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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF EUR 113.6 MILLION
(US\$ 140.0 MILLION EQUIVALENT)

TO THE

REPUBLIC OF TUNISIA

FOR THE

TUNISIA IRRIGATED AGRICULTURE INTENSIFICATION PROJECT

APRIL 26, 2018

Water Global Practice
Middle East and North Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2018)

Currency Unit =	Euro (EUR)
EUR 0.811 =	US\$ 1

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

AFA	<i>Agence Foncière Agricole</i> (Agricultural Land Tenure Agency)
AFD	<i>Agence Française de Développement</i> (French Development Agency)
AMO	<i>Assistance à Maîtrise d’Ouvrage</i> (Assistance to project owner)
ANPE	<i>Agence Nationale pour la Protection de l’Environnement</i> (National Environmental Protection Agency)
APIA	<i>Agence de Promotion des Investissement Agricoles</i> (agricultural Investment Promotion Agency)
APII	<i>Agence de Promotion de l’Industrie et de l’Innovation</i> (Industry and Innovation Promotion Agency)
AVFA	<i>Agence de la Vulgarisation et de la Formation Agricole</i> (Agricultural Extension and Training Agency)
CEPEX	<i>Centre pour la Promotion des Exportations</i> (Export Promotion Center)
CNI	<i>Centre National de l’Informatique</i> (National Information Technologies Center)
CRDA	<i>Commissariat Régional au Développement Agricole</i> (Agricultural Development Regional Directorate)
CTAA	<i>Centre Technique de l’Agro-Alimentaire</i> (Food Processing Technical Center)
COPIL	<i>Comité de Pilotage</i> (Project Steering Committee)
CRES	<i>Cellule Régional d’Exécution et de Suivi</i> (Regional Implementation and Monitoring Team)
DGACTA	<i>Direction Générale de l’Aménagement et Conservation des Terres Agricoles</i> (General Directorate for Agricultural Land Reclamation and Conservation)
DGBGTH	<i>Direction Générale des Barrages et Grands Travaux Hydrauliques</i> (General Directorate for Dams and Large Hydraulic Works)
DGEDA	<i>Direction Générale des Études et du Développement Agricole</i> (General Directorate for Studies and Agricultural Development)
DGGREE	<i>Direction Générale du Génie Rural et de l’Exploitation des Eaux</i> (General Directorate for Rural Engineering and Water Management)
DGIAA	<i>Direction Générale des Industries Agro-Alimentaires</i> (General Directorate for Agribusiness Industries)
DGPA	<i>Direction Générale de la Production Agricole</i> (General Directorate for Agricultural Production)
DGPCQPA	<i>Direction Générale de la Protection et du Contrôle de la Qualité des Produits Agricoles</i> (General Directorate for Protection and Quality Control of Agricultural Products)
DGRE	<i>Direction Générale des Ressources en Eau</i> (General Directorate for Water Resources)
DGRTD	<i>Direction Générale de la Restructuration des Terres Domaniales</i> (General Directorate for the Restructuring of Public Lands)
DMER	<i>Division de l’Hydraulique et de l’Équipement Rural</i>

	(Hydraulic and Rural Equipment Department)
DVPA	<i>Division de la Vulgarisation et de la Production Agricole</i> (Extension and Agricultural Production Division)
EA	Executing Agency
EDP3	Third Export Development Project
EPNA	<i>Établissement Public à caractère Non Administratif</i> (Non Administrative Public Company)
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FEDS	<i>Fiche Environnementale de Diagnostic simplifiée</i> (Simplified Diagnosis Environmental Data Sheet)
GDA	<i>Groupeement de Développement Agricole</i> (Agricultural Development Group)
GHIP	<i>Groupeement Hydraulique d'Intérêt Public</i> (Hydraulic Group of Public Interest)
GICA	<i>Groupeement Interprofessionnel des Conserves Alimentaires</i> (Canned Food Industry Interprofessional Group)
GIS	Geographical information System
GOT	Government of Tunisia
GRS	Grievance Redress Service
HDPE	High Density Polyethylene
I&D	Irrigation and Drainage
ICB	International Competitive Bidding
ILMP	Integrated Landscape Management Project in Lagging Regions Project
INAT	<i>Institut National Agronomique de Tunis</i> (Tunis National Agronomics Institute)
INGC	<i>Institut National des Grandes Cultures</i> (National Institute for Staple Crops)
INRAT	<i>Institut National de la recherche Agronomique de Tunis</i> (Tunis National Agricultural Research Institute)
INRGREF	<i>Institut National de la Recherche en Génie Rural, Eaux et Forêts</i> (National Rural Engineering, Water and Forestry Research Institute)
IRESA	<i>Institut de la Recherche et de l'Enseignement Supérieur Agricole</i> (Agricultural Research and Higher Education Institute)
JICA	Japan International Cooperation Agency
KfW	<i>Kreditanstalt Für Wiederaufbau</i> (German Development Bank)
LCS	Least Cost Selection
MARHP	<i>Ministère de l'Agriculture, des Ressources Hydrauliques et de la Pêche</i> (Ministry of Agriculture, Hydraulic Resources and Fisheries)
MDICI	<i>Ministère du Développement, de l'Investissement et de la Coopération Internationale</i> (Ministry of Development, Investment and International Cooperation)
MENA	Middle East and North Africa
MGS	Matching Grant Scheme
MoU	Memorandum of Understanding

MSME	Micro, Small and Medium Enterprises
NCB	National Competitive Bidding
NDC	Nationally Determined Contribution
NPF	New Procurement Framework
O&M	Operation and Maintenance
ODCO	<i>Office de Développement du Centre Ouest</i> (Center West Regional Development Authority)
ODNO	<i>Office de Développement du Nord Ouest</i> (North West Regional Development Authority)
OTD	<i>Office des Terres Domaniales</i> (Public Land Agency)
PISEAU	<i>Projet d'Investissement du Secteur Eau</i> (Water Sector Investment Project)
PMP	Pest Management Plan
PO	Producer Organization
POM	Project Operational Manual
PPI	<i>Périmètre Public Irrigué</i> (Public Irrigation Scheme)
PPIAF	Public Private Advisory Infrastructure Facility
PPSD	Project Procurement Strategy for Development
PS	Procurement Specialist
PVAPI	<i>Plan de Valorisation Agricole de Périmètre Irrigué</i> (Irrigation Scheme Agricultural Development Plan)
QCBS	Quality and Cost Based Selection
QCS	Qualification of Consultant Selection
QII	Quality in Infrastructure Investment
RPF	Resettlement Policy Framework
RVP	Regional Vice-President
SCADA	Supervisory Control And Data Acquisition
SEM	<i>Société d'Économie Mixte</i> (Public – Private Company)
SMSA	<i>Société Mutuelle de Services Agricoles</i> (Cooperative Society for Agricultural Services)
SMVDA	<i>Société de Mise en Valeur et de Développement Agricole</i> (Agricultural Development Company)
SOE	State-Owned Enterprise
SSS	Single Source Selection
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFDCV	<i>Task Force pour le Développement des Chaînes de Valeur</i> (Value Chain Development Task Force)
UGO	<i>Unité de Gestion par Objectif</i> (Project Management Unit)
YEIP	Youth Economic Inclusion Project
WOP	Without Project
WP	With Project
WPP	Water Partnership Program

**BASIC INFORMATION**

Is this a regionally tagged project?	Country(ies)	Financing Instrument
No		Investment Project Financing

- ☐ Situations of Urgent Need of Assistance or Capacity Constraints
- ☐ Financial Intermediaries
- ☐ Series of Projects

Approval Date	Closing Date	Environmental Assessment Category
17-May-2018	31-Dec-2024	B - Partial Assessment

Bank/IFC Collaboration
No

Proposed Development Objective(s)

The Project Development Objectives (PDO) are to improve the reliability and efficiency of the irrigation and drainage services and strengthen market linkages for irrigated products in selected irrigation schemes.

Components

Component Name	Cost (US\$, millions)
Institutional Modernization	11.07
Rehabilitation and Improvement Works	124.88
Support to Agricultural Development and Market Access	30.99
Project coordination	3.21

**Organizations**

Borrower : Ministry of Development, Investments and International Cooperation

Implementing Agency : Ministry of Agriculture and Water Resources and Fishing (MARHF)

PROJECT FINANCING DATA (US\$, Millions)

☒ Counter-part Funding	☒ IBRD	☐ IDA Credit	☐ IDA Grant	☐ Trust Funds	☐ Parallel Financing
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Total Project Cost:

170.50

Total Financing:

170.50

Financing Gap:

0.00

Of Which Bank Financing (IBRD/IDA):

140.00

Financing (in US\$, millions)

Financing Source	Amount
Borrower	22.50
IBRD-88580	140.00
LOCAL: BENEFICIARIES	8.00
Total	170.50

Expected Disbursements (in US\$, millions)

Fiscal Year	2018	2019	2020	2021	2022	2023	2024	2025
Annual	0.00	2.05	9.50	38.40	38.90	30.70	11.00	9.45
Cumulative	0.00	2.05	11.55	49.95	88.85	119.55	130.55	140.00



INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Agriculture

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● High
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● Substantial
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Substantial
8. Stakeholders	● Substantial



9. Other	● Substantial
10. Overall	● High

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	✓	
Natural Habitats OP/BP 4.04		✓
Forests OP/BP 4.36		✓
Pest Management OP 4.09	✓	
Physical Cultural Resources OP/BP 4.11	✓	
Indigenous Peoples OP/BP 4.10		✓
Involuntary Resettlement OP/BP 4.12	✓	
Safety of Dams OP/BP 4.37	✓	
Projects on International Waterways OP/BP 7.50	✓	
Projects in Disputed Areas OP/BP 7.60		✓

Legal Covenants

Sections and Description

Loan Agreement Schedule 2 Section I.A.1(a): No later than four (4) months after the Effective Date, or such later date as agreed by the Bank, establish, and thereafter maintain, throughout Project implementation, the UGO with composition, terms of reference and resources acceptable to the Bank and defined in the Project Operational Manual.

Sections and Description

Loan Agreement Schedule 2 Section I.A.1(b): No later than three (3) months after the Effective Date, or such later



date ad agreed by the Bank, establish, and thereafter maintain throughout Project implementation, the COPIL with composition acceptable to the Bank and defined in the Project Operational Manual.

Conditions

Type	Description
Disbursement	Loan Agreement Schedule 2 Section III.B.1(b): No withdrawal shall be made under Category (2) [Operation and Maintenance Subsidies under Part 1 (b) of the Project], until evidence satisfactory to the Bank has been furnished to the Bank that the following conditions have been met: (i) (A) the Operator has been legally established and is operating in a manner acceptable to the Bank; and (B) the Borrower, through MARHP, has entered into a Program Agreement with the Operator under terms and conditions acceptable to the Bank; and (ii) for any given Selected Irrigation Scheme where the operation and maintenance will be transferred to the newly established Operator, a debt resorption plan has been approved by the Borrower in consultation with any given GDA operating in these Selected Irrigation Scheme all under terms and conditions acceptable to the Bank and set forth in the Project Operational Manual.
Type Disbursement	Description Loan Agreement Schedule 2 Section III.B.1(c): No withdrawal shall be made under Category (3) [Matching Grants under Part 3.2(d) of the Project], until evidence satisfactory to the Bank has been furnished to the Bank that the following condition has been met: (i) the Matching Grant Manual has been adopted in a manner acceptable to the Bank; and (ii) the Matching Grant Selection Committee has been established with composition acceptable to the Bank and set forth in the Matching Grant Manual.

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Francois Onimus	Team Leader(ADM Responsible)		GWA05
David Olivier Treguer	Team Leader		GFA05



Moustapha Ould El Bechir	Procurement Specialist(ADM Responsible)		GGOPM
Abdoulaye Keita	Procurement Specialist		GGOPM
Blandine Marie Wu Chebili	Procurement Specialist		GGOSC
Mehdi El Batti	Financial Management Specialist	Financial Management	GGOMN
Claudine Kader	Team Member		GWA05
Daniel Camos Daurella	Team Member		GWA05
Elena Segura Labadia	Counsel	Legal	LEGAM
Gabriella Izzi	Team Member		GWA05
Garry Charlier	Team Member	Rural development	GFA04
Jade Salhab	Team Member	Private sector	GFCMW
Marcus Marinus Petrus Wijnen	Peer Reviewer	Water resources	GWA07
Markus Friedrich Vorpahl	Social Safeguards Specialist	Social	GSU05
Meeta Sehgal	Peer Reviewer	Agroeconomist	GFA13
Mehrez Chakchouk	Environmental Safeguards Specialist	Environment	GEN05
Mohamed Adnene Bezzaouia	Environmental Safeguards Specialist	Environment	GEN05
Narjes Jerbi	Team Member		MNCTN
Nina Chee	Safeguards Advisor		OPSES
Parmesh Shah	Team Member	Jobs in Agriculture	GFA07
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Sharon D. C. Faulkner	Team Member		GWA05
Simon Carl O'Meally	Team Member	Governance	GGOMN
Taoufiq Bennouna	Team Member	Environment	GEN05
Vivek Srivastava	Peer Reviewer	Governance	GGODZ
Extended Team			
Name	Title	Organization	Location
Alexandra Sokolova	Economist		Rome,Italy



Henri Carron	Consultant	
Hichem Achour	Consultant Irrigation	Tunisia
Iheb Chalouat	Consultant governance	Tunisia
Larbi Khrouf	Consultant	
Leny Van Oyen	Consultant	



TUNISIA
TUNISIA IRRIGATED AGRICULTURE INTENSIFICATION PROJECT

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I. STRATEGIC CONTEXT

A. Country Context

1. **Seven years after the 2011 revolution, Tunisia has successfully completed its political transition but weak economic performance poses a risk to the poverty reduction gains of the past and to the promotion of greater inclusion.** Civil society organizations, including youth groups, have gained more voice and have pushed for greater transparency and accountability in public service and the elimination of corruption. But tangible economic dividends in terms of greater prospects for economic opportunities and private-sector-led jobs for the population are taking longer to materialize than expected. While poverty incidence was halved between 2000 and 2015 (from 32.5 to 15.2 percent), many households (including some categorized as middle class) remain only slightly above the poverty threshold, making them vulnerable to exogenous shocks. Inequality between regions has risen with poverty increasingly concentrated in a few regions of the country.¹
2. **Tunisia's agricultural sector has a considerable potential to help boost shared prosperity.**² Agriculture accounts for about 10 percent of GDP and, with the food-processing industry, 10 to 12 percent of exports. The value of Tunisia's food production has increased by more than 50 percent over the last 15 years and now stands at over US\$4 billion. About 33 percent of the 11.4 million Tunisians³ live in rural areas and roughly 50 percent depend on agriculture for their livelihoods and employment, representing almost 15 percent of the labor force. In some lagging regions, close to 80 percent of the rural population and almost all women depend on agriculture for income and employment⁴. In 2012, a third of the poor household heads worked in agriculture compared to 16 percent of the non-poor.
3. **There are significant gaps between women and men in both labor force participation, employment, and unemployment rates.** Despite a history of promoting gender equality dating back to the 1960s, women are less likely to participate in the labor force than men⁵ and those who do participate experience higher unemployment rates than men. In rural areas in lagging regions, whereas 65 percent of rural males have an income, this is the case for only about 20 percent of the rural women as they usually work on family farms or are engaged in agriculture related informal sector trading/basic processing activities partly due to their lack sufficient knowledge of market opportunities and access to financial resources.⁶

¹ In 2010, poverty rates ranged from a low rate of 8-9% in the Center-East region and Grand Tunis to a high of 26 and 32% in the North-West and Center-West regions, respectively. These two regions are home to about 47% of the poor (North-West 19% and Center-West 28%). Unemployment rates are 26.2% in the South-East, 23.1% in the South-West, and 19% in the Center-West compared to 10.7% and 9.9% in the North-East and Center-East, respectively.

² An IFC report shows that in Tunisia investment in agriculture creates the most employment and investment in food processing creates the largest value-added compared to the same amount of investment in other sectors (Kapstein, Kim, and Eggeling, 2012).

³ 2017 estimate.

⁴ World Bank. 2014. "The Unfinished Revolution: Bringing Opportunity, Good Jobs and Greater Wealth to All Tunisians." Development Policy Review, Washington, DC.

⁵ According to the World Development Indicator 2017, labor force participation rate (age above 15 years old, modeled ILO estimate) is 24.3% for female and 70.6% for male.

⁶ AFD, Profil Genre Tunisie, 2016.



A specific gender analysis has been conducted during project preparation to inform the design of the project.

B. Sectoral and Institutional Context

4. **Agricultural development is strongly affected by climate change.** Renewable water resources amount to 420 m³/year/inhabitant, which is below the threshold of absolute water scarcity. Agriculture uses close to 80 percent of these resources. Already the country has been affected by a severe drought in 2016 and 2017 resulting in substantial reduction (up to 80 percent) in volumes of water allocated to agriculture. Climate change is predicted to increase temperatures, reduce precipitation, and increase variability. Increased temperatures (an estimated 1-2°C by 2030) will increase water consumption, while lower precipitation (an estimated 5-10 percent drop) will reduce supply. Increased variability will make droughts and floods more frequent and severe and increase pressure on already strained aquifers.⁷ This will create significant economic challenges in the future since irrigated agriculture contributes about 37 percent of the agricultural output and 20 percent to the agricultural exports on only 8 percent of the agricultural land of Tunisia.⁸
5. **The scope for further mobilization of water resources is very limited in Tunisia.** Major infrastructure investments⁹ have allowed Tunisia to capture most of its scarce water, mobilizing 92 percent of the renewable resources, and to deliver it where it is most needed.¹⁰ Investments in irrigation infrastructure have been by far the most important compared to other agricultural subsectors reaching 35 percent of all agricultural investments in the past decades and resulting in the development of 435,000 ha equipped for irrigation, which is 95 percent of the estimated potential. The irrigated areas are concentrated in the North (48 percent) followed by the Center (36 percent) and the South (16 percent). About 53 percent of the equipped area is on public irrigation schemes while the remaining 47 percent are private systems.¹¹ Two thirds of the irrigated area in Tunisia is equipped with efficient irrigation technologies (sprinkler and drip).¹² In addition, the country has a long-standing program of innovative practices such as artificial aquifer recharge and re-use of treated wastewater, even if on limited surfaces.¹³
6. **The Tunisian Government has recognized the need to evolve from a supply side response (increasing water mobilization) to a demand management approach (improving overall efficiency and favoring the**

⁷ Out of the 273 aquifers identified in Tunisia, 71 are considered as overexploited, with water use exceeding the renewal capacity of the aquifers by close to 50 %. Almost all aquifers in the coastal area face salinization problems.

⁸ CACG/SCET. 2017. Institutional Options Study for Irrigation Management in Tunisia.

⁹ On average Tunisia investments in water resources mobilization and utilization mobilized 9 % of total public investment budget and 2 % of GDP according to successive national economic and social development plans.

¹⁰ Renewable resources are composed of 2,650 Mm³/year (56%) of surface water and 2,150 Mm³/year (44%) of groundwater. Hydraulic infrastructure includes 33 large dams with a total capacity of 2.27 Bm³, 253 small dams, 837 reservoirs, 5,512 boreholes and 130,000 wells. In addition, the hydraulic infrastructure includes conveyance facilities to transfer the water from the wetter North to the coast where uses are concentrated and to the dryer South.

¹¹ in the North.

¹² Such modern on farm irrigation equipment is subsidized between 40 and 60% depending on farm size.

¹³ Non-conventional water resources are estimated at 232 Mm³/year or 5% of resources mobilized



most productive uses of water) with a view to improve the overall resilience to climate shocks. Improvement in demand management can come from a combination of physical improvements, more accountable institutions, and support to the farmers in improving agricultural value addition.

7. **This shift in approach is more urgent in the North of the country where 63 percent of the public irrigation areas are concentrated and where most of the water resources are generated from.** Public irrigation schemes built 20 to 40 years ago are caught in the vicious cycle of low added value leading to low cost recovery, lack of maintenance and low level of service. Some areas equipped with irrigation are not exploited (close to 20 percent); cropping intensity is well below potential (80 percent versus 120 percent); part of the crops grown in the areas equipped for irrigation are not irrigated (like cereals and olive trees); and overall, average yields of irrigated crops have a significant margin of increase. Transport losses are estimated to reach 35 percent of water used, resulting in higher cost per cubic meter delivered to the end user.
8. **The priority to uplift the subsector to its performance potential is to provide a reliable service to the users.** Lack of service reliability is a powerful deterrent to agricultural intensification on irrigation schemes, as farmers will not be willing to take the risk of engaging into more profitable crop production if they are facing a high probability of losing production in the event of a technical failure in the irrigation system. However, aging irrigation schemes in Northwestern Tunisia are characterized by frequent breakdowns resulting in multiple service interruptions per irrigation season.
9. **The under-performance of the irrigation subsector has been further compounded by an institutional set up that fails to ensure adequate accountability from the service provider to the users (in delivering the service) and from the user to the service provider (in paying for the service).** Currently, the *Commissariats Régionaux de Développement Agricole* (CRDAs - Regional Agricultural Development Directorates of the Ministry of Agriculture) are in charge of the main systems' operations, while they delegate the *Groupelements de Développement Agricole* (GDA – Agricultural Development Groups) for the water distribution. The dilution of responsibilities between CRDA and GDA, the intrinsic weakness of CRDA (which are public administrative bodies) to deliver a commercial service, their lack of financial autonomy as they rely on the annual budgeting process, and the lack of empowerment and capacity of the GDA are the main reasons for low performance of the current system.
10. **A study conducted during project preparation has identified various options for the establishment of autonomous, financially viable, client-oriented irrigation management entities.** The general principle is that corporatized entities of viable size be fully responsible for the delivery of the irrigation and drainage (I&D) service and accountable to the users. These entities should be managed on a commercial basis while serving the public interest. A strong emphasis of the corporatization process should be to instill a service-oriented culture, with “users” becoming “clients”. A common feature of any option is the need for clear agreement and stakeholder buy-in to the institutional reforms, calling for a strong stakeholder engagement process. The options analyzed include: (i) the public authority; (ii) the corporatized public company (State-Owned Enterprise, SOE); (iii) the public-private company with a majority of public capital; (iv) the public-private company with a majority of private capital; and (v) the farmer based organization. For seven large irrigation schemes located in the North-West and targeted under the project, the proposed option is a public company that will open its capital to private investors after a few years, once key conditions are met (proper technical and financial records available, reasonable level of cost recov-



ery). For one irrigation scheme targeted under the project, the proposed option is the farmer based association since this scheme is a smaller size with sufficient social cohesiveness. The Government is committed to the reform,¹⁴ and consultations held during project preparation showed a broad consensus among stakeholders being conscious that the current situation cannot continue.

11. **Irrigation service charges (water tariffs) have been recognized as a key economic instrument for water resources management for a long time in Tunisia.** Tariffs were kept very low in the 1980s and increased substantially in the 1990s with a view to reach full Operation and Maintenance (O&M) cost recovery. However, tariffs have been frozen since 2002 and as a result they do not cover the growing cost of water services. Current tariffs cover on average 50 to 60 percent of the recurrent O&M costs, not including the renewal charges. International experience shows that improvement in the water service is an incentive for farmers to accept an increase in tariffs and enhance the fee collection rate. In parallel, an increase in transport efficiency can reduce some O&M costs, considering that a share of the water charges is used for pumping water that is lost before being delivered to the end user, or left unaccounted for.
12. **Options for crowding in private finance for infrastructure rehabilitation and improvement have been considered.** International experience - both in the irrigation sector and in other sectors – shows that it is not feasible to get a valuable deal with the private sector under the current settings. However, the consolidation of several irrigation schemes under one single entity of viable size and with proper records, through the establishment of a State-Owned Enterprise (SOE), will enable the mobilization of private capital at a later stage, thus enabling Maximizing Finance for Development. By transferring the responsibility for delivering irrigation and drainage services from an administrative body to an actual SOE, i.e. a corporate entity running on a commercial basis, this project is also consistent with the on-going government's reform of the SOE sector which aims at e.g. improving the technical and commercial performance of key public utilities.
13. **With a secured irrigation service, numerous market opportunities for irrigated agriculture are available in Tunisia,** including fruit trees, industrial crops, vegetable crops, supplementary irrigation for cereals and fodder crops and so on. However, in spite of the successive plans that have made the development of value chains a priority, processing of agricultural products has remained much below expectations. For example, olive oil is still mostly exported in bulk and so are citrus fruits; 75 percent of tomato production in Tunisia is used as low value input in the industry of concentrated tomato paste, instead of exports of fresh tomatoes. At the same time, there are significant spare capacities in the food processing industry, which demonstrates weak linkages between production and transformation. This is largely related to the fragmented production systems and the absence of farmer organizations able to manage storage, (pre-) processing and commercialization of their members' production. Hence, the Government has decided to link irrigation rehabilitation with a strong support to the development of higher value-added agribusiness value chains. A gender lens will also help ensure that those new opportunities will equally benefit men and women. This more holistic approach represents a paradigm shift from previous projects.
14. **The Government and the World Bank have agreed on the implementation of a coordinated value chain support mechanism** across all IBRD financed projects involving such activities in Tunisia, in order to avoid

¹⁴ This commitment was expressed in the letter of request for the project and materialized with the launching of two studies: one institutional options study and one tariff study. A letter of commitment to the reforms was signed by the Minister of Agriculture on March 21, 2018 (see Annex 1 for further details).



duplication of effort in the same geographical areas and to generate economies of scale. A shared multi-agency task force is being established to this end, with financial support already committed from three active or recently approved projects, namely EDP3 (P132381), ILMP (P151030) and YEIP (P158138). This project will support the extension of the Task Force's activities to additional value chains related to irrigated agricultural products and not already included in these other projects. Operational synergies with ILMP beyond value chain coordination have also been considered during preparation.

15. **Agricultural development activities under the project will contribute to mobilizing private finance.** The project will leverage its matching grant component not only to crowd in investments by local farmers in higher value-added activities, but also to de-risk activities that would benefit from private sector investment (such as cold-chain logistics services). The possible intervention of the International Finance Corporation (IFC) in support of value chain development and in liaison with the task force is under consideration. The project intervention will also need to be coordinated with the public subsidy scheme implemented by APIA under *Code des Investissements* (see Annex 1 for details).

C. Higher Level Objectives to which the Project Contributes

16. **Alignment with CPF.** The project is aligned with the Country Partnership Framework (CPF) for the period FY 2016-2021 (Report No. 104123-TN) as discussed by the Board of Executive Directors on May 17, 2016. The CPF consists of three pillars: (i) improve the environment for restoring economic growth and stability; (ii) improve services and opportunities in lagging regions; and (iii) increase social and economic inclusion and opportunities for youth. The proposed project contributes to all three pillars through: (i) improving the institutional framework for irrigated agriculture, which is a necessary condition for the development of agricultural value chains (CPF pillar one); (ii) contributing to the creation of economic opportunities in targeted lagging regions through improved irrigation service delivery and increased economic activity in the agricultural sector (CPF pillar two); and (iii) contributing to economic inclusion of women and youth by targeting agricultural value chain development that can create jobs and economic opportunities for these populations (CPF pillar three).
17. **Contribution to the World Bank Strategic Goals and MENA strategy.** The project will contribute to ending extreme poverty and boosting shared prosperity in a sustainable manner in Tunisia's lagging regions through the new economic activities made possible by a robust irrigation system and the support to agricultural production, local value addition, and market development. It will support the MENA strategy¹⁵ by contributing to the pillar on renewing the social contract through promoting a new, bottom-up development model in lagging regions, with more effective and responsive public services that focus on the poor and vulnerable people and private sector development through value chains to create jobs and opportunities mainly for the youth in Tunisia's lagging regions.
18. **Climate resilience.** The project will contribute to increasing the resilience of Tunisian agriculture to droughts, climate variability and climate change through an improved efficiency in irrigation water usage and enhanced value of agricultural produce per unit volume of water. It will also reduce the electricity consumption per unit volume of productive water. The project will therefore contribute to Tunisia's Nationally Determined Contribution (NDC) in terms of both adaptation and mitigation.

¹⁵ World Bank (2015) MENA Strategy: Economic and Social Inclusion for Peace and Stability in the Middle East and North Africa: A New Strategy for the World Bank Group.



19. **Citizen engagement and gender.** These two dimensions were given due consideration during project preparation and specific actions and indicators have been included in the project design. Citizen engagement is at the core of the institutional reform process whereby a new operator will be established with much increased accountability to irrigation users. Farmers will also be closely associated to and supported for the design of agricultural development plans for each targeted site. The project aims to foster local initiative for agricultural intensification and to provide the necessary assistance and tools for that aim. The gender dimension will be captured through awareness raising activities and women's empowerment in engaging in or scaling up of local processing activities aimed at enhancing local value addition.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

20. The Project Development Objectives (PDO) are to improve the reliability and efficiency of the irrigation and drainage services and strengthen market linkages for irrigated products in selected irrigation schemes.

B. Project Beneficiaries

21. The project will directly benefit agricultural producers on selected schemes who will get access to new or improved I&D services and receive assistance for agricultural intensification and market access. This includes a mix of small and medium scale farmers on public or private land and of public and private farming companies using public land.¹⁶ In addition, the project will provide assistance to farming and agribusiness enterprises who contribute to channeling the production of the irrigation schemes to the market. Employees of these enterprises will benefit from an improved business environment in terms of job security and job creation.¹⁷ Other beneficiaries are the institutions in charge of irrigation management which will benefit from institutional strengthening delivered under the project. Business entities along the value chains will also indirectly benefit from the project. The project will establish mechanisms to target disadvantaged populations, youth groups, unemployed graduates, women in the provision of business support and capacity building measures, and thus reduce inequitable access of women to employment and training in the agricultural sector.
22. The project intervention will be focused on six large schemes in four governorates of the North-West, where most of the large public irrigation schemes are located: Beja, Bizerte, Jendouba and Siliana. The schemes were selected based on their dire physical condition, also linked to their age (30-40 years since construction). Five additional schemes are included, with a specific focus on the reuse of treated wastewater and on the drainage of land prone to salinization. In total, target areas include about 25,900

¹⁶ The total number of water users is estimated at about 3,500 producers (individual farmers or companies).

¹⁷ The total number of jobs created or maintained is estimated at 2,700.



ha of irrigation and/or drainage infrastructures, out of which 480 ha would entail expansion of existing schemes and the remaining area entails rehabilitation and drainage.

C. PDO-Level Results Indicators

23. PDO-level results indicators are the following.¹⁸
- Reduction in the water service disruption (percent)
 - Irrigation system efficiency (percent)
 - O&M cost recovery ratio (percent)
 - Share of production value marketed through contractual arrangements within value chains (percent)
24. The above indicators are complemented by intermediate indicators for each component as presented in the result framework (see section VII). The latter includes a citizen engagement indicator and two gender-sensitive indicators.

III. PROJECT DESCRIPTION

A. Project Components

25. **Theory of change.** Some aging irrigation schemes in Tunisia are trapped in a vicious cycle of low quality of service leading to low agricultural output, low O&M cost recovery and lack of maintenance to maintain the quality of service. Breaking this vicious cycle requires interventions at three levels: (i) improving the quality of service through targeted rehabilitation and improvement works and increased accountability of the service provider; (ii) ensuring O&M cost recovery through a strengthened institutional framework and increased tariff; and (iii) supporting the farmers in improving agricultural value addition through improved productivity and market access.

Component 1: Institutional modernization

26. **Subcomponent 1.1: Establishment of a new irrigation management entity.** This subcomponent will finance the cost of establishing a new, autonomous irrigation management entity – or operator – responsible for the delivery of an improved, more reliable irrigation service. This will include the financing of transaction advisory services, equipping the newly established operator with state-of-the-art operation and maintenance tools (software etc.), payment of transitional O&M subsidy, and building the capacity of the operator's staff. The role of the existing GDAs will be adjusted to the new institutional model and their capacity strengthened to fulfill their new responsibilities.
- Consultants acting as transaction advisers will support the establishment and operationalization of the new operator, including (i) the regulatory and corporate set up, including assessment of assets transfer and redeployment of staff resources as needed and the feasibility to open the operator's

¹⁸ Indicator (a) measures the reliability of the irrigation service; indicators (b) and (c) measure respectively the technical and financial efficiency of the service; and indicator (d) measures the improvement in market linkages.



capital to the private sector; (ii) the preparation of contractual terms –including the new tariff structure and performance standards– for the delegated O&M functions; (iii) an in-depth irrigation users information and engagement process to ensure understanding and ownership of the proposed institutional model; (iv) the setting up of the customer relationship function and other key functions within the new operator; and (v) the evaluation of CRDA and GDA staff competencies and training requirements before their transfer to the new operator.¹⁹

- b. The O&M subsidy will be paid to the operator on a transitional basis to cover the gap between the actual O&M cost and the expected receipts from the irrigation service fee. This subsidy will decrease over time as tariff and fee collection rates increase. The annual subsidy amount will be defined in a performance-based contract signed between the Ministry of Agriculture and the operator.
- c. Operating software including a Geographical Information System (GIS), office building and equipment will be financed as needed to allow the operator to provide a reliable irrigation service and to handle its customer relationship functions.
- d. Training activities will strengthen the capacity of the operator, the GDAs and the public authorities in charge of their oversight. Specific attention will be given to the gender dimension in the way both the re-designed GDAs and the new irrigation management entity operate.²⁰

27. **Subcomponent 1.2: Irrigation efficiency improvement.** This subcomponent will finance consultancy services for the development of an information system for irrigation, piloting of in-field water management systems, and development of an irrigation alert system (based on crop water requirements) to help the farmers make the most efficient use of their allocated water and improve water accounting. An accountability mechanism will be established to monitor the satisfaction of the irrigation users.

Component 2: Rehabilitation and improvement works

28. **Subcomponent 2.1: Rehabilitation and improvement works.** This subcomponent will finance engineering services and rehabilitation, improvement and expansion works for eleven I&D schemes on 25,900 ha, out of which 480 ha of expansion for two of these same schemes.

- a. Engineering services (*Maîtrise d’Oeuvre*) will include: (i) complements to available project studies, as required;²¹ (ii) scheduling, coordination and site management; (iii) management of the execution of works contracts; and (iv) assistance to the contracting authority for provisional and final acceptance of works. One such consultancy contract will be established for each CRDA.
- b. Rehabilitation and improvement works will include: (i) the renovation of the pumping stations, with an increase of their capacity in some cases, and the construction of new pumping stations; (ii) renovation of existing reservoirs and construction of new ones; (iii) the renovation of main pipeline through replacement of obsolete equipment and undersized sections, and creation of new main lines; (iv) the renovation and reinforcement of distribution networks; (v) the creation of remote management systems (SCADA); (vi) the rehabilitation of feeder roads and service roads and ditches where they are in poor condition; and (vii) the construction of drainage systems in some parts of the schemes.

¹⁹ Staff from the CRDA and GDA currently involved in O&M activities will be encouraged to apply to become staff of the newly established operator.

²⁰ For example, by ensuring the operator encourages females to apply to job opportunities as part of its hiring policy.

²¹ As recommended in the report of the program of studies and works of 29 July 2017.



29. The cost of implementing the environmental and social management plans related to the construction works financed by the project is also included under this component. The new infrastructure is mainly located on public land. The cost of compensation to be paid to project affected people, if any, will be borne by the Government.
30. **Subcomponent 2.2: Common services and goods.** This subcomponent will finance consultant services to strengthen the capacity of CRDAs to perform their functions of engineering and construction quality oversight (*Assistance à Maîtrise d'Ouvrage*, AMO) as well as goods and services that are centrally purchased for economies of scale.
 - a. AMO's services will consist in (i) reviewing technical designs and tender documents; (ii) preparing technical guides and standard documents for the rehabilitation and modernization of irrigation structures; (iii) establishing a reference list of unit prices and a database for estimating work costs; (iv) contract management; (v) carrying out technical audits, as needed.
 - b. Centrally purchased goods and services include the supply of meters and flow limiters.

Component 3: Support to agricultural development and market access

31. **Subcomponent 3.1: Strengthening the capacity of producers (and producer organizations) and linking them to the market.** The objective is to improve the management of farms and producer groups through the provision of advisory services, with a view to achieve productivity gains and to add value to the production. This sub-component will be implemented with the engagement with farmers as a key guiding principle, building on the PNO4 Project (P119140)²² and promoting the concept of productive alliances. The recommendations of the Pest Management Plan (PMP) adopted by the Government of Tunisia for the project will be incorporated in the design of this subcomponent's activities as need be. The activities implemented under this subcomponent will include:
 - a. the design and implementation of an integrated and participatory agricultural development plan in each of the selected irrigation schemes, including: (i) the provision of training and technical assistance to: (a) form and consolidate farmer organization structures; and (b) improve their marketing and business skills; all based on the recommendations of the participatory agricultural development plans; and the (ii) provision of support for the dissemination of research results on relevant issues identified as part of the participatory agricultural development plans and value chains analysis to be carried out under Subcomponent 3.2 below, including demonstration of varietal improvement, certified seeds, water management and soil fertility;²³ and
 - b. the preparation of an in-depth analysis of the concession holdings of the organized sector comprised of *sociétés de mise en valeur et de développement agricole*, the Borrower's *Office des Terres Domaniales*, technicians and young farmers leasing public land.
32. The agricultural development plans will be prepared following an in-depth participatory process with all parties involved in the production systems. They will incorporate specific support for women and youth

²² 4th Northwest Mountainous and Forested Areas Development Project (PNO4) (P119140)

²³ The plans developed under this project will be fully complementary with the Integrated Landscape Development Plans (ILDPS) developed under ILMP: while this project will focus only on large-scale public irrigation schemes, ILDPs will have a landscape focus and their irrigation-related interventions will be targeted exclusively at a small- and medium-scale irrigation (*Petite et Moyenne Hydraulique*), thus avoiding overlaps. The design of aggregation models will build on the same operational guidelines developed under ILMP and tapping synergies in developing training tools.



groups in an inclusive approach e.g. dedicated awareness raising activities and training sessions to increase their knowledge for market opportunities and to empower them economically, using all training and investment opportunities provided under this component.

33. **Subcomponent 3.2: Boosting product marketing and developing competitive value chains.** This second subcomponent will support the financing of private and cooperative investment in the modernization of supply chains and post-harvest infrastructure, with a focus on (i) local value addition and (ii) women's groups. This subcomponent will also give a high priority to direct engagement with farmers. The activities under this subcomponent include:
- a. the preparation of market studies and strategic analysis for selected value chains, including the preparation of business investment plans eligible for financing under the Matching Grant Scheme (MGS) below;
 - b. the implementation of actions to promote the quality of selected products, including certification, labeling, geographical indications, and communication and advertising campaigns; and
 - c. the establishment of a MGS to assist agricultural producers and agribusinesses in the implementation of the business investment plans described above focused on selected value chains, including: (i) providing support to: (a) prepare the matching grant manual; (b) design a communication strategy for the MGS; and (ii) providing matching grants to beneficiaries to implement their business improvement plans described above.

Component 4: Project Management

34. This component will support the functioning of the Project Implementing Unit (*Unité de Gestion par Objectif*, UGO) within the MARHP. The UGO will be responsible for project coordination and management, monitoring and evaluation activities, and fiduciary responsibilities. It will compile the reports from the citizen engagement feedback mechanisms under the project (through the operator, the GDA and so on). Through the provision of goods, consultants' services and training, the Component will cover: (i) the equipment cost for the unit; (ii) training of UGO staff; (iii) short term expertise; (iv) impact assessment studies; (v) training, communication and expertise related to the implementation of the project's Environmental and Social Management Framework (ESMF); and (vi) the incremental operating costs for the project at both central and regional levels. The salaries of UGO staff and the project audit will be paid by the Borrower.

B. Project Cost and Financing

35. The total project cost is US\$170.15 million out of which US\$139.65 million will be financed by an IBRD loan. The amount of co-financing is US\$30.5 million and will be made available from the following sources: (i) government contribution estimated at US\$22.5 million (including project related taxes and fees); and (ii) beneficiaries' contribution estimated at US\$8 million (matching contribution to value chain investments financed under Component 3). The government will also contribute in kind to the project cost in the form of salaries for civil servants assigned to the project and assets transferred to the new operator.



Project Components	Project cost	IBRD or IDA Financing	Government Financing	Beneficiaries contribution
Component 1	11.07	10.20	0.87	-
Component 2	124.88	106.06	18.82	-
Component 3	30.99	20.60	2.39	8.0
Component 4	3.21	2.79	0.42	-
Total Costs	170.15	139.65	22.50	8.00
Front End Fees		0.35		
Total Financing Required		140.00		

C. Lessons Learned and Reflected in the Project Design

36. **World Bank engagement in the water sector in Tunisia.** The World Bank has helped the Tunisian Government since 2001 in the financing of a series of sector investment projects to implement the Water Sector Support Program. These projects, called PISEAU 1 (P035707) and 2 (P095847), were designed to support the 1999 Water Sector Strategy and the associated Water Sector Support Program (2001-2011).²⁴ While these projects had significant impact in terms of physical outputs,²⁵ they failed to enable the kind of reforms that were necessary to sustain these results and reach the economic efficiency and institutional objectives laid out in the Government's strategy. PISEAU 2 was rated Moderately Unsatisfactory due to its lack of results on the institutional side as well as its weaknesses on M&E and safeguards requirements.
37. **Institutional modernization.** Following the PISEAU project, the World Bank supported the new Government of Tunisia in re-thinking its approach to irrigation development through targeted analytical work. A PPIAF grant was mobilized to help the Government design feasible institutional modernization options. The study conducted during project preparation compared several options with a varying degree of private sector involvement. It also draws lessons from successful institutional models in France, Morocco and Spain. Details regarding the institutional options are provided in Sections IV and VI and in Annex 1.
38. **Quality of engineering.** Inferior quality of design and construction has been recognized in multiple cases as a major hindrance towards achieving stated irrigation service objectives. A recent Integrity Advisory Note (June 2017) highlights the issues related to quality of design and construction and make recommendations to set up quality control mechanisms. This includes: (i) giving attention to the recruitment of reputable engineering firms with comprehensive terms of reference, (ii) including contract management function and technical audit in the design of the project, and (iii) ensuring an appropriate feedback mechanism.

²⁴ The program was jointly financed by the World Bank, the African Development Bank (AfDB), the Agence Française de Développement (AFD), and the Kreditanstalt für Wiederaufbau (KfW).

²⁵ For example, PISEAU 1 provided improved irrigation on 29,000 ha (two thirds more than the 17,000 ha anticipated) and supplied drinking water to 170,000 people (compared to 100,000 anticipated).



39. **Contract farming and productive alliances.** Contract farming is a practical answer to the need of vertical coordination within value chains to strengthen efficiency, sustainability, adaptation to rapidly changing market demands and management of quality. Producer organizations are essential for smallholders to take part in value chains and cater to market demands, as smallholders can bargain better as a group than as individuals. The development of “productive alliances” –which are long-term partnerships based on pluri-annual business plans in selected value chains between producer organizations and buyers– have been used successfully in a variety of countries, and will be used in this as well as in another recently approved World Bank funded project in Tunisia²⁶ with which close coordination is sought.
40. **Climate change.** A recent World Bank report²⁷ examines the impacts of increasing climate variability and droughts on the agricultural and livestock sector in Tunisia. Future prospects with respect to drought are considered based on the most recent scientific evidence regarding the likely evolution of changes in temperature and precipitation in various parts of the country.²⁸

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

41. **Implementing agency.** The project will be implemented by the Ministry of Agriculture (MARHP). MARHP has a long experience of working with the World Bank, including in drinking water supply and in irrigation, the latest project being PISEAU 2 which recently closed. The *Direction Générale du Génie Rural et de l'Exploitation des Eaux* (General Directorate for Rural Engineering and Water Management, DGGREE) within MARHP will be responsible for the overall coordination of the project. It will be directly responsible for the implementation of the Component 1, subcomponent 2.2 and Component 3, the latter in close coordination with *Direction Générale de la Production Agricole* (General Directorate for Agricultural Production, DGPA).
42. **Implementation at regional level.** The *Commissariat Régional du Développement Agricole* (Regional Office for Agricultural Development, CRDA) in the six Governorates (Béja, Bizerte, Jendouba, Nabeul, Sfax and Siliana) will be responsible for the implementation of subcomponent 2.1. The CRDA will be responsible for the oversight of all construction and construction supervision activities, including the related procurement and financial management, within their areas of jurisdiction (i.e. the region). They will also be involved in the implementation of specific activities under Components 1 and 3 and in the monitoring of all activities in the region (see annex 2 for details).

²⁶ Namely the Integrated Landscape Management Project, ILMP (P151030).

²⁷ World Bank, 2017

²⁸ IPCC projections for the future indicate a very high likelihood of a continued warming trend for Tunisia, where the observed increase in temperature, at around about 0.5 degrees Centigrade per decade, greatly exceeds the global average of about 0.15 degrees since the 1970s. Under a business-as-usual scenario, additional temperature increases of as much as 3 to 7 degrees Centigrade are projected by the end of the 21st Century, with the largest increases (4-7 degrees) occurring during the summer months (June, July, and August). Under the same scenario, projected precipitation declines are on the order of 10-40% annually, including 10-30% in the wet season from October to April and 10 to 40% in the dry part of the year from May through September.



43. **Project management unit.** A Project Management Unit (*Unité de Gestion par Objectif*, UGO) will be set up within DGGREE to strengthen the capacity of DGGREE, DGPA and the CRDA in implementing the project. The UGO will consist of staff appointed from the MARHP and include at the central level a project director who will also be specifically in charge of Component 1, four deputy directors in charge respectively of irrigation (Component 2), agricultural development (Component 3), administration and finance, and monitoring and evaluation, a procurement specialist and an accountant. Short term experts will be mobilized to cater for other aspects of the project, notably safeguards. At regional level, the CRDA will avail their regular staff on part-time basis. In addition, and considering the expected workload, the UGO will have full time staff in the CRDA where the project activities are most substantial: Béja, Bizerte, Jendouba and Siliana. The UGO will be established after the loan agreement is ratified by the Tunisian parliament and its staff appointed thereafter. The establishment of the UGO and appointment of key staff (project director, procurement specialist and four deputy directors), all in a manner satisfactory to the World Bank, will have to be completed no later than four months after project effectiveness to ensure smooth implementation of the project.
44. **Value chain development and matching grant scheme.** The market studies and strategic value chain analyses as well as the coordination of value chain development support under subcomponent 3.2 will be delegated by DGGREE to the Value Chain Development Task Force (TFDCV) supported by the World Bank and hosted by CEPEX, once established (see paragraph 14 and Annex 2). In the meantime, the UGO will manage these activities in coordination with the other World Bank-funded projects. The management of the matching grant scheme under the same subcomponent will be delegated to *Agence de Promotion des Investissement Agricoles* (APIA) in line with its mandate. To this effect, one MoU will be signed: between DGGREE and the CEPEX and another between DGGREE and APIA. The matching grant scheme will be established as a special program within APIA, with targeting and eligibility criteria harmonized with the other World Bank-funded Projects to ensure synergies.²⁹ A subproject selection committee will be established for the purpose of implementing the selection process for this project. APIA will develop a project-specific matching grant manual and work with its regional agencies to implement the matching grant scheme. No disbursement shall occur under the matching grant scheme unless the matching grant manual has been prepared in a manner satisfactory to the World Bank and the subproject selection committee has been established. Finally, a number of contracts with various agencies and organizations will be signed for the implementation of specific activities under Component 3. These contracts are (or will be if not yet known) identified in the project's procurement plan.³⁰
45. **Irrigation schemes operator.** Following the consultations held during project preparation, MARHP intends to establish one single SOE in charge of all I&D schemes rehabilitated under the project and located in the North West (Beja, Bizerte, Jendouba and Siliana regions). The operator will be implementing O&M activities once transferred from the CRDAs and GDAs. It will receive an O&M subsidy as stipulated in a program agreement signed with MARHP. Until such time the operator is established, the CRDA and GDA will continue handling O&M activities.
46. **Program agreement.** An agreement (*contrat-programme*) will be signed between the MARHP and the newly established operator under Component 1. This agreement will stipulate the performance standards (scope and quality of I&D service) required from the operator, the tariff³¹ and expected level of cost

²⁹ This will concretely be implemented through the adoption of similar matching grant manuals across projects.

³⁰ For example, contracts with research organizations for the dissemination of research results; contracts with interprofessional organization for certain value chain development activities; contract with AVFA for public extension services; etc. (see Annex 2).

³¹ Tariffs are legally set up by ministerial decision from MARHP.



recovery, and the amount of subsidy that is expected to be paid during the transitional period, until such time the operator is able to fully cover its costs from the irrigation service fee collection. In addition, considering the level of debt carried by the farmers and in order to put the operator on a solid footing, a debt resorption plan will have to be approved by the MARHP after consulting the GDA before signature of the program agreement with the operator. No disbursement shall occur for payment of O&M subsidies to the newly established operator unless it has been legally established, a debt resorption plan has been approved by MARHP in consultation with the GDAs, and the operator has signed with the MARHP a program agreement satisfactory to the World Bank.

47. **Policy Guidance.** Improving coordination of the irrigated agriculture sector was recognized as a key priority by the Government and a *Comité National de Valorisation des Périmètres Irrigués* (National Irrigation Schemes Intensification Committee) was established by MARHP. The committee is chaired by the Minister and includes representatives from relevant ministerial departments, public agencies and private entities (like value chain organizations). This committee will be used to provide policy guidance to DGGREE with regard to the project. In addition, regional committees (*Commissions Régionales de Valorisation des Périmètres Irrigués*) chaired by the respective Governors have been established in each target Governorate. Finally, the strategic issues related to wastewater reuse will be submitted for discussion and guidance to the *Comité National de Suivi de la Réutilisation des Eaux Usées* (National Wastewater Reuse Monitoring Committee).
48. **Steering Committee.** In addition to these existing committees, a Project Steering Committee (COPIL) will be established to provide an oversight role, review annual work plans and budgets and validate annual project reports prepared by the UGO. The COPIL will be chaired by the Minister at MARHP or his representative and comprise *a minima* of the following directorates and professional organizations: DGGREE, DGFIOF, DGPA, DGEDA and APIA from MARHP, MDICI, Ministry of Finance, DGIAA from the Ministry of Commerce and Industry, one representative from MALE, and one representative from each CRDA. The secretariat of the Steering Committee meetings will be managed by the UGO. The COPIL will need to be established no later than three months after loan effectiveness. In order to ensure necessary coordination with ILMP, the core membership of both projects' steering committees will be shared as long as the two projects are both active.
49. **Project Operational Manual (POM).** The POM was prepared and approved by the Bank. It will be updated during the course of the project as needed and subject to Bank's prior review.

B. Results Monitoring and Evaluation

50. The DGGREE through the UGO will assume overall responsibility of the M&E of the project and include a dedicated M&E specialist who will ensure that data and information are: (i) produced and collected on time; and (ii) of necessary quality, in line with the M&E Manual (that is integral part of the POM). The M&E specialist will thus oversee data collection and cover the collation, analysis and dissemination of reports. The project will use the *Système de Suivi et d'Évaluation de l'Exécution des Projets Publics* developed by the CNI for the recording of financial and physical progress in project implementation. DGGREE will prepare implementation progress reports (IPR) twice a year, as well as quarterly unaudited financial reports (IFR). All project implementation partners will prepare and submit progress reports to DGGREE in accordance with pre-defined formats for reporting in line with the key performance indicators and in accordance with the outputs, activities and inputs under their respective responsibilities.



51. Within the spirit of involving the beneficiaries in performance measurement, there will be periodic surveys to assess the perception of beneficiaries/stakeholders on the services put in place/strengthened with the support of the project. As regards the project's impact evaluations, these will consist of baseline and follow-up assessments (planned at mid-term and prior to project closure) at the level of (panels of) beneficiaries of project interventions at each of the project locations (*Périmètres Publics Irrigués*, PPIs). Project impact will be assessed at the PPI level, covering impact on the production and revenues of producers as a result of improved irrigation/drainage infrastructure, improved local storage and (pre-) processing capacities, as well as linkages with other chain actors. This will also include the assessment of impact on employment as well as gender equality and youth effects generated by the project.

C. Sustainability

52. **Sustainability is at the core of the project design.** By establishing a new, autonomous irrigation management entity and by investing in agricultural and market development in parallel with the rehabilitation, the project brings concrete answers to the viability gap observed in the irrigated agriculture sector. An improved, more reliable irrigation service will allow the farmers to invest in higher value crops. Support provided under Component 3 will help the farmers and agribusinesses alike to make best use of this opportunity through improve production, processing and marketing. This will in turn enhance the farmers' contributive capacity to pay for the irrigation service. A higher rate and more accurate metering of volumes distributed will help improve the system efficiency and save on electricity cost. Farmers will also be accompanied to save water on-farm.
53. **One key element of sustainability is the increase of irrigation service fees.** An increase of 25 percent in real terms (after correction for inflation) was found to be affordable for all types of users in the project financial analysis (see Annex 4). This increase would be progressive over 5 years, and it will start with the application of a new tariff structure and the verification or renewal of all water meters. This will be done in parallel with the rehabilitation works, and after the clients have subscribed to the new I&D service contract with the operator. The new tariff structure was agreed based on the recommendations of the institutional options study. It will include a first term proportional to the maximum flow determined in the I&D service contract,³² and a second term proportional to the volume used. The first term will help the operator manage the maximum flow subscribed on each lateral (distribution pipeline) and on the main (feeder pipeline) and ensure a good level of service. The second term will incentivize farmers to save water. The increased price of the cubic meter can be weathered by the farmers through a more responsible use of the water. Additional increases will be compensated by increased production and value added. For drainage schemes, the related O&M cost will be simply added to the irrigation service bill and shared among all users.
54. **The project will finance O&M subsidies for a transitional period.** According to financial models developed during project preparation, the O&M cost recovery rate is expected to reach 80 percent at the end of the project, thanks to a combination of tariff increase and cost savings. A cost recovery scenario based on the data from the tariff study shows a reduction of cumulative O&M subsidies by 2029 from TND 88 million without project down to TND 15 million with project for the selected schemes. The Government will still need to intervene for the financing of recurrent subsidies during 5 to 6 years after project closing,

³² Maximum flow will be physically enforced by using flow limiters at each hydrant.



on a declining basis, until full cost recovery is achieved. The subsidies would be phased out in 2030 in the with-project situation while they would keep increasing without the project.

55. **Producer organizations.** The project will help producer organizations evolve towards commercially viable entities. Financial viability considerations will be used when assessing the organizations' business plans. The agricultural development plan to be prepared at project inception (during year one) will also incorporate sustainability issues in their design, including long term water availability.
56. **Climate change.** The project will contribute to both adaptation and mitigation objectives of the Tunisian government (see detailed co-benefits description in Annex 4).

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

57. **The overall risk is rated High.** The project is facing high political and governance risk and several substantial risks as described below.
58. **Political and governance risk is high.** Although Tunisia has stabilized politically following the constitutional referendum and the legislative and municipal elections, the post-revolution social context remains fragile. Social tensions have risen since the beginning of 2016 with nationwide protests and other unrests. Progress on the economic and job front is needed to lower social tensions. A benevolent international framework, including financial and political support from the international community, will help mitigate these political risks. The project incorporates significant resources for citizen engagement and communication outreach to mitigate this risk on project locations.
59. **Macroeconomic risk is substantial.** In addition to domestic social tensions, the crisis in Libya, as well as the pressure on the fiscal deficit and the Balance of Payments, pose significant risk to economic developments in Tunisia. These risks will further aggravate the already relatively tight liquidity and asset quality of the banking sector and might have an impact on the agricultural value chains and on the Government's agricultural support policies. The project will help mitigate this risk by increasing the O&M cost recovery for public irrigation schemes and by supporting agricultural competitiveness on local and international markets following a value chain approach.
60. **Sector strategies and policies risk is substantial.** The main risk affecting the project is related to the legal framework supporting the establishment of a new, autonomous irrigation operator in the form of a SOE. This risk will be mitigated through the enactment of a special law enabling the experimentation of this innovative solution in the project areas. The law has been drafted by MARHP and is expected to be approved in 2018. The establishment of the SOE will benefit from the on-going dialogue between the World Bank and the Government of Tunisia about the performance of the SOE. The Project implementation might also be affected by undesirable side effects of government's agricultural policies and lack of resources allocated to important programs such as improving the land registry, extension and training services, access to finance for poor farmers or for transformation of agricultural products. This risk is largely mitigated through the allocation of substantial resources to Component 3 of the project which includes a broad menu of activities in response to the challenges faced by irrigating farmers.



61. **Technical design risk is moderate.** The works include mostly repairs and rehabilitation of pump stations and underground pipe networks, which are commonly used technologies in Tunisia. Extensive design review was conducted during project preparation, through high level experts mobilize with a grant from the Quality in Infrastructure Investment (QII) trust fund from Government of Japan, which will continue to provide support up to project effectiveness.³³ A quality control mechanism involving international consultants will be established under the project to ensure that the construction is done following international standard.
62. **Institutional capacity for implementation and sustainability risk is substantial.** The project relies on several innovative institutional design features that, although well-known in other contexts, are yet to be tested in the Tunisian context. It represents a paradigm shift from the more traditional, engineer-driven approach. Sustainability risk is mitigated through the creation of a new operator with increased accountability towards the clients but there is a risk of delay – notably for the enactment of the above-referred special law. There is also a risk that tariff increases are not implemented. These risks are mitigated through: (i) the completion of the institutional options study and of the tariff study during project preparation; (ii) the mobilization of additional technical assistance under the QII grant,³⁴ and (iii) the technical assistance included under Component 1 of the project, which will be advertised internationally.
63. **Fiduciary risk is rated substantial.** The project will be implemented by the MARHP and based on the Tunisian financial management country system which is found acceptable and provides reasonable assurance on the use of the project's resources for the intended purpose. However, the project design entails the participation of several implementing institutions at the national and regional levels, with mixed fiduciary capacity and experience. Adequate risk mitigation measures have been incorporated in the project design, notably the establishment of an UGO (see Sections VI.C and D).
64. **Environment and social risk is rated substantial.** Although most of the works are simple rehabilitation without any major impact, there are specific risks associated with some of the work program, notably: replacement of asbestos pipes, pollution risk related to the use of treated wastewater for the expansion of El Hajeb (Sfax) scheme, impact of drainage schemes. Agricultural intensification might result in increased use of pesticides. Safety of existing dams supplying the target irrigation schemes has been assessed during project preparation and will require further monitoring during supervision. Rehabilitation and extension of irrigation schemes and drainage schemes will likely invoke temporary acquisition of agricultural land along linear infrastructure to be built or rehabilitated, including pipelines and access roads, and permanent loss of land for new regulation structures. Other environmental and social risks are those usually related to any civil works. Safeguard instruments have been established by MARHP to mitigate these risks (see details under section VI.E to G).
65. **Stakeholders risk is rated substantial.** The new institutional approach, tariff increase and proposed establishment of a new type of contractual relationship between the operator and the farmers, might be rejected by stakeholders – notably at the CRDA, GDA and farmer level. Outreach and communication activities already started under the tariff and institutional option studies – which were both guided by a

³³ One third of this \$300,000 grant will finance international expertise in 2018 for technical reviews of rehabilitation and modernization designs and help prepare technical specifications for the most critical components like water meters and flow limiters, SCADA systems etc.

³⁴ Two third of the same QII grant will be used to finance international and national expertise in 2018 to further elaborate the chosen institutional option and develop a broad communication and outreach strategy targeting the irrigation farmers and other stakeholders.



large steering committee and included numerous meetings at CRDA and GDA levels – and will be continued using funding from the QII grant in 2018 and the technical assistance under Component 1 in the following years. The rehabilitation works and the resulting service improvements will work as an incentive for irrigation users to embrace the reform.

66. **Climate change risk is substantial.** Droughts are clearly a recurrent phenomenon in Tunisia and indeed seem to be becoming more frequent.³⁵ As a result, they are having increasingly serious national and local economic and social impacts.³⁶ The drought observed during the years 2016 and 2017 and the subsequent water shortages have contributed to the tensions in the lagging regions where the project would intervene. In 2017, the water allocation from the dams to the public irrigation schemes was reduced to 20 percent of its nominal (normal year) value in certain areas of the country. The project itself will contribute to drought mitigation through a more efficient and productive use of water. Drought coping mechanisms will be introduced under the new institutional model to improve the Government's drought management capacity.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

67. A financial and economic analysis of the project was conducted and is presented in Annex 4. The project is expected to generate substantial net incremental benefits mainly through: (i) an incremental production resulting from higher cropping intensity (agricultural land will become irrigable again or will be cropped twice a year instead of once); (ii) moderate yield increases on currently irrigated land; (iii) improved cropping patterns towards more lucrative crops; and (iv) improvement of the service level and water supply due to water savings. Furthermore, it is expected that a new institutional model will help improve cost recovery and balance the financial situation of water management entities (currently GDA and CRDA). Improved access to appropriate markets (through productive alliances and value chain support activities) for rural small-scale producers and enterprises would lead to increased income for farmers and entrepreneurs (including young entrepreneurs and women entrepreneurs). Benefits would possibly derive from: (i) improved production of high value products; (ii) enhanced quality of products; (iii) reduced production costs through modernization of production technology; and (iv) incremental employment.
68. Overall, calculations done for Siliana and Jendouba schemes show that expected yield increase as well as intensified production will allow for more produce to be available to sell, increasing revenue for all types of farms. Incremental net benefits will vary depending on the size of the farm and crops cultivated. Calculations done using water price increased by 25 percent show positive net benefits for all types of farms, even without a change in a cropping pattern. Depending on the scenario, the investment would yield a 12 to 18 percent FIRR for Siliana, and a 12 percent FIRR for Jendouba showing robustness to potential water price increase.

³⁵ Since 1990, drought has been officially declared in 1994, 1995, 1997, 2000, 2001, 2002, 2008, 2010, 2013, 2016 and 2017.

³⁶ The most severe drought in 50 years was over three consecutive years from 2000 to 2002 with formal Government interventions costing an estimated \$54 million.



69. The illustrative financial crop and farm models have been used as a basis for the calculation of the overall (economic) benefit stream of the irrigation schemes, after conversion of the financial prices into economic values. The base case Economic Internal Rate of Return (EIRR) is estimated at 19 percent over twenty years for Siliana (assuming a cropping pattern change and an economic cost of water of 0.270 TND/m³) and 11 percent for Jendouba (assuming no cropping pattern change and an economic cost of water of 0.296 TND/m³). The base case Net Present Value of the two schemes' net benefit stream, discounted at 5 percent³⁷, is TND 30.0 million. The analysis has been conducted based on data collected for Laaroussa and Lakhdar irrigation schemes, as estimated to be representative of the type of rehabilitation works as well as the type of benefits expected.

B. Technical

70. **Targeting.** The project will focus its intervention on the large scale public irrigation schemes in the North-West of the country where leverage can be obtained from the public investment. However, additional targeted investments will be done in coastal areas to support specific aspects of the water resources agenda: increased use of non-conventional water (treated wastewater) and soil and water management (drainage).
71. **Institutional model.** The feasibility of various institutional options was analyzed by the institutional options study conducted during project preparation with funding from PPIAF (see paragraph 10). For seven large irrigation schemes located in the North-West and targeted under the project, the proposed option is a public company with participation from the private sector. This requires establishing a SOE first, and opening its capital to private investors once key conditions are met (proper technical and financial records available, reasonable level of cost recovery). A special law would need to be enacted to provide a strong regulatory basis for this company and a program agreement will be established with performance incentives. The MARHP will monitor the SOE performance, and the GDA will be entrusted with user representation role, thus creating the necessary accountability mechanisms which are lacking today. Existing GDAs will be offered the possibility to become the O&M operator when performing well.³⁸ They will eventually be replaced by *Groupements Hydrauliques d'Intérêt Public* (GHIP) under the new *Code des Eaux*. The GHIP will be dedicated to the provision of water service to their members and empowered to enforce collective action when required.
72. **Rehabilitation and improvement works.** All target schemes were developed in the 1980s and 90s using modern standards at the time e.g. pumping regulated with reservoirs, pressurized distribution, on-demand service.³⁹ All schemes are still functioning, but with very unreliable service.⁴⁰ Design studies have been conducted by local engineering consultants under the respective CRDA purview. A design review was conducted during project preparation, with a double focus on: (i) the quality of engineering design (completeness, application of international standards), and (ii) the incorporation of O&M considerations in the designs. The review yielded a number of important recommendations that will be taken into account in finalizing the designs, including: (i) the need to use appropriate methods and parameters to assess the maximum flow during peak period; (ii) adjust design parameters (like friction coefficient) for

³⁷ Source: Technical Note on Discounting Costs and Benefits in Economic Analysis of World Bank Projects

³⁸ This is the case in the Djebba scheme.

³⁹ On demand service is not applicable in El Hajeb scheme (Sfax) because on farm irrigation is done by flooding due to the use of non-conventional water.

⁴⁰ For instance, the number of service interruptions exceed one hundred in a year in Medjez El Bab scheme.



aging infrastructure; (iii) increase storage volumes and create interconnections within the pressurized distribution network to secure the service; and (iv) optimize the design of the pumping stations and pressurized networks in order to yield the lowest net present value of the cumulative investment and O&M costs. The design review was completed with the definition of coherent work packages and an engineering and construction timeframe, also linked to the preparation of the Project Procurement Strategy for Development (PPSD) – see section VI.D. The timeframe takes into account irrigation seasons during which construction activities are constrained. A QII grant was mobilized to provide continued support to MARHP for completion of good quality designs before project effectiveness.

73. **Agricultural development and market access.** Component 3 activities will be carried out in the framework of a comprehensive, holistic and market-driven approach. A first batch of promising value chains identified during project preparation include the fig from Djebba, the pomegranate from Testour and fresh tomato.⁴¹ The other value chains will be selected following the establishment of the agricultural development plans. Value chains which may be supported include fruit trees, vegetables, fodder crops for dairy or meat, dairy products and industrial crops (dried tomato, sugar beet).⁴² About four value chains will be subject to a strategic analysis and would then benefit from funding by the project. Agricultural development plans at irrigation scheme level will be designed in a way that captures synergies and ensures full complementarity with ILMP. Implementation will similarly be carried out with a view of maximizing alignment with the key strategic decisions already made by ILMP.

C. Financial Management

74. A Financial Management Assessment (FMA) was carried out in accordance with the World Bank Policy on Investment Project Financing to evaluate the adequacy of financial management arrangements for the implementation of the project. This assessment reflects the financial management arrangements for the DGGREE of the MARHP, responsible for implementing and carrying out the fiduciary activities of the project. The assessment was complemented by on-site assessments of selected CRDAs (Béja and Nabeul) and APIA.
75. **Risk assessment.** The DGGREE's FM arrangements which will be based on the Tunisian financial management country system are generally acceptable and provide reasonable assurance on the use of the project's resources for the intended purpose. The financial management risk is assessed as Substantial. The project design entails the participation of several implementing institutions at the national and regional levels, with mixed fiduciary capacity and experience. In addition, DGGREE is not yet endowed with the needed fiduciary staff and related fiduciary platform (manual of procedures). Additionally, the six participating CRDAs in charge of implementing about 60 percent of project's budget under Component 2 are still experiencing a number of weaknesses and risks, namely: (i) weak financial management capacity, including FM staff, as they are not familiar with the World Bank's FM and disbursement procedures;

⁴¹ A detailed analysis of the fresh tomato value chain will be conducted under the EDP3 project.

⁴² Although cereal value chains have in general lower value-addition potential and result in less job creation than the value chains cited above, they will also receive some targeted support. This rests on the fact that cereals represent a large share of the current cropping systems, they have a key agronomic role in crop rotations and they are considered as strategic crops by the Government in terms of food security.



(ii) and the long delay in submitting the supporting documents to the central level to initiate the payment process.⁴³

76. **Mitigation measures.** To mitigate the identified risks and weaknesses, the following measures have been identified: (i) the creation of a dedicated Project Implementation Unit (UGO) at the DGGREE within the MARHP, with a fiduciary department that will include a fully dedicated Financial Management Specialist (FMS) at deputy director level, and with additional FM staff located in key CRDA; (ii) the establishment of a detailed POM describing the roles and responsibilities by the central and regional actors and the financial reporting procedures; (iii) each participating CRDA will also be supported by a consulting firm (*Assistance à Maîtrise d'Ouvrage*, AMO) to provide engineering and construction quality oversight and financial management expertise (iv) and the development of simplified reporting templates for the CRDA given the mixed previous experience.
77. **Financial Management arrangements.** The MARHP, through the UGO, will implement the project and will be responsible for the overall fiduciary oversight including financial management. The country financial management systems will be applied such as budgeting, accounting, internal controls, funds flow, financial reporting and external audit. The project's annual activities will be approved with the World Bank and included in the MARHP's annual budget. The project's activities will follow the national budget execution and internal control procedures which include the segregation of duties between the payment authorizer and the public accountant as well as the ex-ante control by the financial controller. This will be complemented by the provisions of the POM which includes detailed procedures at the decentralized level. The project execution at the decentralized level (6 CRDAs) will follow the national financial management procedures. CRDAs will be supported by an AMO in executing the activities but also handling the financial management aspects. The national information management systems respectively ADEB (budgeting) and SIADÉ (treasury) will also be used. Primary financial data to prepare the interim financial report will be generated from these systems and used to elaborate the project's financial reporting statements. The project's funds will be disbursed in a designated account to be opened at the Central Bank which will be part of the treasury single account. The external audit will be carried out by the General Financial Control (*Contrôle Général des Finances*) based on agreed terms of reference. The subcomponent 3.2 matching grant element will be implemented with APIA which has a good track record in this area with the management since its creation in 1983 of the GOT matching grant scheme with no major issue as highlighted in the various external auditor reports. The value chain activities will be implemented by the Task Force for Value Chain Development (TFVDC) which is being set up by the World Bank funded Third Export Development Project (EDP3, P132381).

D. Procurement

78. **Applicable procedures.** Procurement for the project will be carried out in accordance with the provisions stipulated in the Loan Agreement and in World Bank Procurement Regulations for Borrowers (Regulations), dated July 2016 and revised November 2017. The project will be subject to the Bank's Anticorruption Guidelines (*'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants'*), dated October 15, 2006, and revised in January 2011.

⁴³ The review of the audit reports and supervision report of the other World Bank projects (151030 and P086660) revealed mixed capacity at the CRDA in spite of their broad experience in managing donors funded projects. Delay in submitting the financial statements and the supporting documents is a key weakness.



79. **Capacity Assessment.** A procurement capacity assessment was conducted with existing staff of DGGREE, CRDAs of Beja and Nabeul, DGPA and APIA. The assessment is based on the knowledge and procurement experience of these executing agencies (EA) in the implementation of World Bank and non-World Bank projects, taking into account the nature of the expenditures and the likely size of the contracts to be procured. The assessment takes into consideration the performance of the Tunisian public procurement system, and the overall implementation rate of the World Bank's portfolio in Tunisia.
80. **Project Procurement Strategy for Development.** To determine the optimum procurement approach to yield the appropriate response from the market, a Project Procurement Strategy for Development (PPSD) was prepared by DGGREE with the help of the World Bank. Among other things, the strategy takes into consideration the market situation, operational context, previous experience and risks. In addition, the POM defines principal administrative arrangements, information flow, applicable procurement procedures and bidding documents templates. The PPCS also foresees coordination mechanisms that ensure synergies between projects in terms of procurement, as explained in more details under Annex 2.
81. **Procurement plan.** A procurement plan stipulating the procurement method and timing for each package has been prepared, submitted through World Bank Electronic Procurement Tracking System (STEP) and cleared. Advanced procurement has been requested by the Borrower for key consultancy packages including engineering supervision. The related terms of reference have been cleared. Tender documents for work contracts are being revised based on quality review activities and with assistance from a technical assistance financed by a grant from Japan under the Quality in Infrastructure Investment (QII) Trust Fund. Most documents (75 percent of works volume) are expected to be finalized by September 2018. A first batch of documents (for a total amount of about US\$20 million, or 14 percent of loan amount) are expected to be finalized between June and September 2018, and launched at effectiveness. Until such time as the UGO is established, the procurement will be done by the team already in place within DGGREE and the CRDA in charge of design studies supervision.
82. **The procurement risk is rated Substantial.** This risk is mainly related to the lack of resources and capacity before the UGO is established; and the lack of knowledge and experience with the World Bank's new procurement regulations and STEP system. To mitigate risks, in addition to the above, the World Bank's procurement implementation support will include: (i) providing sufficient training to members of the EAs who will be involved in procurement; (ii) reviewing the POM including detailed procurement procedures and standard bidding documents, (iii) providing timely feedback to the EAs; (iv) providing detailed guidance on the World Bank's new procurement framework; (v) monitoring procurement progress against the detailed Procurement Plan; and (vi) ensuring regular supervision missions.

E. Social (including Safeguards)

83. **Social impacts.** The project will directly benefit agricultural producers on selected schemes who will get access to new or improved I&D services and receive assistance for agricultural intensification and market access. It is expected that about 3,500 households benefit directly from the support provided by the project. The beneficiaries include a mix of small and medium scale farmers, and of public and private farming companies such as SMVDAs, SMSAs and other enterprises using public land within the scope of the project's influence. In addition, the project will help farmers, farming and agribusiness enterprises, and farmer organizations to improve their access to market and increase the value of their production. An estimated number of 2,700 employees of these enterprises will benefit from an improved business



environment in terms of job security and job creation. The GDAs to be restructured have a limited number of direct employees (total for the project around 73) who will be granted the opportunity to apply for jobs within the new operator. Compensation will be provided through government programs for any losses endured by staff transferred or dismissed. Labor influx and health and occupational safety will also be part of the implementation and safeguard considerations.

84. **Stakeholder Engagement.** A Grievance Redress Mechanism (GRM) will be provided for the management of all project-related questions, comments or complaints. The GRM covers social and environmental aspects and can deal with problems of acquisition of land, environmental impacts, or other project-related issues (e.g. compensation and evaluation, nuisances, or damage caused by construction). The GRM will cover several stages and involve grievance resolution by local, sub-national and national project entities. It will be in place from the outset of the project and should continue until the completion of the project implementation work and does not deprive the affected or damaged person(s) of recourse to the courts. The GRM, its legitimacy, and the procedures underpinning it and to which the World Bank attaches major importance were discussed during the public consultations. The project will, through participatory selection processes in consultation with beneficiaries, establish mechanisms to target disadvantaged population, youth groups, unemployed graduates, and women in the provision of business support and capacity building measures, and thus reduce inequitable access of women to employment and training in the agricultural sector.
85. **Gender.** The gender analysis conducted during project preparation prioritized the generation of economic opportunities for women through Component 3 activities to close the gender gaps⁴⁴. Women will benefit from dedicated awareness raising and training sessions during the establishment of the agricultural development plans with a view to generate women-led business development proposals and foster their economic empowerment. They will then be supported to apply to the matching grant facility, which will be designed with a strong gender focus. Two specific indicators are included in the results framework to capture progress towards the decrease in the gender gaps.⁴⁵ In particular, they will help monitor how women farmers are better able to access key assets and resources, which has been identified as a gender gap in the analysis.
86. **Resettlement.** Rehabilitation and extension of irrigation schemes and drainage schemes may invoke temporary acquisition of agricultural land along linear infrastructure to be built or rehabilitated, including pipelines and access roads, and permanent acquisition for new regulation structures. Although no such need has been identified so far based on existing designs, land acquisition may occur during project implementation due to possible irrigation system layout changes required to accommodate design improvements or construction constraints, or for the implementation of the subprojects funded under the matching grant scheme. OP/BP 4.12 Involuntary resettlement has been triggered and a Resettlement Policy Framework (RPF) document has been prepared by the borrower to screen and mitigate impacts of land acquisition, and prepare safeguards instruments during project implementation. Labor influx and health and occupational safety will also be part of the implementation and safeguard considerations. The RPF was publicly consulted during a national workshop in November 2017. Clarifications were requested

⁴⁴ The gender analysis identifies the following constraints facing women in agriculture in Tunisia: (i) females (girls; women) tend to engage in non-paid farm work; (ii) females have limited access to land and other resources such as credit; (iii) women face time constraints considering multiple roles (household, raising children, apart from farming); (iv) women farmers use no or simple equipment/tools; and (v) women are faced with limited opportunities for local value addition of the crops produced.

⁴⁵ The targets for those indicators (i.e. 20%) are well above the current percentage of women who are managing farms in Tunisia (estimated at only 6.4% in Tunisia, EU, 2014)



about the procedures of land acquisition and the preparation of Resettlement Action Plans (RAP), and details on the valuation process of ground attachments, which were clarified to the satisfaction of the stakeholders.

F. Environment (including Safeguards)

87. The project is rehabilitating existing infrastructure and adding minor expansion areas and storage or processing facilities. It will therefore have limited and reversible environmental impacts and is classified category B. The project triggers three environmental safeguard policies namely: (i) OP4.01 environmental assessment; (ii) OP4.09 Pest management; and (iii) OP4.11 Physical / cultural resources. Since designs are subject to modification throughout project implementation following the on-demand approach followed by the project, framework instruments are used to mitigate environmental and social impacts. The specific risks are highlighted under paragraph 64 of Section V. In order to mitigate these risks an ESMF and a PMP have been prepared, in addition to the above mentioned RPF. These three documents have been cleared by the World Bank and disclosed in Tunisia and on the World Bank's website on March 15, 2018.
88. Safeguard screening will be conducted before commencement of construction for each irrigation scheme and each infrastructure subproject to be financed under the matching grant facility. This screening will follow the process described in the ESMF and identify the adequate specific safeguard instrument to be elaborated: ESMP or a full ESIA.⁴⁶ The screening will exclude Category A-type sub-projects.
89. The ESMF and PMP have been consulted and discussed with various stakeholders (involving representatives of the main national, regional and local institutions and NGOs) during one national workshop (Bizerte November 15 and 16, 2017). The main recommendations and comments were related to: (i) strengthening scientific research for improving and monitoring the quality of waste water for irrigation purposes; (ii) securing the water supply from dams whose capacity is increasingly affected by siltation; (iii) institutional organization at regional level; and (iv) need of technical assistance for implementation, monitoring and reporting on safeguard aspects at the regional level.

G. Other Safeguard Policies (if applicable)

90. **Safety of dams (OP4.37).** The project will not build or modify any dam, however several schemes depend on existing dams for their water supply, namely Bou Heurtma, Joumine, Sidi Salem and Siliana dams. Due diligence was conducted during project preparation to verify whether safety requirements are met. Dam safety reports submitted by the General Directorate for Dams and Large Hydraulic Works (*Direction Générale des Barrages et des Grands Travaux Hydrauliques*, DGBGTH) relating to the auscultation and annual inspection of the four dams were reviewed and found complete and of good quality. Concerning emergency plans, DGBGTH referred to two existing crisis management tools: a decision charter and a flood management committee. For crisis management - floods, droughts and water scarcity - a national committee chaired by the Secretary of State and bringing together stakeholders and regional committees chaired by the governors meets in times of crisis to make emergency arrangements. There are, however,

⁴⁶ A full ESIA will be required for El Hajeb scheme in Sfax governorate which is supplied by treated wastewater. While technical studies and design are still on-going, the MARHP prepared TOR for a full ESIA to be completed and approved by the World Bank and the ANPE before the work start.



no detailed written instructions. Such instructions are expected to be developed on the basis of ongoing studies and projects, including: (i) a flood management study for Medjerda (JICA funding); (ii) the establishment of an early warning system (KfW funding); and (iii) a flood management component of the Water Sector Support project (EU funding). Additional studies will be incorporated into the terms of reference under preparation for the period 2018-2020 auscultations, which will also include the revision of the Sidi Salem dam management guidelines and the updating of the stability study of the Joumine dam - two key recommendations made in the latest auscultation reports. The implementation of these actions will be monitored by the Bank during project implementation. The review concluded that the policy and instruments related to the safety of dams are in line with the World Bank's policy on dam safety (OP 4.37).

91. **Project on international waterways (OP7.50).** Part of the project is implemented in a transboundary basin: the Medjerda basin shared with Algeria. However, the impact of the project will be negligible, knowing that most of the investment is in rehabilitation. Irrigated areas expansion in the Medjerda basin is limited to the Djebba scheme with about 330 ha added to the scheme. In total it is expected that the project will lower the volumes abstracted from Medjerda river thanks to efficiency gains achieved in rehabilitated schemes. A memo requesting an exception to the notification requirement has been prepared and signed by RVP on January 11, 2018.

H. World Bank Grievance Redress

92. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Tunisia

Tunisia Irrigated Agriculture Intensification Project

Project Development Objectives

The Project Development Objectives (PDO) are to improve the reliability and efficiency of the irrigation and drainage services and strengthen market linkages for irrigated products in selected irrigation schemes.

Project Development Objective Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Reduction in water service disruption		Percentage	0.00	50.00	Annual	Irrigation operator records	Irrigation operator
Description: Percentage reduction of water service disruption with each disruption being measured as the number of days during which irrigation service is interrupted times the affected area for each interruption. Measured interruptions are those related to system breakdown or unscheduled maintenance (for all schemes to be rehabilitated / extended by the project). There are 430 days of interruption in the present situation, however the affected area is not known for each interruption and the baseline for this indicator will be measured starting with 2018 irrigation campaign.							
Name: Irrigation system efficiency		Percentage	65.00	80.00	Annual	Irrigation operator service data	Irrigation operator



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: Volume of water billed to the users divided by volume of water entering the irrigation system, thus measuring the conveyance and distribution efficiency of the public irrigation system. Baseline value is for year 2016.							

Name: Operation and maintenance cost recovery ratio		Percentage	43.00	80.00	Annual	Irrigation operator books	Irrigation operator
Description: Total annual income from irrigation charges divided by total annual cost of operation and maintenance excluding depreciation of infrastructure, weighted average for all schemes (target value will be confirmed at MTR after the operator is established and based on the program agreement). Baseline value is from CRDA and GDA records for year 2016.							

Name: Share of production value marketed through contractual arrangements within value chains		Percentage	15.00	30.00	Annual	Survey of a sample of farmers in project intervention areas	CRDA
Description: Percentage share of the production that is commercialized under prior contract arrangements specifying the quality and price for the product. Baseline value is an estimation for the year 2016.							

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Name: Irrigation tariff increase		Percentage	0.00	25.00	Annual	Irrigation operator billing data	Irrigation operator



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Description: Cumulative tariff increase compared to 2017 baseline for an average user corrected for inflation (baseline value is 0.093 DT per cubic meter on average for all schemes; target value will be confirmed at MTR after the operator is established and based on the program agreement).							
Name: Fee collection rate		Percentage	82.00	95.00	Annual	Irrigation operator books	Irrigation operator
Description: Receipts from irrigation charges divided by amount billed for the same period (fiscal year). Baseline value is for year 2016. Target value will be confirmed at MTR after the operator is established and based on the program agreement.							
Name: Share of users satisfied with irrigation service		Percentage	40.00	70.00	Annual	Survey of a sample of irrigation users	CRDA with irrigation operator
Description: Increase in the share of users declaring they are overall satisfied with the irrigation service they receive (baseline and target value will be adjusted after first survey is completed in 2019).							
Name: Area provided with new/improved irrigation or drainage services	✓	Hectare(Ha)	0.00	25900.00	Annual	Works completion report (following substantial works completion)	CRDA
Area provided with new irrigation or drainage services	✓	Hectare(Ha)	0.00	480.00	Annual	Works completion report (following substantial works completion)	CRDA



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
Area provided with improved irrigation or drainage services	✓	Hectare(Ha)	0.00	25420.00	Annual	Works completion report (following substantial works completion)	CRDA
Description: This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).							
Name: Share of water meters that are operational		Percentage	43.00	90.00	Annual	Irrigation operator data	Irrigation operator
Description: Number of water uncontested bills using water meter data divided by total number of water bills. Baseline value is for year 2016.							
Name: Farmers provided with new or improved irrigation and drainage services		Number	0.00	3500.00	Annual	Operator's and GDA's records	CRDA
Description: Number of farmers who have subscribed a contract for irrigation and/or drainage services on the schemes supported by the project.							
Name: Farmers reached with agricultural assets or services	✓	Number	0.00	1000.00	Annual	This indicator will measure the number of producers who benefit from advisory services and/or receive	APIA, DGPA



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
						financial support from the project for the purchase of assets and/or services through the matching grant mechanism. Data source include: Subproject agreements under matching grant facility; Reports of technical agencies providing farmers training and advisory services; Records of SMSA supported by the project showing active membership	
Farmers reached with agricultural assets or services - Female	✓	Number	0.00	200.00			
Description:							
Name: Farmers who received training to enhance knowledge on market opportunities		Number	0.00	1500.00	Annual	Training reports	CRDA, APIA
Of which women		Percentage	0.00	20.00			
Description: Number of people attending training sessions related to scheme development planning, value chain development, business proposal for matching grant or							



Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source/Methodology	Responsibility for Data Collection
similar.							



Target Values

Project Development Objective Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Reduction in water service disruption	0.00	0.00	0.00	0.00	15.00	30.00	50.00
Irrigation system efficiency	65.00	65.00	65.00	65.00	70.00	75.00	80.00
Operation and maintenance cost recovery ratio	43.00	43.00	45.00	55.00	60.00	70.00	80.00
Share of production value marketed through contractual arrangements within value chains	15.00	15.00	15.00	15.00	20.00	25.00	30.00

Intermediate Results Indicators

Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Irrigation tariff increase	0.00	0.00	5.00	10.00	15.00	20.00	25.00
Fee collection rate	82.00	82.00	82.00	85.00	90.00	93.00	95.00
Share of users satisfied with irrigation service	40.00	40.00	40.00	50.00	60.00	65.00	70.00
Area provided with new/improved irrigation or drainage services	0.00	0.00	0.00	5000.00	10000.00	20000.00	25900.00



Indicator Name	Baseline	YR1	YR2	YR3	YR4	YR5	End Target
Area provided with new irrigation or drainage services	0.00	0.00	0.00	0.00	0.00	330.00	480.00
Area provided with improved irrigation or drainage services	0.00	0.00	0.00	5000.00	10000.00	19700.00	25420.00
Share of water meters that are operational	43.00	40.00	40.00	60.00	70.00	80.00	90.00
Farmers provided with new or improved irrigation and drainage services	0.00	0.00	0.00	500.00	1000.00	2000.00	3500.00
Farmers reached with agricultural assets or services	0.00	0.00	0.00	200.00	500.00	800.00	1000.00
Farmers reached with agricultural assets or services - Female	0.00	0.00	0.00	40.00	80.00	150.00	200.00
Farmers who received training to enhance knowledge on market opportunities	0.00	0.00	200.00	600.00	800.00	1200.00	1500.00
Of which women	0.00		20.00	20.00	20.00	20.00	20.00

ANNEX 1: DETAILED PROJECT DESCRIPTION

COUNTRY : Tunisia Tunisia Irrigated Agriculture Intensification Project

Project objective and location

1. **The Project Development Objectives (PDO)** are to improve the reliability and efficiency of the irrigation and drainage services and strengthen market linkages for irrigated products in selected irrigation schemes. These objectives will be achieved through a combination of institutional modernization, irrigation infrastructure rehabilitation and improvement works, and support to agricultural development and market access.

Target areas

2. **Project location and scope.** The I&D schemes to be rehabilitated have been selected based on their location in four northwestern regions (Governorates) where most of the largest irrigation schemes of the country are located: Beja, Bizerte, Jendouba and Siliana. The six schemes selected for rehabilitation are the oldest ones in these Governorates (built in the 1980s or early 90s) and with urgent need of rehabilitation in order to keep them running. They also benefit from existing rehabilitation studies. Drainage systems will be added to parts of the schemes suffering from hydromorphic conditions. Service roads within the scheme will be rehabilitated where needed. Three more recent schemes will benefit from drainage and road works only, as the irrigation system is still in good condition.
3. Two additional schemes have been selected in Nabeul and Sfax Governorates based on specific needs:
 - a. In Nabeul, a drainage scheme was selected with a view to safeguard the area from rapid soil degradation e.g. salinization and hydromorphic conditions; the scheme is planted with citrus trees and the investments, and related jobs, are at risk of being lost if nothing is done;
 - b. In Sfax, the project includes the rehabilitation and expansion of an irrigation scheme supplied with non-conventional water. El Hajeb scheme was selected based on its location in the area of the country with the most constraints on water resources. The reuse of wastewater appears a promising solution in this specific context. This scheme relies on treated wastewater from Sfax South wastewater treatment plan (WWTP).
4. **Service areas.** In total the project would improve and expand the I&D service for eleven schemes over about 25,900 ha. Irrigation rehabilitation covers 25,420 ha, expansion areas cover 480 ha only. About 166 km of service roads will be rehabilitated. The scope of rehabilitation and new expansion works is shown in table 1.1. Investments under Component 3 might be implemented outside these service areas provided that they will add value to the production generated within these areas.
5. **Design flexibility.** Although irrigation schemes to be supported under the project are known, the innovative approach promoted for the joint institutional and physical improvement of the schemes calls for a demand driven process and requires a great deal of flexibility in the design and implementation of construction works. Hence, details of site-specific interventions are still being fine-tuned and will keep evolving during implementation, as per the process described below. The sites for private investments to be supported under Component 3 are not yet known.

Table 1.1: Scope of rehabilitation and improvement works under Component 2

Governorate	Scheme	Scope of works	Service area / length
Beja	Djebba	New water supply system and re-habilitation for existing areas ¹ Irrigation system expansion	790 ha 331 ha
	Medjez El Bab	Irrigation system rehabilitation New drainage Service roads	3,791 ha 300 ha 7 km
	Testour	Irrigation system rehabilitation Service roads	1,406 ha 7 km
	Gouboullat scheme	New drainage Service roads	1,550 ha 8 km
Bizerte	Mateur	Irrigation system rehabilitation New drainage Service roads	1,930 ha 300 ha 10 km
	Ghézala - Teskaya - Tobias	New drainage Service roads	750 ha 6 km
Jendouba	Boussalem, Badrouna and Bir Lakhedhar (Bou Heurtma scheme)	Irrigation system rehabilitation New drainage Service roads	9,446 ha 2,200 ha 76 km
Nabeul	Grombalia Soliman – Bouzelfa - Beni Khalled	New drainage	700 ha
Siliana	Gaafour – Laaroussa	Irrigation system rehabilitation New drainage Service roads	4,420 ha ² 245 ha ³ 52 km ⁴
	Rmil	New drainage	200 ha
Sfax	El Hajeb ⁵	Irrigation system rehabilitation New expansion	450 ha 150 ha
Total	11 schemes	Irrigation system rehabilitation New expansion New drainage ⁶ Service roads improvements Total new and improved I&D service area	~22,230 ha ~480 ha ~6,240 ha ~166 km ~25,900 ha

Project beneficiaries

6. **Irrigation and drainage users.** The total number of water users who will benefit from an improved service is estimated at 3,500 producers. About 95 percent of them are individual family farmers, the

¹ The irrigation system will complement the supply of spring water for the 184 ha traditional Djebba scheme drawing water from the Medjerda river.

² Out of which 1,728 ha in Gaafour and 2,692 ha in Laaroussa.

³ Out of which 200 ha in Gaafour and 45 ha in Laaroussa.

⁴ Out of which 24 km in Gaafour and 28 km in Laaroussa.

⁵ Scheme using treated wastewater from Sfax South WWTP.

⁶ Out of which 3,200 ha are included within the irrigation system rehabilitation areas.

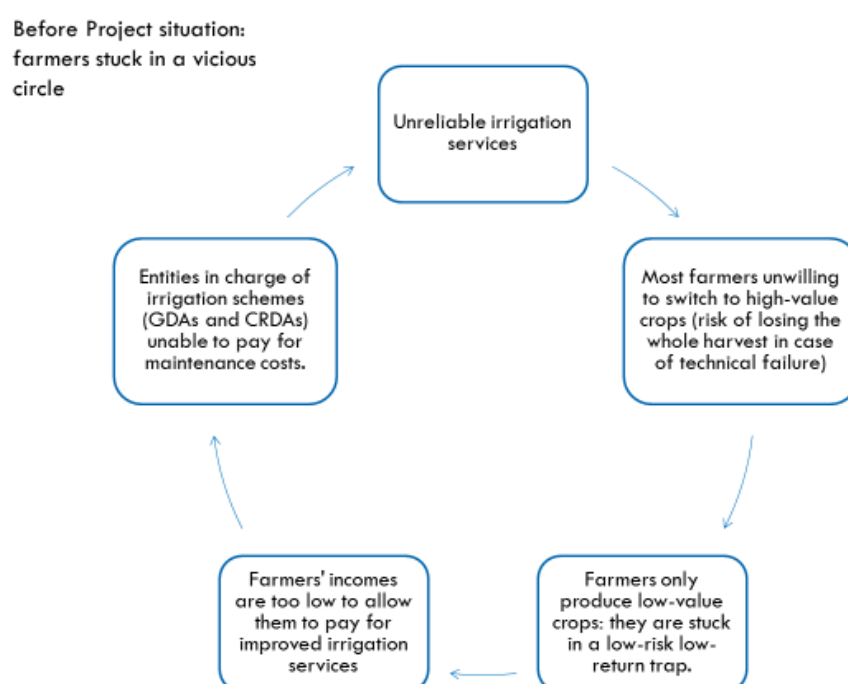
remaining 5 percent include small and medium enterprises as well as a public enterprise (*Office des Terres Domaniales*, OTD).

7. **Producers and value chain investors.** Irrigation users will also benefit from the Component 3 activities as producers. Additional direct beneficiaries include the upstream and downstream enterprises (suppliers, buyers, agro-processors etc.) in the value chains supported by the project. An estimated 1,700 full-time equivalent jobs would be created as a result of the project, in addition to existing jobs that would be secured (another 1,000), bringing the total to 2,700.¹

General Considerations related to the design of the institutional modernization

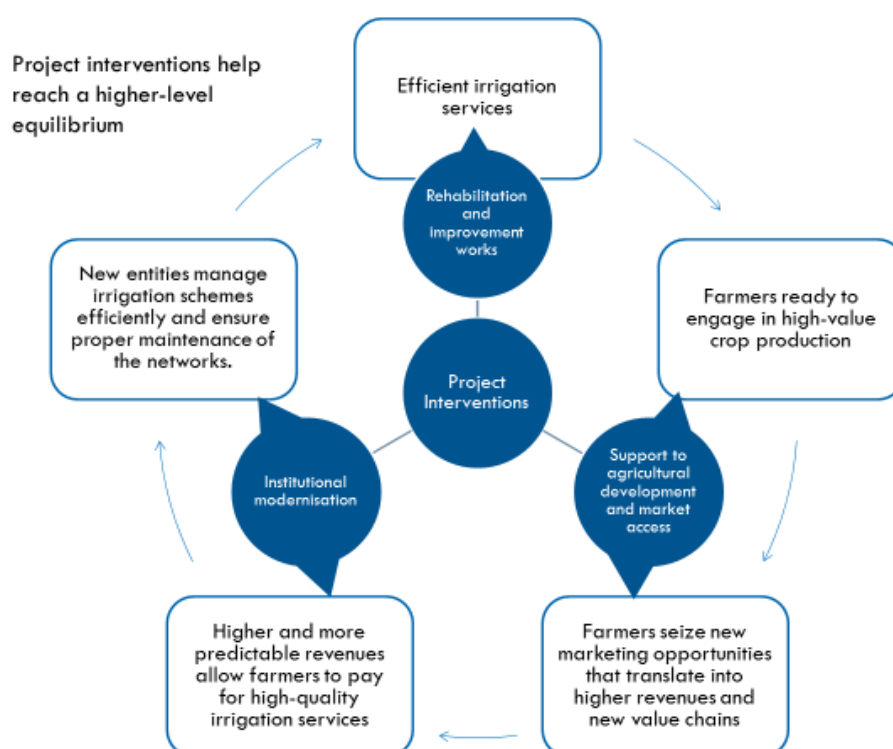
8. **Theory of change.** Some aging irrigation schemes in Tunisia are trapped in a vicious cycle of low quality of service leading to low agricultural output, low O&M cost recovery and lack of maintenance to maintain the quality of service. Breaking this vicious cycle requires interventions at three levels: (i) improving the quality of service through targeted rehabilitation and improvement works and increased accountability of the service provider; (ii) ensure O&M cost recovery through strengthened institutional framework; and (iii) support the farmers in improving agricultural value addition through improved productivity and market access. The theory of change is illustrated by the following two figures.

Figure 1.1: Before Project



¹ Job numbers are based on data from the feasibility studies of Ghezala/Teskraya, Djebba and Gouboullat schemes extrapolated to the whole project area.

Figure 1.2: After Project



9. **Prior analytical work.** The proposed approach to institutional modernization is based on ample pre-existing analytical work and technical assistance, including: (i) a general study on irrigation intensification conducted by FAO, which resulted in the conceptualization of this project; (ii) two technical assistances related to GDA capacity strengthening;¹ and (iii) an irrigation tariff study, funded by KfW. In addition, an institutional options study financed by PPIAF was carried out during project preparation and forms the basis on which the Component 1 was designed. Analytical work related to the impact of climate change on agricultural development was also conducted, and informed the design of Component 3. Finally, the project benefits from the broader policy dialogue on SOE and on value chain development, as described further below.
10. **Current institutional settings for irrigation management.** The current institutional settings are flawed for five main reasons: (i) a one-size-fits-all model involving CRDAs and GDAs is applied across the country, irrespective of the specific characteristics – notably the size and social cohesiveness – of each scheme; (ii) this model does not make the distinction between regulatory (control) and operational functions, which are mixed within the CRDA; (iii) both the CRDA and the GDA are not adapted to manage an irrigation service (see paragraph 11 below); (iv) the interface between the CRDAs and the GDAs is ill-defined (absence of delivery point equipped with flow meter), resulting in a lack of accountability to the final user; and (v) the tariff structure and cost sharing arrangement between the CRDAs and GDAs are not related to the actual costs of operating and maintaining the system. As a result, most GDAs encounter significant managerial problems. Out of the 1,253 GDAs in Tunisia, only 20 percent are considered to be functional with a cost recovery rate above 60 percent and a sustainable level of debt. Most of the GDAs are indebted to the CRDAs and to the electricity supplier. This is especially true in the North-West where the CRDAs have been stepping in to keep the large public irrigation schemes running at the taxpayer's cost.
11. **Need for reform.** In order to ensure accountability to the users there should be only one service provider responsible for the supply of water at the hydrant (farm gate) with the required flow and

¹ One TA funded by AFD and one by KfW.

pressure within one hydraulic system. The specific institutional arrangements should be designed on a case by case basis to be well adapted to the specificities of each irrigation scheme instead of applying a one-size-fits-all model. However, both the CRDA and the GDA are not “fit-for-purpose”. The CRDA is an administrative body (*Établissement Public Administratif*) that does not have the flexibility required to run a commercial service. Due to its reliance on annual public budget and broad mandate spread over the entire agricultural sector, it lacks the incentives to maintain and improve the irrigation infrastructure over time and to develop its customer relationships. The GDA is a private association which is not empowered to enforce the public interest against the private interest of its members.¹ Even with a clarified mandate and proper training and equipment, these entities would not be in a position to guarantee the delivery of the service. Hence there is a strong recognition within the Government that the current model has reached its limits.

12. **Stakeholder consultations.** Consultation activities were implemented during project preparation under the irrigation tariff study and the institutional options study. These consultations involved steering committee meetings including national stakeholders, national workshops and a large number of meetings with local stakeholders in the regions (notably the GDA). The need for reform, including a tariff increase, is widely shared among all irrigation stakeholders.
13. **Guiding principles for institutional modernization.** The institutional options are built on the following core principles:
 - a. Service approach: one operator needs to be fully responsible for the delivery of the irrigation service to the end users;
 - b. Accountability: the service needs to be properly specified as part of a supplier – client relationship whereby the service provider is accountable to the client;
 - c. Financial autonomy: the service provider needs to be financially autonomous for the delivery of the irrigation service – the tariff should cover a large part of the service delivery costs and operational subsidies, if any, need to be predictable and linked to the service provider’s performance i.e. output-based rather than input-based;
 - d. Controlling functions: CRDA role needs to be re-centered on the monitoring and enforcement of public regulations and the CRDA should not be involved in the operation of the schemes. The operator on its side needs to be able to manage the clients’ contracts and suspend the service for clients who are not complying with the terms of their contract;
 - e. Participation (citizen engagement): the users need to be consulted and collectively represented through an appropriate vehicle (which could be an evolution of the current GDA) so that they can voice their concerns during and after implementation of the reform.
14. **Institutional options.** Based on the existing legal framework, various options were considered for the establishment of autonomous, financially viable, client oriented irrigation management entities or operators. These options include: (i) the public authority (*Etablissement public*); (ii) the corporatized public company (State-Owned Enterprise, SOE); (iii) the public-private company (*Société à participation*) with a majority of public capital; (iv) the public-private company with a majority of private capital; and (v) the farmer based association or company (an evolution of the GDA). Options (iii) to (v) can be considered forms of public – private partnership. A SWOT analysis was conducted to assess the strengths and weaknesses of these options and their feasibility within the project timeframe. A public company with participation from the private sector (option iii) though the intermediate step of the establishment of a SOE first (option ii); and the farmer based association or company (option v) have been identified as the most suitable and feasible for the public irrigation schemes targeted by the project. They are further described in the below table. Option (i) would not bring any substantial

¹ As demonstrated by recent court cases.

change to the current situation, and option (iv) is unlikely to be viable at this stage due to the challenges in presenting an attractive deal to the private sector, but it could be considered for other schemes in a next phase based on the results achieved under this project.

15. **Legislative requirements.** For options (i) to (iii), a specific law would be required to secure the transfer of responsibility from the CRDA to the operator in addition to the decree establishing the operator. The law would enable the transfer of functions, assets and staff from the CRDA to the operator and empower the latter to sign new irrigation service agreements and collect irrigation service fees. Alternatively, the operator would have to sign a contract with each CRDA whereby they would delegate their mandate (like they are partially doing now with the GDA) instead of being mandated directly by the MARHP. This alternative is not preferred because of its complexity and lower level of operator's accountability. In addition, the mobilization of public capital has to be included under the annual budget law.¹ The option (v) requires the long pending enactment of the new *Code des Eaux* and of the related decree.² The government is committed to take the necessary legal action in due time,³ and this was confirmed by a letter of commitment to the reforms signed by the Minister of Agriculture on March 21, 2018.

Table 1.2: Suitable Institutional Options

Option	Description
Public Company (State-Owned Enterprise, SOE) (<i>Société publique</i>)	Legal status: corporatized public company established by decree under Law #89-9 of February 1st, 1989, with initial capital endowment to be approved by annual budget law. Special status for staff. Functional autonomy, use of commercial practices. Public assets used to produce the services (e.g. irrigation infrastructure) remain property of the State, company operates with a program agreement signed with the supervising authority.
Public – private company with a majority of public capital (<i>Société publique à participation</i>)	Legal status and rules similar to the public company. In addition, a shareholder agreement is recommended.
Farmer based organization	Legal status: currently <i>Groupeement de Développement Agricole</i> (GDA) and would become a <i>Groupeement Hydraulique d'Intérêt Public</i> (GHIP) under the new <i>Code des Eaux</i> . Broad mandate in current framework, reduced to water service in new <i>Code des Eaux</i> . GHIP established by a vote of the members or at the initiative of the CRDA. At this stage membership is voluntary in current legal framework, and would become mandatory to reflect the “public interest” carried by the GHIP. Adequate enforcement rights would also be required. ⁴ Functional autonomy, community-based governance.

¹ In practice, the company's capital would be mostly provided in kind, by transfer of CRDA assets.

² Despite a stronger legal footing provided in Code des Eaux, the legal basis remains relatively weak if compared with international experience. In particular, the Code des Eaux as it stands does not provide for mandatory membership for all irrigation users (or landowners) within an irrigation scheme. Hence, the long-term viability of option (v) will depend on the final provisions made for GHIP in the Decree. Specific recommendations are made in the institutional options study in this regard.

³ See further below, the legal instrument would be needed by mid-2019.

⁴ Without these stronger enforcement rights, the GHIP will continue relying mostly on peer pressure for the enforcement of collective interests, which means they'll only be viable where there is strong social cohesiveness.

16. **SOE in Tunisia.** The World Bank is involved in a policy dialogue with GOT in relation to the State-Owned Enterprises (SOE) sector (see Box 1.1: Context of State-Owned Enterprises in Tunisia). While many SOE are currently facing some serious challenges in terms of accountability and financial viability, the GOT is committed to take action to improve their performance. The establishment of a new SOE under this project would benefit from this work. A business plan based on a financial model will help ensure that the newly created operators have the resources to fulfill their responsibilities. A progressive tariff increase will be a key feature of the future financial sustainability of the operators.

Box 1.1: Context of State-Owned Enterprises in Tunisia

State-Owned Enterprises (SOEs) have been a core area of reform for Tunisia since the 2011 revolution. In 2014, SOEs as a whole accounted for 9.5 percent of GDP and 15.7 percent of fixed capital at the national level (down from 13 percent respectively 17.5 percent in 2010). Their combined revenues reached TND 24 billion in 2014. Decreasing tax revenues and a growing fiscal deficit have brought the issue of SOE losses and subsidies into the spotlight. Between 2010 and 2014, aggregate revenues of SOEs grew slightly, but profits dramatically declined over the same period from TND 1.2 billion to 0.2 billion. At the same time, SOEs received operating and investment subsidies from the State totaling TND 6.1 billion in 2014 (7.5 percent of GDP). In 2015, external debt of SOEs guaranteed by the State reached 12 percent of GDP. SOE debt to the banking system was about 5 percent of GDP, while the magnitude of the total stock of domestic debt is not known.

The Government has called for profound reform of the SOE sector and put forward an ambitious Reform Strategy and Action Plan but there has been little progress to date. A World Bank-led diagnostic of SOE governance in 2014 pointed to a number of weaknesses.¹ The urgent need for SOE reform and the broad policy direction for reform was articulated by the Prime Minister in a January 2017 public speech. The speech called for differentiated treatment of competitive and non-competitive SOEs and for stakeholder consultation. It also highlighted the broad policy direction for State ownership, noting that the role of the State must be reviewed and that the State will maintain its presence only in strategic sectors.

A World Bank Technical Note from June 2017 identified the following key recommendations, which are consistent with this project's approach:

- a) **Rationalizing the scope and objectives of the SOE sector to focus on corporatized entities that carry out partly or fully commercial activities:** this project will contribute to this objective by transferring the responsibility for delivering irrigation and drainage services from an administrative body to an actual SOE, i.e. a corporate entity running on a fully commercial basis;
- b) **Developing a State ownership policy to recast and separate the State's role as owner from its role as policymaker and regulator and to make the policy directions and the "rules of the game" clear to everyone:** this will be done by clearly separating the mandates of the CRDA and the SOE, and ensuring appropriate accountability mechanism for the SOE through the performance-based program agreement signed with MARHP, thus putting the SOE at arm's length from the policy maker;
- c) **Taking steps toward unifying ownership practices and establishing a centralized SOE ownership entity:** options for SOE ownership will be considered based on applicable Government policies at the time of its creation;
- d) **Strengthening SOE boards of directors:** the composition of the SOE board of directors will be carefully considered to ensure the right skill mix, it will not be made of civil servants only and would include representatives from the regions, agriculture professional bodies, and the public banking sector;
- e) **Piloting reforms in a core group of SOEs:** the project will in effect pilot the SOE reform in the irrigation sector.

¹ La nécessité d'une meilleure gouvernance des entreprises publiques en Tunisie (March 2014). The report is available at <http://documents.worldbank.org/curated/en/403271468108834785/pdf/768750WPOP13380ubliques000Mars02014.pdf>

17. **Cost recovery and financial viability.** The tariff study provides ample material for assessing, on one hand, the current level of cost recovery by CRDA and GDA for the delivery of the irrigation service and, on the other hand, the users' willingness to pay. The short-term objective when the operator is created will be to fully recover the annual O&M cost. Recovering of the depreciation (i.e. the investment cost) would be a medium to long term objective, once productivity gains and higher market value for agricultural products have been realized. The study shows that, although the situation varies quite significantly from one scheme to the next, most schemes should be able to reach 100 percent O&M cost recovery by 2030 with reasonable tariff increases (25 percent on average expected by project closure). The cost recovery will be improved by (i) reducing the variable cost per cubic meter thanks to efficiency improvements; and (ii) increasing the revenue thanks to tariff increase and increased agricultural intensification.
18. **Willingness to pay.** The tariff study provides a thorough evaluation of the contributive capacity of irrigation users. The water productivity in TND per cubic meter ranges from 0.5 to 1.0 depending on the scheme and farm models. Interestingly, the smaller farms tend to have the highest productivity because they have a proportionally higher share of high value crops (like vegetables) in their cropping pattern. This is three to ten times the price of the cubic meter necessary to recover the annual O&M costs (around TND 0.1 to 0.15). There is also evidence that water pumped from boreholes comes at a much higher price than the current tariff. The weak cost recovery is therefore more related to the attitude of the users (willingness to pay) than to their contributive capacity. This problem will be resolved by improving the quality of service and establishing a new tariff structure more responsive to user needs (see below).
19. **Debt resorption.** The tariff study gives an assessment of the debt amount towards GDA and CRDA. Despite two successive debt resorption plans offered by the MARHP in 2012 and 2015, the debt level stays high (two to three years of turnover, although this is highly variable from GDA to GDA). One difficulty is that part of the debt was carried from the CRDA to the GDA back in 2005 and this part is often not recognized by the GDA. Farmers have also been reluctant to the fixed contribution per hectare (applied whether the field is cultivated or not) in the schemes where it has been imposed by the CRDA. Finally, some of the debt belongs to GDA that are totally dysfunctional and cannot be attributed to individual farmers (there was no invoicing at the GDA level). The recoverable part of the debt will be included in debt resorption plans established in consultation with each GDA. The debt will then be allocated to the individual users who have contributed to it and recovered through an appropriate mechanism, for example together with the irrigation service fee.

Component 1: Institutional modernization

20. **Objectives.** The institutional modernization aims at delivering a reliable and efficient irrigation service to the farmers and sustaining the quality of service over time, following the above described guiding principles. To that end, the CRDA will transfer its responsibilities as a service provider to the newly established entity – the operator. The CRDA's role will be that of "project owner" (*maître d'ouvrage*). The CRDA will also monitor the performance of the schemes' operation against agreed indicators as stipulated in the program agreement signed by MARHP with the operator (see below).
21. **Option selection process.** For seven large irrigation schemes located in the North-West and targeted under the project, the Government has decided to establish a public company with participation from the private sector.¹ However, this requires establishing a SOE first, and opening its capital to private investors after a few years, once key conditions are met (proper technical and financial records available, reasonable level of cost recovery). For one irrigation scheme targeted under the project, the

¹ With the exception of the part of Djebba scheme which is an old, traditional scheme, with surface irrigation and managed by a well-functioning GDA with 100% fee recovery. The GDA will have to sign a water supply agreement with the operator in charge of the main conveyance system.

proposed option is the farmer based association or company considering the smaller size with sufficient social cohesiveness. In addition to consultations carried out during project preparation, additional consultations will be organized, initially supported by technical assistance funded by a QII grant, before a transaction adviser consultant is mobilized under Component 1.

22. **Tariff policy and subscription phase.** A binomial tariff structure based on (1) maximum flow requirement and (2) volume used will be implemented with a view to fulfill three complementary objectives: (i) provide incentives for efficient use of water; (ii) reflect cost structure of delivering O&M services; and (iii) adjust the fee amount charged to water users to their actual needs and capacity to pay based on plot size and different crops e.g. supplementary irrigation for winter crops, full irrigation of summer crops, perennial crops. These objectives can be achieved by proposing a range of values for the two components of the tariff and variable contract duration. Importantly, a phase of new subscription will be conducted immediately after the operator is established and farmers will be assisted by the operator to choose the specific terms that will best fit their needs. They will also receive advice to that end from the technical assistance mobilized under Component 3 with a view to link the irrigation service parameters and the farm development objectives. Rehabilitation works on the distribution pipelines will only start after a certain rate of subscription has been achieved by the operator (or the CRDA if the new operator is not yet legally set up). The conditions to subscribe will become more stringent after this first subscription phase to incentivize first movers (early bird rate). Specific focus group discussions with women farmers will be organized when relevant to ensure they have equal access to information and are able to make informed decisions.
23. **Program agreement.** An agreement will be signed between the Ministry in charge (MARHP) and the operator, authorizing the operator to use the irrigation assets and to collect service fees and define its obligations, notably the service standard. This agreement will be akin to an *affermage* contract. It will stipulate the right-of-use of the I&D assets, right to collect the irrigation service fee according to agreed tariff, service specifications and the related performance indicators. It will also indicate the O&M subsidy payments the Government commits to pay during a certain transition period until full cost recovery from water tariff is achieved. The project will finance these subsidies during the first years of the agreement period, provided the agreement is satisfactory to the World Bank (see Annex 2).
24. **Performance monitoring.** The performance of the administration, operation and maintenance functions for the schemes will be measured by Key Performance Indicators (KPI) related to the reliability of the service and the efficiency of water distribution. Some KPI have been defined during preparation and include for example water distribution efficiency and fee collection rate. They will be incorporated in the program agreement linking the MARHP and the operator.
25. **Role of GDA.** Existing water user associations (GDAs) on irrigation schemes transferred to the operator will take a new role as a counterpart representing the interest of the users vis a vis the operator, including through an appropriate citizen engagement mechanism. The GDA will evolve into a GHIP if they remain in charge of O&M. In any case their capacity will be strengthened to fulfill their new role. Since most GDA are currently indebted to the CRDA, and in order to settle this issue before a new operator comes on board, a debt resorption plan will need to be discussed with the GDA and approved by MARHP before launching the subscription campaign. Each user will have to settle its debt in conformity with this debt resorption plan before being entitled to sign an irrigation service contract with the new operator.
26. **Subcomponent 1.1: Establishment of a new irrigation management entity.** The establishment of a new autonomous operator involves a variety of activities and costs. The following table shows the detailed activities for subcomponent 1.1.

Table 1.3 Subcomponent 1.1 activities

Activity Title (indicative Cost) ¹	Description	Readiness
All options		
Consultant services to help set up the transactions, establish the new operator and build the capacity of the supervising authority and of the operator (US\$1.4 million)	Transaction advisory services including assessment and legal due diligence related to asset and staff transfer; detailed financial model and business planning; communication strategy and assistance to farmer engagement process e.g. by setting up customer relationship function; drafting of legal instruments and contractual agreements including new tariff structure and performance standards; capacity enhancement need assessment; on-the-job training for DGGREE and CRDA staffs on contract management; and assessment of private participation in SOE capital.	‘Early’ TA mobilized under QII grant from May to Dec. 2018 TOR for main TA approved, advanced procurement was requested and approved
Compensation for staff transfer or dismissal	Any cost associated with the transfer or dismissal of CRDA and GDA staff, if applicable, cost to be borne by Government budget	Plans to be prepared as stipulated by ESMF
Purchase of operational assets for the operator (US\$2.4 million)	Operating software, office building (refurbishing or new) and equipment will be financed as needed to allow the operator to provide a reliable irrigation service and to handle its customer relationship functions	To be determined by the TA
Performance-based O&M subsidies (US\$5.6 million)	Biannual payment of a performance-based subsidy linked to KPI and progressively phased out as determined in the program agreement.	Payment amounts and modalities will be determined by the TA and included in the program agreement
Training activities for the operator and institutions involved in their oversight (incl. in above envelopes)	Specialized training to strengthen the capacity of the irrigation management operator and the GDAs and the public authorities in charge of their oversight	Training program will be determined by the TA

27. Subcomponent 1.2: Irrigation efficiency improvement. The main focus of this subcomponent is on providing water saving support services to the farmers in order to increase the productivity of water and reduce the irrigation service bills. The following table shows the activities and their degree of readiness for subcomponent 1.2.

Table 1.4: Subcomponent 1.2 activities

Activity Title	Description	Readiness
Consultant services and goods for on-farm irrigation management advisory service and training (US\$0.8 million)	Development of irrigation management support tools including remote sensing, in-field data collection and irrigation advice delivery tools and associated training	TOR to be drafted before effectiveness

¹ All amounts shown in this and the following tables are exclusive of taxes.

Component 2: Rehabilitation and improvement works

28. Design of rehabilitation works. The rehabilitation of the irrigation systems needs to be designed with the objective to ensure the delivery of the required quality of service over time. The following considerations have been raised in the design review conducted during project preparation.

- a. On-demand distribution: except for El Hajeb scheme where on-farm irrigation is done by flooding and for the traditional Djebba scheme where supplemental water will be delivered in bulk and distribution is by open canal system, all schemes to be rehabilitated will provide on-demand irrigation service. This type of service requires that flow limiters be installed at each hydrant, in relation to the farmers' maximum flow requirement defined in his contract with the operator. A statistical approach is then used to determine the resulting flow in the primary and secondary conveyance lines of the distribution system. Minimum pressure requirements also need to be determined and the hydraulic system designed accordingly.¹ In order to control the use of water, flow meters need to be installed on each hydrant and a volumetric charge applied to each individual user. The specifications of the flow limiters and flow meters need to be established by a competent professional since the reliability of these two items is critical to enable the operator to properly manage the irrigation service.
- b. Hydraulic performance of the system: the hydraulic performance of the system – or its capacity to provide the expected service with the required flow and pressure at each hydrant – needs to be determined by way of hydraulic modeling. The model shall be based on a prior assessment of the current performance of the system. Maintenance activities (like internal pipe scrubbing) have to be considered as a first option, before considering replacement.² Additional storage at strategic locations can also help reduce the need for increasing the capacity of the distribution system.
- c. Pumping and storage: one of the main technical issues faced by the operators of the systems is the daily service interruption during electricity supply peak hours. Sufficient storage capacity needs to be provided to avoid pressure loss in the system. The pumping cost can be significantly reduced when sufficient storage is available and using an optimized design of the pump station and rising main. Water hammer protection needs to be properly designed.
- d. Linking different systems: according to the design review, there are interesting opportunities to link different systems together in order to increase their performance. These opportunities have not been considered in the existing studies and were analyzed as part of the design review.³
- e. Automation: SCADA systems are necessary and will be provided for the complex schemes with several pump stations and/or reservoirs. A specific study is needed to establish the detailed specifications of these systems.
- f. Operation and maintenance: appropriate attention shall be given to O&M requirements e.g. ensuring that detailed technical files and instructions be made available to the operator, that safety considerations are incorporated in the design, that maintenance operations are facilitated (including for internal pipe scrubbing) etc.

29. The above design considerations will be incorporated in the design of the schemes' rehabilitation works as part of on-going rehabilitation studies with quality assurance provided under the QII grant.

¹ The pressure at the hydrant is, after the maximum flow, the second main parameter of the on-demand, pressurized irrigation service. Pressure requirement depends on the type of on-farm irrigation and on the topography of the irrigated plot. Friction losses in the hydrant have to be computed. However, exception to the minimal pressure requirement can be allowed for a few plots if their supply at the said pressure would result in a disproportionate increase of the total cost of the system. Such exceptions are then documented in the contract between the user and the operator, and the user might be entitled to a discount.

² Underground pipe lifetime can easily reach 75 years if well maintained.

³ This is notably the case for the following schemes: Testour, Djebba and Laaroussa.

They will also be reflected in the terms of reference for the technical assistance *Assistance à Maîtrise d'Ouvrage* (AMO) and those for the engineering services (*maîtrise d'oeuvre*) under Component 2.

30. **Rehabilitation criteria.** A large part of the works program concerns the renovation of existing structures: pipelines and their associated equipment, mainly the distribution networks in asbestos cement; almost all electrical, hydro-mechanical, electromechanical equipment of pumping stations and hydromechanical equipment of reserves and reservoirs; some components of the civil engineering of pumping stations, reserves and reservoirs; as well as a good part of appurtenant infrastructure (road network, miscellaneous). Three criteria are considered in the context of a diagnostic analysis of the condition of the structures, to determine the content of the renovation program:
- Lifetime: old equipment is characterized by a state of advanced degradation, a risk of failure and a high maintenance cost, announcing the end of the service life. Conventional lifetimes are necessary for the definition of renovation programs.
 - Obsolescence: an out of date product, even if it is in perfect working order, loses part of its use value due to the evolution of technical standards, norms or regulations. Spare parts might become unavailable for equipment that is no longer manufactured. This criterion would apply for the asbestos cement pipelines and justifies their full replacement with HDPE (polyethylene) pipes.
 - Opportunity: the renovation of equipment might be combined with other works (renovation or new works), even if this equipment is neither degraded nor obsolete, but insofar as its replacement will generate an interesting saving on the total cost of ownership.
31. **Subcomponent 2.1: Rehabilitation and improvement works.** This subcomponent includes: (i) engineering services for construction supervision and associated tasks (*maîtrise d'oeuvre*); and (ii) various supply and construction contracts for the rehabilitation and improvement of I&D schemes. The Government will finance the acquisition of land for new structures to be built as the case may be, under the provisions of the Resettlement Policy Framework. The following table gives, for each scheme, the description of the rehabilitation program and the level of readiness in terms of engineering, construction and safeguard requirements.

Table 1.5: Subcomponent 2.1 activities

Activity Title	Description	Readiness
For each CRDA		
Engineering services (<i>maîtrise d'oeuvre</i>) (US\$2.76 m)	(i) complements to available project studies, as required; (ii) scheduling, coordination and site management; (iii) management of the execution of works contracts; (iv) assistance to the contracting authority for provisional and final acceptance of works. One such consultancy contract will be established for each CRDA.	Sample TOR approved and advanced procurement was requested and approved
By scheme		
Djebba (Beja) (US\$5.76 m)	Construction of new pump station, rising main and regulating reservoir (~1,000 m ³) to supply water to the existing Thibar reservoir in off-peak season from Badrouna irrigation scheme facilities (Jendouba). Construction of three new pump stations with rising mains and two new regulating reservoirs (~5,000 m ³ and ~500 m ³) for the supply of existing and expansion areas. New distribution over 331 ha expansion area.	Design study available, to be updated following design review. A new consultant was hired for the update. Tender document expected by September 2018.
Medjez El Bab (Beja) (US\$16.84 m)	Rehabilitation of three pump stations and installation of SCADA system. Construction of two new regulating reservoir (~20,000 m ³ each).	Same

Activity Title	Description	Readiness
	Partial replacement of main conveyance pipeline and hydraulic equipment. Full replacement of asbestos cement distribution pipelines and hydraulic equipment.	
Testour (Beja) (incl. with Medjez El Bab)	Rehabilitation and reinforcement of two pump stations and installation of SCADA system. Construction of one new regulating reservoir (~20,000 m ³) and hydraulic link with neighboring Ain Younès irrigation scheme facilities. Partial replacement of main conveyance pipeline and hydraulic equipment. Partial replacement of asbestos cement distribution pipelines and hydraulic equipment.	Same
Gouboullat (Beja) (US\$3.12 m)	Surface and underground drainage system	Pre-feasibility study available, detailed design and tender document on-going.
Mateur (Bizerte) (US\$9.04 m)	Rehabilitation of existing conveyance pipeline including diversion of one 500 m section through Mateur town. Partial replacement of distribution pipelines and hydraulic equipment. Surface and underground drainage works.	2005 design study available, a new study is on-going. Tender document expected by September 2018.
Ghézala & Teskraya (Bizerte) (US\$3.2 m)	Surface and underground drainage system	Pre-feasibility study available, detailed design and tender document on-going.
Boussalem, Badrouna and Bir Lakhdhar sectors of Bou Heurtma scheme (Jendouba) (US\$22.8 m)	Rehabilitation of four pump stations and two regulating reservoirs, and installation of SCADA system. Desilting of one reservoir (150 000 m ³). Partial replacement of main conveyance pipeline and hydraulic equipment. Full replacement of asbestos cement distribution pipelines and hydraulic equipment. Partial rehabilitation of service roads (43.5 km) New surface and underground drainage system (2 200 ha)	2005 design study available, a new study is on-going. Tender document expected in September 2018.
Grombalia Soliman-Bouzelfa-Beni Khalled (Nabeul) (US\$3.92 m)	Surface and underground drainage system. River training works. Road improvement works.	Design study and tender document available, updates to be done under QII by June 2018.
Gaafour and Laaroussa (Siliana) (US\$11.6 m)	Rehabilitation of two pump stations and installation of SCADA system. Rehabilitation of two reservoirs. Rehabilitation and partial replacement of main conveyance pipelines and hydraulic equipment. Full replacement of asbestos cement distribution pipelines and hydraulic equipment. Rehabilitation of service roads (52 km) New surface and underground drainage system (245 ha)	Design study available, being updated by the same consultant following design review. Tender document expected in June 2018.
Rmil (Siliana) (US\$1.0 m)	Surface and underground drainage system.	Pre-feasibility study available, detailed design and tender document on-going.

Activity Title	Description	Readiness
El Hajeb (Sfax) (US\$6.44 m)	Rehabilitation of pump station. Construction of two new regulating reservoirs (~1,500 m ³ and 5,000 m ³) and rehabilitation of existing reservoir. Full replacement of rising main pipeline and hydraulic equipment. Partial replacement of distribution pipelines and hydraulic equipment. Rehabilitation of service roads. Provision for environmental and social impacts mitigation.	Design study available, being updated by the same consultant following design review. Tender document expected in June 2018.
Provision for contingencies (US\$7.02 m)	Additional works and price and physical contingencies	

32. **Subcomponent 2.2: Common services and goods.** This subcomponent will finance consultant services in support of CRDA's role as "project owner" (*Assistance à Maîtrise d'Ouvrage*, AMO) as well as goods and services that are centrally purchased for economies of scale.

Table 1.6: Subcomponent 2.2 activities

Activity Title	Description	Readiness
Technical assistance to project owner (<i>Assistance à Maîtrise d'Ouvrage</i>) (US\$2.4 m)	TA for (i) reviewing designs and tender documents, following a quality assurance process; (ii) production of technical guides and standard documents for the rehabilitation and improvement of the irrigation structures, taking into account the future needs for operation and maintenance; (iii) establishment of a reference list of unit prices and a database for estimating the cost of the work; (iv) strengthening the capacity of the engineering consultancy firms in charge of construction supervision, with a view to coordinating, standardizing and simplifying their production in all the technical fields implemented, according to the technical guides and standards; (v) engineering supervision for centrally purchased goods; (vi) support to bidding process and contract negotiations for works contracts; (vii) audits to verify the quality of the services provided by the supervising engineers and reinforcement of the capacity of the latter for the resolution of the difficult technical problems, for example production lines hydraulic performance control, main pipelines cleaning, gathering and control of as-built drawings to establish the irrigation scheme O&M technical file. In addition the TA will include the establishment of a GIS to facilitate the monitoring and maintenance of the irrigation networks by the operator.	'Early' TA mobilized under QII grant from Feb. to Dec. 2018 TOR for main TA approved and advanced procurement was requested and approved
Soil and water monitoring (US\$0.16 m)	DGACTA will be supported to implement a soil and water monitoring program.	Specifications to be developed
Purchase of water meters and flow limiters (US\$10 m)	Water meters and flow limiters will be purchased in bulk for quality assurance and harmonization along common standards.	Specifications to be developed by QII TA

Component 3: Support to agricultural development and market access

33. **Objectives.** Increasing significantly the value of agricultural production on the rehabilitated schemes is key for the credibility and success of the proposed project. Component 3 will help improve market linkages and increase value addition in irrigated agriculture. It includes two subcomponents: the first one will focus on strengthening the capacity of producers and producer organizations in getting access to the market, while the second subcomponent will include activities aimed at boosting product marketing and developing competitive value chains. The main value chains considered under this component are fruit trees (like fig and pomegranate), vegetables, fodder crops for dairy or meat, dairy products and industrial crops (like tomato, sugar beet). Specific value chains will be selected within these main ones for project support. Although cereal value chains have in general lower value-addition potential and result in less job creation than the value chains cited above, they will also receive some targeted support. This rests on the fact that cereals represent a large share of the current cropping systems, they have a key agronomic role in crop rotations and they are considered as strategic crops by the GOT in terms of food security.

Box 1.2: An example of a high value crop that critically depends on a reliable irrigation service: the fig of Djebba

Djebba is a small village of roughly 6,000 inhabitants in the Béja Governorate. Fig has been cultivated for centuries and makes up the bulk of farmers' income. A total of 800 farmers organized in two GDAs produce 17 varieties of figs from 25,000 trees. The fig of Djebba received an *Appellation d'Origine Contrôlée* (AOC—"controlled designation of origin") label in 2012. The new label is the recognition of its unique organoleptic characteristics and is accompanied by a set of norms of quality that need to be fulfilled. It also represents an additional opportunity to increase sales and move up the value chain: e.g. women have been trained to process fig products, like jams or dried figs and have developed new marketing channels. But the nascent success of the new AOC is jeopardized by the shortcomings of the irrigation service on which the whole production depends. Ensuring a reliable water service (through the rehabilitation of the irrigation scheme) is critical for the future development of the value chain, which can offer interesting opportunities for job creation.

34. **Market opportunities.** The current contribution of irrigated agriculture to the overall agricultural output is about 37 percent on no more than 8 percent of the agricultural land of Tunisia. Irrigated agriculture provides 20 percent of the country's agricultural exports. In addition, irrigated agriculture represents a major economic development opportunity for lagging regions like the North-West of Tunisia: higher levels of crop and livestock production can provide higher and more stable incomes to farmers and fuel the development of dynamic agro-industries that can in turn stimulate growth and offer job opportunities, especially for women and youth. Regarding marketing of food products, supermarkets have emerged over the last decade in urban areas. This is leading to rapid changes in the marketing of food products, since supermarkets already account for more than 10 percent of food sales nationwide and growing. As in many countries, this evolution drives standards up and benefits the agricultural sector as a whole. However, it is also a factor of increasing duality of agriculture, since only more affluent farmers can mobilize capital and skills to match standards and meet marketing chains' demands.
35. However, Tunisia's irrigated agricultural sub-sector remains well below its potential output resulting in low returns on investment in irrigation and the need for recurrent subsidies for the operation and maintenance (O&M) of the public schemes. Irrigated agriculture has failed so far to realize its full potential because of a number of factors, starting with the lack of reliable water supply, but also because of market access issues, low product valorization, underdeveloped marketing channels, the weakness of research and extension services, the low capacity of producer organizations and the limited access to credit. Some areas equipped with irrigation are not exploited (close to 20 percent); cropping intensity is well below its potential (90 percent versus 130 percent); part of the crops grown in the areas equipped for irrigation are not irrigated (like cereals, especially in the North of the country, and olive trees); and overall, average yields of irrigated crops have a significant margin of increase.

36. To unleash the potential of agriculture and enhance its competitiveness a major reform of agricultural policies would need to be implemented. This would include the following: (i) rationalize and modernize support services for agriculture with increased involvement of farmers and private sector actors along the value chain and improved efficiency in the delivery of public goods; (ii) reduce direct state intervention in the marketing of agricultural products and focus public intervention on the regulatory framework, natural resources management and research and extension; and (iii) shift away gradually from price support and orienting the agricultural policies towards direct income support. While this project is not an appropriate instrument to support such a broad reform, it will aim at filling the gaps within the selected target areas and for specific value chains.
37. Tunisia benefits from a wide range of research, capacity development and extension institutions. The *Institut National des Grandes Cultures* (INGC) has recently developed innovative programs that provided technical advice to small producers through modern communication media (e.g. smartphones) and it has worked towards the diffusion of drought resistant varieties (e.g. the *Maâli* wheat)¹ Tunisian agricultural research is coordinated by the *Institution de la Recherche de l'Enseignement Supérieur Agricole* (IRESA), which has developed collaborations with several *interprofessions*. Research takes place in *Institut National de la Recherche Agronomique de Tunisie* (INRAT) and universities such as the *Institut National Agronomique de Tunis* (INAT). The IRESA supervises several institutes such as the *Institut de l'Olivier*, or the *Institut des Régions Arides* as well as regional extension centres.² The MARHP relies on several agencies for the implementation of its programs, and notably the *Agence de Vulgarisation et de Formation Agricole* (AVFA) for its farmers training and extension services. Finally, several *interprofessions* have been established with Government support to manage (improve) the relationship between the producers and the processing industry.
38. GOT has had a policy of allocating public agricultural land (called “*secteur organisé*” or organized sector) through long term leases within irrigation schemes, to entities such as SMVDA investors, *Lots Technicien*, and *Jeune*. Each undergoes an application process, whereby a plan for the cultivation and use of the land is submitted. Approval preference is given to applicants from the governorate in which the land is located. Lease grantees pay an annual rent for use of the land (waived in initial years for certain groups, e.g. *Lot technicien*). Grantees are to follow a contractual farming plan, however, enforcement of these plans appears to be difficult by lack of appropriate resources in the Ministry of Agriculture.
39. **Subcomponent 3.1: Strengthening the capacity of producers and producer organizations and linking them to the market.** The objective is to improve the management of farms and producer groups through the provision of advisory services, achieve productivity gains and foster upstream and downstream linkages for local value addition. This subcomponent will be implemented with the engagement with farmers as a key guiding principle, building on the PNO4 Project (P119140). This subcomponent has been designed in a way that captures synergies and ensures full complementarity with the Integrated Landscape Management Project (ILMP, P151030). Implementation will similarly be carried out with a view of maximizing alignment with the key strategic decisions already made by ILMP. Activities will include support to producer organizations to promote aggregation models like productive alliances and to facilitate private investment in value addition through better conservation, packaging and primary processing of agricultural products. The subcomponent will monitor soil fertility and include the implementation of a Pest Management Plan. The technical assistance provided under this subcomponent will incorporate specific support for women and youth groups in an inclusive approach e.g. using focus group discussions and specific training sessions to raise their

¹ The rate of penetration of communication technology is particularly high in Tunisia compared to other countries at the same level of GDP per capita. The International Communication Union quotes 128 mobile phones subscription for 100 people.

² See a complete list of institutions in IRESA (2014).

awareness of economic opportunities and link them with available support services. This will be done by involving local expertise in the team facilitating the preparation of these plans, for example mobilized through the *Centre de Recherche d'Etudes, de Documentation et d'Information sur la Femme* (CREDIF) in Tunis and done in cooperation with regional sub-committees of the *Commission Nationale pour la Femme Rurale* in the regions targeted by the project. The POM further defines and specifies the gender specific actions to be envisaged under this component in terms of training, awareness raising and advisory services.

Table 1.7: Subcomponent 3.1 activities

Activity Title	Description	Readiness
Preparation of a comprehensive and participatory agricultural development plan for each PPI, and assistance to its implementation (US\$3.0 m)	Consultant services will be hired to establish an Irrigation Scheme Agricultural Development Plan (<i>Plan de Valorisation Agricole de Périmètre Irrigué</i> [PVAPI]) and to support its implementation. The 5-year PVAPI will be based on extensive agro-socio-economic analysis of the current management of each irrigation scheme: farmer categories, crops, production systems, market linkages, input purchases, marketing channels, etc. It will complement the Integrated Landscape Development Plans (ILDPs) developed under ILMP. ¹ PVAPI will be used to advise the farmers for the subscription to the water service from the newly established irrigation management entities. The plan will include solutions to strengthen the aggregation of production, supply of inputs and services to farmers and production and management of public infrastructure for post-harvest treatments. The consultant team will support public services (CRDA, AVFA) and private advisory support devices during implementation of the plan and ensure inclusiveness through continued awareness raising activities. Women focus groups will be organized to ensure their participation and that the agricultural development plans include provisions to tackle gender gaps.	TORs approved and advanced procurement was requested and approved
Capacity-building of producers and producer organizations (US\$2.8 m)	Direct support in the form of coaching, training and small equipment will be provided to producer organizations based on PVAPI recommendations to strengthen their capacities for the supply of inputs and services to farmers, and to promote the emergence and consolidation of aggregation models like productive alliances, building on the same operational guidelines developed under ILMP and tapping synergies in developing training tools. The design of these interventions will incorporate a strong gender dimension.	TORs and recruitment of consultants during year 1 of project implementation with support from TA.

¹ While PVAPI will focus only on large-scale public irrigation schemes, ILDPs will have a landscape focus and their irrigation-related interventions will be targeted exclusively at small- and medium-scale irrigation (*Petite et Moyenne Hydraulique*), thus avoiding overlaps.

Activity Title	Description	Readiness
Research and development, technological innovation, training and extension. (US\$3.2 m)	Support will be provided based on PVAPI recommendations for the dissemination of research and development and extension results through specialized institutions (INRA, ISERA, INAT, INGC, etc.) and technical centers, in particular for varietal improvements and the diffusion of certified seedlings and seeds, monitoring water management, including groundwater, and soil fertility, improving techno-economic benchmarks, applying the pest management plan ¹ , as well as improving post-harvest treatment techniques.	Selection of relevant proposals to be made during year 2 of project implementation based on PVAPI and value chain analysis.
Technical and economic analysis for the "organized sector" (US\$0.28 m)	Specialized consultancy services will be contracted to carry out, in liaison with the Bureau of Restructuring of State Agricultural Lands (BRTDA) of MARHP an individualized and in-depth analysis of the concession holdings of the SMVDA and OTD's "agro-combinats", as well as an analysis of a sample of farms allocated to technicians and young farmers, and to make recommendations to strengthen their viability, add value, create jobs and contribute to aggregation models with other producers.	TORs approved and advanced procurement was requested and approved

40. **Subcomponent 3.2: Boosting product marketing and developing competitive value chains** This subcomponent will provide support in the form of commercial prospecting, promotion of product quality (certification, labeling, geographical indications). It will also support the financing of private investment in the modernization of supply chains and post-harvest infrastructure. This subcomponent has been designed in full alignment with other World Bank Projects, namely EDP3 (P132381), ILMP (P151030) and YEIP (P158138) through the collaboration within the TFDCV for value chain development and the use of harmonized targeting and eligibility criteria in the matching grant scheme. The implementation of this subcomponent will focus on maximizing farmers' engagement.

Table 1.8: Subcomponent 3.2 activities

Activity Title	Description	Readiness
Task Force for Value Chain Development (TFDCV) (US\$1.32 m)	This includes Consultant services and a contribution to the operational costs of the TFDCV (or the entities that are members of the Task Force should the Task Force not be operational), with a view to produce market studies and strategic analyses of value chains and to support potential investors for the preparation of their business plan and the mobilization of finance through e.g. matching grant scheme. The value chains will be selected following the development of the PVAPI for each PPI. Four value chains would be strategically analyzed under the project, and would then benefit from support under the matching grant scheme. The TFDCV will be working for three other World Bank-funded projects and ensure appropriate coordination.	MoU with TFDCV drafted. Procurement of technical assistance to TFDCV was started under PDE3.
Support to value chains, research of market opportunities and improvement of the quality of products. (US\$2.0 m)	Consulting services, other types of services, equipment and operational costs are included in the project to implement actions aimed at finding market opportunities for the production in the PPI in a perspective of developing integrated and efficient value chain. This may include specific market studies, study tours, participation in fairs or promotional events, and information / training of producers and	Specifications and selection criteria to be defined by VC analysis. A first batch of VC analyses are available and activities will start in first year of project implementation: the fig

¹ Implementation of the recommendations of the Pest Management Plan (PMP), adopted by the GOT.

Activity Title	Description	Readiness
	their organizations on opportunities to add value to their products. These activities will also include the improvement of product quality (certification, labeling, geographical indications, communication and advertising campaigns).	from Djebba, the pomegranate from Testour. A fresh tomato analysis is scheduled to be financed by the EDP3 project in 2018.
Matching Grant Scheme (US\$16.0 m including US\$ 8.0 m project financing)	The project includes the implementation of a matching-grant scheme that will support the financing of private and cooperative investment in the selected value chains. Specific targeting and eligibility criteria will be used to prioritize support along the value chain approach. This will enable new categories of farmers to be reached and the promotion of investment in certain areas and specific sectors targeted by the project (storage and packaging of products, upstream-downstream partnerships in an effort of vertical integration, etc.). The design of the matching grant scheme will incorporate a strong gender dimension, i.e. by ensuring that the incentive structure helps fill gender gaps.	

Component 4: Project Management

41. This component will support the functioning of the Project Implementing Unit (UGO) and associated activities.

Table 1.9: Component 4 activities

Activity Title	Description	Readiness
Assignment of UGO staff (in-kind Government contribution)	See list of UGO staff in Annex 2	TOR for key staff approved and selection process to be launched immediately after loan agreement ratification
UGO training (US\$0.55 m)	Various training activities on project management, procurement and financial management as well as implementation of the training program included in the ESMF, PMP and RPF.	Training on procurement will be provided before project effectiveness
UGO operations (US\$1.52 m)	Procurement of vehicles and office equipment, operating costs	
Short term experts in support of UGO staff (US\$0.08 m)	Experts to assist on outreach and participation, procurement, financial management, monitoring and evaluation and environmental and social safeguards as need be	
Impact evaluation studies (US\$0.64 m)	Impact evaluation studies at mid-term and at project closing	
Wastewater reuse master plan study	The master plan study will assess all investment opportunities based on wastewater reuse in Tunisia. It will propose an institutional framework for the implementation of these investments and establish feasibility studies for a few pilot schemes	WPP grant was used to finance inventory and diagnostic study, study tours and exchange visits, and national conference on which basis terms of reference have been established

42. The Wastewater reuse master plan study has been identified by the Government as a strategic undertaking that will help accompany the transformation of the irrigation sector initiated under the project (with the pilot El Hajeb scheme).¹ The Government will seek grant financing from its partners to finance this activity.

Project budget by category of expenditures

43. The budget by category of expenditure is provided in the following table.

Table 1.10: project budget by category of expenditure (USD million)

CATEGORY	TOTAL	IBRD	GOT	BENEFICIARIES
Goods	20.94	17.60	3.34	-
Works	101.56	86.46	15.09	-
Consultant Services	25.45	21.39	4.06	-
Operating costs	0.60	0.60	-	-
Matching Grants	16.00	8.00	-	8.00
O&M Subsidy	5.60	5.60	-	-
TOTAL	170.15	139.65	22.50	8.00

Project implementation timeline

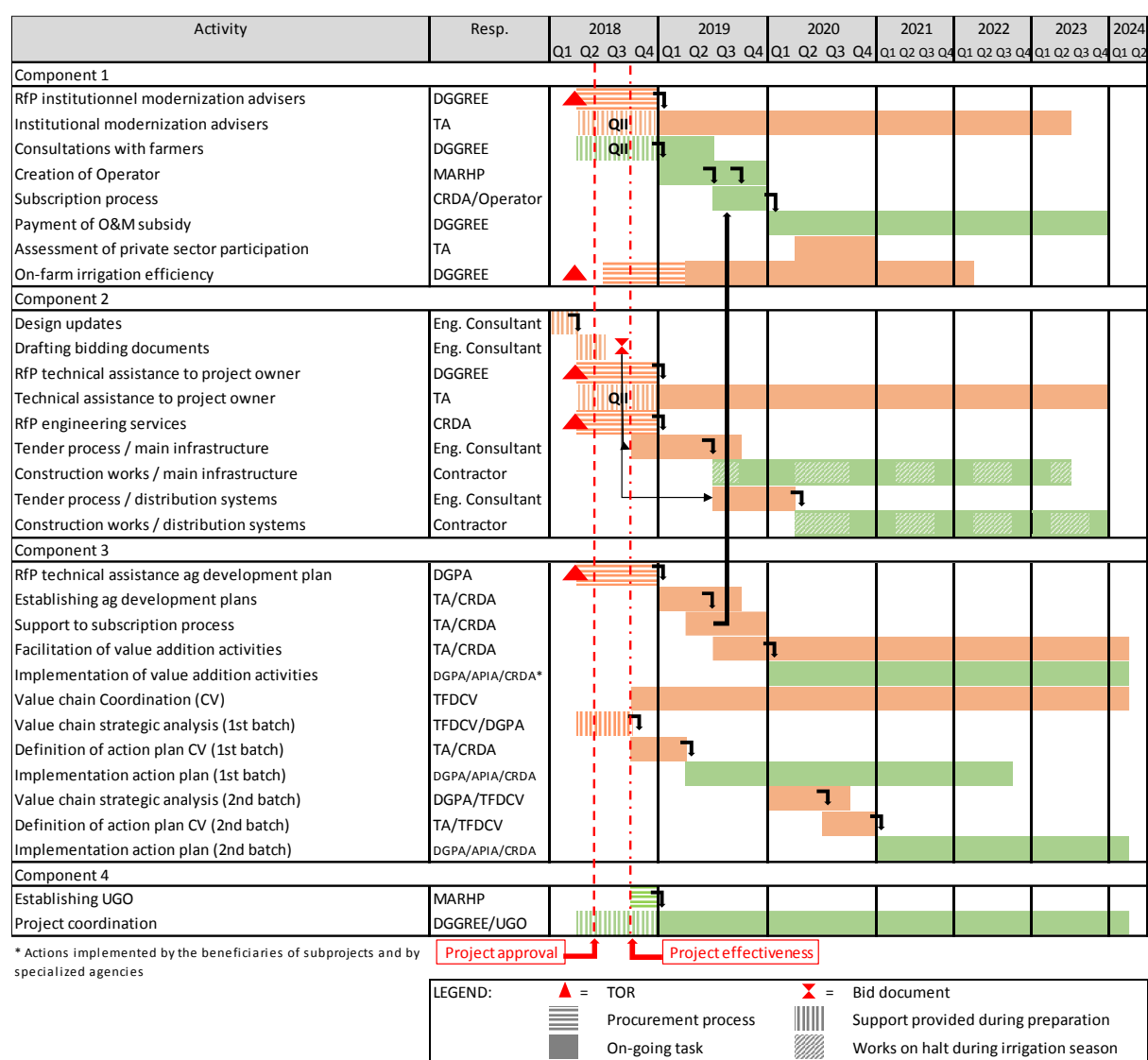
44. In order for the project approach to succeed it is critical that all activities within the three main components are implemented in parallel and in a coordinated manner. An indicative timeline for the implementation of the project has been prepared taking into account the degree of readiness (as shown in above tables) and the implementation principles outlined in Annex 2. It involves the early award of certain consultancy contracts, in particular the TA for the implementation of institutional modernization (Component 1); the TA for *assistance à maîtrise d'ouvrage* (Component 2); the engineering services by CRDA (Component 2); and the TA for the agricultural development plans by PPI (Component 3). A request to this effect was sent by the MDICI on January 8, 2018 and it was approved by the World Bank on February 1, 2018. The respective terms of reference have been approved. In addition, a QII grant was obtained from the Government of Japan to finance technical assistance during the interim period between project loan negotiations and effectiveness. This TA will provide quality review services for work packages and help prepare the outreach campaign in support of the institutional reform program under Component 1.
45. Construction of conveyance (primary) infrastructure would start before the operator is established since the design is based on an estimate of the continuous flow requirement and does not depend on the actual demand at one given time. The construction works for the distribution (secondary and tertiary) reticulation networks will only start after the completion of the initial subscription campaign. The design will be adjusted in line with the actual demand (subscribed flow for each distribution line). The establishment of the new operator is expected to happen in 2019 on time for the operator to run the subscription campaign. In case it is delayed, the TA recruited under Component 1 would step

¹ Although Tunisia has been a precursor in the development and use of non-conventional waters e.g. treated wastewater, this development has been halted due to the operational challenges faced and weak results achieved on the first schemes. The Government now wants to build momentum and define a new approach in order to make best use of these resources. A grant from the Water Partnership Program (WPP) was mobilized to help the key stakeholders work together to draw lessons from the current situation and draft the terms of reference for the master plan.

in and work with the CRDA in advancing the subscription campaign, so that there is no delay in the construction program.

46. The new tariff structure will be applied as soon as the irrigation service agreement has been approved by both parties. The operator will install the new flow limiter and meter at the same time. Service improvements will materialize relatively quickly thanks to the parallel rehabilitation and improvement of the conveyance infrastructure. Reliability will be further increased once the distribution network is rehabilitated. The tariff increases would therefore be phased to be completed once full reliability is achieved.
47. Component 3 will run in parallel, starting with the diagnostic and establishment of the agricultural development plans. These plans will contribute to help the farmers have a better understanding of the business opportunities linked to the schemes' physical improvement and to select the contract (and related tariff) most suited to their business objectives. In terms of value chain development, the project will start with low hanging fruits (first batch of VC) including the fig tree in Djebba (complementing the on-going project supported by Swiss Cooperation (SECO)), the pomegranate in Testour (for which terms of reference have been developed during project preparation), and the fresh tomato (for which support will be provided by the TFDCV as a pilot value chain). A second batch will be launched with VC analysis planned in 2020 by the TFDCV.
48. The following figure shows the project's overall timeframe and relationship between the components.

Figure 1.3: Project implementation schedule



ANNEX 2: IMPLEMENTATION ARRANGEMENTS

COUNTRY : Tunisia Tunisia Irrigated Agriculture Intensification Project

Project Institutional and Implementation Arrangements

1. **Overall Implementation Arrangements.** The project implementing agency is the Ministry of Agriculture, Water Resources, and Fisheries (MARHP). The MARHP will ensure fiduciary management and procurement for all project activities. Project management and coordination will be carried out at national level through the MARHP General Directorate for Rural Engineering and Water Management (DGGREE), which will host a project Implementation Unit (UGO). Technical responsibilities will be allocated to the line directorates at national level. The CRDAs will implement the construction works at the regional level. The CRDA capacity will be strengthened with the adjunction of UGO staff. A Project Steering Committee (COPIL) will be established to provide an oversight role, review annual work plans and budgets and validate annual project reports prepared by the UGO. Existing committees at national and regional levels will be in charge of providing policy guidance related to the project. The roles and responsibilities of the key implementing institutions are detailed below.

At the National Level

2. **Steering Committee.** The Project Steering Committee (COPIL) chaired by the Minister of MARHP, will be made up of different stakeholders: DGGREE, DGFIOP, DGPA and DGEDA from the MARHP, MDICI, Ministry of Finance, DGIAA from the Ministry of Commerce and Industry, one representative from the MALE, as well as one representative from each CRDA. The COPIL is the body supervising and validating project activities. It will provide validation of the updated versions of the Project Operational Manual (POM), annual work plans and budgets, and progress reports. It will meet at least twice a year and whenever deemed necessary by the chair. This Committee will be established by ministerial decision after ratification of the loan agreement by the parliament, and no later than three months after project effectiveness.
3. **Policy Guidance.** Two existing committees will be involved at national level:
 - a. The *Comité National de Valorisation des Périmètres Irrigués* (National Irrigation Schemes Intensification Committee) under MARHP will provide overall guidance on the institutional modernization options and related arrangements and ensure the consistency of the project with sectoral policies and Government programs. The committee will be chaired by the Minister and include representatives from relevant ministerial departments, public agencies and private entities (like value chain organizations).
 - b. The *Comité National de Suivi de la Réutilisation des Eaux Usées* (Wastewater Reuse National Monitoring Committee) will provide policy guidance and review the output of the wastewater reuse master plan study and discuss issues that may arise with regard to the El Hajeb scheme rehabilitation in Sfax (supplied with treated wastewater).
4. **Project Management Unit (*Unité de Gestion par Objectif*, UGO).** The UGO will be hosted by DGGREE and include staff positioned in the CRDA. UGO staff will support the DGGREE and CRDA for overall project management and coordination of all project activities.
5. More specifically, the UGO will be responsible for the following:
 - a. prepare consolidated annual work program and budgets;
 - b. manage the monitoring and evaluation system at the national level, including safeguards;

- c. coordinate and consolidate periodic progress reports for the project activities;
 - d. carry out procurement procedures as needed at the national and regional levels in relationship with responsible technical agencies;
 - e. manage the project's special account;
 - f. maintain a financial management system that is acceptable to the World Bank and in compliance with World Bank procedures for awarding contracts, disbursements, and financial monitoring;
 - g. consolidate data supplied by the directorates and CRDAs involved, and produce annual audited consolidated financial statements and semiannual interim unaudited financial statements in compliance with the financial management manual of the project;
 - h. preparing consolidated financial management and accounting statements in compliance with public accounting principles; and
 - i. preparing semiannual consolidated reports related to physical data on project implementation progress and financial data on disbursements (by component and by category) as well as on commitments for all the funds allocated to the project (World Bank and national budget).
6. Financial reports and statements will be sent to the World Bank through the Ministry of Development, Investment and International Cooperation (MDICI) with copy to the National Steering Committee (COPIL) within 45 days of the end of each calendar semester.
 7. The UGO will be indicatively composed of 21 qualified staff, seconded by the Government and selected on the basis of TORs agreed with the World Bank. The UGO will supplement its capacity with qualified consultants hired by the project as needed.

Table 2.1: UGO staff

Position	Responsibility	Number
Project Director	- Overall management and coordination of the project - UGO management - COPIL Secretariat	1
Deputy Director Irrigation	Management, coordination and quality control for Components 1 and 2	1
Deputy Director Agriculture	Management, coordination and quality control for Component 3	1
Deputy Director responsible for Administration and Finance	Responsible for fiduciary and administrative management of the project and production of consolidated financial statements	1
Deputy Director responsible for Monitoring and Evaluation	- Management of M&E system - Quality control of M&E data - Monitoring of environmental and social safeguards	1
Procurement Specialist	- Responsible for procurement at national level - Support to CRDA for procurement at regional level	1
Financial Management Specialist (accountant)	- Responsible for financial management at national level - Support to CRDA for financial management at regional level	1
Deputy Director in the CRDA	- Project coordination at regional level - Responsible for the implementation of environmental and social safeguards at regional level	4 (Béja, Bizerte, Jendouba and Siliana)

Position	Responsibility	Number
Irrigation engineer in the CRDA	Implementation of Component 2 activities within the region	4 (Béja, Jendouba, Sfax and Siliana)
Agricultural engineer in the CRDA	Implementation of Component 3 activities within the region	2 (Béja, Jendouba)
Livestock specialist in the CRDA	Implementation of Component 3 activities within the region	1 (Jendouba)
Financial Management Specialist (accountant) in the CRDA	Responsible for financial management at regional level	3 (Béja, Jendouba and Siliana)
Total number of staff	(national + regional)	7 + 14 = 21

8. The establishment of the UGO and the appointment of the following key staff will have to be done at the latest by four months after project effectiveness: Project Director, Deputy Director Irrigation, Deputy Director Agriculture, Deputy Director responsible for Administration and Finance, Deputy Director responsible for Monitoring and Evaluation, and Procurement Specialist. Until such time the UGO is formally established, the DGGREE will keep direct responsibility for all UGO mandates.
9. **Technical implementing entities at national level.** Several directorates and agencies will be involved in the implementation and/or supervision of project activities at national level, each with specific responsibilities. DGGREE and DGPA will be the two main directorates involved in project implementation. The DGGREE will reflect the involvement of the various executing agencies (EA) in the project annual work plan and will ensure the necessary coordination, under the oversight of the COPIL. The list of EA is provided below under the subsection "Implementation by component".

At the Regional Level

10. **Agricultural Development Regional Directorate (CRDAs).** The CRDAs of the MARHP are the key implementing institutions for the project activities at the regional (aka governorate) level. The CRDAs of the six targeted governorates will establish in their Hydraulic and Rural Equipment Department (DHER), a regional implementation and monitoring team (*Cellule Régionale d'Exécution et de Suivi*, CRES). CRES will closely coordinate their efforts with the DVPA, responsible for agricultural production at the level of CRDAs. The Head of CRDAs (*Commissaire*) will hold periodic meetings with the participation of the DHER, DVPA and CRES to: (i) review annual work plans and budgets, including results and progress reports; (ii) evaluate progress achieved with respect to expected outcomes and specific objectives; and (iii) facilitate execution by coordinating activities and mobilizing appropriate specialists and partners.
11. **Cellule Régionale d'Exécution et de Suivi (CRES).** CRES are the implementing unit at regional level and as such responsible for preparing and submitting regional annual work programs and budgets, implementing work programs and monitoring budgets, monitoring and evaluating project activities, and ensuring proper compilation of supporting documentation for further payments to service providers and entrepreneurs in the regions. The CRDA *Commissaire* will designate a coordinator for CRES who will be the UGO Deputy Director in the region, when there is one. He/she will report to both the Project Director and the DHER Director. He/she be responsible for periodically sending to the Project Director all project documentation and implementation progress reports including financial data following accepted information transmission procedures. CRES will be made up of qualified staff seconded on a part-time basis by the CRDA and of full time UGO staff as listed in Table 2.1. They will receive support from the project in the form of training, technical assistance, regular supervision mission, guidelines and the like. The project may hire, when necessary and on top of the technical assistance experts from the three main components, consultants in outreach and participation, procurement, financial management, monitoring and evaluation and environmental and social safeguards to support CRES staff.

12. Like for PISEAU 2, the CRES will include an environmental cell composed of one or two staff responsible for (i) coordinating all aspects of safeguard implementation in the region; (ii) collecting and keeping all safeguard-related documents; and (iii) monitoring the implementation of the action plans stipulated in these documents, in liaison with the supervising engineers hired by the project (*maîtres d'oeuvre des travaux*), and related reporting.
13. **Local policy guidance.** The *Commissions Régionales de Valorisation des Périmètres Irrigués*, which are regional committees chaired by the Governor, will review the scheme development plans produced under Component 3 and support the institutional modernization process at the local level.

At irrigation scheme level

14. **Irrigation Management Entity (Operator).** Once established, the operator will become responsible for all O&M activities on the target PPI. It will sign a program agreement with the responsible authority (MARHP) by which it will be entitled to use the irrigation facilities and collect irrigation service fees (covering the cost of operating the drainage system as well where relevant). It will receive assets transferred from the CRDA including offices, workshops and equipment as necessary. It is also expected that some technical and administrative staff from the CRDA and most of the GDA staff will be transferred to the newly established operator.
15. **Program agreement.** The program agreement between the MARHP and the operator will determine the assets subject to right-of-use transfer, service parameters, related performance indicators, and financial support to be expected from the Government. Project funds are earmarked to cover these subsidy payments during the first years. The operator will prepare an administrative and financial management manual that will need to be satisfactory to the World Bank. The operator will also be submitted to the usual reporting and auditing obligations. These various obligations will be stipulated in their program agreement which will have to be cleared with the World Bank before any disbursement can be made against these agreements.

Implementation by component and activity

16. The following table summarizes the responsibilities by component and activity.

Table 2.2: Executing Agencies

Component and activity	Type	Admin responsible entity	Technically resp. entity	Other technical partners
Subcomponent 1.1				
Institutional advisory services, support to operator, training activities	All types of expenses	DGGREE/UGO	DGGREE	DGAJF CRDA for daily oversight of operator
Subcomponent 1.2				
On-farm irrigation management advisory service and training and wastewater reuse master plan study	Consultant services and training	DGGREE/UGO	DGGREE	CRDA CTA, INGC, others
Subcomponent 2.1				
Engineering services Rehabilitation and improvement works	Consultant services, goods and works	CRDA/CRES	CRDA	DGGREE
Implementation of	Included in line above	CRDA/CRES	CRDA	ANPE

Component and activity	Type	Admin responsible entity	Technically resp. entity	Other technical partners
safeguard instruments				
Subcomponent 2.2				
Engineering and construction quality oversight Purchase of Meters and flow limiters	Consultant services and goods	DGGREE/UGO	DGGREE	CRDA will be benefiting from the TA and goods
Subcomponent 3.1				
Agricultural development plans preparation and implementation support	Consultant services	DGGREE/UGO	DGPA	CRDA, AVFA, APIA, TFDCV
Support to R&D and extension	All types of expenses	DGGREE/UGO	DGPA	IRESA, INGC, INRA, others
Capacity-building of producer organizations	All type of expenses	DGGREE/UGO	DGFIOP	DGPA, APIA, CRDA, <i>Groupements Inter-professionnels</i>
Raising awareness of investment opportunities	All type of expenses	DGGREE/UGO	APIA	DGPA, CRDA, GI
"Organized sector" analysis	Consultant services	DGGREE/UGO	DGRTD	DGPA, APIA
PMP implementation	Included in above	CRDA/CRES	CRDA	DGPCQPA, DGPA
Subcomponent 3.2				
Strategic value chain assessment, market studies and assistance to value chain development	Consultant services, operational costs	TFDCV	TFDCV	DGPA, DGIAA, <i>Groupements Inter-professionnels</i>
Support to private investment in the value chains	Matching grant	APIA	APIA	DGPA, CRDA
Support to value chains, research of market opportunities and improvement of the quality of products.	All types, excluding works	DGGREE/UGO	DGPA	DGIAA, CRDA, <i>Groupements Inter-professionnels</i>

17. **Value Chain Development.** Part of subcomponent 3.2 would be implemented by the newly established Value Chain Development Task Force (TFDCV) supported by the World Bank. The TFDCV will be established under CEPEX (through the Third Export Development Project, EDP3, P132381), and will be contracted by the project to cover activities relating to value chains based on agricultural products. provide technical support in selected value chains. During the interim period before the task force is effectively established, the UGO will manage these activities in coordination with the other World Bank-funded projects.

Box 2.1: The Task Force for Value Chain Development (TFDCV)

The project leverages strong synergies with three other World Bank projects. The recently approved Productive Inclusion Opportunities for Young Women and Men Project (YEIP, P158138) and Integrated Landscape Management Project (ILMP, P151030) have a strong focus on value chain development (including agribusiness) in (mostly) the same lagging regions. The third project is the ongoing Tunisia Third Export Development Project (EDP3, P132381), which provides financial and technical services to exporting firms. To increase the efficiency and effectiveness of the support to job creation and economic growth in targeted lagging regions, the four projects will leverage a common value chain development platform to be established within the EDP3 to implement activities to support value chain development. The proposed platform called TFDCV is aimed at maximizing synergies (i) across the above-mentioned projects; and (ii) between specialized MSME support public agencies in order to address the currently fragmented support system, and provide instead an integrated and coordinated value chain development mechanism. The Government sees this as an opportunity to use this common value chain platform as a new way of doing business in Tunisia and inter-ministerial collaboration.¹

The TFDCV will provide technical support in selected value chains, acting as an inter-agency one-stop-shop for relevant services currently offered by these agencies to MSMEs. It will also bring additional value by providing specific services that favor the development of value chains such as advisory on market trends and specifications, the facilitation of value chain-specific public private dialogues, and the identification of needed investments in strategic common services. The TFDCV is set to be established by the end of the first semester of 2018.

The TFDCV will be composed of a multi-disciplinary team selected competitively from various existing technical MSME support agencies (including APIA, APII, CEPEX, GICA, and CTAA) as well as regional development agencies (ODNO, ODCO). The Task Force's staff (full time and specially trained civil servants and consultants) will be in charge of facilitating and managing the delivery of these services, including through leveraging private sector expertise as needed (individual experts and firms), and/or coordinating services offered by partner agencies.

Matching grant

18. The Matching Grant Scheme (MGS) will be based on the system managed by APIA for the agricultural sector, under the *Code de l'Investissement*. APIA uses a detailed implementation manual to describe the process by which an investor can access State subsidies. In general, the subsidy rates vary from 15 percent for large projects to 30 percent for smaller projects and projects promoted by farmer groups. However, rates of 50 to 60 percent are applicable to hard and soft investments related to productivity increases and acquisition of new technologies. The minimum beneficiary contribution is generally set at 30 percent but reduced at 10 percent for smaller projects and projects promoted by farmer groups.
19. **Process.** APIA receives applications through its regional offices on an on-going basis and shall process them within a month. For this project, calls for proposals will be issued locally at each project site on the basis of the agricultural development plans, and nationally for larger investments identified in the investment action plans resulting from the value chain analysis. These calls for proposals will be related to specific value chains and indicate the applicable selection criteria (beyond the general criteria applied by APIA). Specific support to farmers and potential investors will be provided under subcomponent 3.1 TA for productive investments and by the TFDCV for value chain development. The applications will then follow the normal process established by APIA, however the approval will be done by a specific selection committee which will be determined in the MOP.
20. **Subproject agreement and MGS manual.** Subproject agreements will be signed with the investor for each subproject. A model of subproject agreement specific to this project will be established to incorporate project-specific requirements, notably in terms of safeguards. An addendum to the APIA

¹ The importance of a strong coordination and synergy between these projects has been highlighted by a decision in a ministerial meeting held on December 20, 2016.

manual will be established and will have to be approved by the World Bank before any disbursement against the MGS.

21. **Monitoring.** The project will rely on APIA's monitoring system which includes a database of all sub-projects benefitting from subsidies. A specific field in the database will allow APIA to trace the project-funded subprojects.

Financial Management

22. A Financial Management Assessment (FMA) was carried out in accordance with the World Bank Policy on Investment Project Financing to evaluate the adequacy of financial management arrangements for the implementation of the project. This assessment reflects the financial management arrangements for the DGGREE of the MARHP, responsible for implementing and carrying out the fiduciary activities of the project. The assessment was complemented by preliminary on-site assessments of a sample of CRDAs and APIA at national and regional levels.
23. **Risk assessment.** The DGGREE's FM arrangements which will be based on the Tunisian's financial management country system are generally acceptable and provide reasonable assurance on the use of the project's resources for the intended purpose. The financial management risk is assessed as Substantial. The project design entails the participation of several implementing institutions at the national and regional levels, with mixed fiduciary capacity and experience. In addition, DGGREE has not assigned fiduciary staff to the project specifically trained on Bank procedures, and does not have the related manual of procedures. Additionally, the six participating CRDAs in charge of implementing about 60 percent of project's activities under Component Two are still experiencing a number of weaknesses and risks, namely: (i) lack of knowledge of World Bank's FM and disbursement procedures by the staff; (ii) and the long delay in submitting the supporting documents to the central level to initiate the payment process.
24. **Mitigation measures.** To mitigate the identified risks and weaknesses, the following measures have been identified: (i) the creation of a dedicated Project Implementing Unit (UGO) at the DGGREE within the MARHP, with a fiduciary department that will include a fully dedicated Financial Management Specialist (FMS), (ii) a detailed POM describing the roles and responsibilities by the central and regional actors developed with financial reporting procedures, and (iii) and the development of simplified financial reporting templates for the CRDA given the mixed previous experience.
25. **Financial Management arrangements.** The MARHP, through the DGGREE, will implement the project and will be responsible for the overall fiduciary oversight including financial management. The country financial management systems will be applied such as budgeting, accounting, internal controls, funds flow, financial reporting and external audit. The project's annual activities will be approved with the World Bank and included in the MARHP's annual budget. The project's activities will follow the national budget execution and internal control procedures which include the segregation of duties between the payment authorizer and the public accountant as well as the ex-ante control by the financial controller. This will be complemented by the provisions of the POM which includes detailed procedures at the decentralized level. The project execution at the decentralized level (6 CRDAs) will follow the national financial management procedures. CRDAs will be supported by an AMO in executing the activities but also handling the financial management aspects. The national information management systems respectively ADEB (budgeting) and SIADÉ (treasury) will also be used. Primarily financial data to prepare the interim financial report will be generated from these systems and used to elaborate the project's financial reporting statements. The project's funds will be disbursed in a designated account to be opened at the Central Bank which will be part of the treasury single account. The external audit will be carried out by the General Financial Control (*Contrôle Général des Finances*) based on agreed terms of reference. The subcomponent 3.2 matching grant element will be implemented by the APIA which has a good track record in this area with the management since its creation

in 1983 of the GOT matching grant scheme with no major issue as highlighted in the various external auditor reports. The value chain activities will be outsourced to the Task Force for Value Chain Development (TFVDC) which is being set up by the World Bank funded Third Export Development Project (EDP3, P132381). In the interim they would be implemented by the DGGREE / UGO.

26. **Country public financial management analysis.** The 2016 Public Expenditure and Financial Accountability assessment (PEFA) concluded that the legal and administrative framework for public financial management offers an adequate level of assurance regarding reliability of information, predictability and control in budget planning and execution and a strong control environment. However, the report also identified that there is still room for improvement particularly with regards to budget comprehensiveness, transparency and accountability. Ongoing technical assistance has been mobilized by the donors (particularly the European Union and the World Bank) to address the remaining shortcomings. The project will make wide use of the Tunisian public financial management country systems particularly, the procedures for budget preparation, execution, internal control and monitoring; the use of the national budget system ADEB; the use of the treasury single account system; and ex-post review controls such audits performed by government independent entities.
27. **Organizational arrangements and staffing at the central level.** DGGREE is endowed with a fiduciary unit with an increasing work load. It is unlikely that the existing staff will be dedicated exclusively to the project. The appointment of a Deputy Director in charge of Administration and Finance is included as part of the key staff to be appointed to the UGO no later than four months after effectiveness.
28. **Organizational arrangements and staffing at the decentralized level.** At the decentralized level, the project will be implemented by the CRDAs which are parastatal with financial autonomy and with budgets that are hierarchically linked to the national budget. The organization and operating procedures of the CRDAs are established by decree. The review of the audit reports and supervision report of the other World Bank projects (151030 and P086660) revealed mixed capacity at the CRDA in spite of their broad experience in managing donors funded projects. Delay in submitting the financial statements and the supporting documents is a key weakness. Since about 60 percent of the project's activities will be implemented by the CRDA, there is a need to strengthen their capacity.
29. **Organizational arrangement and staffing at TFDCV.** The TFDCV legal framework which includes the staffing arrangement is being finalized. Once the TFDCV will be established a competitive recruitment of the staff will be launched.
30. The table below summarizes the FM risks identified during assessment, and the measures proposed to address them.

Risk type ¹	Risk Rating	Inherent Risk (IR), Control Risk (CR) and Mitigating Measures (MM) incorporated into Project design
Inherent risk	S	
Country level	M	The Public Expenditure and Financial Accountability diagnostic 2015 (PEFA 2015) concluded that the legal and administrative framework for public financial management in Tunisia is sound, and offers a solid level of assurance regarding the reliability of information. Overall, the budgetary process is reliable and there is a strong control environment. Nevertheless, there are transparency and accountability failures that still need to be addressed. The government of Tunisia has embarked on a series of public financial management reforms that aim to improve transparency and accountability, including a results-based budget, accounting reform, a treasury single account, a new organic budget law, etc.
Entity	S	IR - MARHP , through DGFIOP, handles the implementation of a number of investment projects financed by World Bank. However, DGRREE has not track record with the World Bank and it is not possible to transfer the project fiduciary responsibility to DGFIOP fiduciary team which already has an important work load. In addition, the CRDAs have a mixed performance in spite of the various capacity building activities.

¹ The **inherent FM risk** is that which arises from the environment in which the project is situated. The **FM control risk** is the risk that the project's FM system is inadequate to ensure that project funds are used economically and efficiently and for the intended purpose. The **overall FM risk** is the combination of the inherent and control risks as mitigated by the client control frameworks. The **residual FM risk** is the overall FM risk as mitigated by the Bank supervision effort.

Risk type ¹	Risk Rating	Inherent Risk (IR), Control Risk (CR) and Mitigating Measures (MM) incorporated into Project design
		MM – to mitigate this risk a dedicated project implementing unit (UGO), hosted in the DGRREE, would be created. This UGO would have technical and fiduciary staff, including a financial management specialist. Additionally, each participating CRDA will receive technical and financial management support from the UGO.
Project	S	IR – Project design is complex and entails the participation of several implementing institutions at both the national and regional levels, with mixed fiduciary capacity and experience. There is a risk of coordination issues between the national and regional levels, as it is expected there will be a large volume of contracts and payment transactions. MM – i) A strong FM team, including FM staff at both MARPH and the participating CRDAs will be put into place. This team will monitor the release of funds, their use, and the reporting of expenditures. ii) An M&E system, including a module for FM, will be put into place at MARPH and at each participating CRDA, to support project financial transactions and the generation of financial information. This will allow for proper project financial follow-up and monitoring. iii) A Project Operational Manual (POM) clearly defines financial management responsibilities and reporting requirements.
Control risk	S	
Budgeting	S	CR - Weak capacity at the CRDA level to monitor project commitments and budget execution within a reasonable time frame in order to avoid budget overruns, and also to be able to identify significant variations from the initial budget in a timely manner. MM - The following mitigating measures have been envisaged to help minimize budgeting risks: i) There will be specific budget lines for the project at the MARHP level, and also at each participating CRDA level; ii) UGO will be responsible for overall budget oversight and monitoring with support from the AMOs. To that end, UGO will have access to the budget system used by each CRDA, the ADEB EPA system; iii) The information system will allow for the recording of information at both the national (MARPH) and regional levels (CRDAs); iv) The information system will allow external integration with the ADEB EPA system at the CRDA level, which will enable automated balance reconciliation.
Accounting	M	CR – The project will use the ADEB and SIAD systems to gather, record, and summarize the project's financial transactions. It is worth noting that ADEB is already deployed at the CRDAs level but its uses still requires some additional hands-on-support MM - To mitigate this risk, the project will engage with the Ministry of Finance for the hands-on-support on the use of ADEB and SIAD at the CRDA levels. Periodic reconciliations and cross checking against the information in those systems will be performed by UGO at the national level, and by each CRDA at the regional level, to ensure that all transactions are properly booked.
Internal Control	S	CR – The project will rely on the Tunisian internal control system for budget execution. This system relies on the principle of the strict separation of duties, as there are different layers of approvals at each stage of the spending process. This process is governed by the Public Accounting Code (<i>Code de la Comptabilité Public</i>) promulgated by Law No. 73-81 of December 31, 1973. For expenditures financed under external resources, the payment request and payment issuance follows a separate track, as they are handled by the CBT, and paid from a designated account (DA). This may represent a risk for expenditures at the CRDA level, as there is a lack of knowledge on World Bank disbursement procedures and requirements. MM – To mitigate this risk, the preparation of payment requests, and liaison with the Central Bank will be performed by UGO, with support from CRDA's FM staff. The POM describes in detail the procedures, responsibilities, and interactions among stakeholders
Flow of Funds	S	CR – Fund flow arrangements for the project will imply one flow of funds by which invoices are paid in line with the Tunisia's Treasury Single Account procedures both at the central and decentralized level, including for the matching grant scheme. MM – To mitigate risks related to the proper and timely flow of project funds, the following measures have been agreed upon: i) A segregated designated account (DA) will be opened at the Central Bank of Tunisia (CBT) for the whole project. Only FM staff within DGGREE / UGO at MARPH will be in charge of liaising with CBT. ii) All payment requests, including those from the CRDAs, will be reviewed by the DGGREE / UGO before submission to the CBT. iii) The CBT will make payments to service providers and/or project beneficiaries. iv) APIA has been identified to manage the matching grant scheme based on its comparative advantage in this area. This will include sample based technical audit of the small grants .
Financing Reporting	S	CR - Project financial reporting arrangements are complex: they require broad coordination efforts at both the national and regional levels in order to produce and transmit consolidated project financial statements to project management as well as to the World Bank for timely decision making. Also experience shown CRDAs have difficulty to prepare and timely submit their financial statements. MM - To mitigate this risk, the following actions will be put into place:

Risk type ¹	Risk Rating	Inherent Risk (IR), Control Risk (CR) and Mitigating Measures (MM) incorporated into Project design
		i) The POM clearly defines financial management reporting responsibilities, specifying which reports must be prepared, by whom, and their due dates and required content. ii) Simplified and customized financial statements will be developed and agreed for the CRDA.
Auditing	S	CR – There is a risk of overdue audit reports. MM - To mitigate this risk: i) The UGO, with support from the participating CRDAs, will ensure that there is a timely fiscal year-end accounting closure, and a timely preparation of the consolidated project's final financial statements. ii) The information system will support the production of consolidated annual financial statements. iii) Detailed terms of reference (TORs) will be prepared by UGO and shared with the independent auditor. Deadlines for the submission of the audit report will be clearly stated in the TORs. In addition, the TOR will include technical audit of the small grants.
Overall FM risk	S	

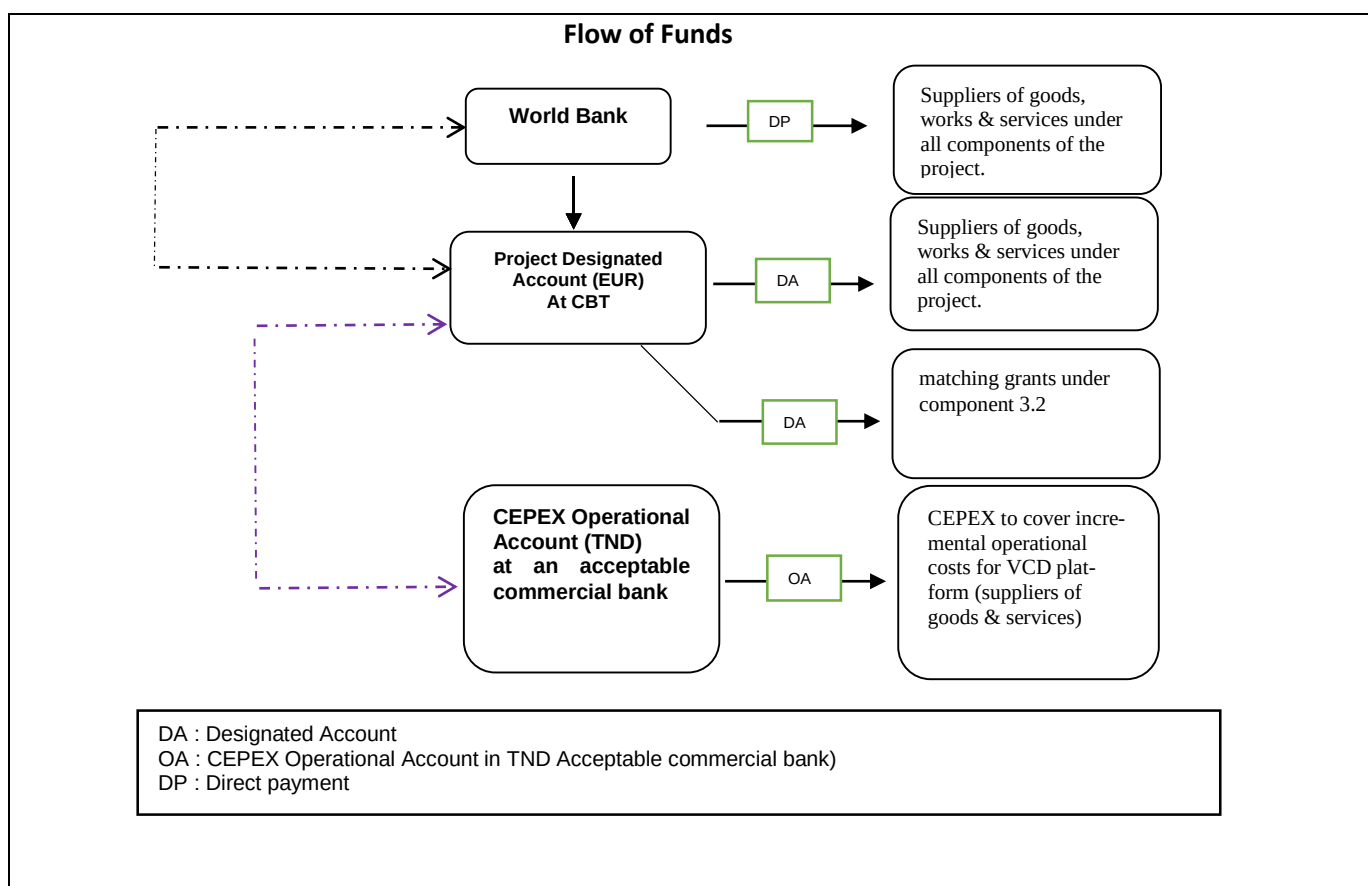
31. **Annual work program.** In parallel with the preparation of national budget law, the UGO will prepare and submit to the World Bank, a proposed annual work program and budget for the next following Fiscal Year, giving details of: (a) a time table of programs and activities scheduled for implementation during that next Fiscal Year; and (b) the estimated cost of each such program or activity, along with the budget line item and source of funding corresponding to each program or no later. Synchronization with the national budget law preparation is a key risk that could affect the planning process of the project. As such delay in submitting the project's activities in the budget law could lead to the absence or underestimation of the project in the budget law. This risk is higher for the year of the project effectiveness. To mitigate this risk, the project's activities for the effectiveness year have been selected from the MARHP 2018 budget.
32. **Budgeting.** Overall, the government of Tunisia has a well-developed budget process. The procedures for preparation, execution, and control are clearly established in the National Budget Framework Law (*Loi organique du budget*). Line ministries, including MARHP, are fully responsible for budgeting and managing their appropriations, including funds allocated for programs and projects. The proposed project will be included in the annual budget of the government of Tunisia under the budget allocation heading for MARHP, and there will be specific budget lines for the project at the MARHP level, and also at each participating CRDA level. In fact, once the loan is endorsed by the parliament, the total amount of the project will be written and published under the Government Budget Law (*Loi de Finances*), and annual indicative allocations will be budgeted at the MARHP and CRDA levels for project execution.
33. **Information management system.** The system used to register budget appropriations is ADEB (*Système d'aide à la décision budgétaire*). This is the national computerized budget system that allows for the proper record of commitments and payments, and for adequate budget monitoring and control as it offers a sound control environment and an adequate segregation of duties. The ADEB system has an official budgetary classification which is the basis for the preparation of consolidated budget execution information of all government expenses (budget). Besides, for all the expenditures financed under the Loan, the UGO will make use of the system SIADE (*Système informatisé d'aide à la dette extérieure* for the off-budget part) to maintain separate accounts related to external funding management. Information from both, ADEB and SIADE on project are processed to elaborate the project financial statement.
34. **Accounting.** In Tunisia, all financial and accounting operations of the government are carried out, controlled and accounted for according to the public sector accounting standards laid down in the Public Accounting Code (*Code de la Comptabilité Publique*) which is on cash basis. This code was promulgated by Law No. 73-81 of December 31, 1973. The project accounting will be held using the public sector accounting standards stated in the Public Accounting Code which call for cash basis. The project financial statements will be prepared based on information generated from ADEB and SIADE.

35. **Internal Controls.** The project will use the existing internal control system in place within the MARHP and MoF. This will be complemented by the POM which includes detailed additional procedures at the decentralized level. The MoF internal control system is deemed satisfactory by the World Bank. This system encompasses the following: i) appropriate guidelines for annual budget preparation and implementation, ii) clear segregation of duties between the payment authorizers and the public accountant, iii) ex ante control of the financial controller, iv) regular reconciliations of bank accounts that provide reasonable assurance of the accuracy of financial records, v) acceptable procedures for documentation and record retention, and vi) verification of the eligibility of the expenditure by the UGO as per requirements established in the project Loan Agreement and Disbursement Letter and then process the orders and issues checks. A POM, prepared and approved, defines roles and responsibilities in the coordination between the central and the decentralized levels.

Disbursements

36. **Funds Flow.** The disbursements of the loan proceeds will be made through the advance to the designated account disbursement method mainly. A segregated designated account denominated in EUR will be opened at the Central Bank of Tunisia on behalf of the project implementing unit at the central level that will authorize the payments on the designated account following the procedures and guidelines already in place and used for most of the Tunisian portfolio and in accordance with the Disbursement and Financial Information Letter (DFIL). The UGO will be responsible for providing the supporting documents for eligible expenditures to the Central Bank of Tunisia that will be preparing the Withdrawal Application for Designated account replenishment that should be signed by authorized signatories from the Central Bank. Total project's eligible expenditure will be summarized in the Statement of Expenditures (SOE) prepared by CBT and will be submitted to the World Bank for processing. If the World Bank determines that an ineligible expenditure has been financed by loan proceeds, the World Bank may require the Borrower to either refund the amount to the designated account, or in exceptional circumstances, as provided in the World Bank disbursement policies, provide substitute documentation. The description of the funds flow is presented below.
37. **Flow of funds for matching grants.** Whenever there is a need to make payments related to matching grants, the UGO with the support of the APIA, and after having reviewed the payment schedule and matching grant scheme for a given beneficiary, will instruct the CBT to make such payments from the Project DA account directly to the Beneficiary bank account. Detailed control mechanisms are provided in the POM.
38. **Flow of funds to finance VC Platform operational costs.** The UGO will make funds available to the TFDCV (under the CEPEX) based on quarterly forecasts of projected operational expenditures in which the Value Chain platform estimates will incur as per MOU to be signed by the concerned parties. An advance will be made from the project DA to the Operating Account opened by CEPEX for the solely purpose of managing project funds for the financing of operating costs related to the VC component. Further advances to the Operating Account will be made upon reporting by the VC platform (CEPEX) on the use of a prior advance.
39. **Flow of funds for Performance-based O&M.** The payment of the performance-based subsidy linked to KPIs until such time full cost recovery is achieved, will be made on biannual basis. The terms of the contract will be determined during the first year of the project with the assistance of TA included under Component 1. These terms will be reviewed by the team including the World Bank's FM specialist before the disbursement condition is lifted. Adequate controls will have to be incorporated in the contract and detailed in the POM as for the subsequent payments. This will include submission of the adequate supporting documents confirming the completion of the KPI and technical audit.

Figure 2.1: Flow of Funds



40. **Financial reporting.** The project will primarily use ADEB (budgeting) and SIAD (treasury) to gather, record and summarize project's financial transactions as well as elaborate the financial statements. The format of the Interim Financial Reporting (IFR) to be prepared 45 days after the end of the calendar semester and the Financial Statements were agreed and reflected in the Project Operational Manual. Each IFRs will comprise the following: (i) report on the sources and use of funds cumulative (project-to-date; year-to-date) and for the period, showing budgeted amounts versus actual expenditures, including a variance analysis; and (ii) forecast of sources and uses of funds. A simplified reporting format will be developed in consultation with our counterparts during preparation for the involved CRDAs to facilitate the consolidation of the financial data and the preparation of the IFR at the project implementation unit (UGO) at the central level
41. **External Audit.** Donors funded project in the MARHP are audited by an independent auditor acceptable to the bank (i.e. the General Financial Control). The review of the World Bank funded project in the sector (P08666) did not reveal any significant issue in the audit arrangement and in the opinions which were consistently unqualified. The General Financial Control will therefore audit the project financial statements including the designated account based on further discussion with the government counterparts. The financial statements will be prepared in accordance with acceptable accounting standards and audited in accordance with acceptable international auditing standards. To that end terms of reference (TOR) for the audit work will be prepared and submitted to the World Bank for its acceptance. The TORs will encompass both the audit of the financial transactions and an assessment of the internal control both at the UGO and the CRDA including the APIA and should cover all the operations implemented under the project as well as all sources of financing including in kind contributions if any. In addition, the TOR will include technical audit of the small grants and the performance-based contracts. As a minimum requirement, the auditor will produce (a) an annual audit report including his/her opinion on the project annual financial statements and (b) a management letter on internal controls. The auditor will submit the audit report to the Ministry of Development,

Investment and International Cooperation (MDICI) which will forward it to the World Bank within six months after the end of the fiscal year.

Procurement

42. Procurement will be carried out in accordance with the provisions stipulated in the Loan Agreement and the World Bank New Procurement Framework (NPF) for Investment Project Financing, applicable from July 1, 2016 and revised November 2017. Within the Framework are four mandatory documents available on the World Bank's website (<http://www.worldbank.org/procurement>): Policy, Directive, Procedure, and Procurement Regulations for Borrowers (Regulations).
43. To determine the optimum procurement approach that will yield the right type of response from the market, a PPSD was developed to consider, among other things, the market situation, the operational context, previous experience and risks. The PPSD was prepared by the Borrower with World Bank support and was used for the elaboration and validation of the Procurement Plan. In addition, the POM defines the main aspects of administrative arrangements, information flow, procurement applicable procedures and models of bidding documents.
44. The PPSD also foresees coordination mechanisms that ensure synergies between projects in terms of procurement. A case worth highlighting is the contract(s) concerning technical services for value chain development, which will be serve four different lending operations that cover this same activity (value chain development): i) the Tunisia Third Export Development Project (PDE3); ii) the Integrated Landscapes Management in Tunisia's Lagging Regions; iii) The Tunisia Youth Economic Inclusion Project; and iv) this Project. In this case, the government (through the CEPEX, who will host the common Platform created for coordination purposes) will use the "framework agreement" method to hire consulting firms to conduct this activity in compliance with article 7.33 and annex XV of the procurement regulations for IPF borrowers (July 2016 revised November 2017). The framework contract will be included in the procurement plan of the PDE3. This project will then sign direct call-off contracts with the selected firms hired through the framework agreement (shown as single source selection contracts in this project's procurement plan). As indicated in article 3.2 of annex XV of the World Bank Procurement Regulations for Borrowers (edition of July 2016 revised November 2017), the CEPEX (Implementation agency in the third export development project, currently effective) will be assigned as the "lead entity" for that framework agreement.

Capacity assessment

45. Due to the national regulation, the UGO will be formally created after project effectiveness. However, a procurement capacity assessment has started with existing staff of DGGREE, the CRDAs of Beja, Bizerte and Nabeul, DGPA and APIA. The assessment is based on the knowledge and procurement experience of these executing agencies (EAs) in the implementation of World Bank and other financing institutions projects, taking into account the nature of the expenditures and the likely size of the contracts to be procured. The main objectives of this assessment were to determine whether the implementing agencies have the capacity to adequately carry out the procurement activities of the project. Potential procurement risks identified during the assessment were also analyzed, in order to recommend adequate mitigation measures. The assessment also takes into consideration the performance of the Tunisian public procurement system, and the overall implementation rate of the World Bank's portfolio in Tunisia
46. The main objectives of this assessment were to determine whether the implementing agencies have the capacity to adequately carry out the procurement activities of the project. This evaluation took into account the entire procurement process, which encompasses: (i) planning; (ii) preparation of ToRs and bidding documents; (iii) receipt and evaluation of bids or proposals; (iv) finalization and

signing of the contract or agreement; (v) monitoring the execution; and (vi) filing and archiving of documents for audit and post review.

47. This assessment also took into consideration the performance of the Tunisian public procurement system and the overall implementation rate of the World Bank's portfolio in Tunisia. Potential procurement risks identified during the assessment are also analyzed to recommend adequate mitigation measures. The procurement risk is rated Substantial. The summary risk assessment and recommendations are shown in the table below.

Table 2.3: Procurement summary risk assessment and recommendations

Findings	Issues/Risks	Initial risk level	Mitigation Measures
Implementing agency level			
Different level of interest among institutional actors.	Many institutional actors at the central and regional levels involved. Lack of coordination and delays in implementation.	Substantial	Regular communication on the project development objectives, outcomes and impacts in each region.
Lack of resources and capacity to commit on the quality of the project implementation	Insufficient number of the needed experimented staff to implement the procurement activities.	High	Recruitment of some short-terms experts based on needs. Training of the team in charge of the project within the UGO and CRDAs on procurement procedures and tools. Providing technical assistance to support the UGO staff.
Internal operation manuals (archive, procurement, etc.) obsolete		Substantial	Comprehensive review of internal operation manuals. Can be completed with the detailed POM
Project level			
Lack of knowledge with mandatory IT tools	New mandatory tools from the Bank (STEP), the TUNEPS e-procurement system and INJAZ	Substantial	Training on STEP, provision of the adequate materiel (computers and internet access with good speed) to the staff in charge of STEP management
Poor knowledge of the Bank's new procurement framework	None of procurement specialists at the central, regional and local level have knowledge of the NPF. This may result in delays in launching the procurement process at the beginning of the project implementation.	Substantial	Training of project coordinator and fiduciary staff of project preparation team within DGGREE. Additional specific training on new procurement framework to be provided to relevant UGO members once nominated before the project's effectiveness date. More supervision mission with post procurement review of contracts and audit of the project

Findings	Issues/Risks	Initial risk level	Mitigation Measures
Double applications of national and Bank procurement procedures	Confusion and eventual conflict between the Bank and the national procurement procedures, contributing to some delays in the process and to the poor implementation performance of the project	Substantial	The manual will clarify that the Bank procedures are mandatory as set in the Loan agreement.
Unavailability of adequate bidding Documents	Customized bidding documents conform to the national or/and the Bank procedures missing for the project.	Moderate	All procurement standard documents to be used by all stakeholders annexed to the POM.
Overall risk level		Substantial	

48. Procurement implementation support will include: (a) building capacity through some training to members of EAs who are handling procurement activities, mainly the full-time dedicated procurement specialist within the UGO; (b) reviewing the POM and standard bidding documents; (c) providing timely feedback to the EAs; (d) providing detailed guidance on World Bank new procurement framework; and (e) monitoring procurement progress against the detailed Procurement Plan. Depending on the workload, some short-term experts can be recruited to assist the UGO. Component 4 will support the establishment and functioning of the UGO and associated activities.

Thresholds by Methods and for Prior Review

49. The applicable thresholds by method and for prior review, in conformity with the NPF, are meant to be used for the procurement planning at the beginning of the project implementation. They may be revised during implementation depending on the findings and recommendations of the World Bank's procurement specialist supervising the activities in view of the project performance, procurement implementation the subsequent risk assessment.

Table 2.4: Procurement Prior Review Thresholds (US\$ thousands)

Type of procurement	Prior review threshold (US\$ thousands)
Works (including turnkey, supply & installation of plant and equipment, and PPP)	10,000
Goods, information technology and non-consulting services	2,000
Consultants: firms	1,000
Consultants: individuals	300

Table 2.5: Thresholds for Procurement Approaches and Methods (US\$ thousands)

Type of procurement	Open international $\geq$	Open national <	RfQ $\leq$
Works (including turnkey, supply & installation of plant and equipment, and PPP)	10,000	10,000	300
Goods, information technology and non-consulting services	3,000	3,000	200
Shortlist of national consulting firms	300	300	

Procurement Categories and Methods

50. The following procurement methods may be used: (i) for goods, works and non-consulting services: International Competitive Bidding (ICB), National Competitive Bidding (NCB) and Direct Contracting; and (ii) for consulting services: Quality and Cost Based Selection (QCBS), Least Cost Selection (LCS), Qualifications of Consultant Selection (QCS) and Single Source Selection (SSS). Each procurement method and the related process have been detailed in the POM approved.
51. The following provisions will be applied whatever the category and method of procurement:
- An open and competitive approach to market provides all eligible prospective firms or individual consultants with timely and adequate advertisement of requirements, is the default approach for any contract to be financed by the Bank. Any exception to this approach will require the Bank's approval;
 - The eligibility of bidders shall be as defined under Section III of the Procurement Regulations. Provisions mentioned in that chapter on sanction or debarment related to fraud and corruption, will be applicable;
 - No foreign bidder shall be required to submit a bid in association with domestic firms as a condition for bidding;
 - Each bidding document shall clearly set out the bid evaluation process, the bidders' qualification criteria and the contract award conditions;
 - Technical and financial bids will always be publicly opened, and such public bid opening shall take place immediately or closely after the deadline for submission of bids. No evaluation of bids shall take place at the bid public opening session; and,
 - Any contract to be financed by the Bank, but awarded without respect and conformity to the procurement procedures and SBDs as detailed in the POM will be taken in charge and financed by the Borrower.

Advance Contracting

52. The Borrower has notified the Bank about its willingness to perform advance contracting for some consultancy services to speed up the project implementation. Following request sent by Borrower dated January 8, 2018 the Bank has confirmed its agreement to proceed with the procurement process subject to following Bank procurement procedures and policies related to Advance Procurement as set in the Procurement Regulations for IPF Borrowers July 2016 and revised November 2017.

Procurement Plans

53. The Borrower developed a detailed procurement plan (PP) for the entire project implementation with all contracts to be financed by the Bank, the type of expenditures (goods, works or services), the most appropriate procurement methods, estimated amounts and the estimated contract start date. The PP was sent to the Bank through STEP and approved by the Bank. The PP will be published on the ONMP's website.¹ It will be updated by the UGO annually or as required to reflect the actual project implementation needs.
54. The preparation of the PPSD helped the Borrower to optimize the process and to minimize the risk of lack of ownership. Indeed, the DGGREE and EAs have collaborated to identify and list for each contract (i) entities in charge of all administrative and procurement processes (preparation of the bidding documents, publication, signature of contracts, payment, etc.) and (ii) entities involved in the

¹ <http://www.marchespublics.gov.tn/onmp/programmeannuel/liste-prgannuel.php?lang=fr>

technical works (definition of terms of reference and contribution to the bid evaluation processes) for each contract.

55. **Operating Costs.** Operating Costs are incremental expenses arising under the project and based on Annual Work Plans and Budgets approved by the Bank pursuant to the Financing Agreements. They are incurred based on eligible expenses as defined in the Financing Agreement and cannot include salaries of the Borrower's civil and public servants. The procedures for managing these expenditures will be governed by the Recipient's own administrative procedures, acceptable to the Bank.

Specific aspects regarding the value chain analysis and matching grant under subcomponent 3.2

56. Considering the proposed synergies to be built between four World Bank funded projects with regard to value chain development, a specific approach was devised for the procurement of consultancy services in this area. A consultancy firm will be competitively selected under the PDE3 project and sign a framework agreement with CEPEX which will host the TFDCV. Each project will then sign call-of contracts with this firm following the terms of the framework agreement. The call-of contract will show as a single-source selection in this project's PP.

Environmental and Social (including safeguards)

57. The project is classified category B. Globally, It triggers six safeguard policies : (i) OP/BP 4.01 because it has the potential to impact the environment due to activities related to civil works ; (ii) OP/BP 4.09 related to Pest Management since agricultural intensification and diversification can lead to increased use of pesticides with all the risks involved on water resources, soil and consumer's health ; (iii) OP/BP 4.11 related to Physical Cultural Resources in the case of a fortuitous discovery of a cultural object during civil works especially in certain governorates targeted by the project like Beja and Sili-ana ; (iv) OP/BP 4.37 for Safety of Dams to further guarantee the sustainability of water supply, in fact water required for irrigation of rehabilitated PPIs comes exclusively from four dams for which good state and safety are necessary conditions to secure water supply ; (v) OP/BP 7.50 related to Projects on International Waterways because some areas of the project are partly located in the Medjerda River Basin which is shared between Algeria and Tunisia and (vi) OP/BP 4.12 for Involuntary Resettlement because some construction may occur on the footprint of the irrigation infrastructure to be rehabilitated or in the right of way when installing the drainage system and might result in loss of assets or access to assets.
58. Given the framework nature of the project (under which the detailed technical activities and location of some areas which will be affected by sub-projects¹ will be completed and well recognized during project implementation), the management of the social and environmental issues will be conducted in two stages.
- Stage 1: Three instruments are prepared prior to appraisal, ESMF, PMP and RPF in which mitigation of all mentioned specific risks highlighted below, monitoring of indicators, assessment of the implementation of procedures and mitigation and institutional measures were outlined in order to implement the sub-projects in accordance with safeguards best practice. The instruments were submitted for public consultation on November 15 and 16, 2017, and were disclosed in Tunisia in the website ONAGRI and on the World Bank's external website on March 15, 2018.
 - Stage 2: The second stage will be after screening which will lead to the preparation, during project implementation, of specific safeguard instruments for each site or group of sites in

¹ especially for irrigation and drainage distribution networks and when supporting private and cooperative investments in post-harvest infrastructure within the subcomponent 3.2 of the program

accordance with the framework instruments such as: (i) full ESIA whenever the Tunisian regulation requires it ; (ii) specific environmental and social management plan (ESMP); (iii) specific resettlement plan / resettlement action plan whenever necessary; and (iv) possibly a specific plan of pest management. The screening will exclude Category A-type sub-projects.

59. The CRDA in charge will prepare the FEDS relating to each sub-project/investment, together with all the relevant information (general presentation of the proposed adjustments, their objectives and location, their beneficiaries, their costs, assessments of the impacts at fair value and the calculation of the results according to the overall score awarded) that will enable the appropriate safeguard instrument to be correctly identified. With the support of the technical units of MARHP's central technical departments and the coordination of the project at the DGGREE level, the CRDA, assisted by an expert recruited as part of technical assistance for Component 2, will adapt the ToRs for each investment, will develop and validate the safeguard documents (ESIA, ESMP) before transmitting them to the UGO (DGGREE) which will send them to the World Bank for review and to ANPE for clearance. MARHP will finally issue its authorization on the advice of the ANPE and through DGGREE will publish this document on the ONAGRI website (hosted by MARHP). All these safeguard instruments (ESIAs, ESMPs) prepared will be consulted and physically accessible to PAPs in paper format at the regional CRDA level before any subproject implementation. As executing agency for the project, DGGREE will be responsible to follow up on the mitigating measures and will report them as part of the progress report to the project.
60. **ESMF.** Specific environmental and social risks are associated with the project activities, notably: hydrological risk related to the drainage works, minor impacts usually related to civil work during rehabilitation and expansion activities, pollution and sanitary risks related to the use of treated wastewater for the expansion of El Hajeb (Sfax) scheme and to the manipulations during possible replacements of asbestos cement pipes.
61. The ESMF consists especially of:
 - a. Review for Tunisian regulations and institutional capacities in environmental and social management related to the project. This review had identified gaps between the Tunisian regulation and the World Bank safeguards policies and specify the procedures to be applied;
 - b. Specific environmental and social benefits of the project regarding institutional, technical, environmental and socio-economic aspects;
 - c. Potential social and environmental impacts which may be generated by the project activities and measures to mitigate or repair, and/or compensate these impacts during the whole project cycle (preparation, implementation and operation);
 - d. Land determination which may lead, whenever it is necessary to the triggering of the process of land clearance in some areas that have to be expropriated according to the procedures described in the RPF;
 - e. Safeguard screening for each infrastructure subproject to be financed under the matching grant facility by preparing a sheet in the form of a FEDS to identify the adequate specific safeguard instrument as specified above;
 - f. Overview of the current operational complaint management mechanism at MARHP and proposed measures for its improvement to be easier to apply and adapted to the specificities of the project;
 - g. Environmental monitoring measures with the adequate indicators which have to be adapted for each project; and
 - h. Institutional measures including a capacity building program for relevant officials and stakeholders.

62. **PMP.** Agricultural intensification and diversification can lead to increased use of pesticides and fertilizers with all the risks that may impact environmental and human health. The purpose is to prepare and implement a Pesticide Management Tool that will control pest and pesticides management by users. It specifies and develops good practices when choosing and handling pesticides which must be harmless to inhabitants and domestic animals in the treated areas as well as to the personnel who apply them.
63. The plan includes:
- a. Description of the current situation in Tunisia in the field of pesticide management, the main stakeholders involved in the life cycle of pesticides and Tunisian experiences in promoting biological control methods towards pest management in agriculture and agroforestry sectors and also in managing stocks of pesticides and empty containers used for packaging through the African Stockpiles Program for Obsolete Pesticides handled by ANGED in Tunisia;
 - b. Evaluation of the capacity of the Tunisia's institutional and regulatory framework to promote and support safe, efficient and rational management of pesticides and to incorporate safeguarding proposals into the project;
 - c. Proposed action plan for pesticide management including: (i) Selection of pesticides and preparations before acquisition; (ii) Purchase procedures where buyers must ensure that the product they are buying is the one they have been recommended to buy; (iii) measures taken to manage transport and storage risks; (iv) good practices for the handling and use of the product; (v) management of empty containers; and (vi) measures taken to promote the use of alternative pest control methods;
 - d. Monitoring and evaluation plan with adequate indicators specifying responsibilities in coordinating and monitoring the implementation of the action plan; and
 - e. Training program for actors involved in pesticide management and measures taken to insure information and public awareness towards risks of pesticides in order to reduce this risk (disease and intoxication by pesticides), and induce a real change in behavior.
64. **RPF.** The Resettlement Policy Framework (RPF) provides guidance on the implementation of resettlement considering the national legislation and operational policy 4.12 of the World Bank that applies to the project.
65. In 2016, Tunisia revised its legislation on expropriations for public purposes to improve their performance. The functional analysis of these new texts shows that they do not fully meet the requirements of the World Bank's Operational Policy 4.12 (OP 4.12) regarding involuntary resettlement, particularly regarding the compensation of people without title on their land, the use of the market value for calculating compensation, and setting up of a consultation process at different stages. Thus, some elements of the national procedure had to be adapted to meet these requirements. To ensure that all policy principles of OP 4.12 are taken into account, an entitlement matrix has been prepared to determine compensation requirements for most of the types of cases that may be encountered and different types of persons affected.
66. An organizational structure for the RPF has been defined based on the institutional arrangements of the project. This set up includes a steering committee which gives the main orientations and validates annually the work plans and the budget, a management unit by objective (UGO) supported by a technical assistance which will ensure the coordination of the whole project. At the operational level, there will be within the *Commissariat régional de développement agricole* (CRDA) a regional implementation and monitoring unit (CRES) which ensures the implementation and monitoring of contracts and management of the different components in each CRDA. For each PPI, a consultant will be recruited to control the construction companies that will carry out the work. These consultants will

need to be recruited promptly and will carry out, as part of the implementation of the LAF, the assessment of land requirements simultaneously with the readings of the outputs for the preparation of the GIS for the PPI network, as well as the plot identification survey and socio-economic surveys once the land acquisition needs are validated by the UGO. This consultant will also prepare the safeguards instruments required to clear the rights of way. The SRP or RAP will to be implemented by the UGO with the help of the CRDAs and the competent administrations defined in the Tunisian legislation.

67. It is the obligation of the DGGREE to ensure that the terms of reference of various technical assistance consider the elements of the implementation of this document. The costs involved in carrying out the various studies prior to the release of rights of way and the monitoring of these actions are included in the project budget. Only the costs of compensation and compensation that are the responsibility of the Tunisian State have not been evaluated.
68. A consultation workshop was held in mid-November 2017. CRDA, GDA and some NGOs were represented. It emerged from these consultations that this approach to resettlement was new to most participants, but it seemed interesting to them. Comments from the consultation workshop have been integrated into the RPF. Public consultations will be undertaken prior to the submission of RAP prepared under the project to the World Bank.
69. **Environmental sustainability / Use of climate smart agriculture.** While taking into account the results of the environmental and social remediation plan of PISEAU II, the design of the safeguard documents (ESMF, PMP) in accordance with the triggered safeguard policies allow better required environmental sustainability. The aforementioned documents include a series of related processes which aim at: (i) identifying environmental and social risks related to the implementation of project activities; (ii) developing the corresponding mitigation measures; (iii) implementing the mechanisms for their realization, monitoring and control during all phases and (iv) planning for an institutional development, capacity building and monitoring / assessment programs. These measures will contribute to better decision-making to manage the safeguarding aspects and ensure the desired sustainability. Also, the use of treated waste water and new irrigation techniques along with prudent and rational use of agricultural pesticides while encouraging integrated pest management will Reinforce the Tunisian policy for water saving and encourage preservation of conventional resources in order to enable Tunisia, classified under water stress, to promote climate-friendly agriculture.

Monitoring and Evaluation

70. **Overview.** As indicated in Section IV, the project's M&E system will capture the measurement of and communication on progress, results and impact as defined in the Results Framework, using different instruments (among which periodic progress reports, surveys, beneficiary assessments and impact studies, in addition to data bases that record financial and physical progress in project implementation). The overall purpose of the M&E system is to have a management information system that (i) allows for assessing whether the project/its components are on track as per initial plans or whether corrective measures are needed, (ii) engages the beneficiaries in performance measurement (including the use of perception surveys) and is complemented by (iii) independent assessments (surveys; impact assessments).
71. **System principles.** The following principles will be adopted to ensure result focused project management:
 - a. Project performance will be monitored against the (annual) project implementation plan through recording of activities delivered and outputs achieved under each of the components (products or services as a result of project interventions). Focus will be on collecting and

compiling concise and relevant information that measures progress in line with the corresponding key indicators. Activity and output recording will be linked to financial data that, together with information on achieved activities and outputs, will allow for supervision of progress regarding project performance/indicators according to a predetermined schedule;

- b. Project impact relates to the higher-level indicators of the results framework, which will be measured through specific impact assessments and cover baseline surveys (start), follow-up surveys (mid-term) and impact assessments (prior to project closure) at the level of (panels of) beneficiaries of project interventions at each of the PIPs;
- c. Learning is an important feature of the project's M&E system. To this end the project will document lessons learned, best practices, as well as challenges and share these through periodic planning and review meetings at the national and regional levels.

72. **Institutional structure and responsibilities.** The UGO will bear the overall responsibility of the M&E of the project and will provide consolidated implementation progress reports (IPRs) twice a year as well as quarterly unaudited financial reports (IFR) covering financial management and the status of disbursement. A management information system (MIS) will be established at the level of the UGO and operated by its M&E specialist. UGO's consolidated reporting will be based on the periodic reporting by the implementing agencies (CRDAs) that have operational responsibilities regarding the respective components/sub-components (including monitoring of inputs, activities and outputs. To this end the project will strengthen the internal M&E and fiduciary system of these agencies to ensure that data collection, management and analysis use uniform principles and procedures. The project will use the CNI system as appropriate – for which training of users will be conducted by CNI at the different project levels (national and regional).

73. **Data collection.** the UGO will ensure that data collection is uniform and recorded/reported according to formats and a calendar the UGO will prepare and provide to the implementing agencies. To this end a performance indicator reference sheet will be prepared for each indicator (based on the results framework) prior to the collection of any data collection, covering: a precise definition of the indicator; its unit of measurement; its justification and expected use by project management; its disaggregation such as by crop, gender, youth, employment (as appropriate); the method of data collection/calculation; the periodicity of data collection or timing at which data are to be collected; the responsibilities for and estimated cost of data collection; procedures for data quality assessment; plan for data analysis, review and reporting.

74. **Evaluation.** In addition to periodic (annual) implementation support missions conducted jointly by the World Bank and Government of Tunisia to assess the status of key project outcomes, a mid-term review will be conducted within 24 months after effectiveness to assess achievements and constraints and recommend, where needed, adjustments. When required (in case of major gaps between planned achievements versus actual progress), specific evaluations will be conducted during project implementation. A final evaluation will be conducted in the last year of implementation to assess the overall achievement of expected results. Also, a project completion report will be prepared no later than six months after project closure.

75. For further details, reference is made to the M&E Manual (included in the Project Operational Manual).

ANNEX 3: IMPLEMENTATION SUPPORT PLAN

COUNTRY : Tunisia Tunisia Irrigated Agriculture Intensification Project

Strategy and Approach for Implementation Support

1. The World Bank will support the implementation of the project through a combination of fiduciary, technical supervision, monitoring and evaluation (M&E), and coordination. Teams composed of World Bank staff and consultants will support the project's implementation. The strategy for implementation support takes into consideration the technical and institutional capacity of the MARHP and the CRDA, and the number and complexity of the contracts that will need to be procured.
2. The project design incorporates several features that will support its implementation: (i) mobilization of technical assistance during preparation including the institutional options study funded by PPIAF and the Quality in Infrastructure Investment grant funded by Government of Japan; (ii) specialized technical assistance under each component; (iii) a specialized entity (TFDCV) established for the purpose of implementing value chain development support for four World Bank funded projects.

Implementation Support Plan and Resource Requirements

3. The World Bank team will include a Task Team Leader; and specialists in: procurement, financial management, safeguards; and technical experts (engineer, agro-economist). Support will involve supervision missions conducted on a semester basis, in addition to exchanges by email, audio, and video as needed. Procurement and financial management training will be provided in the first months of project implementation (and even before effectiveness as far as procurement is concerned). Fiduciary support will be provided primarily by the World Bank's procurement and financial management specialists based in the World Bank Country Office in Tunis. In addition to biannual supervision missions, these specialists will be available on an ad hoc basis to provide support as required to the project implementing entities. Safeguards staff will coordinate with CRDA technical staff to oversee monitoring of environmental and social impacts and ensure that the CRDA are satisfactorily executing the EMPs. The following table summarizes the focus of implementation support at various stages of the project.
4. A mid-term review is expected to take place about 24 months after the Effectiveness Date.

Time	Focus	Skills Needed
Before effectiveness	Advanced procurement of key consultancy contracts (technical assistance and engineering supervision)	Procurement training Technical support for TOR
First 12 months	Establishment of project implementation arrangements. Procurement of works and monitoring of technical assistance contracts. Establishment of new operator.	Technical support for procurement and consultant mobilization. Governance and institutional support for the institutional settings.
12-48 months	Project supervision and quality assurance. Monitoring effectiveness.	Hydraulic engineer, irrigation engineer, agronomist, agro-economist, safeguards, procurement, financial management

Skills Needed	Number of Staff Weeks	Number of Trips
Technical (Hydraulic engineer, irrigation engineer, agronomist, agro-economist, governance)	6 weeks / year	2 per year
Procurement	3 weeks / year	2 per year
Financial management	2 weeks / year	2 per year
Safeguards	2 weeks / year	1 per year

ANNEX 4: ECONOMIC AND FINANCIAL ANALYSIS

COUNTRY : Tunisia

Tunisia Irrigated Agriculture Intensification Project

I. INTRODUCTION

1. This annex presents the economic and financial analysis of the Tunisia Irrigated Agriculture Intensification Project (mentioned hereafter as the project). Financial analysis aims at demonstrating that income-generating activities on farm and off-farm, as proposed by the project, are profitable and therefore sustainable. The economic analysis aims at demonstrating that, from an economic perspective, the project as a whole is viable, taking into account, as much as possible, all quantifiable and additional costs and benefits in with and without project situations using economic values and prices.
2. The project is expected to generate substantial net incremental benefits mainly through (i) improved irrigation and road infrastructure; and (ii) improved access to market through development of productive alliances and value chain support activities. It will maintain and even increase the value of public goods (public hydraulic and road assets) which may serve many more beneficiaries than the mere water users.
3. The irrigation infrastructure improvement component would concentrate on upgrading selected irrigation schemes covering about 25,900 ha, and improving water delivery and water management. During six years of the project implementation, investments in irrigation infrastructure would benefit to about 3,500 producers. The component is expected to produce the following benefits: (i) yield increases on currently irrigated lands; (ii) improved cropping patterns towards more lucrative crops; and (iii) improvement of the service level and water supply due to water savings. Furthermore, it is expected that a new management structure will benefit from improved water cost recovery and will improve the financial situation of water management units (currently DGAs and CRDAs).
4. Improved access to appropriate markets (through productive alliances and value chain support activities conducted under Component 3) for rural small-scale producers and enterprises would lead to the creation of new business opportunities and an increased income for farmers and entrepreneurs (including young entrepreneurs and women entrepreneurs). Benefits would possibly derive from: (i) improved production of high value products; (ii) enhanced quality of products; (iii) reduced production costs through modernization of production technology; and (iv) incremental employment. Given the demand driven character of the project, the sites for private investments to be supported under Component 3 are not yet known.
5. Therefore, the analysis of the VC supporting activities have an illustrative purpose, to present the types of activities that could be supported by the project and the type and magnitude of expected benefits. The analysis of the irrigation infrastructure improvement component has been conducted based on data from Siliana and Jendouba irrigation schemes (Laaroussa and Lakhdar schemes), representing together about 16,300 ha or about 64 percent of the surface to be rehabilitated by the project.

II. DATA SOURCES AND GENERAL ASSUMPTIONS

6. **Sources.** The data used in this analysis have been collected from MAHRP; additional data were collected through review of feasibility studies prepared for irrigation schemes selected under the project, as well as from the study *Etude d'évaluation de la politique tarifaire et révision et mise en oeuvre de nouveaux modes de tarification en Tunisie* (the "tariff study", April 2017). In particular, information was collected on labor and input requirements for various crops, capital and operation costs, prevailing wages, yields, farm gate and market prices of agriculture produce.

7. **Exchange Rate.** The official currency exchanges of the Tunisian Dinar (TND) into foreign currencies are free. The official exchange rate of TND 2.4 = USD 1 (average actual rate for May 2017) has been used throughout the present analysis.
8. **Prices.** Input and output prices have been collected from the feasibility studies and inflated (using inflation data from EIU) to obtain 2017 constant prices. Conversion factors have been used in economic analysis for different crops and products to account for a distortion perceived in the market prices with respect to border prices. Conversion factors used in the present analysis have been provided by the feasibility studies of irrigation schemes.
9. **Cost of Labour.** The standard salary for agricultural unskilled labor in the project areas is about TND 15 per day. Given the lack of precise information on rural employment in the project area and consequently on the real opportunity cost of agricultural labor, a Shadow Wage Rate Factor (SWRF) of 0.95¹ has been used in the economic analysis to reflect the opportunity costs of unskilled labor in the project area. Labor is assumed to be hired labor.
10. **Cost of Water.** Irrigation fee considered in the present analysis has been based on the tariff study, conducted for Siliana and Jendouba irrigation schemes. Water tariffs used in the analysis are 0.065 TND/m³ at GDA level and 0.09 TND/m³ at farmers' level for normal tariffs, and 0.045 TND/m³ and 0.065 TND/m³, respectively, for preferential tariffs² for Siliana. For Jendouba, it is 0.045 TND/m³ at GDA level and 0.065 TND/m³ at farmers' level for normal tariffs, and 0.023 TND/m³ and 0.033 TND/m³, respectively, for preferential tariffs³. The economic cost of irrigation water in Siliana would be as high as 0.27 TND/m³ at farmers' level⁴ in Siliana, and 0.296 TND/m³ in Jendouba⁵. It's been conservatively assumed that the whole area is currently irrigated, although water availability is unreliable and water volume is insufficient in many areas.
11. **Production models.** In calculating the overall benefits from investments in irrigation infrastructure, following assumptions were used:
 - a. The analyzed area (Jendouba and Siliana irrigation scheme) has been divided between 5 production models in Siliana and 4 production models in Jendouba: All models present different cropping patterns and yields.
 - b. Incremental benefits are estimated by comparison of the without project (WOP) and the with-project (WP) gross margins per hectare of a representative selection of typical crops for each type of farm (M1 to M4/M5). The results were further aggregated in the benefits cash flow for the entire irrigation scheme.

1 Assumption used in the feasibility studies prepared for selected irrigation schemes.

2 Applied to cereal crops

3 Tarification binome au niveau des grands PPI: cas de Jendouba, p.40.

4 Tarification binome au niveau des grands PPI: Cas de Siliana (Avril 2017)

5 Tarification binome au niveau des grands PPI: cas de Jendouba, p.41.

Table 4.1: Production models.

a) Siliana

	%	ha	exploitation type	average model used
M1	20%	538	small cereal production farm	S<4ha 2.5
M2	14%	377	small mixed production farm	S<4ha 2.5
M3	22%	592	medium farm	S<4<10ha 5
M4	27%	727	large farm	S>10ha 20
M5	17%	458	SMVDA El Borj Industrial	463ha 463
	100%	2692		
Source: Hydroplant study				

b) Jendouba

	%	ha	exploitation type	model used
M1	9%	850	small cereal production farm	S<4ha 4
M2	18%	1700	small mixed production farm	S<4ha 8.5
M3	15%	1417	medium farm	S<4<10ha 1
M4	58%	5479	large farm	S>20ha 325
	100%	9446		
Source: CRDA study, Etude de faisabilité, Jendouba				

12. The estimated incremental benefits are considered to be relatively conservative. The analysis excludes a number of possible benefits in the WP scenario in order to simplify the analysis and to avoid the risk of over-estimating benefits. Excluded quantifiable benefits are: (i) non-irrigated crops and abandoned land in the WOP scenario; (ii) a further decline in the irrigated area in the WOP scenario; (iii) cropping intensity WOP has been assumed 100 percent and (iv) a non-farm income from employment during the rehabilitation works.
13. **Cropping Patterns¹ and Yields.** Overall, the cropping pattern in Siliana is dominated by cereals, arboriculture, followed by horticulture and fodder. However, each production model presents a particular pattern. Improved water availability in the currently irrigated agricultural area and restored water supply are expected to result in increased cropping intensity (to 120 percent WP), in increased yields (10 percent)² and a shift of the cropping pattern towards higher value crops. This is expected to occur at the expense of areas currently used for production of cereals and fodder. Given the fact that each production model (or type of farm) will use a different technical/ agronomic package, yields will also vary for each model. For Jendouba, current cropping pattern and yield data has been collected from the tariff study, while assumptions for the WP situation were taken from the feasibility study prepared by CRDA of Jendouba. Overall, cropping pattern in Jendouba is dominated by cereals and forage (especially in larger farms), with vegetables, pulses and citrus having a smaller share. For Siliana, the analysis followed assumptions presented in the feasibility study, and included an assumption of the change in the cropping pattern. For Jendouba, the analysis tried to present additional scenarios (6 in total), with and without change in the existing cropping pattern, with different yields' response to water and with different water costs.

¹ The cropping patterns are derived from the Laaroussa and Lakhdar PPIs, as deemed representative for the respective zones.

² WOP situation presents the yields collected from the *Etude d'évaluation de la politique tarifaire et révision et mise en oeuvre de nouveaux modes de tarification* study in Jendouba. An indicative 10% increase has been used in WP situation, given the inconsistency in yield data found in the *Feasibility study for Laaroussa PPI*.

III. Project Benefits

14. The project is expected to generate substantial net incremental benefits coming mainly from two types of investments: (i) rehabilitation of irrigation schemes and instauration of more reliable and efficient irrigation service, and (ii) creation of market linkages and support to value addition in irrigated agriculture.
15. The benefits of investments in rehabilitation of irrigation schemes and instauration of more reliable and efficient irrigation service would mainly arise from increased agricultural (crop) production due to better access to water and more efficient irrigation system; increased ability to move into higher value crops; increased livestock production due to increased water availability; improved water resources management and water savings; and increased efficiency of water management entities using a commercial approach towards service delivery.
16. The benefits from support to market linkages and value addition in irrigated agriculture would potentially arise from: (i) enhanced access to market through development of value chain support activities (possibly through schemes such as productive alliances or contract farming); (ii) quality improvement in products and value addition along the chain; (iii) changes in temporal value of products through improved storage facilities which would allow the product to be sold at a time when prices are more favorable; (iv) losses avoided during production, processing and transportation of produce through improved storage, processing and rural infrastructures; (v) an increased proportion of farm produce being marketed; (vi) better access to finance resulting in additional investments and generating additional salaried employment, thereby increasing demand for agricultural produce as well as professional and input services (multiplier effect).

IV. Financial Analysis

A. Primary Production Crop Models

17. Several illustrative crop budgets were prepared to show the impact of the potential investments in irrigation on agricultural production. The WOP situation represents crops with insufficient irrigation or rain fed (for cereals and fodder), the WP models illustrate impact of better irrigation on crop yields and cropping pattern. Summary of the crop budgets and underlying technical assumptions on which these models are based, are presented below.
18. It is expected that more water available and its more reliable supply will have an impact on yields and furthermore, on crop intensification, allowing for a three-field system (instead of a current two-field) where farmers could plant more crops and therefore increase production. Introduction of horticultural crops (for small farms) will allow a shift towards a higher value crop, while introduction of legumes (for larger mixed farms with a diversified cropping pattern) will have a positive impact on productivity (legumes have the ability to fix nitrogen and so fertilize the soil). For Siliana, WP situation presents two scenarios (WP1 and WP2), calculated using different water prices (financial prices collected in 2017 used in WP1 models, and prices increased by 25 percent used in WP2 models). Financial results per crop and per hectare for two scenarios are presented in Table 4.2 (a).
19. For Jendouba, WOP model has been prepared using the data from the tariff study. It's been assumed that cereals and fodder are cultivated in rain fed conditions, while vegetables and citrus are insufficiently irrigated¹. WP situation has 6 different scenarios: a) scenario 1 shows water consumption (and therefore water cost to the farmer) increase, yield increase and a cropping pattern change² (as per

¹ Etude de faisabilité du CRDA Jendouba shows that about 50% of potatoes are irrigated (drip); the same assumption was used in the analysis for vegetable crops and citrus, given lack of more precise data.

² Introduction of a three-field system: 1 sole cerealière, 1 sole maraîchère, 1 sole fourragère, plus introduction d'une culture dérobée (maïs / sorgho). Intensification: 120%

Jendouba CRDA assumptions), with water charges paid by the farmer at the current rate¹; b) scenario 2 uses the main assumptions of the scenario 1, however water charges are increased by 25 percent; c) scenario 3 presents conservative assumptions that there will be no cropping pattern change and furthermore, no positive yield response to increased water consumption, with water charges paid by the farmer at the current rate²; d) scenario 4 uses the assumptions of the scenario 3, applying increased (by 25 percent) water tariffs; e) scenario 5 shows no changes in cropping pattern and increased yields, with 25 percent water fees increase; and f) scenario 6 uses the assumptions of the scenario 5 (no changes in cropping pattern, increased water consumption and increased yields), and applies increased (by 25 percent) water tariffs. A summary of the results is shown in Table 4.2 (b).

Table 4.2: Summary incremental financial net benefits per model and per ha (TND)

a) Siliana

	scenario 1			scenario 2	
	per model	per ha		per model	per ha
M1	1,242	497	✓	1,071	429
M2	1,249	499	✓	1,112	445
M3	14,346	2,869	✓	5,676	1,135
M4	24,555	1,228	✓	22,848	1,142
M5*	67,804	146	✓	48,786	105
N.B.: incremental net benefits of the M5 are due only to an increase in yields; no assumption was made on intensification/cropping pattern change due to the lack of data					

b) Jendouba

	scenario 1		scenario 2		scenario 3		scenario 4		scenario 5		scenario 6	
	per model	per ha	per model	per ha	per model	per ha	per model	per ha	per model	per ha	per model	per ha
M1	3,258	815	2,587	647	-263	-66	-476	-119	5,599	1,400	1,643	411
M2	9,506	1118	8,719	1,026	899	106	518	61	10,325	1,215	11,633	1,369
M3	19,954	1287	19,681	1,270	-913	-59	-1,178	-76	16,974	1,095	18,119	1,169
M4	497,284	1532	508,695	1,568	-18,271	-56	-22,710	-70	125,627	387	157,707	486

B. Farm Level Analysis

20. For the financial analysis at the farm level, crop budgets results were aggregated in a typical farm budget for each production model. Typical cropping patterns per farm type were applied to the number of hectares per farm to obtain the number of hectares per crop and per farm. Returns per farm were obtained by multiplication of a return per hectare and per crop by the number of hectares under this crop within the farm. These farm budgets represent indicative illustrations of an average benefit per farm with the objective to demonstrate the level of the impact per farm from investments in irrigation as promoted by the project.
21. Financial impact of the project on farm households will varies depending on the size of the farm and crops cultivated. Overall, calculations done for Siliana show that expected yield increase as well as intensified production will allow for more produce to be available to sell, increasing revenue for all

¹ 0.045 TND/m³ at GDA level and 0.065 TND/m³ at farmers' level for normal tariffs, and 0.023 TND/m³ and 0.033 TND/m³, respectively, for preferential tariffs.

² 0.045 TND/m³ at GDA level and 0.065 TND/m³ at farmers' level for normal tariffs, and 0.023 TND/m³ and 0.033 TND/m³, respectively, for preferential tariffs.

types of farms. However, incremental net benefits are expected to be less important for small cereal and mixed farms than for large and medium ones due to a larger share of horticultural crops and higher yields. Calculations done in the scenario 2 using water price increased by 25 percent show positive net benefits for all types of farms.

22. In Jendouba larger farm models show smaller benefits per hectare due to an important share of cereals and fodder in the cropping pattern and relatively low yields¹. Furthermore, scenarios 3 and 4 show that with an unchanged situation (no cropping pattern change and no yield improvement), an increased water bill (at increased or even at current rate) will be not financially sustainable for the farmer. A positive yield response to increased water (scenario 5 and 6) would allow the farmer to pay its full water consumption at current as well as at increased (+25 percent) rate and still have positive incremental net benefits, even without a change in a cropping pattern.

C. Irrigation Scheme Analysis

23. **Irrigation Scheme Model.** The illustrative financial crop models per hectare discussed here above have been used to aggregate financial benefits per irrigation scheme. Several irrigation schemes models have been made, based on data available for Laaroussa (Siliana) and Lakhdar (Jendouba) schemes to illustrate the returns obtained per scheme. Investment costs have been estimated at about TND 54.7 million for Jendouba and about TND 31 million for Siliana. Recurrent costs - including small equipment and infrastructure replacement as well as maintenance costs – were estimated at 543 TND/ha/year in Siliana² and 248 TND in Jendouba³. It's been assumed that the rehabilitation works will progress over the whole investment period; first (partial) benefits are expected in the first year; full benefits will be reached in year 3. Two scenarios were applied to the Siliana model (scenario 1: changed cropping pattern and water price as it has been collected in 2017, and scenario 2: change cropping pattern and water price with a 25 percent increase). Two other scenarios were applied to Jendouba model (scenario 1: no change in cropping pattern and water price as it has been collected in 2017, and scenario 2: no change in cropping pattern and water price with a 25 percent increase). The investment would yield a 18 percent FIRR for scenario 1 and 12 percent FIRR for scenario 2 in Siliana, and a 12 percent FIRR for both scenarios in Jendouba showing robustness to potential water price increase. The summary of the analysis is presented in Table 4.3 (a) and (b).

Table 4.3: Financial Analysis Summary. Irrigation Scheme Models

a) Siliana

Siliana: irrigation scheme financial analysis (scenario 1)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
% realization	7	21	28	25	18	1				
COSTS										
Investment costs	2,210,077	6,530,736	8,559,165	7,833,538	5,495,320	379,164				
Recurrent costs		93,504	187,008	739,613	1,463,857	2,126,700	2,591,693	2,591,693	2,591,693	2,591,693
Total costs	2,210,077	6,624,240	8,746,173	8,573,152	6,959,177	2,505,864	2,591,693	2,591,693	2,591,693	2,591,693
BENEFITS	332,103	1,424,162	3,148,148	5,081,116	6,727,982	7,490,574	7,490,574	7,490,574	7,490,574	7,490,574
CASH FLOW	(1,877,974)	(5,200,078)	(5,598,025)	(3,492,036)	(231,195)	4,984,710	4,898,881	4,898,881	4,898,881	4,898,881
IRR	18%									
NPV	25,510,336									

¹ Yields for WP scenarios were taken from the Feasibility study prepared by the CRDA of Jendouba.

² Tarification binome au niveau des grands PPI: cas de Siliana

³ Etude de faisabilité, CRDA Jendouba (with project situation, FEA, p. 113.)

Siliana: irrigation scheme financial analysis (scenario 2)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
COSTS										
Investment costs	2,210,077	6,530,736	8,559,165	7,833,538	5,495,320	379,164				
Recurrent costs		93,504	187,008	739,613	1,463,857	2,126,700	2,591,693	2,591,693	2,591,693	2,591,693
Total costs	2,210,077	6,624,240	8,746,173	8,573,152	6,959,177	2,505,864	2,591,693	2,591,693	2,591,693	2,591,693
BENEFITS	279,535	1,198,733	2,649,830	4,276,831	5,663,016	6,304,898	6,304,898	6,304,898	6,304,898	6,304,898
CASH FLOW	(1,930,542)	(5,425,508)	(6,096,343)	(4,296,321)	(1,296,161)	3,799,034	3,713,205	3,713,205	3,713,205	3,713,205
IRR	12%									
NPV	12,286,962									

b) Jendouba

Jendouba: irrigation scheme financial analysis (scenario 1, TD)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
COSTS										
Investment costs	3,900,135	11,524,829	15,104,408	13,823,891	9,697,624	669,113				
Recurrent costs		102,927.64	205,855	814,154	1,611,388	2,341,035	2,852,891	2,888,107	2,888,107	2,888,107
Total costs	3,900,135	11,627,756	15,310,264	14,638,045	11,309,013	3,010,148	2,852,891	2,888,107	2,888,107	2,888,107
BENEFITS	365,275	1,688,171	3,822,390	6,060,182	7,831,567	9,652,009	9,652,009	9,652,009	9,652,009	9,652,009
CASH FLOW	(3,534,860)	(9,939,585)	(11,487,873)	(8,577,863)	(3,477,446)	6,641,861	6,799,118	6,763,902	6,763,902	6,763,902
IRR	12%									
NPV	22,855,586									

Jendouba: irrigation scheme financial analysis (scenario 2, TD)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
COSTS										
Investment costs	3,900,135	11,524,829	15,104,408	13,823,891	9,697,624	669,113				
Recurrent costs		102,927.64	205,855	814,154	1,611,388	2,341,035	2,852,891	2,888,107	2,888,107	2,888,107
Total costs	3,900,135	11,627,756	15,310,264	14,638,045	11,309,013	3,010,148	2,852,891	2,888,107	2,888,107	2,888,107
BENEFITS	368,808	1,704,501	3,859,365	6,118,803	7,907,323	9,733,623	9,733,623	9,733,623	9,733,623	9,733,623
CASH FLOW	(3,531,327)	(9,923,255)	(11,450,898)	(8,519,241)	(3,401,689)	6,723,475	6,880,732	6,845,516	6,845,516	6,845,516
IRR	12%									
NPV	23,677,031									

D. Scheme Operator Analysis

24. For the financial analysis at the scheme operator level, a specific financial model was established using data from the tariff study extrapolated to all seven schemes included in the project in the four northwestern governorates. The total area under the operator's purview would be 21,800 ha. The model takes into account the current price for water and current level of GDA debt (based on 2016 data from tariff study) and makes projections for tariff increase and debt recovery until 2029. In the WP situation the model incorporates assumptions related to increased technical and financial efficiency of the operator, as compared to the current CRDA – GDA institutional model. The results are provided in the following table.

Table 4.4: Scheme Operator Analysis (TND values)

Situation	Without Project	With Project
Annual tariff increase in real terms	0%	5%
Total tariff increase during project lifetime in real terms	0%	25%
GDA Debt at project start (2018)	16,259,752	
GDA Debt at project end (2024)	32,117,886	14,920,454
GDA Debt in 2029	48,526,514	5,386,136
Cumulated O&M subsidy by 2029	87,513,614	15,409,873
Cost recovery rate by end of project	29%	92% ¹

¹ A lower target value of 80% is retained in the result framework in order to account for unexpected circumstances.

Cost recovery rate by 2029	24%	101%
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25. The total amount of O&M subsidy to be paid to the operator in order to balance its accounts over the 2020-2023 period is estimated by the model at TND 12.5 million.

V. VALUE ADDITION

26. One of the objectives of the project is to help improve market linkages and boost value addition in irrigated agriculture. The value chain approach is not very well developed yet in Tunisia. The concept is known, but still very little applied in practice. The project intends to help fill this gap, however concrete policy options as well as activities to be promoted by the project (that could be very different from one irrigation scheme to another), as well as the selection of crops to be supported will be confirmed at a later stage of project formulation.
27. The project will work not only on the supply side (building the capacity of farmers to produce up to market specifications), but also on the demand side, developing competitive agricultural value chains. Cheese value chain has been selected to illustrate dynamics, challenges and potential within a value chain and possible impact from project interventions. Data used are based on the stock-taking study carried out in the areas of intervention.¹

A. Indicative Activity Models.

28. Cheese processing value chain. Cheese processing sector consists of 50 cheese production units using fresh milk (industrial and artisanal facilities) with a processing capacity of around 500,000 liters/day, and 5 processed cheese production units from imported cheese off-cuts with a total capacity of 8,000 tons per year. In addition to these units, several artisanal cheese dairies produce mostly fresh cheeses. Cheese (fresh, pressed and processed) represents about 17 percent of all dairy production in the country.
29. Tunisia's current cheese production prospects are greatest for processed cheese. With 70 percent of the current local cheese market and a substantial global market (USD 2.6 billion in global imports in 2015), this type of cheese represents great opportunities for export. Tunisia is nearly self-sufficient in the category and has an established export market of USD 2.4 million (709,559 MT) in 2015. However, market opportunities for cheese production in Tunisia are facing some limitations, mainly: a) milk quality; and b) absorption capacity of current processing units (as milk oversupply creates temporary problems)². Given the fact that dairy sector operates within a fixed milk pricing system, where the price paid to farmer (currently TND 0.73/liter) doesn't reflect production costs, and therefore doesn't encourage producers to improve milk quality. **Error! Reference source not found.** presents the value chain for industrial cheese processor.
30. Dairy processing/cheese making unit model was prepared, based on this data, as well as on the information collected during design of the World Bank-funded ILMP. Cheese and fermented milk products are highly valued throughout the country. Capital to expand capacity for cheese/dairy processors would stimulate the demand for milk production, absorbing some excess of supply, and providing a significant benefit to dairy farmers. The viability of this expansion would be highly dependent on the assurance of steady supply of fresh milk (presently some processors already contract with farmers to guarantee a minimum supply of milk) and could be reinforced by the investment in the livestock drinking points and improved herd management practices.

¹ Tunisia Agriculture Sector Study: Wheat and dairy value Chain Analysis, GDS (March 2017)

² GDS report mentions that cheese production currently operates at its maximum capacity.

31. The model assumes creation of a new enterprise within Laaroussa irrigation scheme, purchasing milk from about 80 farmers based in the area, and processing about 792,000 liters of milk annually at full development (YR 3), with an additional production of 87,120 kg of cheese at full development. Incremental revenue is derived from sales of cheese, which is sold in the same year that the milk is purchased. At full development, the enterprise would purchase the milk of 282 cows, mostly owned by smallholders. The model shows an incremental net benefit of TND 322,269 per year. The model results in an internal rate of return of 12 percent over 10 years.

B. Productive Alliance Approach.

32. The Project will be promoting Productive Alliances (PA) approach, with alliances expected to generate significant positive impacts in terms of increases in (i) production, (ii) sales, (iii) income and (iv) employment and, (v) spill overs for the completed PA projects. Ex-post evaluation of PA projects shows that producers benefit from better product quality and diversification and hence increased sales volume and prices and, higher income of beneficiary households. Specifically, increases in sales have been reported to range between 20 percent and 60 percent¹ (measured by sales receipts, sales volume marketed, net sales revenue, or absolute sales value). It's been assumed that with the project, PAs created within selected value chains will contribute to 20 percent sales increase.
33. The project will support establishment of formal agreements between groups of organized farmers and a buyer for the provision of the commodities supported by the project, in a specified quantity and quality, through investment in production and marketing and technical assistance. These agreements will mainly bring the following benefits:
- a. **Economies of scale and reliability of the delivery.** Within cheese value chain, milk have been increasingly collected through formal channels, however due to low milk quality, the rejection of processors buying from collectors is about 15 percent annually. For agro-processors who are interested in purchasing large quantities, a reliable and sizable supply is often a serious challenge. At the same time, during peaks lactation (March to May) there is an oversupply of milk, as to compare to the capacities of industrial processors. PA promote and support farmers' organization and therefore offer an interesting opportunity for commercial partners eager to stabilize their input provision. The reduction of logistical costs due to economies of scale is part of the benefits for the buyer, as well as the reduced risk on the reliability of the supply.
 - b. **Quality of the products and value addition.** The project will provide technical assistance to the organized farmers participating in the project. The effects of this technical assistance will be reflected in the improved quality of the products produced within the value chain, which represents an advantage for buyers interested in commercializing high quality agricultural products (e.g. higher quality cheeses), as well as for the sellers that are able to access a higher quality segments of the market (i.e. organic certification, GI, new cheese varieties, etc).
 - c. **Better access to the market (for dairy farmers and collectors).** The farms involved in milk production benefit at the first stages of the value chain from improved quality and higher price obtained for it (farms selling high quality milk directly to processors report prices up to TND 0.92/liter instead of TND 0.73/liter), as well as from a guaranteed market and an increased demand. On the processor's side, improved milk quality and logistics improvements will contribute to export market development in volume (as excess of milk could be utilized) and in value (as higher milk quality would allow to engage in production of higher value cheese production and new markets).

¹Linking Farmers to Markets through Productive Alliances, World Bank (2016)

VI. Economic analysis

34. **Benefit Stream.** The illustrative financial crop and farm models discussed here above have been used as a basis for the calculation of the overall (economic) benefit stream of the Laaroussa irrigation scheme, after conversion of the financial prices into economic values.¹ Given that at this stage it would be difficult to precisely identify the types of value chain support, or crops supported, the illustration dairy models (milk production and cheese processing model) weren't integrated to the calculation of overall economic benefits of the irrigation schemes. However, calculations made using economic values show an incremental net benefit increase for milk producers, while the use of economic value of milk purchased by the cheese processor decrease its benefits to negative values (unless it's assumed that a quality premium is paid for a higher quality cheese produced).
35. **Cost Stream.** In order to estimate the scheme's economic viability, in terms of Economic Internal Rate of Return (EIRR), the cash flow calculated includes the irrigation scheme rehabilitation costs, as estimated during the design mission. These costs include all investments as well as their recurrent costs (mainly operation and maintenance).
36. **Estimated Return.** The base case Economic Internal Rate of Return (EIRR) is estimated at 19 percent over twenty years for Siliana model (assuming a cropping pattern change and an economic cost of water of 0.27 TND/m³). The base case Net Present Value of the scheme's net benefit stream, discounted at 5 percent², is TND 10.7 million. For Jendouba, the base case Economic Internal Rate of Return (EIRR) is estimated at 11 percent (assuming no cropping pattern change and an economic cost of water of 0.296 TND/m³), and the Net Present Value at TND 19.3 million. The summary of the economic analysis is presented in Table 4.5 (a) and (b). The analysis has been conducted based on data collected for Laaroussa and Lakhdar irrigation schemes, as estimated to be representative of the type of rehabilitation works as well as the type of benefits expected. Therefore, similar results can be expected from the other irrigation schemes under the project.

Table 4.5: Summary of the economic analysis

a) Siliana

Siliana: irrigation scheme economic analysis										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
	0.585	1.17	1.755	1.17	0.585	0.585				
COSTS										
Investment costs	2,210,077	6,530,736	8,559,165	7,833,538	5,495,320	379,164				
Recurrent costs		84154	168307	665652	1317471	1914030	2332523	2332523	2332523	2332523
Replacement costs										
Total costs	2,210,077	6,614,890	8,727,472	8,499,190	6,812,791	2,293,194	2,332,523	2,332,523	2,332,523	2,332,523
BENEFITS	329,706	1,413,882	3,125,424	5,044,440	6,679,419	7,436,506	7,436,506	7,436,506	7,436,506	7,436,506
CASH FLOW	(1,880,371)	(5,201,008)	(5,602,048)	(3,454,750)	(133,373)	5,143,312	5,103,983	5,103,983	5,103,983	5,103,983
IRR	19%									
NPV	10,709,361									

b) Jendouba

Jendouba: irrigation scheme economic analysis (TD)										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10-20
COSTS										
Investment costs	3,900,135	11,524,829	15,104,408	13,823,891	9,697,624	669,113				
Recurrent costs	-	102,928	205,855	814,154	1,611,388	2,341,035	2,852,891	2,888,107	2,888,107	2,888,107
Total costs	3,900,135	11,627,756	15,310,264	14,638,045	11,309,013	3,010,148	2,852,891	2,888,107	2,888,107	2,888,107
BENEFITS	365,564	1,567,654	3,465,341	5,593,067	7,405,864	9,355,706	9,355,706	9,355,706	9,355,706	9,355,706
CASH FLOW	(3,534,571)	(10,060,102)	(11,844,922)	(9,044,978)	(3,903,149)	6,345,558	6,502,815	6,467,599	6,467,599	6,467,599
IRR	11%									
NPV	19,310,519									

VII. CARBON SEQUESTRATION

¹ In calculating the overall benefits all amounts in the financial models equivalent to simple transfer payments within the economy (subsidies, taxes and loans) have been excluded.

² Source: Technical Note on Discounting Costs and Benefits in Economic Analysis of World Bank Projects

37. Carbon-Balance Appraisal has been conducted (using Ex-ACT tool) for Component 2 (irrigation infrastructure improvement) of the Project. Since the details of site-specific interventions of Components 1 and 3 (institutional modernization and support to market access) are still in development, there was no sufficient data to conduct an Ex-Act assessment.
38. The analysis takes into account Component 2 presented in the analysis above which supports most of technical activities foreseen by the project, and which is therefore expected to have a relevant impact on the carbon balance: a) developing agroforestry; b) improving annual; c) improving land with inputs; d) investing in irrigation systems.
39. The project foresees to support agroforestry by improving irrigation within degraded tree plantations. It should allow for the protection of watersheds by reducing erosion and sedimentation, but also by sequestering carbon, which should impact positively on carbon balance. The project will also promote the adoption of improved agricultural practices in annual crops which should allow for both an increase in yields and a reduction in carbon emissions. Improving annual crops is expected through sustainable intensification diversification of irrigated and rainfed agricultural systems within the project area. Improved practices will consist mainly in adopting new measures in irrigation, which should ensure an increase in productivity in a conservative approach that strengthens the management of natural resources to improve the environment and living conditions. Furthermore, it should generate substantial financial and economic benefits.
40. The project will be implemented over a 6-year period. The carbon accounting method also integrates a capitalization phase (14 years) which should cumulate to 20 years when summed to the project implementation phase. Within Ex-ACT, each improved practice implies a corresponding mitigation potential. The biggest potential in our case comes from the adoption of improved water management.
41. The total project area covers 25,900 ha of land, nearly all being cropped. The croplands are composed of: annual crops, tree crops, wetlands (to be drained under the project) and some fallow agricultural land that will be converted to cultivation with better irrigation. There is almost no land use change within the project for the croplands as project activities are fostering the implementation of changes in water and land management and not in land use.
42. Component 2 creates a total emission of 22 tons of equivalent CO₂, but also creates a total net sink carbon balance of about 0.4 million tons of eq-CO₂ of avoided emissions or increased carbon sequestration over the full analysis duration of 20 years. The project shows a mitigation potential generated mainly by agricultural activities of the component (promotion and adoption of more sustainable practices in annual crops and water management). This is equivalent to reduced emissions of -20 tCO₂-e per hectare over the full duration or -1 tCO₂-e per hectare annually.
43. Carbon balance values can be roughly estimated with an opportunity price ranging between USD 39 and 80 per tCO₂-e by 2020 and rising to USD 50 -100 per tCO₂-e by 2030. Using a low estimate of the carbon price, the net benefit of GHG emissions over 20 years constitutes a value of USD 14.9 million¹, while it is USD 29.6 million when using high estimate. This shows that the PPI's current internal returns (between 11 and 19 percent, depending on scenario used) could potentially increase when environmental return is considered.

¹ Shadow price of carbon discounted at the same discount rate used for the other costs and benefits of the analysis.



Climate change co-benefits (adaptation and mitigation)

44. The project interventions are expected to generate both adaptation and mitigation co-benefits as qualitatively described in the below tables.

Components and Sub-Component	Description of Potential Climate Change Adaptation Co-Benefits
Component 1: Institutional modernization	
Subcomponent 1.1: establishment of new irrigation management entities (US\$9.4 million IBRD)	Activities under Component 1 are inherently geared towards improving the irrigation service for farmers, thus improving their overall resilience to climate change.
Subcomponent 1.2: irrigation efficiency improvement (US\$0.8 million IBRD)	Subcomponent 1 will contribute to strengthen the institutions in charge of irrigation schemes O&M, thus ensuring longer lifespan through improved routine maintenance of the infrastructure and equipment. It will also help these institutions devise drought management plans. The interventions carried out by the new institutions at the scheme level will have a strong climate-smart dimension and will serve as a blueprint for future interventions in other irrigation schemes. Subcomponent 1.2 will help famers reduce their water use at the field level by better timing their irrigation schedules— thanks to the development of irrigation management support tools (remote sensing, in-field data collection and irrigation advice delivery tools and associated training that are all climate-informed in design). All these activities will directly contribute to building their resilience to climate variability and climate change and ensure that they are able to maintain their livelihoods in the face of growing threats for Tunisian agriculture—as described above (Climate Variability Context).
Component 2 Rehabilitation and improvement works	
Subcomponent 2.1: rehabilitation and improvement works (US\$93.5 million IBRD)	Activities carried out under these 2 subcomponents will help substantively increase the overall efficiency of irrigation schemes. The avoided water losses in the irrigation schemes will ensure that the total quantity of water stored in the dams is more effectively used to help the overall Tunisian agricultural sector be more resilient in the face of climate variability and climate change. A more reliable and more flexible irrigation service will also ensure that farmers are able to develop fine-tuned strategies to cope with climate variability and climate change, thus increasing their overall resilience.
Subcomponent 2.2: common services and goods (US\$12.6 million IBRD)	
Component 3: Support to agricultural development and market access	
Subcomponent 3.1: strengthening the capacity of producers (and producer organizations) and linking them to the market (US\$9.3 million IBRD)	Activities under these 2 subcomponents will strengthen agriculture’s overall climate resilience, at different levels of the value chains. In particular, these interventions will bring about adaptation co-benefits, with, e.g. more efficient irrigation technologies that could be adopted by beneficiaries in their production processes—notably through the IBRD-financed matching grant scheme. More broadly, adaptation co-benefits would also be brought about by a better organization of supply chains, which would ensure that value chain stakeholders are better able to cope with climate-induced



Components and Sub-Component	Description of Potential Climate Change Adaptation Co-Benefits
Subcomponent 3.2: boosting product marketing and developing competitive value chains (US\$11.3 million IBRD)	shocks and disruptions At the production level, interventions supporting higher quality products would bring about climate change co-benefits— e.g. certification schemes contain provisions that help farmers adopt new practices/techniques and varieties that increase their resilience to climate change and climate variability. In addition, the diffusion of technological innovation will boost farmers' adaptation to climate change, notably by helping them better time their harvests.
Component 4: Project management	
Project management (US\$2.8 million IBRD)	This component will contribute to the implementation of the three technical components

Components and Sub-Component	Description of Potential Climate Change Mitigation Co-Benefits
Component 1: Institutional modernization	
Subcomponent 1.1: establishment of new irrigation management entities (US\$9.4 million IBRD)	The increased efficiency in irrigation management brought about in the activities supported under Component 1 will lead to a better timing of the application of complementary inputs—seeds, fertilizers, pesticides, etc.—which will increase the overall efficiency of agricultural practices, thus resulting in mitigation co-benefits—owing to the more efficient use of machineries like tractors, harvesters, seeders—by reducing energy use overall, thus yielding energy efficiency benefits that are expected to lower net greenhouse gas emissions.
Subcomponent 1.2: irrigation efficiency improvement (US\$0.8 million IBRD)	
Component 2 Rehabilitation and improvement works	
Subcomponent 2.1: rehabilitation and improvement works (US\$93.5 million IBRD)	The activities carried out under Component 2 will generate energy savings by, e.g., replacing old pumps with more energy-efficient ones, thus decreasing net greenhouse gas emissions linked to fossil fuel energy consumption.
Subcomponent 2.2: common services and goods (US\$12.6 million IBRD)	
Component 3: Support to agricultural development and market access	
Subcomponent 3.1: strengthening the capacity of producers (and producer organizations) and linking them to the market (US\$9.3 million IBRD)	Activities under these 2 subcomponents will bring about mitigation co-benefits, with, e.g. renewable energy that could be adopted by beneficiaries in their production processes—notably through the IBRD-financed matching grant scheme. More broadly, mitigation co-benefits would also be brought about by a better organization of supply chains, which would spur better logistical efficiency overall, thus leading to higher energy efficiency and decreased greenhouse gas emissions.



Components and Sub-Component	Description of Potential Climate Change Mitigation Co-Benefits
Subcomponent 3.2: boosting product marketing and developing competitive value chains (US\$11.3 million IBRD)	At the production level, interventions supporting higher quality products would bring about climate change co-benefits— e.g. certification schemes contain provisions that help farmers adopt new practices/techniques that could also help tap the mitigation potential that can arise from improved agricultural practices and the ensuing increased carbon sequestration in soils. In addition, the diffusion of technological innovation will help farmer better time their harvests and thus decrease post-harvest losses, leading to a decrease in greenhouse gas emissions (notably methane). As no assumption was made in the GHG accounting exercise regarding improved agronomic practices and manure management, it can be safely argued that the amount of 624,275 tCO₂eq over 20 years in emission reductions is a conservative estimate.
Component 4: Project management	
Project management (US\$2.8 million IBRD)	This component will contribute to the implementation of the three technical components



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Tunisia Irrigated Agriculture Intensification Project (P160245)

