

# READINESS & PREPARATORY SUPPORT

## PROPOSAL TEMPLATE

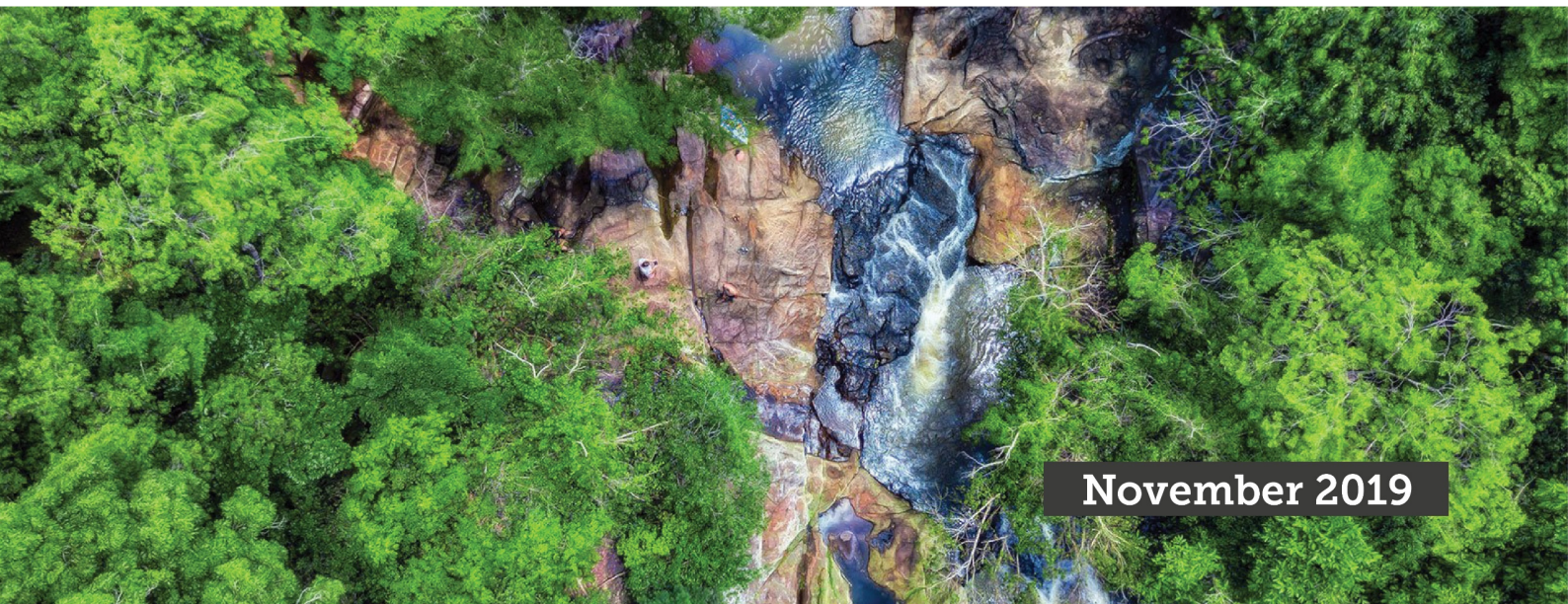
---



**Proposal title:** Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia

**Country:** Tunisia

**National designated authority:** Ministry of the Environment



November 2019

Before completing this proposal template, **please read the guidebook** and learn how to access funding under the GCF Readiness & Preparatory Support Programme.

Download the guidebook:  
<https://g.cf/xxxxx>



<b>Implementing Institution:</b>	UNEP-CTCN
<b>Date of first submission:</b>	30 June 2020
<b>Date of current submission / version number</b>	9 April 2021 V.5

Please visit the Country Portal on the GCF website to submit this proposal via the **online system**.

When submitting the proposal, please name the file:  
GCF Readiness -[Country]-[yyymmdd]

## Before completing this proposal template, **please read the guidebook** and learn how to access funding under the GCF Readiness & Preparatory Support Programme.

Download the guidebook:  
<https://g.cf/xxxxx>



### How to complete this document?

This document should be completed by National Designated Authorities (NDA) or focal points with support from their Delivery Partners where relevant. Once completed, this document should be submitted to the GCF by the NDA or focal point via the **online submission system**, accessible through the Country Portal of the GCF website.

Please be concise. If you need to include any additional information, please attach it to the proposal.

If the Delivery Partner implementing the Readiness support is not a GCF Accredited Entity for project Funding Proposals, please complete the Financial Management Capacity Assessment (FMCA) questionnaire and submit it prior to or with this Readiness proposal. The FMCA is available for download at the [Library](#) page of the GCF website.

### Where to get support?

If you are not sure how to complete this document, or require support, please send an e-mail to [countries@gcfund.org](mailto:countries@gcfund.org).

You can also complete as much of this document as you can and then send it to [countries@gcfund.org](mailto:countries@gcfund.org), copying both the Readiness Delivery Partner and the relevant GCF Regional Desks. Please refer to the [Country Profiles](#) page of the GCF website to identify the relevant GCF Country Dialogue Specialist and Regional Advisor.

We will get back to you within five (5) working days to acknowledge receipt of your submission and discuss the way forward.

### Note: Environmental and Social Safeguards and Gender

Throughout this document, when answering questions and providing details, please make sure to pay special attention to environmental, social and gender issues, particularly to the situation of vulnerable populations, including women and men. Please be specific about proposed actions to address these issues. Consult Annex IV of the Readiness Guidebook for more information.

## Please visit the Country Portal on the GCF website to submit this proposal via the **online system**.

When submitting the proposal, please name the file:  
GCF Readiness -[Country]-[yyymmdd]

## 1. SUMMARY

<b>1.1 Country submitting the proposal</b>	Country name:	TUNISIA
	Name of institution representing NDA or Focal Point:	Ministry of the Environment
	Name of contact person:	Chokri Mezghani
	Contact person's position:	National focal point
	Telephone number:	(216) 98 385 022 / (+216) 50 518 674
	Email:	chokri.mezghani@mineat.gov.tn
	Full office address:	Ministry of the Environment, Tunis, Tunisia
	Additional email addresses that need to be copied on correspondences:	Type here
<b>1.2 Date of initial submission</b>	30 June 2020	
<b>1.3 Last date of resubmission</b>	9 April 2021	<b>Version number</b> 5
<b>1.4 Which institution will implement the Readiness and Preparatory Support project?</b>	<input type="checkbox"/> National designated authority <input checked="" type="checkbox"/> Accredited entity <input type="checkbox"/> Delivery partner	
	Please provide contact information if the implementing partner is not the NDA/focal point	
	Name of institution:	United Nations Environment Programme (UNEP) on behalf of The Climate Technology Centre and Network (CTCN)
	Name of official:	Kelly West
	Position:	GCF AE Focal Point
	Telephone number:	+254-20 76 24147
	Email:	<a href="mailto:kelly.west@un.org">kelly.west@un.org</a>
	Full office address:	United Nations Avenue, NFO Block 2-3 NW P.O. Box 30552-00100 Nairobi, Kenya  Rose Mwebaza, Director of CTCN, <a href="mailto:mwebaza@un.org">mwebaza@un.org</a> Rajiv Garg, <a href="mailto:gargr@un.org">gargr@un.org</a> Hemini Vrontamitis, <a href="mailto:Hemini.vrontamitis@un.org">Hemini.vrontamitis@un.org</a> ; <a href="mailto:unep-gcf@un.org">unep-gcf@un.org</a>
<b>1.5 Title of the Readiness support proposal</b>	Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia	

### 1.6 Type of Readiness support sought

Please select the relevant GCF Readiness objective(s) below (click on the box – please refer to Annex I and II in the Guidebook):

- I. Capacity building
- II. Strategic frameworks
- III. Adaptation planning
- IV. Pipeline development
- V. Knowledge sharing and learning

### 1.7 Brief summary of the request

Tunisia is in one of the world's most water-scarce and dry regions. The Nationally Determined Contribution (NDC) for Tunisia indicates that its economy, the population, and ecosystems are highly vulnerable to climate change (CC). The country is expected to see shrinking of agricultural land areas due to increasing water scarcity. The reduction of agricultural GDP as a result of declining yields is estimated at about 5 to 10% by as early as 2030<sup>1</sup>.

Drinking water is a scarce and expensive resource in Tunisia and the pressure on already scarce resource are increasing. Considering the climate change, population increase and the demand for water, the SONEDE<sup>2</sup> is searching for long-term solutions to address water scarcity, such as installation of desalination plants, water transfer, dams and other solutions. Many of the available options are highly energy-intensive thus causing high operational costs.

Tunisia has made water resources management and access to water for the population a national priority. Implementation of smart water networks is one way of supporting this national priority and is a core activity of this readiness proposal. The implementation of the proposed smart water network will on a long term horizon improve the management of the water resources in the whole of Tunisia, and on a shorter term in the Sahel district of Tunisia, which will be the target area of the activities of this project.

The main objective of the activities described in this readiness proposal is to demonstrate the benefits of a smart water supply network through application and testing in the selected pilot areas. The experiences gained will help testing technologies and their benefits in the specific areas, but will also assist the Tunisian authorities in developing an overall action plan for implementing smart water network that will help to:

- reduce and rationalize water consumption through smart meter installations
- reduce non-revenue water in the distribution network through hydraulic modelling and strategic installation of flow meters
- reduce energy consumption by optimizing water production and distribution management through hydraulic modelling and smart metering
- achieve smart management of local water resources.

The readiness project outcomes will also inform the design of a strategic national framework for implementing smart water systems in Tunisia including the funding mechanism (e.g. GCF).

The readiness proposal will address the identified gaps and needs for transformation of the current water distribution networks to smart water network,

<sup>1</sup> Intended Nationally Determined Contribution of Tunisia - 2015

<sup>2</sup> Société Nationale d'Exploitation et de Distribution des Eaux (SONEDE) - the national water distribution company

including lack of technology experience and sufficient knowledge on the available technologies as well as lack of knowledge about the existing distribution system. It will also help define requirements for potentially needed adjustments of legal and policy frameworks to allow for successful implementation of smart water metering.

It will do so by piloting solutions that will:

- 1) inform selection of appropriate smart water technologies,
- 2) demonstrate the possibilities of implementation,
- 3) help assess the expected benefits vs investments to be made,
- 4) inform design and organization of large-scale deployment and its potential macro level benefits.

SONEDE will be the main direct beneficiary of the proposed project activities as the implementing of smart water network will make SONEDE able to improve the network efficiency, reduce operation costs, increase customer satisfaction, and ensure that the country can manage its water resources in a more sustainable way at the regional and national levels. By extension to the entire country, the beneficiaries will also include the water users as smart metering will help identify and reduce water wastage and leakages, making the water less expensive and available for other users.

#### 1.8 Total requested amount and currency

USD 437,280

#### 1.9 Implementation period

18 months

#### 1.10 Is this request a multiple-year strategic Readiness implementation request?

- Yes  
 No

For more information on how a country may be eligible to access Readiness support through this modality, please refer to **Annex IV of the Readiness Guidebook**.

#### 1.11 Complementarity and coherence of existing readiness support

- Yes  
 No

Tunisia received **Readiness support through the Sahara and Sahel Observatory for NDA Strengthening and Country Programming** (US\$ 300,000 in 2016 for 24 months, and US\$ 330,000 in 2019 for 18 months). The first of these readiness proposals contributed to creation of enabling environment for climate finance. It also prioritized activities on capacity-building and mobilization of the private sector to encourage climate smart investments. The second readiness proposal will address the additional needs for project development capacity and communication at the national level, effective involvement of national entities in the GCF accreditation process and private sector mobilization in addressing climate challenges. The activities under this readiness proposal will be complementary to the Outcomes 4 and 5 of the latter Readiness proposal as they will address, both, generation of potential concept note for upscaling of the smart metering activities nationally, and will also directly address private sector engagement in mitigation and adaptation activities through development of business models for private sector participation.

The Tunisia GCF country programme "NDA Strengthening & Country Programming" was submitted in March 2019. One of the main objectives of this programme is to contribute significantly to the sustainable management of water resources, along other priorities such as the improvement of agriculture sector resilience, the conservation of

ecosystems, the adaptation of the tourism and health sector and the promotion of professional training. The activities under this readiness project will bear direct significance to the sustainable management of water resources, by addressing better management of the available resources through smart metering systems.

Further, Tunisia has submitted a **NAP readiness proposal on Food Security and Adaptation Priorities in the Agricultural Sector in Tunisia** with FAO as the implementing institution. The objective of this project is to enhance the resilience of the agriculture sector (including water, crops, livestock, fisheries and forestry), rural community and food security by creating an enabling environment and adopting well-informed and integrated programs for adaptation. Its objective is also to generate knowledge on key adaptation and resilience options which can then be anchored into ongoing national planning processes.

The ADAPT-ACTION, a program funded by the French Agency for Development (AFD), provides technical assistance and capacity-building to strengthen climate governance and climate-change adaptation. Its outputs include current and future (2050 and 2100) climate scenarios and climate vulnerability assessments, which will be used as inputs in this proposed project. This current readiness proposal will contribute to strengthening climate governance through informed data on consumption patterns of different consumers groups which is one of the objectives of the ongoing project.

Further, Tunisia is also preparing an **additional NAP readiness proposal on Advancing risk-informed development and Land-use planning** in Tunisia, with UNDP as the implementing institution. The likely objective of this project is to mainstream climate change adaptation options in the socio-economic and land use planning at both national and local levels.

This readiness proposal is complementary to the above-mentioned NAP readiness activities as it will identify and test specific technologies which can help reduce water loss and wastage within distribution networks and will mobilize the private sector for climate smart investments in the water sector. Through these activities the proposed readiness project will have an indirect impact on water availability which can be directed towards agriculture use. Here further options of primary treatment of wastewater and its reuse for agriculture can also be explored in the future. It will also help identify appropriate planning approaches for further improvements and the most appropriate ways to upscale similar activities nationally, contributing to broader development of national level planning for adaptation and mitigation.

Finally, the activities in the proposed project will lead to a development of a concept note (Outcome 4.3) thereby also contributing to the GCF Country Programming and project pipeline development.

## 2. SITUATION ANALYSIS

### Background

Tunisia is an arid country with very limited water resources. The per capita available annual water resource potential is estimated to be only 385 m<sup>3</sup>·<sup>3</sup>, which is below the limit for “absolute water scarcity” which is defined as 500 m<sup>3</sup>/year per capita by UN Water<sup>4</sup>. With the expected increase of the living standards as well as the development of the agriculture, industry, and tourism sectors, the water shortage will be further exacerbated in the future. The demand continues to rise, and the volume produced by SONEDE in 2013 was 612 Mm<sup>3</sup> while the 2030 water strategy projected the production to be less than 500 Mm<sup>3</sup> in 2030<sup>5</sup>.

The production of water in the country also requires large amounts of energy for treatment and distribution, situating SONEDE as the biggest energy consumer in Tunisia and imposing a high cost of water. Geographically, drinking water resources of good quality are located mainly in the northern parts and in the interior of the country, while the main consumption centers are on the coast, hence the need to transport water over long distances<sup>6</sup>.

Tunisia will also be impacted by the climate change due to expected increase in temperature and reduced rainfall. The preparedness of Tunisia to meet such challenge is a precondition to its future water resources reliability. Furthermore, the expected rise in the sea level will increase salinization of the coastal aquifers. In the north approximately 80%<sup>7</sup> of the demand is supplied by surface water. Often the groundwater schemes are overexploited.

This situation is expected to be exacerbated by climate change over the coming years, with the decrease in conventional water resources estimated at about 28 % by 2030. The decline in surface waters would be approaching 5 % by the same year. Furthermore, following the expected rise in the sea level, losses through the salinization of coastal aquifers are estimated to account for about 50 % of the current resources of these aquifers by 2030, amounting to almost 150 million m<sup>3</sup><sup>8</sup>.

The Government of Tunisia fully recognizes the threat that climate change poses. It has adopted process to address environmental issues and the water sector is mentioned as one of the key adaptation sectors in Tunisia’s first Nationally Determined Contribution<sup>9</sup>, with emphasis on water scarcity. Tunisia submitted its NDC to the UNFCCC in 2015 and ratified the Paris Agreement in February 2017. The NDC contains a section on adaptation highlighting major needs identified by some sectors, specifically water resources, coastline, agriculture, ecosystems, tourism and health. The government has also undertaken vulnerability assessments of water resources to climate change with support from Global Water Partnership in 2016.

### Policy context for water resources management

Population growth, increasing water demand and the degradation of water quality have all led the government to explore ways to modernize the water law framework. The legislative and regulatory framework aimed at promoting investment in and rationalization of the water management system. It has been the object of several reforms focused on the water sector in general and specifically on water conservation.

The Water Code of 1975 governs the allocation of water resources and includes several articles to protect and preserve water resources. A water law reform was initiated in 2009 to reflect the changing socioeconomic circumstances, and subsequently new water law was approved by the Council of Ministers in September 2019 for submission to the parliament.

Several related laws, decrees and related regulations have been enacted (see table below). However, some regulations are still pending, e.g., drinking water standards. Some regulations have not been fully implemented

<sup>3</sup> Tunisia Technology Needs Assessment report: Adaptation, 2015. <https://unfccc.int/tclear/tna/reports.html>

<sup>4</sup> <https://www.un.org/waterforlifedecade/scarcity.shtml>

<sup>5</sup> Tunisia Technology Needs Assessment report: Adaptation, 2015. <https://unfccc.int/tclear/tna/reports.html>

<sup>6</sup> Tunisia Technology Action Plan for adaptation, 2017. <https://unfccc.int/tclear/tna/reports.html>

<sup>7</sup> Tunisia Technology Action Plan for adaptation, 2017. <https://unfccc.int/tclear/tna/reports.html>

<sup>8</sup> Tunisia Technology Action Plan for adaptation, 2017. <https://unfccc.int/tclear/tna/reports.html>

<sup>9</sup> Intended Nationally Determined Contribution, Tunisia, August 2015



or were rarely applied, such as the provisions regarding the protection of the public water domain and water disconnection for non-payment of bills. This is largely attributed to lack of reliable information of data to identify the network gaps and responsible parties.

#### Water Sector Laws and Regulations in Tunisia<sup>10</sup>

Activity	Law/regulation
<b>Water allocations</b>	• National Water Council Decree No. 407/2010 of 9 March 2010.
<b>Water quality and national drinking water standards</b>	• Law 82-66 of 6 August 1982 on standardization and quality. • NT 09 14. • Law 75-16 of 31 March 1975 (Water Code), as amended and supplemented by Law 87-35 of 6 July 1987 and Law of 88-94 of 2 August 1988.
<b>Municipal water supply and sanitation</b>	• Law 93-41 of 19 April 1993 on the change of law to create ONAS of 3 August 1974.
<b>Industrial effluent standards</b>	• Decree 85-56 of 2 January 1985 on the terms of discharges into the receiving environment, changed in 1991. • Decree 2005-1991 of July 2005 defining the study of environmental impact.
<b>Irrigation and drainage</b>	• Law 30/2000 on the development of agricultural land within the public irrigated perimeters (PPI).
<b>Extreme events</b>	• Law 75-16 of 31 March 1975 (Water Code), as amended and supplemented by Law 87-35 of 6 July 1987 and Law 88-94 of 2 August 1988.

#### Ongoing measures to address water scarcity

The Ministry of Agriculture, Water Resources and Fisheries (MARHP) has since 1995 developed several strategies for mobilization of water resources, including the implementation of a national program to save water in the agriculture and drinking water sectors. The MARHP has also developed a collaboration with Global Water Partnership (GWP) to promote and facilitate the implementation of Integrated Water Resources Management (IWRM) with a strengthened participation of stakeholders in Tunisia, at local, national and transboundary level.

Between 2010 and 2016, about 69% of the total irrigated areas in Tunisia adopted water-saving technologies, with an efficiency varying between 38% and 85% and an average of 59%, which is far from the desired norm of around 80% in the pressurized networks<sup>11</sup>. The low level of efficiency can be explained not only by the physical losses in the networks but also the administrative losses due to illegal connections and insufficient registration of water meters.

The overall domestic water distribution network performance was estimated at 70.3% in 2017, with about 30% of the incoming water lost during transportation. This indicator has been worsening during the last decade, in part because 25% of this network is more than 37 years old. Some measures have been taken in recent years, such as the renovation of the existing network. The aim is to gradually improve efficiency to 88.9%, saving around 86 MCM of water. This is equivalent to approximately 20% of the volume of water consumed and invoiced and exceeds the capacity of four seawater desalination plants currently under construction.<sup>12</sup>

<sup>10</sup> Water Management in Tunisia: <https://water.fanack.com/tunisia/water-management-tunisia/>

<sup>11</sup> Water Management in Tunisia: <https://water.fanack.com/tunisia/water-management-tunisia/>

<sup>12</sup> Water Challenges Tunisia: <https://water.fanack.com/tunisia/water-challenges-tunisia/>

The Ministry of Environment has also implemented several strategies to protect the water resources and strengthen the MARHPs efforts: The ministry has among others developed a strategy to reuse treated wastewater and established a Technology Action Plan making water resources a prioritized sector.

### National adaptation and mitigation priorities

As part of the National Adaptation Plan for 2016-2020 Tunisia has prioritized the management of water resources and set the following targets:

- Increase mobilization from 92 to 95 % of available water resources% in 2020
- **Increase the efficiency of water distribution systems from 72,6 to 80 % in 2020**
- Ensure a drinking water supply rate in rural areas of 96 % in 2020
- Reuse 50 % of treated wastewater

Drinking water, which accounts for 18% of water needs in Tunisia is essential and a prerequisite for the socio-economic development of the country. To secure the water supply in Sahel district, water must be transported from the north through channels and pipelines. The SONEDE has started to use sea water as a new water resource by construction of several desalination plants. Water transport, treatment and distribution therefore requires a lot of energy and the SONEDE has become the highest energy consumer in the country.

Energy consumption is also a prioritized sector in Tunisia. Among the important goals are:

- **Tunisia's Nationally Determined Contribution (NDC), elaborated in 2015, pledges to reduce its carbon intensity by 41% (13% unconditionally and another 28% conditionally) by 2030 relative to 2010 levels.**
- The National Adaptation Plan for 2016-2020 has set as goals the increase of renewable energy from 3% to 12% and the reduction of energy intensity by 3% per year.

The SONEDE will therefore develop a strategy for implementing a “smart water network” in order to:

- reduce and rationalize water consumption
- reduce non-revenue water which represents over 20 % of water production
- optimize and reduce its energy consumption
- achieve a smart management of local water resources.

The **national Technology Needs Assessment (TNA)** conducted in 2015, identified 7 priority technologies for adaptation needs within water sector. Smart drinking water networks was one of the prioritized technologies. Based on multicriteria analysis, the installation of smart water technologies was ranked as second priority amongst the 7 identified adaptation technologies within water sector<sup>13</sup>. Such technology is relevant for all SONEDE connections (2.6 million meters) and in particular for large consumers and for concentrated dwellings.

Subsequently, the Tunisia **national Technology Action Plan (TAP)**<sup>14</sup> for adaptation sector produced in 2017, outlined the key aspects of the national technology action plan for implementation of smart drinking water technologies. The national assessment on the implementation of such technologies established that smart water technologies are applicable to all SONEDE connections (2.6 million water meters) and in particular to large consumers and for concentrated dwellings. The priority areas outlined for implementation of this technology were divided in three types:

1. Tourist areas;
2. Industrial zones;
3. Buildings in large residential areas.

The technology action plan estimates that SONEDE has 2.8 million subscribers and the long-term ambition is to

<sup>13</sup> Tunisia Technology Needs Assessment report: Adaptation, 2015. <https://unfccc.int/tclear/tna/reports.html>

<sup>14</sup> The Technology Action Plan (TAP) is a concise plan for the uptake and diffusion of prioritized technologies that will contribute to a country's efforts to reduce greenhouse gases and adapt to climate change: <https://unfccc.int/tclear/tna/guidance.html>

implement the smart water management system by 2050 throughout the territory with the creation of centralized technical management (for each system). In the short term, implementation of a reliable and functional macro counting, sectoring of the network and installment of zone flow meters on a large systems and systems with poor yield was proposed, in order to reduce water deficits and reduce costs<sup>15</sup>.

Smart water networks present a potential for significant benefits in urban and rural settings. In addition, important benefits from the use of this technology could be explored within irrigation systems, with the potential for achieving considerable water savings and providing useful information that can be used to optimize irrigation.

### **Addressing national priorities through smart water network**

The proposed project activities will directly address the above-identified national targets and technology priorities relating to water-use efficiency outlined in TNA and TAP documents, the NDC targets for reduced energy intensity, as well as SONEDE's own strategic goals for implementation of smart water networks. It will do so through implementation of smart metering systems and testing of smart metering technologies.

The advantages associated with the development of such smart water networks are numerous, which explains their gradual rise to international importance.

Integration of information and communication technologies in water networks offers managers in-depth knowledge and better control of their infrastructures in order to control and diagnose problems, to prioritize and manage water resources, continuous and remote maintenance operations and use the data provided to optimize all aspects of the performance of water distribution networks.

It also enables subscribers to control their water consumption.

An intelligent water network comprises a set of solutions and systems using new information and communication technologies. Smart water networks consist of two key layers:

- “Smart Metering”: which concerns with micro-metering (metering among subscribers) with the new smart metering infrastructure based on the installation of smart subscriber meters connected to a centralized system ensuring to remotely know the consumption of each subscriber, to be informed of anomalies on the network, optimize resource management and offer new services.
- “Smart Pipe”: which is related to macro-metering and network management, making reference to the communicative nature of water networks (pressure sensors, flowmeters, etc to detect any leaks and optimize the operation of networks). The intelligent water network includes intelligent measurement means (water meters intelligent, pressure sensors, flow meters, etc.) which are coupled with decision support tools through means of communication.

Improving the performance of drinking water networks and rationalizing consumption of subscribers saves water and preserves existing water resources, therefore contributing to better adaptation to climate change through efficient use of existing resource base.

A smart water network also contributes to mitigation targets, as water savings and intelligent management of water pumping reduced need for unnecessary water production and distribution, reducing the energy consumption of water systems. In addition to the climate change mitigation benefits, this creates important economic savings as well.

### **Key stakeholders and beneficiaries of the project**

SONEDE (Société Nationale d'Exploitation et de Distribution des Eaux) is the entity responsible for production and distribution of drinking water within entire Tunisia and will as such play a key role in this project. Their mandate includes:

- Studies, installation, and operations of water production facilities
- Treatment and distribution and drinking water
- Operation of the distribution network
- Commercial management of the water user

<sup>15</sup> Tunisia national Technology Action Plan for adaptation, 2017.

SONEDE will be the main direct beneficiary of the proposed project activities as by implementing a smart water network, SONEDE will be able to improve the network efficiency, reduce operation costs, increase customer satisfaction, and ensure that the country can manage its water resources in a more sustainable way at the regional and national levels.

The Government and SONEDE have prepared the Water Supply Security Program (WSSP) with the following three objectives: (i) Ensuring the long-term financial viability of SONEDE and improving its operational performance (ii) Improving the quality of the services provided and enhancing customer relations (iii) Securing and reinforcing access to drinking water at the national level.

The WSSP is based on the following two pillars:

- (i) WSSP's Reform Strategy and
- (ii) an investment program to secure and reinforce drinking water infrastructure.

The objectives of the WSSP include modernizing the utility, reinforcing the quality of services offered to clients, and ensuring its financial viability and the preservation of its assets. The investment program includes investments in the mobilization of nonconventional brackish and sea water through desalination; reinforcement of the water supply network; incorporating part of the rural areas into SONEDE's network; improvement of the performance of conveyance and distribution networks; and reinforcement of production systems.

Other key stakeholders include relevant technical staff from Sousse and Monastir, as well as the Ministry of Environment on a national level.

By extension, project beneficiaries will also be water users across the user groups, as smart metering will help identify and reduce water wastage and leakages, making the water available for other uses and users.

The private sector will be invited to participate in relevant workshops including providing feedbacks to the National Action Plan for implementation of smart water networks in Tunisia. Further, in the post-project process of upscaling the implementation of smart water network systems to a national scale in Tunisia there will be a high potential for involving the private sector (e.g. consulting firms, contractors, manufactures, suppliers) in carrying out analyses of existing networks and advising on how to upgrade to smart water network systems. The private sector in Tunisia can potentially also play an important role in selling and maintaining equipment (e.g., smart water meters, online monitoring systems, etc.) to be used for the upgraded networks. In cases where a private entity is the owner of a water network system (e.g., industry, irrigations scheme) it is expected that if a more efficient use of the water / lower operation costs can be achieved by investing in smart water technologies this option will be attractive for such private entities.

An obvious example of a Public-Private-Partnership (PPP) in relation to expanding the use of smart water technologies to a national level in Tunisia could be for SONEDE to enter into "Performance Based Leakage Reduction Contracts" where the private contractor will apply the demonstrated smart water technologies and be paid a performance-based fee linked to the detection in the "lost water" through leakages and unauthorised connections while the fixed fee paid to the contractor for its services is relatively small. The contract may include detection as well as the actual repair work depending on the specific capacities of the water utilities. The Public-Private-Partnership Legal Resource Center (PPPLRC) under the World Bank Group provides [models](#) for such contractual agreements between the public and private entities. This readiness and preparatory project will include the previous experiences of involving the private sector in the water sector of Tunisia as described in the [report](#) "La gouvernance des services de l'eau en Tunisie - Surmonter les défis de la participation du secteur privé" by OECD.

### **Barriers and gaps to scaling up implementation of smart water networks**

The national TNA identified smart water systems as one of the highest priority technologies for national adaptation needs within water sector. The subsequent Technology Action Plan assessed the main national level barriers to implementation of the smart water networks. These include:

Economic barriers:

- Investments considered significant (change of meters) and at the level of the information system (transmitters, antennas, etc.) to set up a modern billing management system and ensure voluminous storage of data, power supply to the meters
- Difficulty in measuring their profitability at the macro and micro level.

## Technological barriers:

- Lack of a global industry standard for smart water networks: The need for inter-communicating systems
- Need for power supply to smart meters.
- Need for system maintenance
- The operation of these meters requires the establishment of a network of antennas to read them

## Social acceptance/privacy barriers:

- Social acceptance for different reasons (e.g. risk of using private information for commercial purposes., lack of privacy, risk of data hacking, risk of fraud)
- Risk of reduction in the number of employees responsible for reading meters.
- Fear of an increase in the invoice (better counting accuracy)

## Environmental barriers:

- Increase in electromagnetic pollution of the environment: disturbance of sensitive electronic equipment;
- Increase in emissions harmful to health such as cell phones.

The present readiness proposal will address key barriers related to economic barriers, technological and social barriers for Tunisia to implement more efficient and water distribution networks and adopt smart water technologies. The specific barriers that project will address across these dimensions directly respond to the proposed mitigation measures within TAP report, and can be summarized as follows :

1. **Lack of technology experience.** Relatively few water managers in Tunisia have sufficient knowledge on the available technologies (equipment/hardware for monitoring as well as software for modelling of distribution systems) and how to apply them in practice.
2. **Lack of knowledge about distribution systems.** To further implementation of the smart water technologies, a knowledge of the baseline distribution systems and how these will interact with the smart technologies is necessary. In addition, administrative losses due to illegal connections and insufficient registration of water meters is an important problem with the existing systems, but these are also difficult to identify and manage without proper knowledge about the distribution system.
3. **Lack of demonstration cases for specific technologies.** The lack of demonstration cases from Tunisia proving how the smart technologies can increase the efficiency of water supply schemes (reduce investment and operational costs) and at the same time reduce the greenhouse gas emission prevents forming larger scale plans for wider adoption and implementation of such technologies nationwide. With testing of specific technologies done in the Tunisian context there will be much better understanding their specific benefits and challenges, within both adaptation and mitigation.
4. **Lack of understanding of necessary legal and policy framework adjustments.** In contrast to the energy sector, there is no experience from implementation and operation of smart water networks in Tunisia. Many technologies exist, but none has been implemented on a large scale in the Tunisian context. It is therefore necessary to identify the best technologies and the conditions for their implementation (technical, institutional, governance, financing, etc.). Moreover, the benefits of smart water networks are not known in the Tunisian context. In order to set up a National Action Plan, it is necessary to assess the expected benefits from the end users (demand management), to the distribution network (reduction of non-revenue water) and to the production network (optimization of production capacity/energy). Without testing of implementation of smart technologies in local context, it remains unclear whether the current legal and policy framework for water distribution and supply need amendments to enable such technology upscaling. With testing of technologies in local context, SONEDE and the decision makers will be in a much better position to prepare the National Action Plan for implementing improved water management at a national level and requirements for potentially needed adjustments of legal frameworks, regulations or policies to allow for implementation of smart water metering.

This current readiness proposal activities will address these barriers and will provide the necessary recommendations on the technologies and implementation frameworks to best integrate and upscale use of smart water technologies.

This Readiness Proposal also aims to evaluate and estimate the benefits of a smart water network being in line with the SONEDE strategy. The Readiness Proposal will also propose a National Action Plan for upscaling any

findings and benefits to the national level.

The activities will be focusing on the following fields of action to address the above-identified barriers and gaps:

- Assess the different existing technologies for smart water systems; identify the most appropriate technologies and their implementation in the Tunisian context (addressing barriers 1 and 3).
- A better understanding of the distribution network and assessment of smart metering data will enable improved localization of the loss components of non-revenue water in the network. and quantify the customer metering error and daily usage for non-revenue water reduction initiatives (addressing barrier 2).
- The Readiness Proposal will develop a framework and prototype application of smart water distribution network and will perform a test in site with the installation of smart meters in order to evaluate the technologies available and estimate the potential reduction of water consumption. Through smart meters the end-user will have access to relevant usage data thereby raising awareness and help the user in changing its consumption behavior. The smart meters would also lead to better accounting system and provide an indication of water losses in the distribution system (addressing barriers 2 and 3).
- The Readiness Proposal will set up a hydraulic model and divide the distribution network into District Metered Areas (DMA) and propose the optimal locations for future installation of flow meters for DMAs and the bulk transmission network. It will also create a better understanding of the water production system and a smart operation of the system will enable to optimize and reduce energy consumption for water production and transport in future (addressing barriers 2, 3 and 4).
- The Readiness Proposal will set up a hydraulic model over the water production network and process available data from SCADA-systems (Supervisory Control and Data Acquisition) to develop an optimization algorithm in order to identify the operating set points for different configurations of consumption and water availability, creating a better picture of the overall system and system needs (addressing barriers 2 and 3).
- The findings from the above activities will support the definition a National Action Plan to improve water management through the implementation of a smart water networks, which will consider learning experiences and findings from the piloting activities, and necessary adjustments on the policy and regulatory levels in relation to operation of smart water systems (addressing barrier 4).

The pilot project area is located in the Sousse and Monastir area. Sousse and Monastir are part of the water district of the center of Tunisia (DR1). The water is supplied from Belli water treatment plant and the Kerouan groundwater treatment plant. To secure the water supply in the south of Tunisia a new dam and a desalination water plant are under construction.

It has been selected based on following key criteria:

- 1) it has well known information of the existing water networks for technology validation purposes,
- 2) it will soon be supplied by a desalination plant via water transfer pipe thus making it a relevant candidate for need for energy optimisation for water production and distribution,
- 3) it has a several types of consumption (domestic, industrial, seasonal tourism) which can help assess the cross benefits for the different water users.

#### **Synergies and complementarity with other ongoing activities**

The proposed readiness project will produce important benefits to a number of related initiatives and will contribute towards national level adaptation and mitigation targets and priorities. The complementarity with other initiatives and projects is summarized below:

Project/initiative	Focus	Complementarity
Sahara and Sahel Observatory for NDA Strengthening and Country Programming <sup>16</sup>	The Sahara and Sahel Observatory for NDA Strengthening and Country Programming contributed to creation of an enabling environment for climate finance by strengthening the Focal Point and the Strategic Engagement Framework with the Fund (Phase 1). It also prioritized activities on capacity-building and mobilization of the private sector to encourage climate smart investments.	<p>The readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia” is aligned with the “Sahara and Sahel Observatory for NDA Strengthening and Country Programming”, as following the empowerment of the NDA, it is fulfilling its role and responsibility in relation to the Fund by presenting the current proposal.</p> <p>The “Sahara and Sahel Observatory for NDA Strengthening and Country Programming” developed a country programme. This proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia” is directly connected to the objectives of the “Sahara and Sahel Observatory for NDA Strengthening and Country Programming” as it would lead to development of concept notes for further implementation..</p>
Tunisia GCF country programme “NDA Strengthening & Country Programming” <sup>17</sup>	<p>The objectives of the Tunisia GCF country programme “NDA Strengthening and Country Programming” were to strengthen the country capacity, engage the stakeholders in a consultative process, provide a direct access to the country (Phase 2). The achievement of these steps has enabled the current proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “to be submitted.</p> <p>The objectives of the Tunisia GCF country programme “NDA Strengthening and Country Programming” is also to enhance the resilience of the agriculture sector</p>	<p>The readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “will identify and test specific technologies which can help reduce water loss and wastage within distribution networks and will mobilize the private sector for climate smart investments in the water sector.</p> <p>The readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ will be complementary to the Outcomes 4 “Access to Finance” and 5 “Private sector mobilization” of the Tunisia GCF country programme</p>

<sup>16</sup> Sahara and Sahel Observatory for NDA Strengthening and Country Programming : <https://www.greenclimate.fund/sites/default/files/document/readiness-proposals-tunisia-oss-nda-strengthening-and-country-programming.pdf>

<sup>17</sup> Tunisia GCF country programme “NDA Strengthening & Country Programming”: <https://www.greenclimate.fund/document/nda-strengthening-country-programming-phase-2-support-tunisia-through-oss>

	<p>(including water, crops, livestock, fisheries and forestry), rural community and food security by creating an enabling environment and adopting well-informed and integrated programs for adaptation.</p>	<p>“NDA Strengthening and Country Programming” Readiness proposal as they will address, both, generation of potential concept note for upscaling of the smart metering activities nationally and will also directly address private sector engagement in mitigation and adaptation activities through development of business models for private sector participation.</p>
<p>NAP readiness proposal on Food Security and Adaptation Priorities in the Agricultural Sector in Tunisia</p>	<p>The readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ builds on prior efforts, including the “NAP readiness proposal on Food Security and Adaptation Priorities in the Agricultural Sector in Tunisia”, and aims to advance an effective and cross-sectoral national adaptation plan, with a particular focus on an important objective of the 2016-2020 Economic and Social Development Plan, which relates to territorial planning.</p>	<p>This readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ if implemented have the potential to provide Realtime and accurate water use data to Activity 1.1.1 (support the development of a 5-year work plan until 2024 for the Adaptation Technical Committee established by the Decree created by UGPO), Activity 1.1.2 (Establish an Adaptation Partnership Forum), Activity 1.1.3 (Establish an online platform for information and sharing and exchange and for reporting on adaptation priorities and projects) and Activity 1.1.4 (Undertake a mapping and analysis of key decision making stakeholders and bodies in Tunisia) of the” NAP readiness proposal on Food Security and Adaptation Priorities in the Agricultural Sector in Tunisia”.</p> <p>Results of this readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ would provide input to Activity 2.1.1 on establishing a platform to benchmark resource efficient and climate resilient agriculture and Agri food investments of the ” NAP readiness proposal on Food Security and Adaptation Priorities in the Agricultural Sector in Tunisia”.</p> <p>Further the results of this readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ can be used in Activity 2.3.1 to develop funding strategy for CCA projects related to agriculture sector focusing on irrigation aspects of the ”NAP readiness proposal on Food Security and Adaptation Priorities in the</p>



		Agricultural Sector in Tunisia”.
ADAPT-ACTION (French Agency for Development (AFD)) <sup>18</sup>	(AFD) funded program to provide technical assistance and capacity-building to strengthen climate governance and climate-change adaptation. Its outputs include current and future (2050 and 2100) climate scenarios and climate vulnerability assessments, which will be used as inputs in this proposed project.	This readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ will contribute to strengthening climate governance through informed data on consumption patterns of different consumers groups which is one of the objectives of the ongoing project.
NAP Readiness Proposal on Advancing risk-informed development and land-use planning in Tunisia (UNDP NAP) <sup>19</sup>	This readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ builds on prior efforts, including the NAP Readiness Proposal on Advancing risk-informed development and land-use planning in Tunisia (UNDP NAP) and aims to advance an effective and cross-sectoral national adaptation plan, with a particular focus on an important objective of the 2016-2020 Economic and Social Development Plan, which relates to territorial planning.	The outcomes of this readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ relating to smart water metering network will contribute to identification of a concrete deliverable under the development of 5-year workplan as mentioned in the NAP Readiness Proposal on Advancing risk-informed development and land-use planning in Tunisia (UNDP NAP) . The outcome of this readiness proposal “Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia “ can also feed in the sub outcome (1.3 - Capacity building for national and local planners is strengthened) on strengthening capacity building for national and local planners and sub outcome (1.4- The National Adaptation Framework is finalized) National Adaptation Framework of the NAP Readiness Proposal on Advancing risk-informed development and land-use planning in Tunisia (UNDP NAP).

Further to the synergies with these specific project, the proposed readiness activities will also directly contribute to establish a framework for implementation the Water Strategy 2050, the aim of which is to develop good water governance and adopt a demand-based water resources approach in Tunisia.

<sup>18</sup> ADAPT-ACTION:

<https://www.afd.fr/en/adaptation#:~:text=The%20Adapt'Action%20Facility%20is, support%20to%20strengthen%20climate%20governance.>

<sup>19</sup> NAP Readiness Proposal on Advancing risk-informed development and land-use planning in Tunisia :

[https://info.undp.org/docs/pdc/Documents/TUN/6213%20Tunisia%20NAP%20GCF\\_31%20July%202019\\_CLEAN.pdf](https://info.undp.org/docs/pdc/Documents/TUN/6213%20Tunisia%20NAP%20GCF_31%20July%202019_CLEAN.pdf)

The assistance will help Tunisia develop an adaptation plan in line with the Sustainable Development Goals adopted by UN in 2015:

- Secure water supply (6. Clean water and sanitation and 11. Sustainable cities and communities)
- Reduce and rationalize water consumption and reduce non-revenue water (12. Responsible consumption and production)
- Optimize and reduce energy consumption (12. Responsible consumption and production and 13. Climate action)

### 3. LOGICAL FRAMEWORK

Outcomes	Baseline <sup>20</sup>	Targets	Outputs	Activities (brief description)	Deliverables <sup>21</sup>
----------	------------------------	---------	---------	-----------------------------------	----------------------------

---

<sup>20</sup> Please briefly elaborate on current baselines on which the proposed activities can be built on, processes that are in place that the current Readiness proposal can strengthen, or any gaps that the proposed activities would fill in. If more space is needed, please elaborate this in Section 4.

<sup>21</sup> Please include tangible and specific deliverables for each activity proposed, Please note that during implementation all deliverables should be included within the implementation reports for GCF consideration.

<p>Outcome 2.2:</p> <p>GCF recipient countries have developed or enhanced strategic frameworks to address policy gaps, improve sectoral expertise, and enhance enabling environments for GCF programming in low-emission investment</p>	<p>The potential gains in terms of water and energy savings by implementation of smart water meters and system optimization are not known to Tunisian water managers and decision makers .</p>	<p>Feasibility of all prioritized technologies is assessed and potential benefits to water and energy savings at pilot sites and at national level are estimated.</p>	<p>Output 2.2.1: Assessment of the performance of the current water supply system in the pilot area completed and an analysis of the benefits of introducing a smart-water network in Tunisia conducted.</p>	<p><u>Activity 2.2.1: Assessing the status of current water supply system.</u> This activity includes the assessment of the performance of water supply system, the identification of Smart Water state-of-the-art and organization of a workshop to present the actual performance of the water system as well as the expected benefits in terms of water and energy savings and reduction of non-revenue water. The workshop will involve the managers of SONEDE and the department of the DR1<sup>22</sup> (production, distribution, engineering, energy department), i.e. about 10 to 15 people.</p> <p><i>SubActivity 2.2.1a. Assess water supply system performance</i></p> <p>This sub-activity will cover performance assessment of the water production and distribution systems. It includes the collection and analysis of available data for Sousse and Monastir for the past 3 years: water consumption (invoiced), losses, water production and energy costs on daily, monthly or yearly basis. The data required should be as detailed as possible and provided by the existing SCADA systems and customer usage invoice records.</p> <p><i>SubActivity 2.2.1b: Analyse case studies of Smart Water state-of-the-art technologies in 5 other countries/utilities</i></p>	<p><u>Deliverable 2.2.1:</u> The report will include:</p> <ul style="list-style-type: none"> <li>- a presentation of the collected data</li> <li>- a quality assessment of the data</li> <li>- a statistical analysis</li> <li>- a list of the key performance indicators focusing on system losses</li> </ul> <ul style="list-style-type: none"> <li>- identification of examples of smart water systems and analysis of five relevant cases</li> <li>- the progress of smart water network for each studied case</li> <li>- the chosen action plan, technologies and tools deployed for each case studied</li> <li>- the identified barriers and challenges</li> <li>- inventory and assessment of observed or expected benefits in smart water network</li> </ul> <p>Workshop report and presentation material</p>
---	--	---	--	--	---

<sup>22</sup> DR1 is the water district for the center of Tunisia

				<p>The aim of this subactivity is to identify state-of-art smart meter technologies used in other countries, and their benefits. It will evaluate the experiences from at least five different countries/water companies. Preliminary research will be conducted to ensure that the contexts are similar to that of Tunisia to the extent possible.</p>	
			<p>Output 2.2.2: Pilot work conducted on various smart end user metering technologies in the Tunisian context and feasibility of integration into existing infrastructure assessed</p>	<p><u>Activity 2.2.2: Test and evaluate feasibility of integration of different technologies for smart end- user metering in the local context</u></p> <p>The aim of this activity is to evaluate the available smart meter technologies and their feasibility for integration in the existing Tunisian water supply infrastructure. The activity will include:</p> <ul style="list-style-type: none"> <li>- Benchmarking of the technologies of the smart meter or automatic meter reading (AMR) systems currently used worldwide, and their respective relevance in the Tunisian context.</li> <li>- Identification of institutional and legal framework needs in collaboration with the relevant institutions.</li> <li>- Inventory, analysis and evaluation of communication technologies and protocols for data transfer (PLC, 2G, radio, IoT etc.)</li> <li>- Assessment of the feasibility of integrating the smart water meter project into the smart grid project of the STEG (Société Tunisienne de l'Electricité et du Gaz)</li> <li>- Field implementation or experimentation of communicating device (retrofit) on existing flowmeters.</li> </ul>	<p><u>Deliverable 2.2.2:</u> Report describing:</p> <ul style="list-style-type: none"> <li>- the different technologies available and their relevance to the Tunisian context.</li> <li>- the requirements and the adjustments needed in the legal and regulatory frameworks for water management for their integration</li> <li>- the identified opportunities and challenges of collaboration with STEG</li> <li>- the experimentation and its results on installation and maintenance of the smart meters, data transfer and management reliability and energy consumption.</li> <li>- an estimate of installation and maintenance costs.</li> </ul>

			<p>Output 2.2.3: Smart water end user application developed and tested to assess the impacts on the water consumption including possible underlying behavioral changes by the water users.</p>	<p><u>Activity 2.2.3: Prototype of a smart water end-user application</u></p> <p>This activity will estimate the potential for reducing the water and energy consumption caused by the behavioral changes by the water users due to the information provided by the smart meters.</p> <p>The activity is divided into the following steps:</p> <ul style="list-style-type: none"> <li>- develop an application based on design thinking method <sup>23</sup></li> <li>- define consumer panel with representatives from the regional context (residential, industrial and tourist activity area)</li> <li>- establish an experimentation protocol</li> <li>- consumer panel testing of the developed application and water use impact assessment</li> <li>- assess trends/changes in end-user behavior in relation to the information provided.</li> <li>- estimate potential gains from the installation of smart meters on a larger scale.</li> </ul>	<p><u>Deliverables 2.2.3:</u> Report describing:</p> <ul style="list-style-type: none"> <li>-the developed smart water end user application</li> <li>- methodology and the implementation of the pilot testing</li> <li>- definition of a sampling process (household, industry, hotel, etc.)</li> <li>- the impact on the behavioral changes of the water users</li> <li>- an initial rough estimation of the potential reduction in water and energy consumption for the pilot area (will be further refined under Activity 2.2.4 and 2.2.5).</li> </ul>
--	--	--	--	---	--

<sup>23</sup> Clarification on design thinking method : A specific application will be developed following a global approach called collaborative design or design thinking. This approach is based on a co-creativity process involving feedback from the end user very early in the design process. At the stage of writing the readiness proposal, no application adapted to the Tunisian context is known. This is why it is proposed to develop such a specific application for the evaluation of the behavior of smart meters end-users

			<p>Output 2.2.4: Hydraulic model of the study area set up and deployed to assess potential for reduction of water losses at the district area scale</p>	<p><u>Activity 2.2.4: Establish the hydraulic profile of the production and distribution systems</u></p> <p><i>Sub-Activity 2.2.4a: Analyze the hydraulic operation of the water production system</i></p> <p>The activity is divided in the following steps:</p> <ul style="list-style-type: none"> <li>- Collection and analysis of data (SCADA, GIS, Customer Information Systems)</li> <li>- Building of the hydraulic model</li> <li>- Calibration of the model from available measurement data</li> <li>- Conducting hydraulic analysis of the existing system (identification of possible weakness/deficiency)</li> <li>- Setup of a hydraulic model scenario of future water production (including Kalaa Kebira dam and the new desalination water plant in Sousse). The future model scenario will include increased future consumption due to population growth and the future network required to service this demand.</li> <li>- Workshop to present the models and the impacts of the future water production. The workshop will involve the managers of department of the DR1 (production, distribution, engineering, energy department), i.e. about 10 to 15 people</li> </ul> <p><i>Sub-Activity 2.2.4b: Analyze the hydraulic operation of the water distribution system</i></p>	<p><u>Deliverable 2.2.4:</u></p> <p>Hydraulic model with:</p> <ul style="list-style-type: none"> <li>- the existing water production system</li> <li>- the future water production system</li> <li>- water distribution system over the studied area</li> </ul> <p>Report:</p> <ul style="list-style-type: none"> <li>- describing model development and calibration results</li> <li>- short analysis of the existing system performance</li> <li>- flowmeters location plan which are required to be installed in order to quantify and manage non-revenue water</li> <li>- an estimation of the expected reduction of water losses</li> </ul> <p>Workshop reports and materials.</p>
--	--	--	---	---	---

				<p>The aim of this activity is to understand how much non-revenue water can be reduced through implementation of a hydraulic model and smart metering. A distribution zone will be chosen within Sousse and Monastir network. The activity is divided into the following steps:</p> <ul style="list-style-type: none"><li>- Collection and analysis of GIS data</li><li>- Build-up of a hydraulic model</li><li>- Hydraulic analysis of the theoretical system as there is no measurement data available at this time.</li><li>- Dividing network into District Metered Areas (DMAs) to install flowmeters on the distribution network. (The data from the flowmeters will enable a better quantification and localization of the physical water loss components of non-revenue water).</li><li>- Workshop to present the models and the benefits expected in reduction of water wastage from non-revenue water. The workshop will involve the managers of department of the DR1 (production, distribution, engineering, energy department), i.e. about 10 to 15 people.</li></ul>	
--	--	--	--	--	--



			<p>Output 2.2.5: Hydraulic model piloted with optimization for energy use and potential energy savings from deploying smart water meters estimated.</p>	<p><u>Activity 2.2.5: Assessing energy savings from optimization of water production and distribution system</u></p> <p>The aim of this activity is to evaluate the energy savings from smart operation of the system.</p> <p>In this activity the hydraulic model will be tested and further developed in order to understand the system behavior and to minimize the costs which are mostly energy costs for water production and transport.</p> <p>Optimization will be performed for the following scenarios:</p> <ul style="list-style-type: none"> <li>- Existing water production system</li> <li>- Future water production system (including Kalaa Kebira dam and the desalination plant)</li> <li>- Consumption profile including estimated reduction from smart meters and changed end user behavior</li> <li>- Estimated reduction of non-revenue water</li> <li>- Estimation of the future population changes in the pilot study areas</li> </ul> <p>The activity is divided in different tasks:</p> <ul style="list-style-type: none"> <li>- Definition of the constraints of the system (e.g. water supply 24/7, water levels in the storage tanks, minimum service pressure, electricity pricing)</li> <li>- Definition of the objective function (e.g. reduce energy consumption)</li> <li>- Development of an optimization algorithm</li> <li>- Delivery of the operating controls/rules/set points for different configurations of network water consumption and availability.</li> </ul>	<p><u>Deliverables 2.2.5:</u></p> <p>An upgraded hydraulic model with optimized operating strategy for energy savings.</p> <p>The report will include:</p> <ul style="list-style-type: none"> <li>- proposed action plan and measures and related expected benefits</li> <li>- suggestions on complementary monitoring equipment and the development of the SCADA system already planned by the client</li> <li>- estimation of energy savings for the proposed optimization measures.</li> </ul> <p>Workshop report and presentation materials</p>
--	--	--	---	---	---

				<p>-Evaluation of optimization benefits</p> <p>-Workshop to present the expected benefits of water optimization. The workshop will involve the managers of department of the DR1 (production, distribution, engineering, energy department), i.e. about 10 to 15 people.</p>	
<p>Outcome 2.4:</p> <p>Strategies for transforming and attracting private sector investment for low emissions and resilience developed and being used</p>	<p>There is currently no technical, legal, and institutional framework in Tunisia for the coordinated national implementation of smart water systems and thus lack of investments in more efficient water systems.</p>	<p>Action plan for upscaling and implementation of smart water network as well as the necessary regulatory and institutional amendments enabling development of a feasible business model for engagement of private sector.</p>	<p>Output 2.4.1: National Action Plan for implementation of smart water network deployment developed.</p>	<p><u>Activity 2.4.1: Preparing the national action plan for smart water network deployment strategy using pilot findings</u></p> <p>The aim of this activity is to compile the results of the pilot testing in order to prepare the action plan or upscaling of smart water metering technologies nationally, including assessment of the institutional, regulatory and technical requirements.</p> <p>The activity includes the following steps:</p> <ul style="list-style-type: none"> <li>- Cost and benefit analysis for each segment of the smart network: optimization of water production, reduction of non-revenue water and reduction of consumption.</li> <li>- Development of an action plan including a business model for private sector participation (consulting firms, providers of equipment, maintenance services, privately owned water networks (e.g. industries, irrigation schemes etc)</li> <li>- Recommendations for an awareness program to support scale up the deployment and management of the smart water network nationally.</li> <li>- Workshop to present the action plan</li> </ul>	<p><u>Deliverable 2.4.1:</u></p> <ul style="list-style-type: none"> <li>- Report compiling results of the pilot work</li> <li>- Documentation describing recommendations for further development of the smart water network. (These recommendations can then be used for a project proposition to the GCF.)</li> <li>- Proposed Business Model for private sector participation</li> <li>- Action Plan Publication</li> </ul> <p>Workshop report and presentation materials</p>

				and the business model. The workshop will involve the NDE, NDA, MARHP, managers of SONEDE and DR1 i.e. about 15 to 20 people	
<p><b>Outcome 4.3</b> An increase in the number of quality project concept notes developed and submitted that target SIDS, LDCs and African states.</p>	<p><b>Baseline 4.3</b> 2 Concept Notes on Climate Resilient Agriculture, resilience of ecosystems have been developed, and one Concept Note on Food and Energy Nexus to address Climate Change Impacts.</p>	<p><b>Target 4.3</b> 1 quality climate sensitive technology related Concept Note developed and submitted that target SIDS, LDCs and African states. Country project pipeline in line with its international climate commitments is strengthened</p>	<p><b>Output 4.3.1</b> 1 Concept Note developed and submitted that targets SIDS, LDCs and African states.</p>	<p><u>Activity 4.3.1 Develop and submit 1 project Concept Note that targets SIDS, LDCs and African States.</u> The activity includes identifying, prioritizing and selecting 1 viable project idea emerged from the TAP, which will be developed into 1 GCF Concept Note that targets SIDS, LDCs and African States.. One Concept Note developed and submitted that targets SIDS, LDCs and African states.</p>	<p>Deliverable 4.3.1 (i) Report on project ideas considered, prioritized and selected</p> <p>Deliverable 4.3.2 (ii) 1 Concept Note developed and submitted that targets SIDS, LDCs and African states.</p>

## 4. THEORY OF CHANGE

### TOC Narrative

This section provides the rationale for this GCF Readiness project and defines a Theory of Change that identifies the causal processes through which the project is intended to achieve its expected outputs, outcomes, and goal.

### Goal

The long-term goal of this project is to improve water management in water supply system and reduce greenhouse gas emissions for water distribution.

### Goal Statement

If TUNISIA/SONEDE defines the technical conditions and the expected benefits of a smart water network **THEN** the deployment of smart water networks would improve water management and would reduce greenhouse gas emissions **BECAUSE** TUNISIA/SONEDE will be able to define a relevant strategic framework for the implementation of smart water networks at a national level and prioritize its investments.

The theory of change diagram displays the results chain that maps the interactions between the outcomes, outputs, inputs and impacts. The long-term objective is a transformation of the water sector distribution of Tunisia and the encouragement of new business growth, GHG emissions abatement and the transformational change that can deliver on Tunisia water sector targets to prevent losses and efficient management of it as a resource.

The outcomes 2.1 and 2.4 of this project are both linked to the GCF Strategic Objective 2 “Strategic Frameworks” while outcome 4.3 is linked to Objective 4 “Pipeline Development”. GCF recipient countries develop robust strategic frameworks to guide GCF investment in complementary other climate financiers”. More specifically, the outcomes of the project will support the Tunisian authorities in upscaling the improved water management of water supply schemes for the entire Tunisia and thus resulting in reduced water demands, reduced energy demand and thus reduced greenhouse gas emissions. Outcome 4.3 will ensure an increase in the number of quality project concept notes developed and submitted that target SIDS, LDCs and African States..

Further the outputs of the project will describe and quantify the potential benefits by improved water management (efficient water distribution systems and operation). Output 2.4.1 “National Action Plan for implementation of smart water network deployment developed” will be developed based on the outputs 2.2.1 - 2.2.5 and will guide where investments will be most beneficial and how improved water management can be implemented at the national level in Tunisia. Output 4.3.1 will enable the development of scalable bankable projects that focus on prioritised sectors and deliver quantifiable emissions reductions as well as quantifiable climate adaptation benefits through the development of a concept note (CN) that targets SIDS, LDCs, and African States.

The following activities would lead to specific outputs:

An assessment of the actual performance of the existing water distribution system would be conducted. This would include the collection and analysis of available data for Sousse and Monastir, for the past 3 years: water consumption (invoiced), losses, water production and energy costs on daily, monthly, or yearly basis. It would also identify the global strategies in place, the technologies and tools that are used and the benefits that can be expected. This would help benchmark and would evaluate the situation in at least five different countries/water companies. This activity will cover both water production and distribution systems.

Evaluation of different available smart meter technologies would be conducted to evaluate their feasibility in the Tunisian context. Legal and ethical aspects would be studied including a) the use of personal data, b) data security, c) water pricing, and d) ICT regulation. Some examples are automatic meter reading (AMR) systems, institutional and legal development needs, evaluation of communication technologies and protocols for data transfer, integrating the smart water meter project into the smart grid project of the STEG and experimentation of communicating device (retrofit) on existing flowmeters.

Based on the above two activities, it will be possible to estimate the potential water consumption reduction due to behavioral end user changes based on information from the smart meters. This would include development of a software application based design, experimentation protocols, assess trends/changes in end-user behavior in relation to the information and potential gains due to the installation of smart meters.

A hydraulic model for both production and distribution would be established and model scenario for future water production would be generated. This future model scenario will also include increased future consumption due to population growth and the future network required to service this demand.

The potential gains in terms of energy costs due to the smart operation of the system would be then evaluated. The hydraulic model will be tested and further developed in order to understand system behavior and optimize the costs which are mostly energy costs, for water production and transport. This would also lead to estimation of how much non-revenue water can be reduced with the help of smart metering.

The results of the above activities would be subjected to a multicriteria analysis in order to prepare the action plan for upscaling the outcomes of all activities nationally, and the institutional and technical requirements to do so, with specific focus on potential for GCF funding.

The above activities will help Tunisia to develop a National Action Plan to scale up the deployment of a smart water network at national level to secure water supply and limit its GHG emissions. Furthermore, in order to conduct these activities, the most important input to the project will be the timely and efficient collaboration with the water managers and operators of the pilot water schemes in Sousse and Monastir including access to data for the production, the distribution system and the end-user consumption. National and international consultants and their specific knowledge on improved water management including smart water metering is another important input to the project.

However, these activities would be carried out based on following **assumptions** :

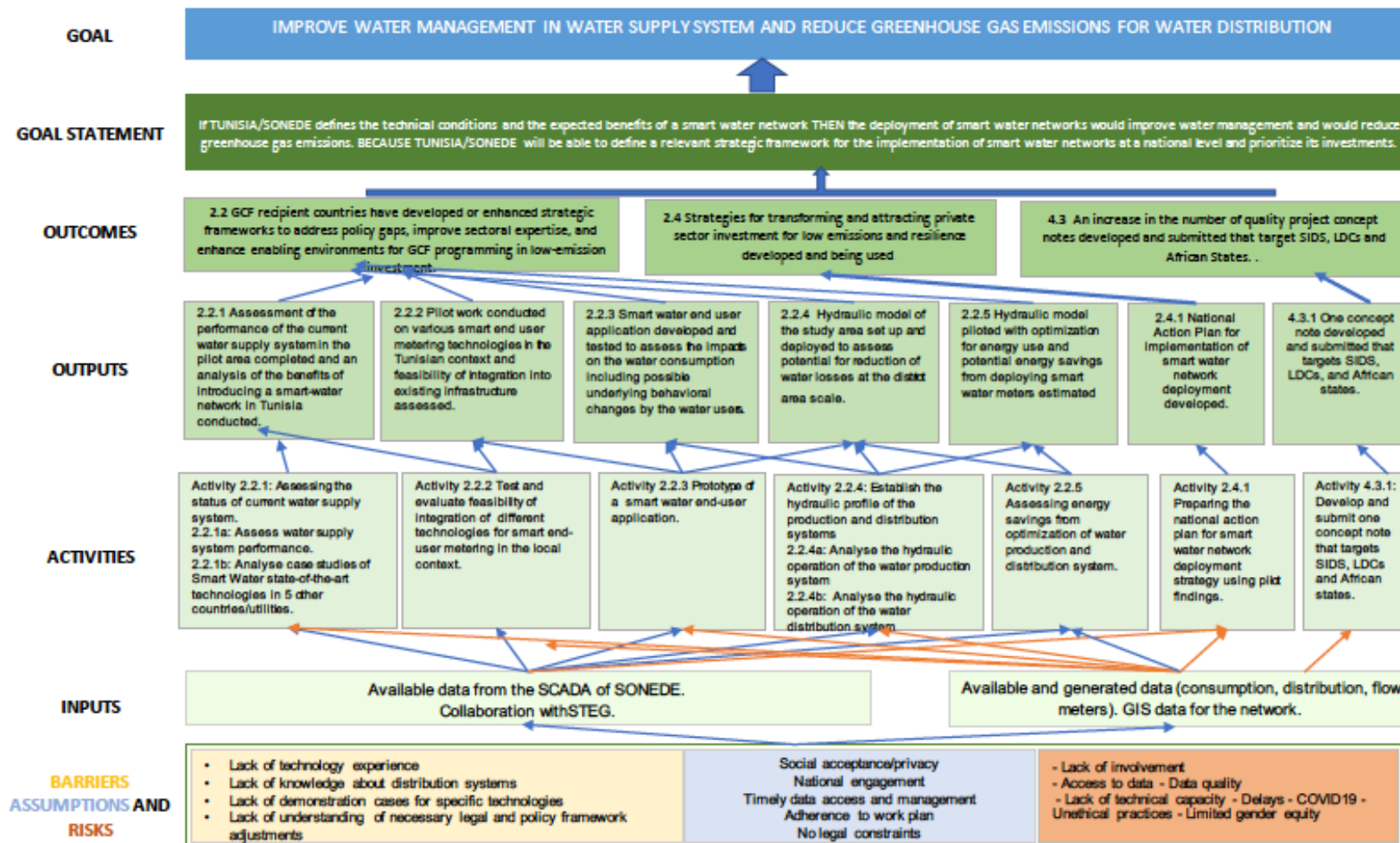
- **Social acceptance/privacy:** Willingness and interest from the public and private sector stakeholders to participate in the proposed test of using smart water metering for the water supply distribution system and share the necessary consumption information.
- **National Engagement:** Willingness and availability of SONEDE and other national technical staff to provide necessary guidance data and information to inform project implementation and assessments.
- **Adherence to work plan:** The planned field activities can be carried out as planned (e.g. will not be impacted by possible COVID-19 restrictions).
- **No legal constraints:** No legal or institutional constraints affecting project execution. Possible identified legal or institutional constraints for the implementation of a smart water systems will be addressed by the respective authorities
- **Timely data access and management:** All needed data and information on the distribution systems and its users will be timely available for the project.

Preliminary assessment has identified following **risks** that might affect successful and timely delivery on project outputs:

- **Lack of involvement:** Lack of involvement by the public and private sector key stakeholders, resulting in limiting the possibilities of scaling up the results of this project outside of the proposed study areas.
- **Access to data:** Problems with data accessibility, mainly from the SONEDE and other involved stakeholders
- **Data quality:** project delays due to insufficient data quality
- **Lack of technical capacity:** Lack of capacity by the beneficiaries to use or implement the results of this technical assistance
- **Delays:** Delay in implementation of readiness programme
- **COVID-19:** Activities delayed or otherwise compromised due to limited face-to-face interaction with stakeholders and travel restrictions
- **Unethical practices:** Money laundering, terrorist financing, or other prohibited practices under project execution
- **Limited gender equity:** Resistance against or lack of interest from stakeholders in the active promotion of gender equality in project activities and upscaling activities

Reference is also made to section 6.3 describing these risks in more detail, including proposed mitigation measures.

The Theory of Change diagram below describes graphically the links between the proposed activities the outputs and the outcomes in order to reach its overall long-term goal.



## 5 BUDGET, PROCUREMENT, IMPLEMENTATION AND DISBURSEMENT PLAN

### 5.1 Budget plan

Please complete the Budget Plan in Excel using the template available in the [Library](#) page of the GCF website.

As in Excel sheet attached

Within CTCN technical assistance a minimum amount of 1% of total budget is dedicated to gender mainstreaming, assuring that the gender topic is properly embedded into the technical analysis and is assessed by a gender expert. The presence of a gender expert within the consultant's roster is a requirement within the ToR. CTCN gender mainstreaming tool will be used as baseline reference to assure that gender issues will be included since the early stage of the technology prioritization of this proposal and throughout all the subsequent Outputs. A description of the gender tool can be found at this link: <https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development>

### 5.2 Procurement plan

As in the Excel sheet

Overall financial management and procurement of goods and services under this readiness and preparatory support proposal will be guided by UN regulations, rules, policies and procedures and the Framework Agreement between the GCF and UNEP.

Further, procurement of goods and services will follow the general principles stated under clause 7 of the "Framework Agreement" between Green Climate Fund (GCF) and UNEP. UNEP will comply with its obligation under clause 7(a) of the Framework Agreement, which states "The procurement of Goods and Services for Approved Readiness Support Proposals, whether by the Delivery Partner or by a third party, shall be done in accordance with the rules, policies and procedures of the Delivery Partner.

UNEP will be responsible for the implementation of the readiness activities and for procurement and contractual services, as well as reporting on the progress of this implementation in close coordination and strategic guidance from the NDA/FP. The procurement actions and the operational services will be carried forward in accordance with UNEP and procurement guidelines as agreed under the "Framework Agreement" between Green Climate Fund (GCF) and UNEP.

CTCN procedure for procurement: For a request that is eligible and prioritized, the Climate Technology Manager in charge of the request sources the appropriate expertise to develop the Terms of Reference of the assistance (called 'Response Plan' as per CTCN procedures). The response plan provides specific information on the technical assistance to be delivered, including activities, outputs, expected outcomes and impacts, timeline, indicators or measuring assistance progress and success, stakeholders to be involved, etc. The response plan, once finalized, is signed by the national focal point of the CTCN in the concerned country (National Designated Entity), the institution which originated the CTCN request for technical assistance and the CTCN Director and constitutes the basis of the assistance to be implemented and monitored upon the approval and in cooperation with the NDA.

Based on the needs and expertise required in the response plan, the Climate Technology Manager selects the organization that will implement the assistance, depending on their experience and expertise related to the assistance requested and on their cost-effectiveness in conducting the assistance. The assistance can be either implemented by an organization from the CTCN Consortium, or by an organization member of the Network. The selection of organizations from the Network is conducted through a procurement process, as per UN rules and regulations, in order to select the best proposals, based on expertise, experience and cost-effectiveness.

The selection of organizations from the Consortium is based on a justification for selection of a Consortium Partner as implementer also based on expertise, experience and cost-effectiveness. For the purpose of this proposal, the CTCN decided to select an organization of the Consortium because the UNEP-DHI Center has the

expertise and experience necessary to implement the readiness proposal, DHI is also a collaborating center of excellence of UNEP and its rates are approved by the UNEP.

For this technical assistance, UNEP-DHI Partnership – Centre for Water and Environment (<http://www.unepdhi.org/>), a CTCN Consortium Partner, has been selected to implement the activities according to CTCN, as per the procedure described above. UNEP-DHI is a United Nations Environment Programme center of expertise. The Centre was established in 2001 and is hosted by DHI group at its headquarters in Denmark (<http://www.dhigroup.com/>). UNEP-DHI is dedicated to improving the management of freshwater resources from the local to the global level.

For this technical assistance, the procurement is single sourced as UNEP-DHI will be the sole service provider in line with art 2(c) of the “modalities and procedures of the Climate Technology Centre and Network” as approved by the UNFCCC COP at its 19th session in decision 25/CP.19. UNEP-DHI will carry out the activities and produce the deliverables against the budget and timeline described in section 5 and in the legal agreement between UNEP/CTCN and DHI (as host of UNEP-DHI. UNEP-DHI is contractually bound to the following:

“In its procedures for procurement of any goods, services or other requirements with funds made available by UNEP under this PCA, DHI shall ensure that, when awarding contracts, it shall safeguard the principles established by the UN Secretariat for procurement, unless otherwise agreed in writing by UNEP. The principles established by the UN Secretariat for procurement are as follows:

- a) Allowable procurement methods are established unambiguously at an appropriate hierarchical level along with the associated conditions under which each method may be used, including a requirement for approval by an official that is held accountable.
- b) Competitive procurement is the default method of procurement.
- c) Fractioning of contracts to limit competition is prohibited.
- d) Appropriate standards for international competitive tendering are specified and are consistent with international standards.
- e) The responsibilities are distinct and provide for segregation of duties so as to avoid conflict of interest and external interference
- f) in procurement transactions; and
- g) Principles of best value for the money and fairness, integrity, and transparency shall be given due consideration in the exercise
- h) of procurement functions.”

Additionally, UNEP-DHI needs to fulfil audit requirements in accordance with the contract. Those requirements include submitting a copy of consolidated audited financial statements within six months of the end of every fiscal year covering the duration of the agreement. The audit needs to be carried out by the auditors of an independent and accredited audit firm and the audit report and recommendation needs to include such comments as the auditor may deem appropriate in respect of UNEP funded operations generally and, in particular, the opinion should clearly indicate that funds transferred by UNEP were covered by the scope of the audit.

### 5.3 Implementation Plan

Please complete the Implementation Plan in Excel using the template available in the [Library](#) page of the GCF website.

#### As in Excel Sheet

### 5.4 Disbursement schedule

Please specify the proposed schedule for requesting disbursements from the GCF. For periodicity, specify whether it's quarterly, bi-annually or annually only.

UNEP as the Delivery Partner for this Readiness and Preparatory Support Proposal will submit requests for disbursement for approved proposals to the GCF in accordance with the Second Amended and Restated Framework Readiness and Preparatory Support Grant Agreement entered into between GCF and UNEP on 2nd June 2020 (“Framework Agreement”). Disbursement requests will be signed by the authorized representative of



the UNEP and will include details of the bank account into which the grant will be deposited. UNEP, the Delivery Partner for this R&P Support Proposal for Tunisia, will administer the grant disbursed by the GCF in accordance with UNEP's regulations, rules, and procedures including maintenance of records of grant, disbursements and expenditure.

**Readiness Proposal that falls within a Framework Agreement with the GCF**

Disbursements will be made in accordance to Clause 4 "*Disbursement of Grants*" and Clause 5 "*Use of Grant Proceeds by the Delivery Partner*" of the Second Amended and Restated Framework Readiness and Preparatory Support Grant Agreement entered into between UNEP and GCF on 2 June 2020. The Delivery Partner is entitled to submit 2 request(s) for disbursement each year and is also entitled to request one interim request for disbursement within 30 days of notification of approval.

## 6 IMPLEMENTATION ARRANGEMENTS AND OTHER INFORMATION

### 6.1 Implementation arrangements

Please describe how implementation arrangements will be made and how funds will be managed by the NDA and/or the Delivery Partner.

UNEP will manage the funds for the activities under this readiness proposal as per UN regulations, rules, and procedures. UNEP will agree on a plan with the NDA and NDE of Tunisia to monitor the implementation of the activities. However, UNEP will be responsible for the implementation, monitoring and reporting of the activities under this readiness and preparatory support proposal in accordance with UNEP's policies and procedures and the Framework Agreement, dated 2nd June 2020.

UNEP is the responsible party who will ensure the delivery of anticipated outputs and outcomes, which must report to the Green Climate Fund on project outcomes and report to the GCF.

For this technical assistance, UNEP-DHI Partnership (<http://www.unepdhi.org/>), which is a CTCN Consortium Partner, has been selected to implement the activities according to CTCN procedure (see Section 5 for more information about the selection procedure). UNEP will enter an implementation agreement with DHI for the delivery of the technical assistance. The agreement will stipulate the specific budget, activities, timeline and deliverables to be produced.

DHI will report to UNEP as per their contractual arrangement and in line with UN rules and regulations. DHI will produce regular progress and financial reports and will submit deliverables to UNEP, and funds will only be released if and when the deliverables are satisfactory and cleared by CTCN/UNEP. DHI will return any unspent

funds within ninety days of expiry or notice of termination of the CTCN/UNEP – DHI legal agreement or the completion of the response plan and related budget.

The UNFCCC country focal points for technology (NDE) and finance (NDA) will provide active support to the implementer in the execution of this technical assistance. Their roles as country focal points will include, but not be limited to: Ensuring the activities associated with the implementation of this technical assistance are aligned with national climate priorities; promote and engage with key stakeholders as identified by the implementer; promote and present this technical assistance in climate change-related events; and participate in CTCN events and in national workshops affiliated with this technical assistance, if required. They will also be expected to provide guidance and review any relevant documents produced and will be kept apprised of the progress of the technical assistance. The role of the NDE and NDA is that of coordination. They will seek inputs from relevant stakeholders in the various Ministries and convey it to the UNEP/CTCN.

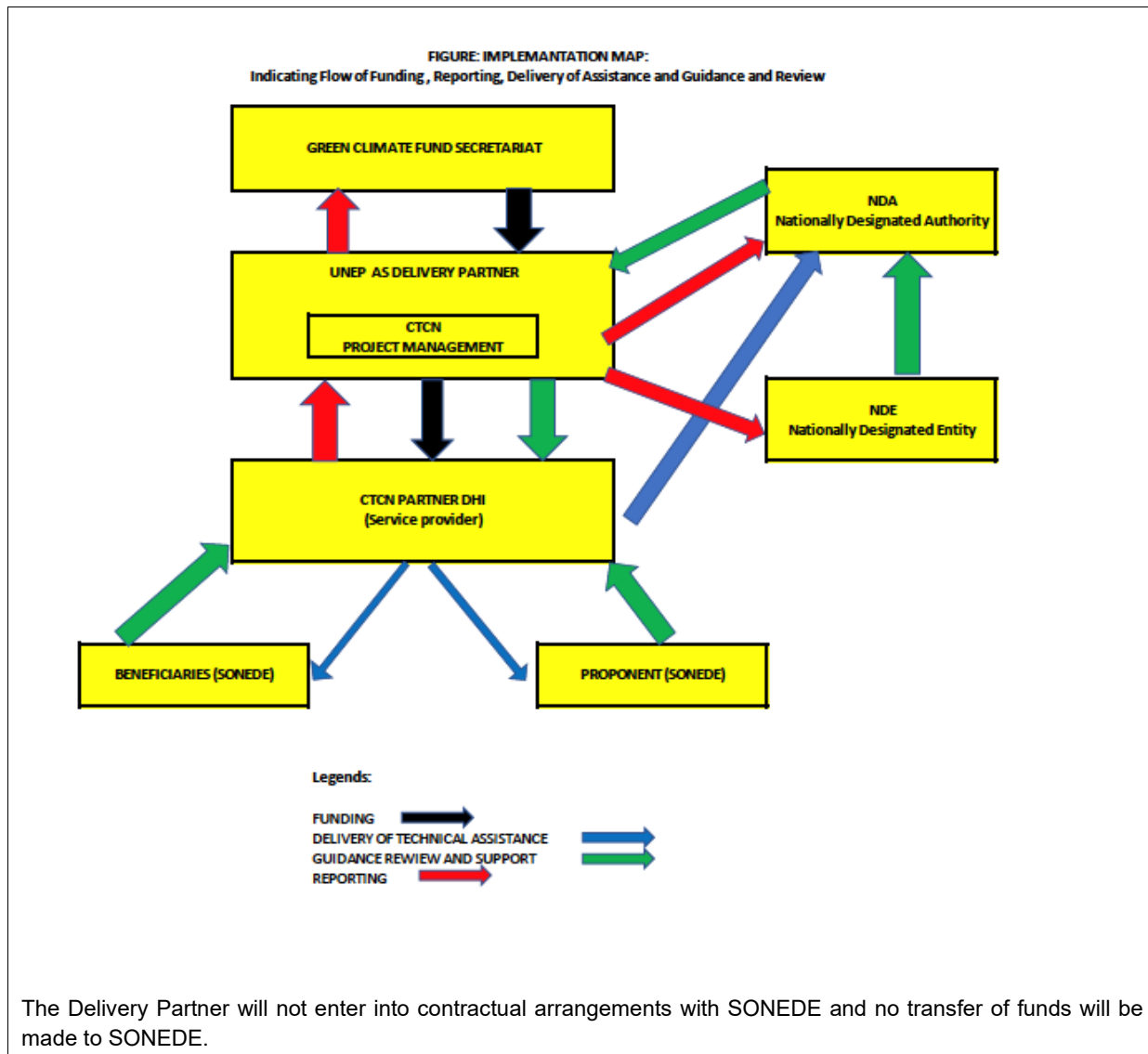
SONEDE is the direct beneficiary of this technical assistance. The SONEDE supervises and supports the delivery partners in relation to the outputs 2.2.1, 2.2.2, 2.2.3, 2.2.4, 2.2.5 and 2.4.1. This may include providing data when requested or reviewing outputs, but will not involve implementation of the outputs themselves.

In terms of Governance: Climate Technology Centre and Network (CTCN) was established by Conference of the Parties (COP) in Cancun in December 2010. The CTCN was established to provide technical assistance and capacity building activities responding to requests from developing country parties. Following competitive bidding, the COP decided that the CTCN would be hosted by UNEP through a consortium which include DHI; to be co-led by UNIDO. This is the CTCN 'host'. CTCN also has an extensive network of organizations that can collaborate to successfully deliver this project. A network of 500+ organizations has subsequently joined the CTCN.

The CTCN (hosted by UNEP-UNIDO) aims to provide technical assistance to the Government of Tunisia, as per its COP Mandate, and is thus supporting Tunisia to develop this readiness proposal. The CTCN Engagement with the Government of Tunisia is mature with close co-operation between the NDA and NDE.

For this work in Tunisia, UNEP will be responsible for the implementation of the readiness activities and for procurement and contractual services, as well as reporting on the progress of this implementation in close coordination and strategic guidance from the NDA/FP. The procurement actions and the operational services will be carried forward in accordance with UN policies and procurement guidelines. UNEP have significant experience of delivering and supporting similar projects among other projects in developing countries. They have a wide network of local/ regional offices and expertise of the Africa region.

The implementation map below summarizes the different interactions between the different parties involved in this technical assistance.



## 6.2 Implementation and execution roles and responsibilities

Please briefly describe how the activities will be implemented and outputs delivered by project staff and consultants.

The CTCN process for managing technical assistance is the following: Requests for technical assistance can be prepared by any applicant organization from a developing country, but all requests must be submitted by the CTCN NDE (national focal point in the concerned country). Once submitted, all requests submitted by developing countries are assessed as per eligibility, balancing and prioritization criteria approved by the CTCN Advisory Board. The three eligibility criteria are the following: 1) The support provided will contribute to increased resilience and/or mitigate emissions, and is aligned with national plans; 2) The support will enhance endogenous capacities; and; 3) Processes are in place in the requesting country to monitor and evaluate any support provided (that is, project accountability is ensured). Balancing criteria are looking at inter and intra-regional a geographical balance (with a preference for requests submitted by LDCs and other highly vulnerable and low capacity countries; balance between adaptation and mitigation objectives, and balance between various types of support spanning the technology cycle. Prioritization criteria consider a number of elements that demonstrate project strength and potential for success, including the promotion of endogenous capacities and appropriate technologies, potential for scale up, for South-South cooperation, for leveraging public and private financing, for creating social, economic and social benefits, promoting gender equality etc.

Once a request is deemed eligible and prioritized, the CTCN selects the best expertise among its consortium

partners to develop a response plan. The criteria for selection are: Relevant technical expertise, Experience and network in national context, Relevant language capacity, Response Planning track record, Representative u

Based on the discussion with the NDE, NDA and request proponent and feedback from the CTCN, the consortium partner develops the response plan. Once an advanced version is prepared, it is presented to CTCN's director NDE and NDA for signature. Once the response plan is signed, the contracting of the implementer starts. The request proponent of this project is the Ministry of Agriculture, Water Resources and Fisheries (MARHP) of Tunisia. Physical meetings took place with stakeholders in early 2020 and thereafter the GCF readiness proposal were framed in consultations with the NDA, the NDE and relevant stakeholders. The beneficiaries of this project include the STEG, the CITET, the Ministry of Agriculture, Water Resources and Fisheries (MARHP) of Tunisia.

As per the COP mandate and the guidance of the Advisory Board of the CTCN, it selects the partner for implementation of the activities through a competitive bidding process amongst its registered network members which are more than 500 in number or through its Consortium partner. For this TA the consortium partner is chosen to implement the activities is DHI. DHI has demonstrated following strengths

- Proven project management expertise of managing and delivering complicated multi-stakeholder projects involving surveys, data collections, capacity development programs working with national and international organizations.
- Proven expertise of engaging and mobilizing typical stakeholders from private and public sector to design/implement national policy and regulations.
- Proven relevant experience of market assessments, technical support for policy implementation and financial mechanisms.
- Proven expertise in developing or updating national plans.
- Proven experience of writing technical reports, outreach and communication materials.
- Experience of working in respective country.

The generic qualifications, skills and experience of team members in the network members which would be selected for implementation of the activities are enumerated below:

Expert title	Minim qualification requirements	Necessary experience
National expert (Water distribution specialist)	Master's degree in project management/ water distribution / masterplan / hydraulics	<ul style="list-style-type: none"> <li>- minimum 10 years of relevant expertise; expertise in water distribution, hydraulics and project management,</li> <li>- Familiarity with the UN process, technology needs assessment methodology and technology actions planning</li> <li>- working experience in the country highly desired</li> <li>- language skills: excellent command of oral and written English and French.</li> </ul>
International expert (water distribution specialist)	Master's degree in water distribution, hydraulics, water management	<ul style="list-style-type: none"> <li>- minimum 10 years of relevant expertise.</li> <li>- expertise in water distribution, hydraulics</li> <li>- <u>integrated water management</u></li> <li>- <u>data management, statistics</u></li> <li>- language skills: excellent command of oral and written English and French.</li> </ul>
National consultant (IT specialist)	Master's degree in Information Technologies, electricity, smart metering	<ul style="list-style-type: none"> <li>- minimum 10 years of relevant expertise.</li> <li>- expertise in IT</li> <li>- <u>Communication, HAN/WAN/LAN</u></li> <li>- <u>IoT</u></li> </ul>
International consultant (software development specialist)	Master's degree in Information Technologies, electricity, smart metering	<ul style="list-style-type: none"> <li>- minimum 10 years of expertise in IT</li> <li>- <u>IoT</u></li> </ul>
National consultant (hydraulics and	Master's degree in hydraulics, modelling and	<ul style="list-style-type: none"> <li>- minimum 5 years of relevant skills.</li> <li>- water distribution hydraulics</li> </ul>

modelling specialist)	masterplans	<ul style="list-style-type: none"> <li>- <u>hydraulic modelling</u></li> <li>- <u>data management</u></li> </ul>
International expert (hydraulics and modelling specialist)	Master's degree in hydraulics and modelling	<ul style="list-style-type: none"> <li>- minimum 15 years of relevant expertise.</li> <li>- expertise in WD hydraulics</li> <li>- <u>expertise in modelling</u></li> <li>- <u>expertise in optimization</u></li> <li>- <u>expertise in decision support systems</u></li> </ul>
International expert (optimization specialist)	Master's degree software development	<ul style="list-style-type: none"> <li>- minimum 5 years of relevant expertise.</li> <li>- software development</li> <li>- <u>agile process</u></li> <li>- <u>design thinking</u></li> </ul>
National consultant (socio economic specialist)	A university degree in socio-economy	<ul style="list-style-type: none"> <li>- minimum 5 years of relevant skills.</li> <li>- economics, statistics</li> <li>- sociology</li> <li>- <u>behavioural survey</u></li> <li>- knowledge and experience of gender studies</li> </ul>

In addition, the CTCN will engage a consultant for project management activities. The role of this consultant would be to manage the project activities as "Project Manager", this includes GCF reporting, planning for budget and procurement, following up on the timeliness of the deliverables and monitoring of key performance indicators.

### 6.3 Risks and mitigation measures

Please include a set of identified risks and mitigation actions for each. Please utilize the risk table below that identifies the probability of a given risk occurring and the entity that will manage the risk. Please refer to Part III Section 6.3 of the Readiness Guidebook for further information on how to complete this section.

Risk category	Specific risk(s) / Risk(s) description	Probability of occurrence (low, medium, high)	Impact level (low, medium, high)	Mitigation action(s)	Entity(ies) responsible to manage the risk(s)
Lack of Involvement	Lack of involvement by the public and private sector key stakeholders, resulting in limiting the possibilities of scaling up the results of this project outside of the proposed study areas.	Low	Medium	<p>Meetings and workshop with relevant stakeholders and actors who have shown interest in collaborating have already taken place.</p> <p>During project implementation a thorough consultative and participatory</p>	NDA/ Proponent (SONEDE), CTCN/ DHI

Risk category	Specific risk(s) / Risk(s) description	Probability of occurrence (low, medium, high)	Impact level (low, medium, high)	Mitigation action(s)	Entity(ies) responsible to manage the risk(s)
				approach will be applied.	
Access to data	Problems with data accessibility, mainly from the SONEDE and other involved stakeholders.	Low	High	Clear communication channels and information sharing will be established.  Required data will be thoroughly described and communicated to stakeholders.	NDA/ Proponent (SONEDE), CTCN/ DHI
Data Quality	Project delays due to insufficient data quality	Medium	Medium	Identify available data and clarify uncertainties.	NDA/ Proponent (SONEDE), CTCN/ DHI
Lack of technical/capacity risk	Lack of capacity by the beneficiaries to use or implement the results of this technical assistance	Low	Low	The project is in line with national policies and the project will be executed in close coordination with the beneficiary, the SONEDE.  Workshops will be held, and a training program delivered to enhance capabilities and enable transfer of knowledge.	NDA/ Proponent (SONEDE), CTCN/ DHI
Delays	Delay in implementation of readiness programme	Low	Low	Project management procedures in place. UNEP actively engaged	UNEP/CTCN, DHI and NDA
COVID-19	Activities delayed or	Medium	Medium	DHI will hire local consultants	UNEP/CTCN, DHI,

Risk category	Specific risk(s) / Risk(s) description	Probability of occurrence (low, medium, high)	Impact level (low, medium, high)	Mitigation action(s)	Entity(ies) responsible to manage the risk(s)
	otherwise compromised due to limited face-to-face interaction and travel restrictions			<p>with previous experience with the various local stakeholders to facilitate flow of information. Data collection will be performed adhering to applicable Health and Safety rules in the country.</p> <p>CTCN will provide tools for remote collaboration and engagement.</p> <p>Unused travel budget may be repurposed to complement remote collaboration tools or additional related costs stemming from Covid-19 situation.</p>	
Unethical practices	Money laundering, terrorist financing, or other prohibited practices under project execution	Low	Low	The DHI would be contracted as per the UN procurement rules. There is no direct transfer of money to any local entity.	UNEP/CTCN
Limited equity	Gender Resistance against or lack of interest from the stakeholders, in the active promotion of gender equality	Low	Low	This Project will pursue thorough and gender responsive integration and ensure stakeholder involvement at all levels.	CTCN, SONEDE

Risk category	Specific risk(s) / Risk(s) description	Probability of occurrence (low, medium, high)	Impact level (low, medium, high)	Mitigation action(s)	Entity(ies) responsible to manage the risk(s)
	in project activities or upscaling activities				

#### 6.4 Monitoring

UNEP-CTCN will ensure that the progress of the planned activities as well as any material issues arising in the implementation are tracked throughout the project implementation through use of project management tools and scheduled calls between the implementer, the office of the NDA/NDE. In addition, quarterly calls will be held between the CTCN, the NDA and the NDE to discuss main outputs from the project. The main issues arising from these meetings will be discussed, fed back to the GCF and if corrective action is needed, they will be communicated to the DHI as potential updates. Besides this, information will be reported twice annually to the GCF, one for the period January through June and another for the period between July and December through interim reports.

Further, upon UNEP-CTCN contracting DHI, for execution of this proposal, DHI will produce a detailed work plan and a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan would include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the work Plan and the M&E plan for implementation.

Upon completion of all activities and outputs, as per the CTCN procedures all the technical assistance implemented by CTCN are subjected to monitoring and evaluation and are mapped in the Performance Measurement Framework of the CTCN, which is in alignment with reporting on the implementation of the Technology Framework under Article 10, paragraph 4, of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). The data during and after the completion of the project is collected through the well-defined templates as below:

- M&E Plan and Impact Statement Form
- Technical Assistance Closure Report Template
- Technical Assistance NDE Feedback Form
- Post-implementation NDE survey
- Event and Training Reporting Template
- Training Evaluation Form

The results are shared with the countries and continuously followed up in terms of progress made towards the implementation of the recommendations of the technical assistance delivered.

Methodology for Monitoring of deliverables:

Deliverable by output	Provisions for country ownership and engagement and key aspects for monitoring of success
Output 2.2.1 Actual performance of the water supply system and of the potential for improvement (limits and barriers) assessed.	UNEP-DHI will be responsible for defining the framework for the assessment, identifying key aspects that are necessary to analyze for baseline assessment of the system. In addition, SONEDE will play a central role by providing data and technical guidance that will assist in the delivery on this output, being the entity that has been involved in a number of projects to improve water management practices in the country. The involvement of



	<p>SONEDE will also help establish a direct link to the relevant public and private stakeholders in Tunisia, to ensure that the project implementation by the national and international consultants is delivered with the highest level of impact and best value for money considerations.</p> <p>A cornerstone of the activities under this output will be the collection and analysis of available data for Sousse and Monastir, for the past 3 years. This will be done in close collaboration with local experts and entities responsible for maintaining the datasets, ensuring that the activities build on existing expertise in country and are based on realistic, on-the-ground information collected from the country. The data will be provided by the existing SCADA systems and customer usage invoice records, requiring close involvement of local data custodians, experts and authorities.</p> <p>It is also proposed that key outputs are circulated for relevant feedback from other key beneficiaries of the project, including, but not limited to STEG, the CITET, the Ministry of Agriculture, Water Resources and Fisheries (MARHP) of Tunisia.</p> <p>The success will be based on ensuring that the necessary baseline information to fully understand the baseline setting of the network, including barriers and challenges, is collected from necessary authorities. Baseline information and datasets will be key not only in understanding the system dynamics, but also by measuring any incremental improvement that the smart technologies can deliver in view of water and energy savings.</p>
<p>Output 2.2.2</p> <p>Modifications/Changes to legal policies and technical specifications identified and recommended</p>	<p>The evaluation-, and subsequently the implementation of the different technologies for smart metering will be conditioned by the appropriateness of the existing legal and physical infrastructure frameworks in place. Both, with UNEP-DHI collating the information, STEG and SONEDE will provide feedback, inputs and guidance on the baseline situation with regard to the network situation, including policy and legal framework guidance to ensure that the technology transfer is compatible with the existing legal and technical environment, and, moreover, the existing strategic direction and goals for future development.</p> <p>Specifically, the implementation of activities will take into consideration the smart grid project of the STEG to identify opportunities for alignment and integration of the two efforts. MARPH might be further involved to provide integration of the technologies in line with existing policy and regulatory environment.</p> <p>This Readiness project will furthermore evaluate and estimate the benefits of a smart water network being in line with the SONEDE strategy and will also propose an action plan for upscaling to the national level. In this way it will be ensured that SONEDE is aligned and has ownership of the technological implementation activities. For success of the project, it will be the aim that proposed integration of the smart technologies meaningfully supports the existing strategic objectives and ongoing network improvement initiatives.</p>

<p>Output 2.2.3</p> <p>Water consumption reduction at the end user and at the district area assessed</p>	<p>A key aspect of the implementation of the activities under this output is direct involvement of a consumer panel representatives of the regional context (residential, industrial and tourist activity area). In this way, potential consumers of water (i.e. the proposed technology) will be engaged in the testing process and will be able to provide feedback on the application and savings results.</p> <p>Selection of the consumer panel and communication with the panel will be undertaken with the direct support from SONEDE as the focal organization of this request.</p> <p>The results from the consumer panel representatives will provide direct inputs to the plan for a successful new technology integration in the network.</p>
<p>Output 2.2.4</p> <p>Potential for reduction of water losses at the district area scale assessed</p>	<p>The local data sources and experts with understanding of the existing hydraulic system and networks within Sousse and Monastir are central to the successful execution of these two activities. Therefore, the calibration and analysis of model results will be done in close involvement with SONEDE and specifically the heads of department of the DR1 (production, distribution, engineering, energy department of the DR1 water district). This will ensure early introduction of the local staff and experts to the potential new technologies but will also ensure that their intrinsic knowledge of the existing setup and limitations of the network are taken into consideration, as well as calibration and refinement of the models applied.</p> <p>The results of the model exercises will be presented to the abovementioned experts in two workshops setting for feedback.</p> <p>The indicators for monitoring success on delivery of these outputs will include comparison with baseline situation in view of improving parameters such as incoming water lost during transportation and energy use for transportation/pumping.</p>
<p>Output 2.2.5</p> <p>Potential energy savings estimated.</p>	
<p>Output 2.4.1</p> <p>Strategy of smart water deployment refined.</p>	<p>Alignment of the technological activities with the SONEDE strategy will be an important consideration at the early stage of the project implementation, as well as that of opportunities with the STEG smart grid infrastructure project. This, and other sectoral/cross-sectoral strategies for future development will be given due consideration and incorporated in the strategy for smart water deployment. In addition, the capacity of the responsible institutions and users to maintain and make use of the technologies in question will be considered, as well as the capacity for smooth integration of the data in existing information and management systems.</p> <p>UNEP-DHI, with involvement of SONEDE, NDA and NDE will collate the results of all the above activities, with the alignment of existing policies and strategies. Key indicators for success will be delivery of demonstrable results that the proposed technologies have the potential to create substantial energy and water savings for the existing and future distribution networks. Furthermore, the deliverables should demonstrate a feasible implementation road map that is aligned with existing policy and regulatory strategies and frameworks.</p>
<p>Output 4.3.1</p> <p>Develop and submit one Concept Note that targets SIDS, LDCs and African states.</p>	<p>A first report on project ideas will be prepared including the ideas that have been considered, prioritized and selected.</p> <p>One concept note will be developed and submitted that targets SIDS, LDCs and African States.</p>

## 6.5 Other Relevant Information

### Previous Cooperation

The CTCN (hosted by UNEP-UNIDO) aims to provide technical assistance to the Government of Tunisia, as per its COP Mandate as given below, and is thus supporting Tunisia to develop this readiness proposal. The CTCN Engagement with the Government of the Tunisia is mature with close co-operation between the NDA and NDE.

For this work in Tunisia, UNEP will be responsible for the implementation of the readiness activities and for procurement and contractual services, as well as reporting on the progress of this implementation in close coordination and strategic guidance from the NDA/FP. The procurement actions and the operational services will be carried forward in accordance with UN policies and procurement guidelines. UNEP have significant experience of delivering and supporting similar projects among other projects in developing countries. They have a wide network of local/ regional offices and expertise of the Africa Region. This includes undertaking of technology need assessments in 2012 in Tunisia. CTCN has supported Tunisia with two (as bulleted below) other technical assistance during the last 3 years and its relationship with the stakeholders is matured and trustworthy.

- The development of a standard for digestate utilization in Tunisian agriculture –(Fast Technical Assistance)
- Capacity building to gain expertise in efficient lighting systems

The relevant COP decisions which made Tunisia select UNEP-CTCN as accredited agency to implement the readiness projects are:

#### **Decision 14/CP.22: Linkages between the Technology Mechanism and the Financial Mechanism of the Convention**

Para 4. Welcomes the increased engagement between the Green Climate Fund and the Climate Technology Centre and Network, particularly with respect to utilizing the Readiness and Preparatory Support Programme and the Project Preparation Facility of the fund, noting the potential of such engagement in supporting developing country Parties to build their capacity for implementing technology projects and programmes.

Para 6. Invites Green Climate Fund national designated authorities and focal points to use the support available to them under the Readiness and Preparatory Support Programme to, inter alia, conduct technology needs assessments and develop technology action plans.

Para 7. Also invites developing country Parties to develop and submit technology-related projects, including those resulting from technology needs assessments and from the technical assistance of the Climate Technology Centre and Network, to the operating entities of the Financial Mechanism for implementation, in accordance with their respective policies and processes.

#### **Decision 15/CP.22: Enhancing climate technology development and transfer through the Technology Mechanism**

Para 13. Underlines the importance of well-functioning and strengthened collaboration between the national designated authorities for the Green Climate Fund, the focal points for the Global Environment Facility and the national designated entities for technology development and transfer

Para 15. Welcomes the increased engagement between the Green Climate Fund and the Climate Technology Centre and Network, particularly with respect to utilizing the Readiness and Preparatory Support Programme and the Project Preparation Facility of the fund in order to respond to country-driven requests for technical assistance.

Para 16. Encourages the advancement of the engagement referred to in paragraph 15 above, including through the strengthening of collaboration between national designated authorities for the Green Climate Fund and national designated entities for technology development and transfer.

Para 17. Invites the Climate Technology Centre and Network to include the outcomes of the engagement referred to in paragraphs 15 and 16 above in its annual report to the Conference of the Parties at its twenty-third session.”

This readiness proposal is as a result of discussions between Tunisia NDA and the CTCN focal point the NDE. This resulted to submission of a technical assistance to CTCN to support the country to studies for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia. Though the request was submitted to CTCN the NDA endorsed the use of the readiness fund for the

execution of this request through UNEP (which host the CTCN) as the accredited entity. The current Readiness Proposal would lead to identification of technology that would be used for upgradation of the water network system in Tunisia. It would also establish the strategic framework for implementation which aligns itself to the national priority and also matches the ongoing effort on Water Sector Reforms led by the World Bank in Tunisia.

### Sustainability and Exit Strategy

The project inherently builds sustainability at the national by providing guidance and tools. A substantial part of the project activities will consist in building local capacity of key stakeholders who bear the responsibility of managing the program in the long term. Project sustainability will be monitored by the CTCN after the project is implemented (with support from the GCF). This will be reported to UNFCCC and UNEP via reporting procedures in place dedicated to activities. A capturing of lessons learned, and knowledge management will be fulfilled through the CTCN online Knowledge portal.

Among the outputs of this proposal, the development of a concept note will ensure implementation of the project. Concept notes will create a quality potential project pipeline that can be further developed into proposals for GCF financing.

As per the CTCN procedure all request for technical assistance implemented by CTCN are subjected to monitoring and evaluation and are mapped in the Performance Measurement Framework of the CTCN, which is in alignment with reporting on the implementation of the Technology Framework under Article 10, paragraph 4, of the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). The data during and after the completion of the project is collected through the well-defined templates as below:

- M&E Plan and Impact Statement Form
- Technical Assistance Closure Report Template
- Technical Assistance NDE Feedback Form
- Post-implementation NDE survey
- Event and Training Reporting Template
- Training Evaluation Form

The results of the technical assistance feedback are shared with the countries and continuously followed up in terms of progress made towards the implementation of the recommendations of the technical assistance delivered.

### Accredited Entity Statement on Conflict of Interest

To avoid any possible conflicts of interest deriving from the delivery partner's role as an accredited entity, the prioritization of investments and projects in the context of this readiness grant, will be made through a broad consultation process with relevant stakeholders, including other potential implementing entities. The final validation of these priorities will be carried out through the countries' own relevant coordination mechanism and institutional arrangements, with the participation of other government agencies, as well as representatives from civil society and private sector as the NDA deems relevant, to ensure chosen priorities are fully aligned with national plans and strategies and adequately includes inputs from consulted stakeholders.

### Whistle Blower Protection

Further UNEP being part of the UN Secretariat adheres to the **United Nations Ethics Office** prescribed **Whistle Blower Protection** by the Secretariat's ST/SGB/2005/21.<sup>24</sup> The Ethics Office has the authority to take preventive action against potential repercussions the [whistle blower](#) may receive.<sup>25,26</sup>

<sup>24</sup> *Annan, Kofi* (19 December 2005). "Secretary-General's Bulletin - Protection against retaliation for reporting misconduct and for cooperating with duly authorized audits or investigations". [undocs.org. United Nations. ST/SGB/2005/21](https://undocs.org/United Nations/ST/SGB/2005/21). Retrieved 24 March 2017.

<sup>25</sup> "The UN Ethics Office promotes an ethical organizational culture based on our shared values of integrity, accountability, transparency and respect. It is independent, impartial, confidential and professional". [www.un.org](http://www.un.org). Retrieved 2017-08-10.

<sup>26</sup> "The UN Ethics Office promotes an ethical organizational culture based on our shared values of integrity, accountability, transparency and respect. It is independent, impartial, confidential and professional". [www.un.org](http://www.un.org).

By providing protection for staff who may otherwise be reluctant to come forward, the UN learns about and is able to respond to misconduct. This strengthens accountability and maintains the integrity of its operations and programmes.

Protection against retaliation applies to all staff members, interns and UN volunteers. Punishing consultants who report violations of UN rules and regulations is also prohibited.

UNEP will comply with its obligations under the "Framework Agreement". UNEP has already provided information on its Grievance Redress Mechanism through the accreditation process. For more information, please refer to <https://www.unenvironment.org/resources/report/uneps-environmental-social-and-economic-sustainability-stakeholder-response>. Please note that the UNEP website provides a direct link for stakeholders to report project concerns.

#### **AML/CFT and "know your customer"**

UNEP will comply with its obligations under the "Framework Agreement", including applying UN fiduciary principles and standards relating to any "know your customer" checks, AML/CFT and financial sanctions imposed by the United Nations Security Council, which should enable UNEP to comply with the Policy on Prohibited Practices and the principles of the AML/CFT Policy. There are currently no United Nations Security Council (UNSC) restrictive measures in force within Tunisia. UNEPs screening processes for prohibited practices and money laundering have been shared with the GCF Secretariat through the accreditation process. For more information on UNEPs Misconduct and Anti-fraud Policies is available at <https://www.unenvironment.org/about-un-environment-programme/policies-and-strategies/misconduct-and-anti-fraud-policies>

# READINESS & PREPARATORY SUPPORT

## BUDGET, PROCUREMENT & IMPLEMENTATION PLAN



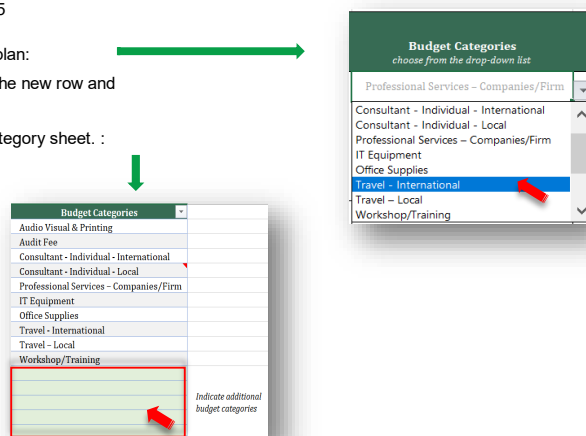
### Readiness Grant Budget Preparation Guidelines

This file contains three specific planning tools to complete the supplementary information required when submitting a proposal for Readiness Programme support (including for NAP/adaptation planning):

- Budget plan and accompany Budget notes
- Procurement plan
- Implementation plan

#### The following considerations are important when completing the budget:

1. Before preparing the Readiness and budget, procurement, and implementation plans, please read the full guidance contained in the Readiness Programme Guidebook, specifically Part III Section 5
2. You can select the appropriate budget categories from the dropdown list in the budget plan:
3. To insert additional rows, right click on the row number below where you wish to insert the new row and choose INSERT.
4. Additional budget categories may be added by manually typing them on the Budget Category sheet. :
5. The Budget Notes sheet should be used to record explanations, further details or cost breakdowns for individual lines



#### Project Management Cost:

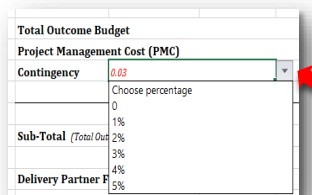
Project management costs (PMC) are the direct administrative costs incurred to execute a project. They should cover only incremental costs incurred due to the GCF contribution. In most cases, these costs are directly related to the support of a dedicated project management unit which manages the day to day execution related activities of the project.

#### General Principles for PMC costs:

1. The percentage of PMC financed by GCF should not be more than the percentage share of the overall budget financed by GCF
2. PMC budget thresholds: Up to 7.5 per cent of total activity budget.
  - > PMC exceeding 7.5 per cent for the readiness (including NAPs) proposals, and PPF proposals, up to \$ 3 million will require detailed documentation and justification supporting the entire PMC budget.
  - > The PMC should be shown as a separate component in the project budget. A detailed breakdown of PMC should be provided by budget category.
  - > Indicative list of eligible project management costs:
    - > **Project staffing and consultants:** Project manager, Project Assistant, Procurement personnel, Finance personnel & Support/admin. Personnel
    - > **Other direct costs:** Office equipment, Mission related travel cost of the PMU, Project management systems and information technology, Office supplies, Audit cost

#### Contingency :

1. Select the appropriate % of Contingency Budget from the dropdown list :
2. Contingency budget for unforeseen costs arising during the project implementation should not be included in the outcome budget separately.
3. Contingency budget must be used for any unforeseen programme (output level) cost that is unrelated to implementation/service fee.
4. Any use of contingency must be reported to and agreed by the GCF Secretariat in writing in advance provided with justifications that are acceptable to the GCF
5. If by the end of the grant implementation period, you have not spent Contingency, you may not increase the scope of the project or make any other expenditures using the Contingency.



Budget Categories
Audio Visual & Printing
Audit Fee
Consultant - Individual - International
Consultant - Individual - Local
Professional Services – Companies/Firm
IT Equipment
Office Supplies
Travel - International
Travel – Local
Workshop/Training
Equipment - Water Flow Meters

*Indicate additional budget categories*





FOR GREEN CLIMATE FUND SECRETARIAT'S USE ONLY

Breakdown (per budget category)	Total (per budget category)
Audio Visual & Printing	5,000.00
Audit Fee	2,500.00
Consultant - Individual - International	221,250.00
Consultant - Individual - Local	118,000.00
Professional Services – Companies/Firm	-
IT Equipment	-
Office Supplies	-
Travel - International	10,400.00
Travel – Local	7,900.00
Workshop/Training	12,000.00
Equipment - Water Flow Meters	15,000.00
0	-
0	-
0	-
0	-
<b>Total Outcome Budget + PMC</b>	<b>392,050.00</b>

FOR GREEN CLIMATE FUND SECRETARIAT'S USE ONLY

<b>Total Outcome Budget</b>		<b>365,750.00</b>
<b>Project Management Cost (PMC)</b>	7.2% requested	<b>26,300.00</b>
<b>Contingency</b>	3% requested	<b>10,972.50</b>
<hr/>		
<b>Sub-Total</b> (Total Outcome Budget + Contingency + PMC)		<b>403,022.50</b>
<b>Delivery Partner Fee (DP)</b> - Up to 8.5% of the Sub-Total		<b>34,256.91</b>
<hr/>		
<b>Total Project Budget</b> (Total Activity Budget + Contingency + PMC + DP)	\$	<b>437,280.00</b>

Budget Note	Detailed Description
A	One international expert (water distribution specialist) @ \$750 per day
B	One national expert (water distribution specialist) @ \$400 per day
C	Workshop for 10 to 15 people managed by a national expert and an international expert for 1 day
D	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day
E	Travel international : includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week
F	One international expert (water distribution specialist) @ \$750 per day
G	One national consultant (IT specialist) @ \$400 per day
H	Purchase flowmeters or devices for existing flowmeters for experimentation
I	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day
J	One international consultant (software development specialist) @ \$750 per day
K	One national consultant (IT specialist) @ \$400 per day
L	Travel international : includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week
M	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day+
N	One international expert (optimization specialist) @ \$750 per day
O	One national consultant (hydraulics and modelling specialist) @ \$400 per day
P	Travel international : includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week
Q	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day
R	Workshop for 10 to 15 people managed by a national expert and an international expert for 1 day
S	One international expert (hydraulics and modelling specialist) @ \$750 per day
T	Travel international : includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week
U	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day
V	Workshop for 10 to 15 people managed by a national expert and an international expert for 1 day
W	One international expert (water distribution specialist) @ \$750 per day
X	One national consultant (socio-economist specialist) @ \$400 per day
Y	Workshop for 10 to 15 people managed by a national expert and an international expert for 1 day
Z	Travel international : includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week
AA	Travel national : includes return trip from Tunis to Sousse, hotel, food & beverage and allowances for 1 day
AB	Printing fees, reports for all stakeholders
AC	One international expert (water distribution specialist) @ \$750 per day
AD	One national expert (water distribution specialist) @ \$400 per day
AE	PMC - one international consultant @ \$750 per day
AF	PMC - Audit fee
AG	PMC- travels - includes flight from Europe, local transportation, hotel, food & beverage and allowances for 1 week

## 5.2 Procurement Plan

For goods, services, and consultancies to be procured, please list the items, descriptions in relation to the activities in Section 3, estimated cost, procurement method, relevant threshold, and the estimated dates. Please include the procurement plan for at least the first tranche of disbursement requested below and provide a full procurement plan for the entire duration of the implementation period if available at this stage.

Item	Item Description	Estimated Cost (US\$)	Procurement Method	Thresholds		Estimated Start Date	Projected Contracting Date
				(Min-Max monetary value for which indicated procurement method must be used)			
<b>Goods and Non-Consulting Services</b>							
<b>Sub-Total (US\$)</b>		\$	-				
<b>Consultancy Services</b>							
Contract of services to implement the technical assistance	Development of Strategic Framework for upgradation to a smart water network system through technological interventions in Sousse and Monastir in Tunisia	368,250.00	**As per the CTCN rules and procedures established under the climate convention and approved by the Advisory Board of the CTCN	\$368,250.00		1-Apr-2021	30-Oct-2021
<b>Sub-Total (US\$)</b>		\$	368,250.00				

\*\*For this technical assistance, UNEP DHI Partnership – Centre for Water and Environment (<http://www.unepdhi.org/>), a CTCN Consortium Partner, has been selected to implement the activities according to CTCN, as per the procedure described above. UNEP DHI is a United Nations Environment Programme centre of expertise. The Centre was established in 2001 and is hosted by DHI group at its headquarters in Denmark (<http://www.dhigroup.com/>). UNEP DHI is dedicated to improving the management of freshwater resources from the local to the global level.

For this technical assistance, the procurement is single sourced as UNEP DHI will be the sole service provider in line with art 2(c) of the “modalities and procedures of the Climate Technology Centre and Network” as approved by the UNFCCC COP at its 19th session in decision 25/CP.19. UNEP DHI will carry out the activities and produce the deliverables against the budget and timeline described in section 5 and in the legal agreement between UNEP/CTCN and DHI (as host of UNEP DHI).

