender equality. – Debate and exchange: always with an educational approach: explain the path of the risk chains, clarify, and simplify the links

Workshop aspect	Summary of approach and outcomes
	<ul style="list-style-type: none"> – Results: understanding of the method, control of the links between risk and adaptation, prior adjustments, validation
Preparation	<ul style="list-style-type: none"> – Identification of options for building a database of climate change adaptation measures, actions, projects, and programmes. – To facilitate the exercise and ensure articulation with the national strategy for the sustainable development of oases, a correlation matrix between the risk chains and the strategic axes of the strategy was developed. – A spreadsheet summarising the actions that meet the objectives of the strategic axes was developed
Project development	<ul style="list-style-type: none"> – The work consists of detailing the measures adopted in previous years – Each action should be the subject of detailed sheets giving the characteristics of each project with sufficient precision for each operator to be able to clearly assess what is expected of him and what commitments he is called upon to make. – These sheets should clearly indicate What objective does the project contribute to? The nature of the project. What are the expected results of the action? The exact scope of the project The estimated cost (possibly of the various stages if the project is to be carried out in successive stages)

Identified needs

Prospective project participants and beneficiaries expressed several interrelated needs during the abovementioned consultations. These needs are summarized⁸⁴ below:

- Assistance with technical capacity development for sustainable agriculture, fire prevention and protection, as well as eradication of invasive alien species (addressed by the proposed project under component 1, 2 and 3);
- Provision of equipment and infrastructure for sustainable groundwater abstraction and more efficient irrigation (addressed by the proposed project under component 2); and
- Diversification and strengthening of climate-sensitive livelihoods (addressed by the proposed project under component 2 and 3).

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Component 1: Strengthening institutional and technical capacity for oasis management

Baseline scenario (without Adaptation Fund resources)

Currently, the government of Tunisia has limited capacity to implement tangible adaptation solutions for improved management of oasis agroecosystems. This is largely because national- and local-level decision-makers, as well as vulnerable communities, have limited technical and institutional capacity for the effective and efficient implementation of these solutions.

The national government and regional bodies are moreover aware of the threats posed by climate change to the sustainable development of the region. However, given the magnitude of social (high poverty rates, limited access to public services, social unrest in some parts of the area) and economic (balance of payments, budget deficits, high unemployment, and limited access to public services) problems, there is less concerted action to promote adaptation efforts to the inevitable consequences of climate change. Given the constrained policy framework and limited technical and institutional

⁸⁴ A detailed analysis of stakeholder needs will be presented during development of the Funding Proposal.

capacity of the public sector in Tunisia as well as vulnerable communities to adapt to climate change threats, it is unlikely that effective on-the-ground adaptation actions will be implemented in the absence of external support.

Additionality (with Adaptation Fund resources)

AF resources will be used to strengthen the technical capacity of national and subnational government, as well as vulnerable community levels for improved management of oases agroecosystems. This will be achieved through cross-sectoral capacity-building initiatives, which will be implemented at a national level and within vulnerable communities in the oases of Tozeur. The project will produce a strengthened evidence base for sustainable management of oases agroecosystems, as well as knowledge products that can contribute to the revision of key policies on ecosystem and agrosystem renewal and water management. AF resources will be essential to invest in these efforts, which will not be undertaken in their absence, given the limited resources available to the Tunisian government as a whole.

Component 2: Adopting climate adaptation and livelihood enhancement measures

Baseline scenario (without Adaptation Fund resources)

Climate change impacts are intensifying in the region, making climate-sensitive livelihoods like agriculture increasingly marginal. In the southern areas of Tunisia, already common droughts are projected to become more frequent, reducing soil humidity, accelerating desertification, negatively impacting agricultural productivity, and placing further pressure on limited groundwater resources⁸⁵. Oases are likely to be acutely affected by these impacts, as is identified in Tunisia's 3rd National Communication which is of particular concern given their socio-economic importance in otherwise arid and marginal areas. The combination of all of these climate impacts is likely to lead to a range of consequential socioeconomic impacts, including reduced food security and economic development, fewer livelihood opportunities and an increase in conflict over already scarce resources. Without urgent investment into strengthening climate-sensitive livelihood activities, the knock-on effect of acute and chronic climate change impacts will severely affect the ability of vulnerable oasis communities to sustain their livelihoods. These issues are compounded by limited access to finance and alternative sources of income, limited levels of awareness on climate change, as well as the disproportionate vulnerability of women, the youth, the elderly, and people with disabilities.

Additionality (with Adaptation Fund resources)

Proposed project interventions under Component 2 will contribute to developing more climate-resilient livelihoods in the oases of Tozeur. By improving the efficiency and sustainability of groundwater abstraction and irrigation, as well as sustainably intensifying agricultural production, AF resources will contribute to a transformative shift in the climate resilience of communities that rely on the oasis agroecosystems. Similarly, by implementing fire and degradation prevention measures, the project will strengthen the supply of ecosystem goods and services provided by oasis agroecosystems in Tozeur. Further activities funded under Component 2 that will decrease the reliance on climate-sensitive agriculture is the income diversification by establishing a business incubator, prioritising disproportionately-vulnerable groups, to diversify livelihood activities and catalyse income generation in traditional oases.

Component 3: Improving knowledge management and the evidence base for oasis management

Baseline scenario (without Adaptation Fund resources)

The evidence base for sustainable use of oases and climate-resilient livelihoods is scarce in the

⁸⁵ 81% of the national annual water potential is utilized under current conditions.

Tunisian context. Without concerted effort behind and investment in strengthening technical capacity for improved governance of oasis agroecosystems, as well as supporting efforts to reduce the climate-sensitivity of the livelihood activities of the most vulnerable communities, the opportunity to develop a robust evidence base for these kinds of interventions will not be realised. It is therefore likely that there will be no action under the baseline scenario, to promote efficient water resource use that could illustrate the costs and benefits of such adaptation measures over time in oases.

Additionality (with Adaptation Fund resources)

AF resources would facilitate the engagement of local communities and the dissemination of information generated on the cost-effectiveness of different interventions on the ground, enabling government and regional bodies to integrate nationally and regionally appropriate adaptation knowledge into their climate change strategies. This will facilitate the translation of conceptual adaptation measures into action on the ground, thereby increasing the resilience of vulnerable populations in oases to climate change threats. The results of the activities and interventions under Component 3 will allow the project to be upscaled and/or replicated in other parts of Tunisia and the region.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project/programme.

Long-term sustainability has been addressed in the project design by: i) actively involving prospective project beneficiaries in the co-design of proposed activities and implementation arrangements; ii) targeting technical capacity at the community level to ensure that stakeholders have adequate knowledge and skills to sustain the benefits of project interventions; iii) targeting community training extensively on climate-resilient techniques for water and agricultural management specifically adapted to oases; and iv) maintaining skills in water-efficient irrigation technology, including maintenance and upkeep of this infrastructure and equipment.

The project ensures sustainability through the community-based participatory approach promoted in all project activities, which enables communities and local authorities to take ownership of the project results. The sustainability of the project is enhanced by the sustainable land management and soil and water conservation approaches that are promoted and form the core of the sustainable environment and resource management approach to building resilience to future climate shocks.

Long-term sustainability will be pursued through institutional development and capacity-building programs designed to create a critical mass of effective practitioners and users, and among all actors, from public sector institutions to grassroots organizations and civil society. Replicability of the project's outcomes will be ensured through the dissemination of lessons learned from the field demonstration trials and locally adapted management systems adopted by the beneficiaries, with the capture and curation of this ensured by the information portal to be developed under Component 3.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project/programme.

A preliminary screening of the potential environmental and social impacts and risks that may arise as a result of the proposed project is presented below, with an overall ESS rating of Category C (minimal or no adverse environmental or social risks and/or impacts). This screening was undertaken in accordance with Adaptation Fund's Environmental and Social Principles.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>		<p align="center">X (low to no risk)</p> <p>The proposed project will be implemented in climate-vulnerable areas. A preliminary assessment of Tunisia's legislative framework has been undertaken to identify relevant legislation with which the project will comply. The legislation relevant to the proposed project is presented in Part II, Section D of this Concept Note. During full project formulation, extensive stakeholder engagements will be conducted with relevant national and local governments to ensure that the project meets all relevant legal requirements of the country.</p>
<i>Access and Equity</i>		<p align="center">X (low to no risk)</p> <p>The proposed project is not expected to prevent beneficiary communities from accessing basic health services, clean water and sanitation, energy, education, housing, nor adversely affect working conditions and land rights. Project beneficiaries of the proposed project are decision-makers, first responders and climate vulnerable local communities. Within these groups, there is a risk that certain decision-makers and community members may benefit more than others, as a result of entrenched systems of privilege, access, and authority. To mitigate this risk, all relevant project stakeholders were engaged during the development of this Concept Note⁸⁶. These engagements will be continued during the development of the full proposal to ensure that project activities deliver equitable adaptation benefits to all.</p>
<i>Marginalized and Vulnerable Groups</i>		<p align="center">X (low risk)</p> <p>There is a risk that vulnerable and marginalised groups will have disproportionate constraints on their access to project activities.</p> <p>This risk has been considered during the development of this</p>

⁸⁶ A summary of the consultative stakeholder engagement process undertaken during project development is presented in Part II, Section H.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		<p>Concept Note and mitigation measures will develop further during full funding proposal to ensure that marginalised and vulnerable groups, particularly women, the youth and people living with disabilities, will not be adversely affected by project activities. Instead, these marginalised groups will be prioritised to benefit from responsive climate change adaptation interventions implemented under the project. To avoid the exclusion of marginalised communities, these groups have been involved during Concept Note Development and will be involved in the community consultations carried out during the preparation of the full project proposal to ensure equitable participation and that social impacts do not unjustly impact on marginalised and vulnerable groups.</p>
<i>Human Rights</i>	<p align="center">X (no risk)</p> <p>No activities are or will be included in the design of the proposed project that are not in line with established international human rights. Moreover, the proposed project will promote the basic human rights of access to food, water, and information.</p>	
<i>Gender Equality and Women's Empowerment</i>		<p align="center">X (low to moderate risk)</p> <p>Since the proposed project is targeting communities where men occupy the majority of the leadership positions, there is a risk that women will not receive equitable adaptation benefits under the proposed interventions. To mitigate this risk, gender equality and women's empowerment will be promoted and include more details during the development of the full proposal and further stakeholder consultations. Furthermore, proposal preparations and project activities have been designed to encourage and enable the meaningful participation of women, as well as the active participation in technical assessments and capacity-building activities.</p>
<i>Core Labour Rights</i>		<p align="center">X (low risk)</p> <p>National- and local-level governments as well as vulnerable communities will be involved in the operation and maintenance of project interventions. Although unlikely, these individuals may be exposed to the risk of accidents in implementing project interventions.</p> <p>Core labour rights will be respected and considered in project design and implementation. All relevant project stakeholders will be involved in the design of project activities to ensure that relevant labour legislation is adhered to.</p>
<i>Indigenous Peoples</i>		<p align="center">X (low risk)</p> <p>Indigenous communities were consulted throughout the design of project interventions, and as a result, the project</p>

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		activities are reflective of the specific needs of these communities. The project will ensure safe community consultations by obtaining Free Prior and Informed Consent (FPIC) with all communities involved as part of the initial stages of implementation. The process will be repeated prior to any initial engagements that occur as part of project design. Further compliance of the project with the rights of indigenous peoples will be ensured by aligning project activities with the rights and responsibilities outlined in the UN Declaration on the Rights of Indigenous Peoples and other applicable national and international instruments.
<i>Involuntary Resettlement</i>	<p align="center">X (no risk)</p> <p>No activities are or will be included in the project design that will result in involuntary resettlement.</p>	
<i>Protection of Natural Habitats</i>	<p align="center">X (low to no risk)</p> <p>The project is not expected to have any negative impact on natural habitats, including those: i) legally protected; ii) officially proposed for protection; iii) recognised by authoritative sources for their high conservation value, including as critical habitat; or iv) recognised as protected by traditional or indigenous local communities. Project activities will also avoid introducing invasive plants by only using local and indigenous species. The proposed project approach environmentally positive and is expected to have a net positive impact on the environment by restoring or protecting the ecosystem services generated by oasis agroecosystems.</p>	
<i>Conservation of Biological Diversity</i>	<p align="center">X (low to no risk)</p> <p>Tunisia is party to the United Nations Convention on Biological Diversity, and the project has been designed to align with those principles. The action plans developed under the project will require only indigenous species to be used in all restoration activities to ensure minimal ecological impacts.</p>	
<i>Climate Change</i>	<p align="center">X (no risk)</p> <p>The project will contribute to climate change adaptation efforts in Tunisia and has been designed in line with national priorities established in the country's NDC, NAP and the National Climate Change Strategy for Tunisia.</p>	
<i>Pollution Prevention and Resource Efficiency</i>	<p align="center">X (low to no risk)</p> <p>Project activities are not expected to result in any significant pollution. Project design of tangible interventions such as the improvement of irrigation networks will ensure that all applicable international standards are met for maximising resource efficiency and</p>	

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
	minimising waste production and the release of pollutants, including carbon emissions.	
<i>Public Health</i>	<p align="center">X (low to no risk)</p> <p>Project activities will have no foreseeable negative effect on public health. Activities under Component 2 will likely improve public health through the improvement of water quality and improved food security from increased agricultural productivity and livelihood diversification.</p>	
<i>Physical and Cultural Heritage</i>	<p align="center">X (low to no risk)</p> <p>A central aspect of the project's objective is to preserve the function of traditional oases in Tozeur. Proposed project interventions are therefore not expected to cause any damage to physical and cultural heritage. Moreover, the participatory approach to project design has used local knowledge to ensure that physical and cultural heritage is not negatively affected by on-the-ground activities. The location of physical and cultural heritage sites will be considered during site selection to reduce the likelihood of negative impacts of project intervention on local heritage.</p>	
<i>Lands and Soil Conservation</i>	<p align="center">X (low to no risk)</p> <p>Proposed project interventions will promote improved land use management under future climate change conditions. No project activities are expected to result in the degradation of lands. Rather, project activities are anticipated to contribute to reducing degradation of oasis agroecosystems in Tozeur.</p>	

PART III: IMPLEMENTATION ARRANGEMENTS

A. Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund

The proposed project's overall and specific objectives, as well as the anticipated project outcomes align favourably with several Fund outcomes (2, 3, and 6) and outputs (3.2, 4.0, and 6.0). Table 10 cross-references the objectives and outcomes of the proposed project to the respective fund outcome and output, including the relevant project and fund indicators and the corresponding amount of funding requested.

Table 10. Overview of alignment between the project's objectives and outcomes with the Adaptation Fund Results Framework

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
To strengthen institutional and technical capacity for oasis management	Number of national policies, strategies, programmes and other system components contributing to zero hunger and other SDGs enhanced with WFP-facilitated South-South and triangular cooperation support	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	3 217 500
To promote the adoption of climate adaptation and livelihood enhancement measures	WFP Climate Resilience Capacity Score (CRCS)	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods	4 244 800
To improve knowledge management and the evidence base for oasis management	Proportion of the population in targeted communities reporting environmental benefits	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Percentage of targeted population applying appropriate adaptation responses	879 800
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Strengthened governance for climate-adaptive management of oasis ecosystems	Number of tools or products developed or revised to enhance national systems contributing to zero hunger and other SDGs as part of WFP capacity strengthening	Output 4.0: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	2.1.2 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)	532 500
Enhanced livelihoods for oasis communities through more efficient agrosystems	Number of people benefiting from assets and climate adaptation practices facilitated by WFP's risk management activities	Output 6.0: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or	920 000

			community livelihood strategies	
Improved knowledge and evidence on climate adaptation in oasis ecosystems	Number of national institutions engaged in WFP capacity strengthening activities at national and subnational levels	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	482 300

B. Management arrangements

The proposed project will be executed over a five-year period in collaboration between the World Food Programme (WFP) and the Tunisian Ministry of Environment (MoEnv; The Ministry), through the National Coordination Unit on Climate Change (UGPO-CC).

Implementing Entity

WFP is submitting this project as an accredited Multilateral Implementing Entity (MIE) for the AF. In its capacity as MIE, WFP will be in charge of the project cycle management, overseeing overall project progress, including financial oversight, monitoring and evaluation support, as well as technical backstopping and reporting to the AF. At the national level, the project will be coordinated through support of the WFP Country Office. Additional, technical support will be provided as required by the WFP Regional Bureau in Cairo, and WFP Headquarters in Rome, Italy.

Executing Entity

The Executing Entity (EE) will be the Ministry of Environment, the Government entity responsible for management of the national climate change agenda in Tunisia. Through the coordination function of the UGPO-CC, the Ministry will be responsible of effective and efficient delivery of the project outputs and ensuring objectives and outcomes are achieved as per the project document. In this regard, the Ministry will coordinate and collaborate with other governmental bodies and non-governmental organizations at the national, regional/governorate, and delegation/district levels for the implementation of the Project activities. The following are some of the entities identified as key partners and potential members of the project's National Steering Committee: Ministry of Local Development, Ministry of Tourism, Ministry of Agriculture and Water Resources, Ministry of Social Affairs, Ministry of Cultural Affairs, Ministry of Vocational Training and Employment, in addition to partner community-based organizations (CBOs) and private sector in the oases of the Tozeur Governorate.

The Ministry will lead the implementation of Component 1 of the Project to establish the mechanisms and organizational structures for climate-adaptive, sustainable and inclusive management of oases ecosystems in Tozeur. While in implementing Components 2 and 3, the Ministry will coordinate with regional and local offices of concerned ministries and authorities to deliver the proposed interventions. In addition to WFP's principal role as MIE, the Executing Entity (EE) requested WFP to also provide Direct Project Services (DPS) in the form of managing the procurement, administration and financial management functions required for project execution.

Project Management Unit

Upon receipt of funding, the Project will set up a Project Management Unit (PMU) to manage all execution responsibilities and be responsible for the progress reporting on all field-level activities. The PMU will be tasked with the day-to-day operations and management of the Project activities under the direct supervision of the National Project Manager (PM). A fulltime PM will be hired and will be supported by Project Regional Coordinator (PRC) and a team for administration and financial matters.

To ensure strong coordination and close interaction with both national level discussions and field-level execution, the PMU will operate at two levels. The PM will be stationed in the Capital for close liaison with the national governmental agencies and other stakeholder partners present there. At the regional/governorate level, the PMU will be established, and operations will be coordinated by the PRC and will have their office located in Tozeur Governorate.

As part of the proposed governance mechanism for oases ecosystems management and to enhance community-level ownership of project activities, Project Field Facilitators will be hired in each of the 5 delegations/districts in Tozeur Governorate from its residents. These coordinators will be assigned the responsibility of facilitating the communication and direct interaction with local cooperating partners (CPs) and beneficiaries on behalf of the PMU.

The PMU will solicit consultancy services and technical expertise for specialised support to initiation and implementation of the Project activities (in addition to M&E, gender, and environmental and social safeguards).

National Steering Committee

The National Steering Committee (NSC) will constitute representation from the concerned ministries and Government authorities to provide overall guidance and policy support to the Project execution. The NSC and the PMU functions will be supported by the establishment of a Sub-technical Secretariat, affiliated from the NSC and composed of nominated technical experts from Government entities, universities, and research institutions. The role of the Sub-technical Secretariat of the NSC will be to provide specialized advice on technical issues and specific technicalities to support the PMU on ensuring technical soundness of the project interventions.

Local Project Committee

The Local Project Committee (LPC) will include representatives of different local authorities at delegation/district level, as well as Community-based Organizations (CBOs) and other representatives from the supported communities. The LPC aims to strengthen community ownership and participatory planning through supporting continuous engagement and open communication channels between the PMU and Project Field Facilitator(s) and the beneficiaries receiving direct and indirect support through the project activities.

The proposed project’s governance structure, including flow of funds and reporting lines, is shown below in Figure 13.

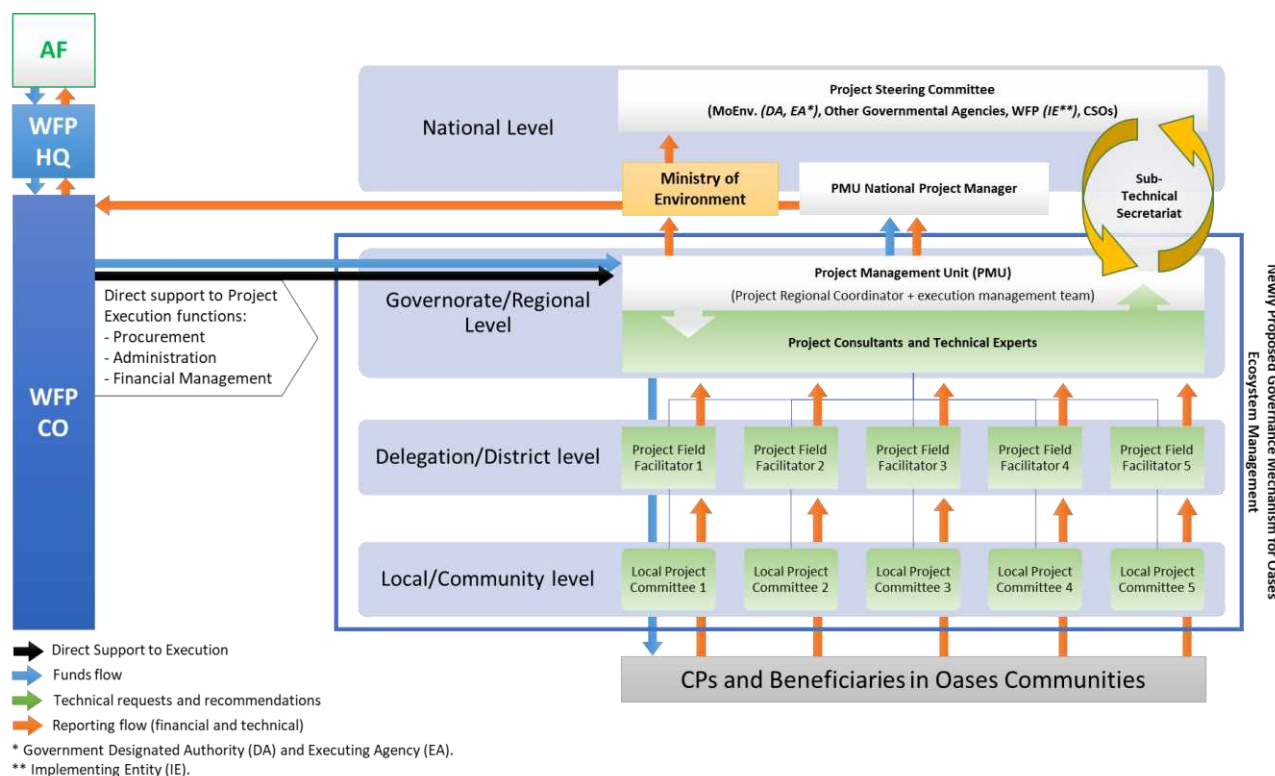


Figure 13. Organogram showing project governance and execution structures.

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government⁸⁷

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project proposal. Please attach the endorsement letter(s) with this template; add as many participating governments as possible if a regional project/programme:

Taoufik Sayadi Senior Engineer, Head of Division, Ministry of Environment	Date: July 18 th , 2023
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B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Also provide the project contact person's name, telephone number and email address.

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (Tunisia's Nationally Determined Contribution 2021, and National Climate Change Adaptation Plan 2021-23) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>

⁸⁷ Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

<p>Raoul Balletto Country Director WFP Tunisia</p> <p>Signature</p> <p>Implementing Entity Coordinator</p>		 <p>Royan Philippe O.I.C</p> 
Date: August 1st, 2023	Tel. and email: +216 56 27 57 57 raoul.balletto@wfp.org	
Project Contact Person: Hazar Belli		
Tel. and Email: +216 98 572 022 hazar.belli@wfp.org		

ANNEX 2: LETTER OF ENDORSEMENT

REPUBLIC OF TUNISIA

MINISTRY OF ENVIRONMENT



ADAPTATION FUND

Letter of Endorsement by Republic of Tunisia

Tunis, the 18 July 2023

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Project Concept Note « **Strengthening adaptive capacity and livelihood security in the most vulnerable oases of the Governate of Tozeur** »

In my capacity as designated authority for the Adaptation Fund in Tunisia, I confirm that the above national project concept note is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Tunisia.

Accordingly, I am pleased to endorse the above project concept note with support from the Adaptation Fund. If approved, the project will be implemented by World Food Program (WFP), and executed by the Ministry of Environment.

Sincerely,

National Focal point for the Adaptation Fund

Taoufik Sayadi

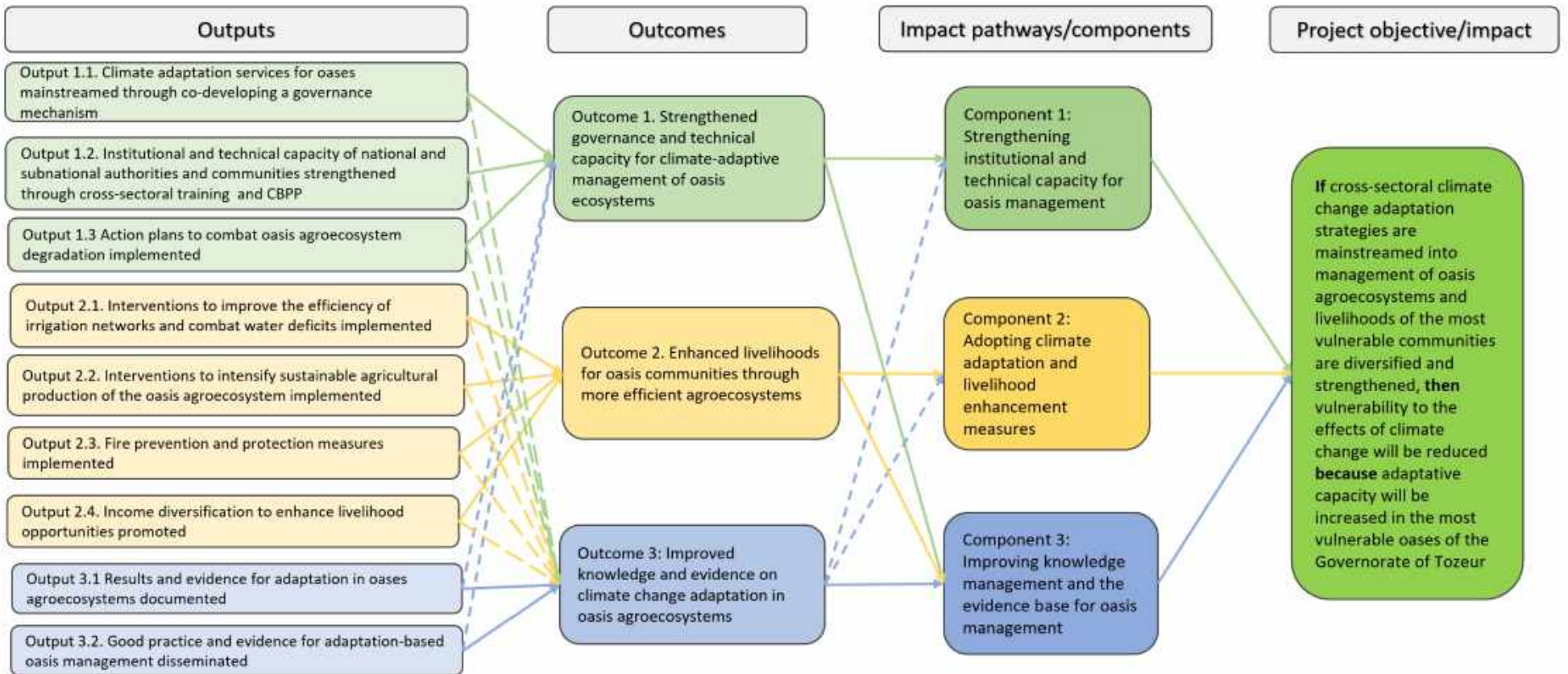
Senior Engineer, Head of Division, Ministry of Environment

A handwritten signature in blue ink, appearing to read 'Taoufik Sayadi'.



ANNEX 1: PROJECT THEORY OF CHANGE

Drivers: increased temperature, aridity and water stress; overexploitation of groundwater resources; increased risk of wildfires and alien invasives species; declining economic opportunities and increased out-migration; limited technical capacity for oasis management



Assumptions: Good participation and involvement of project participants, decision-makers & beneficiaries; new livelihood opportunities are adopted by beneficiary communities; climate adaptation continues to be a high priority for national and subnational governments