



**REPUBLIQUE TUNISIENNE**

**MINISTERE DE L'INVESTISSEMENT ET DE LA COOPERATION INTERNATIONALE**  
**MINISTERE DE L'AGRICULTURE, DES RESSOURCES HYDRAULIQUES ET DE LA PECHE**  
Commissariat Régional de Développement Agricole de Zaghouan

**PROJECT : AGRICULTURAL SUBSECTOR DEVELOPMENT AND  
PROMOTION PROJECT IN ZAGHOUAN GOVERNORATE (PDPFA-  
GZ)**

**COUNTRY : TUNISIA**

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**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) SUMMARY**

**May 2019**

## SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

<b>Project Name</b>	:	Agricultural Subsector Development and Promotion Project in Zaghouan Governorate (PDPFA-GZ)
<b>Country</b>	:	TUNISIA

### 1. INTRODUCTION

At the request of the Tunisian authorities, the African Development Bank Group will support the implementation of the Agricultural Subsector Development and Promotion Project in Zaghouan Governorate (PDPFA-GZ) in Tunisia.

**In accordance with the Bank's Integrated Safeguards System, from an environmental and social standpoint, the project is classified in Category 2 in view of the negative environmental and social impacts identified, which are of low-to-moderate significance.**

In accordance with Tunisian law concerning environmental and social safeguards, an Environmental and Social Impact Notice and Environmental and Social Impact Plan have been produced. They have to be validated by the National Environmental Protection Agency (ANPE). Since the project affects people, property and livelihoods, a Framework Resettlement Action Plan (FRAP) was also produced pending finalisation of the definitive technical studies prior to works implementation.

This document presents a summary of the PDPFA-GZ ESMP. The summary was prepared in compliance with AfDB's Environmental and Social Assessment Guidelines and Procedures for Category 2 projects.

### 2. PROJECT DESCRIPTION

#### 2.1 Project Objectives

PDPFA-GZ's overall objective is to reduce poverty, unemployment and inequality (gender, socio-economic and rural-urban) in Zaghouan Governorate. The project's specific objective is to increase value added through the promotion of the following priority<sup>1</sup> subsectors: olive oil, tomato, milk and other regional organic products that constitute niches with strong potential in terms of jobs, income and the generation of foreign exchange for the country.

#### 2.2 Project Components

To be implemented over a three-year period, the project comprises three components: (A) Rural Infrastructure Support; (B) Sustainable Agricultural and Value Chains Development; and (C) Project Management and Coordination. The activities are summarised in the Table below:

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<sup>1</sup> The priority sub-sectors were defined in a concerted manner, based on environmental (soil conservation, water use, bio-diversity), social (local job creation, improvement of the status of rural women) and economic criteria (level of value added, income stability, adaptability to promising markets).

Table: Detailed Project Components

COMPONENTS	COMPONENT DESCRIPTION
<p><b>A: Rural Infrastructure Support</b></p>	<p><b>A1 Irrigation improvements:</b> (i) rehabilitation and equipping of 1158 ha of old public irrigated areas (PIA) with 4,000 lm of asbestos-cement pipes to be replaced by others made of polyethylene, PEHD; (ii) development of 350 new irrigated areas (IA).</p> <p><b>A2 Construction of boreholes and surface wells:</b> (i) construction of 12 boreholes (150-200 m); (ii) construction of 50 new surface wells powered from clean energy (solar) sources; (iii) an update study on the reviews of groundwater use; (iv) strengthening of the piezometric measurement network to monitor and control groundwater levels.</p> <p><b>A3 Soil and Water Conservation (SWC):</b> (i) construction and consolidation of mechanical and manual bench terraces over 9430 ha, dry-stone bunds over 570 ha, 600 ha of gully correction improvements, 25 wadi protection barriers; (ii) development of 8 hillside lakes and 120 recharge structures; (iii) clearing and re-profiling of wadis over 47 km, and sanitation of 600 ha of plains.</p> <p><b>A4 Forest Management and Biodiversity Conservation:</b> (i) forest and pastoral development over 200 hectares, forest rehabilitation, land consolidation over 13,000 ha; (ii) opening/maintenance of 345 km of forest trails and firebreak trenches; (iii) development of the Djebel Zaghouan National Park and its Ecomuseum. <b>A5 Rural Roads:</b> (i) improvement of 51.5 km of rural roads.</p>
<p><b>B: Sustainable Agricultural and Value Chains Development</b></p>	<p><b>B1 Sustainable Agricultural Development:</b> (i) development of plot irrigation: procurement of water-saving equipment (drip irrigation) for 1000 hectares on PIAs; (ii) development of tree cultivation: planting of 5900 ha of olive and almond trees, purchase of plants and tank-trailers; (iii) purchase of seeds for fodder crops, Medicago and Sulla seeds for 1000 ha.; (iv) procurement of equipment for the CRDA soil laboratory; (v) dissemination of technological packages, resilient and organic techniques, required quality standards, training in the maintenance of structures by agricultural advisors; and (vi) land re-parcelling to promote women's access to property.</p> <p><b>B2 Gender-Sensitive Agricultural Value Chains:</b> <u>Olive oil subsector:</u> (i) procurement of equipment for SMSAs, GDAs and women's cooperatives (olive-picking equipment, olive wood crushing machines and sprayers); (ii) procurement of an organic olive oil extraction unit; and (iii) support for the construction of two multipurpose centres to accommodate organic olive oil agro-industrial units. <u>Tomato subsector:</u> (i) support for the construction of a complete tomato drying unit comprising: 1 washer, 1 grader, one cutter, driers for fruit and vegetables, one vacuum packaging machine. <u>Organic products from the region:</u> (i) support to SMSAs for conversion of products into organic mode and certification; (ii) procurement of composting equipment (compost crushers, diverters and compost spreaders); (iii) procurement of equipment for women (honey and organic wax extractors, distillers, cereal and spice grinders and essential oil extractors and driers). <u>Milk Subsector:</u> (i) construction of 2 milk collection centres; (ii) procurement of a batch of organic fodder production, conservation and manure spreading equipment; (iii) procurement of two batches of milk collection and cooling equipment; (iv) development of good hygiene practices and standards; and (iv) training in rangeland management and fodder production.</p> <p><b>B3. Market Access:</b> (i) promotion of self-clustering around SMSAs and GDAs, and clustering around private agricultural enterprises; (ii) promotion of agricultural product competitiveness: quality, compliance with standards, traceability, certification, logo; (iii) study on a market access strategy for local and organic labelled products.</p> <p><b>B4 Agricultural entrepreneurship, women and youth employability.</b> <u>Specific support to women:</u> (i) incubation and installation of 200 women agricultural entrepreneurs, (ii) construction of 200 water tanks; (iii) supply of inputs for market gardening and tree cultivation; (iv) procurement of artisanal equipment and wild rose seedlings; (vii) training in the extraction and distilling of aromatic and medicinal plants; (viii) creation of product sales outlets; and (ix) training in marketing and commercialisation. <u>Support fund for women's innovative MSME initiatives:</u> (i) establishment of a partial guarantee fund (50%) in partner institutions targeting women's enterprises with strong growth potential; (ii) provision of incubation and advisory services. <u>Support to 50 young agripreneur cooperatives (50% will be young women):</u> (i) support for the preparation of business plans; (ii) training in incubation centres (Zaghouan Business Centre, Mograne School Nursery, etc.); (iii) granting and servicing of titled plots in the new irrigated areas; and (iv) intermediation</p>

COMPONENTS	COMPONENT DESCRIPTION
	<p>with local financing structures.</p> <p><b>B5 Stakeholder capacity building:</b> (i) equipping of technical services involved in project implementation (Zaghouan CRDA, Mograne School, etc.); (ii) results-based management training, value chain approach, gender, climate change and resilience, market access mechanisms, product standards and quality, etc.; (iii) consolidation of participatory development plans (PDP); (iv) organisational and management support for GDS, SMSAs and women’s cooperatives, and creation of regional networks and unions; (v) development of partnerships (contracting) with finance institutions, private enterprises, employers’ and trade union organisations (UTAP), inter-professional groups and training, research and advisory support institutions.</p>
<b>C: Project Coordination and Management</b>	<p><b>C1 Project Management Unit:</b> Planning and coordination of project activities, administrative, accounting and financial management, procurement of goods, works and services, development of a communication plan, project implementation monitoring and evaluation, and gender-sensitive impact analysis.</p> <p><b>C2 Steering Committee</b></p>

### 2.3 Project Cost

The project’s estimated total cost is TND 150.02 million, inclusive of all taxes i.e. EUR 43.86 million. The costs were estimated based on April 2019 current prices. The cost includes land that the structures planned under the project will occupy. A provision has been made for physical and financial contingencies (5% and 7% of the base cost, respectively, contingent on local and international inflation. The financing plan comprises EUR 25.21 million from AfDB, TND 16.23 million from the Tunisian Government and a EUR 2.42 million contribution by the beneficiaries.

### 2.4 Project Impact Area and Beneficiaries

#### 2.4.1 Project Impact Area

The project impact area (PIA) covers Zaghouan Governorate, in particular the vulnerable areas of the six delegations of Zaghouan, Zriba, Saouef, Nadhour, El Fahs and Bir Mchargua, i.e. 44 of the Governorate’s 47 administrative divisions. Despite its strong agricultural potential (272,000 ha of arable land), the region’s agro-ecological systems are highly vulnerable to climate change. There has been a reduction in water resources and severe soil erosion affecting almost 52,000 of cropland, which appears in various forms ranging from top soil stripping to gulying of variable intensity. Furthermore, extreme weather events alternating flooding and droughts are intensifying. This has resulted in an average poverty rate of 20% and unemployment rate of 16.9% compared to 14.8% nationally. Women are more affected by illiteracy (37% of rural women) and precariousness (only 19% of them own resources). The Governorate appears on the list of regions eligible for the different investment incentives aimed at reducing environmental and social fragility factors, and narrowing intra-regional inequality. Despite the fragility of its specific mountainous ecosystems, this Governorate provides many significant agro-environmental functions and has strong ecotourism and cultural potential as well as potential for the production of local produce.

#### 2.4.2 Project Beneficiaries

The PDPFA-GZ will benefit 12,500 households i.e. over 90,650 inhabitants, 50.2% of whom are women, in the 44 administrative divisions (out of the 47 in the Governorate). They will be provided with support to improve production and productivity following successful land consolidation and conversion to organic agriculture. Special attention will be paid to women (and more to women heads of household) and young people who make up the bulk of the vulnerable segments of the population. They will benefit from 40-45% of the newly improved PIAs and 75% of the activities linked to produce processing and marketing, especially organic products. The direct beneficiaries will be selected in close cooperation with CRDA, SMSAs, GDAs and UTAP, based on a participatory, inclusive and partnership approach.

### 3. STRATEGIC, ADMINISTRATIVE AND LEGAL FRAMEWORK

#### 3.1 Legal and Regulatory Framework

Environmental protection is based on Tunisian standards and regulations. In accordance with Tunisian law, it is mandatory under the Urban and Regional Development Code (Law No. 2003-78) to prepare EIAs prior to any improvement works or infrastructure programme. The approach for its application is set out in Decree No. 2005-1991 of 11 July 2005 on environmental impact assessment, which provides for assessing the consequences that an envisaged development project will have on the environment and ensuring that they are duly taken into account in the project design, implementation and operation.

Other texts govern environmental protection in Tunisia. The main instruments relating to the project are: (i) Law No. 75-16 of 21 March 1975 enacting the Water Resources Code; (ii) Decree No. 82-1355 of 16 October 1982 regulating the recycling of used oils; (iii) Decree No. 85-56 of 2 January 1985 stipulating the conditions under which discharges are regulated or prohibited in receiving environments; (iv) Tunisian Standard NT109.14 (1988) relating to liquid hydrocarbons (Rules for the Development and Use of Liquid First and Second Class Hydrocarbon Deposits); (v) Order of the Minister of National Economy of 20 July 1989 approving Standard NT106.02 (1989) on environmental protection (sewage discharges into water environments); (vi) Decree No. 91-362 of 13 March 1991 issued by the Prime Minister's Office and published in JORT on 26 March 1993 instituting the conduct of environmental impact assessments; (vii) Law No. 95-73 of 24 July 1995 on public coastlands, which stipulates that environmental protection mainly covers the seaside, beaches, sebkhas (salt flats), sand dunes, islands, cliffs and the various components of coastlands, with the exception of fortresses and other defence facilities; (viii) Order of the Minister of Industry of 13 April 1996 approving Tunisian Standard NT106.04 (January 1995) on ambient air; (ix) Law No. 96-41 of 10 June 1996 on wastes and control of waste management and disposal; and (x) Decree No. 2000-2339 of 10 October 2000 establishing the list of hazardous wastes.

Tunisia has made significant progress towards mainstreaming the social component in development project implementation. The terms and conditions for land use and expropriation of property for public purpose are now governed by Law No. 2016-53 of 11 July 2016 on expropriation for public purpose, which amends and supplements Law No. 76-85 of 11 August 1976 revising the law on expropriation for public purpose. It outlines the rules governing land tenure and State property in Tunisia.

#### 3.2 Institutional and Administrative Framework

The project institutional and administrative organisation can be summarised as follows:

- **The Ministry of Agriculture and Development:** the Zaghouan Regional Agricultural Development Commission (CRDA) is responsible for project management and coordination. In this regard, it will establish a Project Management Unit (PMU);
- **The Ministry of Environment and Sustainable Development,** responsible for the design and implementation of the National Environmental Protection Policy. It intervenes in the project through the institutions under its oversight, in particular the National Environmental Protection Agency (ANPE). Established in 1988, ANPE is charged with combatting pollution, especially industrial. Its duty is also to study and control the country's environment to eliminate all sources of degradation of the natural environment and quality of life. In this regard, it approves the environmental impact assessments of projects subject to this procedure;
- **Agricultural Land Agency (AFA):** established by Law No. 17 of 16 March 1977, AFA's main responsibilities are: (a) responsibility for all real estate operations described in the 1963 Agrarian Reform Law concerning public irrigated areas (PIAs); (b) the acquisition of areas exceeding the minimum surface area of public irrigated areas; (c) compensation for public irrigated areas in accordance with the Agrarian Reform Law; and (d) consolidation of public irrigated areas.

- **The Ministry of Interior through Zaghuan Governorate** which, under its powers, must take all the measures required to implement the ordinance of the President of the Court of First Instance having jurisdiction to take possession of expropriated property and ensure access to the property without disturbance.

### 3.3 AfDB Safeguards Policies

The Integrated Safeguards System (ISS) through its five operational safeguards (OSs):

- **Operational Safeguard 1– Environmental Assessment:** This operational safeguard is triggered because the project is an investment project subject *de facto* to an environmental and social assessment;
- **Operational Safeguard 2 – Involuntary Resettlement:** This operational safeguard is triggered because the project will entail expropriations;
- **Operational Safeguard 3 – Biodiversity, Renewable Resources and Ecosystem Services:** This operational safeguard **has not been triggered**.
- **Operational Safeguard 4 – Pollution Prevention and Control, Hazardous Materials and Resource Efficiency:** This operational safeguard **has not been triggered**.
- **Operational Safeguard 5 - Pollution Prevention and Control, Hazardous Materials and Resource Efficiency:** this operational safeguard is triggered in instances where there is a risk of various forms of pollution and nuisances during works relating to site operations.

Other relevant policies and guidelines are applicable once triggered under the ISS.

It should be noted that Tunisia has ratified international environmental protection conventions and instruments that are therefore applicable to this project.

## 4. MAIN ENVIRONMENTAL AND SOCIAL COMPONENTS

Under the impact of human pressure, the initial environmental situation in the project impact area is characterised by significant and varied degradation affecting several environmental components. This degradation was identified through document review, field visits, and public consultations held in all six of the Governorate’s delegations. The main environmental stakes and challenges facing the project area are:

- Serious degradation (human and natural origin) of the irrigated areas and their infrastructure now affect the fertility of agricultural land, agricultural production and the quality of farmers’ produce and income. The decline in the availability of irrigation water is caused by the depletion of water tables used (and sometimes by the deterioration of its quality) as well as by the loss of distributed water and increase in the number of leaks from channels. The irrigation equipment is at an advanced state of dilapidation, exacerbated by the lack of upkeep and maintenance and/or renewal of the equipment by farmers in the irrigated areas;
- The drop in agricultural production and productivity is not only due to the intensity and frequency of cultivation, and the declining availability of water caused by the drying-up of boreholes and depletion of other sources of irrigation water but also to: (i) the failure to master good agricultural practices regarding fertilisation, tillage and control of all kinds of vermin and pests; (ii) weak professional organisation of farmers (at the highest and secondary levels); (iii) non-existence of upstream and downstream production integration based on agriculture prevalent in the project area. (iii) failure to master agricultural and managerial practices (at GDA and SMSA level) that would guarantee the required quality, quantity and frequencies required by the new remunerative markets and consequently, the practising of professional, modern and sustainable agriculture with high value added;



- Depending on the area, land erosion and land degradation with silting, gullyng, formation of glacis and appearance of soil crusting. Such phenomena appear and worsen due to the irregularity (in terms of frequency and intensity) of rainfall, on the one hand, and an increase in run-off water intensity causing variable areas of flood-prone land, on the other. Rainfall fluctuations as well as sparse plant cover in some places sometimes result in serious flooding accompanied by considerable soil loss.
- The gullyng of slopes and erosion of banks as well as the silting of temporary water courses and wadis, and their obstruction by large quantities of all types of waste and invasive plants have resulted in the loss of the many agro-environmental functions. The discharge of solid waste into wadis and the invasion of water courses by weeds contribute to the reduction of the water flow rate and exacerbate local flooding. These flood waters cause water to flow into urban areas and destroy some buildings (Sammar Wadi);
- Falling and rising costs of inputs, and the lack and inadequate support to the operation of under-and poorly equipped nurseries;
- Difficulties in transporting agricultural products from the irrigated areas and agricultural inputs to them because of continuing degradation of the farm roads serving these areas;
- As regards land management, the non-existence and malfunctioning of the grassroots land commission in most of the municipality's villages;
- Insufficient natural resource management and conservation structures; insufficient supervisory staff and resources at the level of local agricultural structures tasked with providing support to the population and making a significant contribution to the restoration of environmental resources, reducing illicit and uncontrolled exploitation of wood and non-wood forest products, in particular aromatic and medicinal plants;
- The obvious lack of product processing and enhancement capacity, and the very limited number of units dedicated to it despite the real potential that exists for the production of high quality organic olive oil and other products with high market values (e.g. essences and extracts of aromatic and medicinal plants, dairy products, etc.);
- Climate forecasts envisaged under the most likely climate change scenarios would result in the disappearance of some species (plant and wildlife) and the migration of some species to favourable areas. It is expected that soil degradation will worsen, crop productivity will decline, cropping areas will shift southwards towards the north of the governorate, the scale of parasite, pest and vermin attacks will increase, the types of farms and their management will change, and the rural community will become increasingly impoverished.

## 5. MAIN ENVIRONMENTAL AND SOCIAL IMPACTS

Varying from one phase of the project to another, the project's positive and negative impacts on the physical, human and socio-economic environments are presented below.

### 5.1 Construction Phase

During the **construction phase**, employment and the public works and related services sector will benefit from the project's positive spin-off. However, negative impacts deemed moderate to minor could occur during this phase. In particular, these impacts concern air emissions, noise and vibrations as well as disruption of the natural storm water drainage networks. These are compounded by the generation of solid waste (which should be eliminated, reused or recycled), the risks of accidental spillage of harmful and/or toxic chemical products (fuel, oils, etc.) resulting in the contamination of soil and ground water, modification and disruption of traffic and increased risks for operators, local residents and users. The relative significance of the negative impacts on the biophysical environment is considered moderate to minor. From a human and socio-economic standpoint, job creation and demand for services generate positive impacts, the significance of which is deemed moderate. To mitigate and eliminate the project's negative impacts, measures will be taken to prevent and control accidental pollution.

## 5.2 Operational Phase

As regards the operation of the rural infrastructure of the agricultural, irrigation and rural facilities established or rehabilitated, the project's operational phase will have the following **positive impacts**.

**A.** Overall, the *rehabilitation of farm roads* contributes to the development of various agricultural, agribusiness, ecotourism and service-related activities that may include:

- Facilitation of access to the areas concerned and creation of jobs for local youths;
- Reduction of transport cost and travel time;
- Facilitation of the sale and enhancement of local agricultural output, development of local, regional and national trade, promotion and facilitation of access to new international markets;
- Facilitation of the procurement of inputs, agricultural equipment, products and consumables necessary for agricultural production;
- Development and promotion of access to enhancement and processing activities;
- Renewed interest in local investment, facilitation of access for NGOs and operators of development projects, including technical and financial partners (TFPs) and multilateral development banks (MDBs);
- Operation and development of agricultural, agribusiness, ecotourism and service-related SMEs/SMIs, including maintenance services and job creation for young people;
- Enhancement of protected areas and other tourist sites; and
- Reduction in vehicle operating and maintenance costs.

**B.** *Development of other agricultural and rural infrastructure* (construction of new boreholes, rehabilitation of irrigated areas, establishment of new irrigated areas and creation of hillside lakes):

- The new boreholes will separate drinking water networks from irrigation water networks, and avoid problems relating to the management of a mixed system and the allocation of water resources solely to irrigation;
- The introduction and promotion of drip irrigation techniques will help to save water, enhance production and improve farmland; and
- Contribution to the achievement of food security objectives.

**C.** *Soil and Water Conservation (SWC)*: SWC works will contribute to a significant reduction of erosion and run-off water management through the preservation of soil potential and fertility, retention of run-off water and increased crop and grazing land yields.

**D.** *Other PDFPA components and activities*: The project will have positive environmental impacts on income and the quality of life of the inhabitants of the targeted areas through the promotion of the olive, milk and tomato sub-sectors as well as the development of organic farming. These potential positive impacts include:

- The resolution of land tenure problems and land consolidation will help to improve agricultural development and modernise agricultural investment activities;
- The promotion of income-generating activities (IGA) will diversify sources of income, support small farms managed by women and check urban migration;



- Households that benefit from family vegetable plots and micro-projects will be able to meet their food requirements, generate income and strengthen women's empowerment;
- The development of organic agriculture will reduce the consumption of fertiliser in comparison with traditional methods, and reduce chemical soil and water pollution;
- The development of the role of the Zaghouan National Park in the dissemination of environmental culture to the people and improvement of their living environment.
- Improvement of service delivery quality of the soil laboratory will contribute to prevent degradation of the soil and ensure its optimal use.

**The main potential negative impacts caused by the different components are:**

- Increase in conflicts could occur as a result of inequitable access to infrastructure and natural resources: water and soil;
- Agricultural intensification through the use of fertilisers and pest control products could create risks of contamination of producers and the environment;
- The initiation of SWC works during cropping periods could disrupt agricultural activities and provoke conflicts; and
- The risk of an increase in the number of traffic accidents on rehabilitated roads.

An assessment of the main **positive impacts** of the operational phase showed that all these impacts on the biophysical, human and socio-economic environments are unanimously deemed of *major significance*.

## 6. MITIGATION AND ENHANCEMENT MEASURES

In accordance with AfDB policies/ISS and Tunisian environmental regulations, a mitigation and enhancement programme proposes to boost project benefits and reduce the negative environmental and social impacts to acceptable levels. The site activities will have a *moderate positive impact* on employment as well as economic spin-off on public works enterprises and ancillary services. However, they will also generate potential **negative impacts** considered relatively significant and ranging from *moderate to minor*, during the construction phase. However the contractor is required to establish an efficient organisation and management plan at the level of the work sites and base camps that is respectful of the environment. It must also collaborate with the CRDA to offer training and sensitisation programmes to staff focused on hygiene, safety and health measures, and respect for the customs and traditions of the local population. Concerning the preventive and curative measures aimed at eliminating or mitigating the E&S impacts during the construction phase, the ESIN recommended a series of mitigation measures focused on the following themes: (i) protection of soil and groundwater resources; (ii) preservation of soil stability, prevention of uncontrolled storm water run-off and protection of drainage networks; (iii) protection and restoration of existing infrastructure; (iv) protection of dwellings and other personal property; (v) protection of the archaeological heritage; (vi) solid waste management; prevention and reduction of emissions of gaseous pollutants and dust; (vii) prevention and reduction of noise levels and vibrations; and (viii) minimisation of areas where vegetation has been destroyed and site restoration.

As regards the closing of sites, the CRDA will make the necessary arrangements with its contractors to ensure that sites are closed in compliance with applicable standards. It will ensure that: (i) no solid waste (all categories) will be abandoned on site or in the environs and easements work sites; and (ii) the restoration of access roads, storage areas used and work camp areas. At site closure, the agricultural, irrigation works as well as SWC works and other construction works that will be handed over by the contractor(s) will be the subject of a technical inspection by appointed agencies. Road signage on farm roads and finished structures will be installed in accordance with existing criteria and standards.

## **6.1 Risk Management and Safety Measures**

The public works sector and public infrastructure construction or rehabilitation sites are areas where most work-related accidents occur. The most serious accidents occur during preparation of the site and foundations. On the sites, in general, the main cause of fatal accidents at work are due to people falling. Other possible causes are accidents involving machinery or transport, falling objects, fire, etc. The other risks to be considered as causes of incidents include: (i) chemical risks (reaction, explosives, noxiousness, toxicity, corrosion, etc.); (ii) physical (vibrations, noise) and mechanical risks (moving parts, handling of goods, pressure tanks, etc.); (iii) fire risks (inflammable products, spontaneous combustion products, etc.); (iv) risks of falling (subsidence of foundation trenches, landslides, etc.); and (v) external risks (road traffic, etc.). Depending on the nature of the activity and status of the works, there is need to comply with specific safety measures: (i) personal protection equipment; (ii) collective protective equipment: shoring of wells and trenches, effective protection against the risk of falling objects; (iii) control of on-site order, cleanliness and lighting; (iv) appropriate measures against fire and explosion hazards, and for the use of toxic products; and (v) adequate signage at dangerous areas of the sites (wells, power transformers, etc.). Therefore, the contractor is responsible for risk management. However, CRDA will supervise control work by recruiting a Control Mission whose responsibilities will include validation, monitoring and implementation of the envisaged security measures.

## **6.2 Traffic Management and Movement of Site Machinery**

Regarding activities related to traffic and the movement of site machinery, Table 1 below presents the main measures envisaged, defines the responsibilities and implementation procedures as well as means of controlling the implementation and effectiveness of these measures.

## **6.3 Environmental and Social Management of the Works**

The measures envisaged to ensure adequate environmental monitoring during the construction period are presented in Tables 3, 4 and 5, below. These measures aim to: control air pollution, control sound pollution, manage the production of solid waste and waste water, mitigate the risk of accidental spillage of polluting and hazardous substances, mitigate the risk of accidental bodily injury, on- and offsite, minimise disruption to people's movements and access, and minimise the inconvenience to vehicular traffic, the slowing down of traffic and traffic jams.

## **6.4 Waste Management Plan (WMP)**

A plan has been proposed, which defines the methods and resources to be deployed for waste collection, storage, transport and management. This management will be based on the 3RV-E principle: reduction at source, reuse, recycling, recovery and elimination. The contractor must see to the selective collection of waste and its storage in appropriate containers. Possible destinations are proposed for the waste under the WMP. The cost estimation factors in the cost of transporting waste and depositing it at the controlled landfill site of Zaghouan Governorate. The recovery of recyclable waste and oils, oil filters and used grease is considered the responsibility of approved collectors and, consequently, no induced costs are envisaged. The removal of waste from the site will cost between TND 11,000 and 13,000; i.e. USD 3.5 to 4.3 thousand. These costs are low since: (i) about 98% of waste generated by the site is inert and will be systematically reused as backfill or disposed of at the controlled public landfill site. This quantity is low and estimated at between 8 and 10 tonnes; (ii) the 60 to 80 trees uprooted (i.e. about 40 to 50 tonnes of plant waste) will be sold or transferred to charcoal manufacturers. An initial outlay of TND 45 thousand i.e. USD 15 thousand is also planned to develop and equip the waste sorting and storage areas. Implementation of the site waste management plan (all operations) will generate costs of about TND 15 thousand. Therefore, the total site waste management costs will be approximately TND 43 thousand, i.e. about USD 14,500.

## **6.5 Environmental and Social Management of the Operational Phase**

Apart from upkeep and maintenance interventions carried out in compliance with applicable standards for the operation of the infrastructure and structures planned under PDPFA, those that are usually the responsibility of CRDA are indicated in Table 6 where the measures intended to manage the impacts of the operational phase for the different PPDA alternatives are set out.

**Table 1: ESMP – Works Phase/Site Vehicular Traffic Management Measures**

POTENTIAL NEGATIVE IMPACTS	MITIGATION ACTIONS - MEASURES	RESPONSIBILITY AND IMPLEMENTATION PROCEDURE	CONTROL, MONITORING & INTERVENTION	RESPONSIBILITY FOR CONTROL AND MONITORING	MONITORING AND PERFORMANCE INDICATORS
<p><b>AIR POLLUTION</b></p> <p>Dust and smoke from the exhausts of trucks and site machinery.</p>	<p>Impose a speed limit (on site – at the site entrances).</p> <p>Ensure that machinery is properly maintained, mainly prevent emissions of black smoke.</p> <p>Cut the engine when the machine is not moving.</p>	<p>Contractor (under the supervision of the Control Mission)</p>	<p>Recruit an environment and safety officer for the contractor.</p> <p>Carry out a technical inspection and verification of the state of vehicles and site machinery (before and during construction).</p> <p>Make inspection visits to sites and relevant offsite places on a weekly basis at least.</p>	<p>CRDA Control Mission</p>	<p>ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles made available).</p> <p>All vehicles have a log book indicating: the mileage, dates and type of maintenance.</p> <p>Equipment on site and supplied (water tank, cisterns, etc.).</p> <p>Number of vehicles and machines below standard: None</p> <p>Weekly reports prepared and forwarded to CRDA.</p>
	<p>Cover the site access roads with a hard surface as soon as possible.</p> <p>Regularly spray the site roads with the assistance of tanker-trailers.</p>	<p>CRDA : Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts</p>	<p>Carry out targeted air pollution inspections.</p>	<p>Authority responsible for the environment.</p>	<p>Inspection report forwarded to CRDA.</p>
			<p>Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions.</p>	<p>CRDA Control Mission.</p> <p>Civil society representatives.</p>	<p>Complaints registers placed in the municipalities concerned.</p> <p>Number of complaints: None</p>

<b>SOUND NUISANCE</b>	Plan road traffic to avoid periods of sound nuisance, peak pedestrian and traffic periods.	Contractor (under the supervision of the Control Mission)	Appoint an environment and safety officer for the contractor.	CRDA Control Mission.	ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles made available).	
	Cut the engine when the machine is not moving.		Carry out a technical inspection and verification of the state vehicles and site machinery (before and during construction).			Authority responsible for the environment.
	Ensure that the machinery is properly maintained and prevent high levels of noise from site vehicles.	CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts.	Make inspection visits to sites and relevant offsite places on a weekly basis at least		All noisy machinery equipped with mufflers.	
	Limit site vehicular traffic and delivery operations to daytime periods from Monday to Saturday from 7 a.m. to 7 p.m.		Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions.		Number of vehicles and machines below standard: None	
					Weekly reports prepared and forwarded to CRDA	
					Complaints registers placed in the municipalities concerned	
					Number of complaints: None	
<b>TRAFFIC ACCIDENTS:</b> Increased risk	Establish a traffic diversion plan: Determine alternative traffic routes and traffic diversions, taking into account the safety of local residents as the works progress.	Contractor	Regular inspection of road signs installed (off- and on site).	CRDA Control Mission.	All drivers are trained and sensitised.	
	Install temporary signage for rural roads during the works with signs and corresponding traffic lights.		Regular inspection of the state of guard rails, security barriers and site fencing.			Authority responsible for the environment.
	Close the site and prohibit all access (of cars and pedestrians) to the site perimeter.	CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts.	Offer training and sensitisation sessions to transport truck drivers	Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions.	CRDA Control Mission.	Complaints registers placed in the municipalities concerned.
	Plan works outside crop years (harvest, food-gathering, etc.)					
<b>DISRUPTION TO TRAFFIC ON ROADS</b>						

**Table 2: ESMP- Works Phase/ Environmental and Social Management of Site Installations**

POTENTIAL NEGATIVE IMPACTS	MITIGATION ACTIONS - MEASURES	RESPONSIBILITY AND IMPLEMENTATION PROCEDURE	CONTROL, MONITORING & INTERVENTION	RESPONSIBILITY FOR CONTROL AND MONITORING	MONITORING AND PERFORMANCE INDICATORS
<p><b>INCONVENIENCE CAUSED BY SITES</b> (Space occupancy)</p>	<p>Group together all site equipment (cabins, machines, equipment, waste and fuel storage areas.) strictly at site level and not encroach on unreserved spaces (public or private):</p> <ul style="list-style-type: none"> <li>▪ Propose an access and traffic plan</li> <li>▪ Avoid storing and handling hazardous products</li> <li>▪ Collect and manage sanitary waste water and prevent spillage of waste or non-waste water;</li> <li>▪ Collect and manage solid waste (household and other)</li> <li>▪ Restore and rehabilitate the areas used as base camps</li> <li>▪ Comply with hygiene and safety conditions, and ensure drinking water supply</li> <li>▪ Prepare an abandonment plan (site restoration and removal of all waste and equipment installed)</li> </ul>	<p>Contractor (under the supervision of the Control Mission)</p> <p>CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts</p>	<p>Appoint an environment and safety officer for the contractor</p> <p>Carry out a technical inspection and verification of the state of vehicles and site machinery (before and during construction)</p> <p>Make inspection visits to sites and relevant offsite places on a weekly basis at least</p>	<p>CRDA Control Mission</p> <p>Authority responsible for the environment</p>	<p>ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles made available)</p> <p>Equipment on site and supplied (water tank, cisterns, etc.)</p> <p>Weekly reports prepared and forwarded to CRDA</p>
			<p>Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions</p>	<p>CRDA Control Mission</p> <p>Civil society representatives</p>	<p>Complaints registers placed in the municipalities concerned</p> <p>Number of complaints: None</p>

**Table 3: ESMP – Works Phase/ Environmental and Social Mitigation Measures for the Land Environment**

POTENTIAL NEGATIVE IMPACTS	MITIGATION ACTIONS - MEASURES	RESPONSIBILITY AND IMPLEMENTATION PROCEDURE	CONTROL, MONITORING & INTERVENTION	RESPONSIBILITY FOR CONTROL AND MONITORING	MONITORING AND PERFORMANCE INDICATORS
<b>AIR POLLUTION:</b> excavation work, soil excavation, demolition, storage and transportation of waste materials and rubble from demolitions, discharging and handling of construction materials, etc.	Use water jets to reduce dust, create storage areas  Use tarpaulins to cover and eliminate the generation of dust from piles of stored materials.  Ensure that the machines are well maintained and essentially prevent black smoke emissions.	Contractor  CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts.  Offer training and sensitisation sessions to all site operators (foreman, workers, deliverers, drivers, etc.).	Appoint an environment and safety officer for the contractor.	CRDA Control Mission.  Authority responsible for the environment.	ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles made available).  All vehicles have a log book indicating: the mileage, dates and type of maintenance.  Equipment on site and supplied (water tank, cisterns, etc.).  Number of vehicles and machines below standard: None  Weekly reports prepared and forwarded to CRDA.
			Carry out a technical inspection and verification of the state of vehicles and site machinery (before and during construction).  Make inspection visits to sites and relevant offsite places on a weekly basis at least	Authority responsible for the environment.	Inspection report forwarded to CRDA.
			Carry out targeted air pollution inspections	CRDA Control Mission.  Civil society representatives.	Complaints registers placed in the municipalities concerned.  Number of complaints: None
	Plan very noisy activities in compliance with government restrictions to avoid sensitive periods (Night: 10 p.m. to 7 a.m.).	Contractor  CRDA: Prepare environmental clauses to be included in the STS of	Appoint an environment and safety officer for the contractor.	CRDA Control Mission.  Authority responsible	ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles

<p><b>SOUND NUISANCE</b> for local residents</p>	<p>Warn the local communities about particularly noisy activities.</p> <p>Install compressors, generators, etc. as far away as possible from BASE camps and site managers' premises.</p> <p>Use mufflers and acoustic barriers, etc., if sound levels are exceeded to prevent noise nuisance.</p>	<p>the BDs for works implementation contracts.</p> <p>Offer training and sensitisation sessions to all site operators (foreman, workers, deliverers, drivers, etc.).</p>	<p>Monitor noise levels by appropriate receivers on and off-site.</p> <p>Carry out inspection visits to relevant sites and places under the supervision of the environment officer on a weekly basis at least.</p>	<p>for the environment.</p>	<p>made available)</p> <p>All noisy machinery equipped with mufflers.</p> <p>Number of vehicles and machines below standard: None</p> <p>Weekly reports prepared and forwarded to CRDA.</p>
			<p>Carry out noise level measurement campaigns.</p>	<p>Authority responsible for environment.</p>	
				<p>Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions.</p>	<p>CRDA Control Mission.</p> <p>Civil society representatives.</p>
<p><b>WASTE WATER:</b> Water pollution that could cause diseases</p> <p>Spread of vermin</p> <p>Odour nuisance</p>	<p>Prohibit defecation outside latrines</p> <p>Ensure the existence of sanitary facilities and that they are correctly sized to contain waste water prior to works commencement.</p> <p>Otherwise, the contractor must install and properly manage latrines</p> <p>Prohibit defecation outside the latrines.</p>	<p>Contractor</p> <p>CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts.</p> <p>Offer training and sensitisation sessions to all site operators (foreman, workers, deliverers, drivers, etc.)</p>	<p>Carry out inspection visits to relevant sites and places under the supervision of the environment officer on a weekly basis at least.</p>	<p>CRDA Control Mission.</p> <p>Authority responsible for the environment.</p>	<p>No defecation on site or in the wild.</p>



<b>ACCIDENTAL SPILLAGE:</b> Pollution by lubricants, hydrocarbons and hydraulic fluids, including groundwater pollution	Use impervious surfaces with dykes for all potentially contaminated areas equipped with a storm water drainage system and hydrocarbon separator so that effluents exiting comply with the required limits.	Contractor  CRDA: Prepare environmental and social clauses to be included in the STS of the BDs for works implementation contracts.	Carry out inspection visits to relevant sites and places under the supervision of the environment officer on a weekly basis at least.	CRDA Control Mission.  Authority responsible for the environment.	Weekly reports prepared and forwarded to CRDA.  No accidental spillage observed.
	All hydrocarbon refuelling equipment must have a drip tray.		Establish procedures for recording all public claims and action taken as well as the effectiveness of the corrective actions	CRDA Control Mission.  Authority responsible for the environment.	Complaints registers placed in the municipalities concerned.  Number of complaints: None
	If the soil is accidentally contaminated, remove it and send it to a specialised centre for treatment and disposal.				
<b>INCREASED RISK OF EROSION AND FLOODING</b>	<ul style="list-style-type: none"> <li>▪ Carry out detailed topographical studies before works commencement.</li> <li>▪ Limit the areas of intervention to the minimum required by the safety rules and requirements, and reduce to a strict minimum the uprooting of trees and plant cover.</li> <li>▪ Reduce the use of spaces and resources (soil, quarry products, water, etc.).</li> <li>▪ Restrict the movement of transport trucks, works machinery and all vehicles to reserved areas.</li> <li>▪ Prepare and implement a plan to restore the edges of roads and other structures, restore and stabilise slopes to minimise the risks of uncontrolled storm water run-off.</li> <li>▪ Stabilise and rapidly protect disturbed areas, and anticipate any interruption to the works.</li> <li>▪ Control the concentration of water on the site when it becomes inevitable and reduce the strength of the concentrated water</li> <li>▪ All access and easements required for the</li> </ul>	Contractor:  Prepare a contingency plan for: adverse weather conditions, storms, prolonged works stoppage.  Prepare an emergency response plan.  CRDA: Prepare environmental and social clauses to be included in the STS of the BDs for works implementation contracts.  Offer sensitisation sessions to all site operators (internal and external).	Appoint an environment and safety officer for the contractor.  Carry out daily monitoring at the erosion-prone site.  Carry out inspection visits to relevant sites and places under the supervision of the environment officer (weekly)	CRDA Control Mission.  Authority responsible for the environment.	ES recruitment files forwarded to CRDA, ES recruited, trained and operational (resources and vehicles made available).  Contingency and response plans prepared and forwarded to CRDA (to be validated by the authorities concerned).  Weekly reports prepared and forwarded to CRDA.  No flooding, no triggering of erosion.  Works completion observed without reservations (drainage operational, edges and slopes restored and made secure, ditches filled in, etc.).
				Establish procedures for recording all public claims.	CRDA Control Mission.  Authority responsible for the environment Civil society

	<p>works will be rehabilitated and restored to their original condition.</p> <ul style="list-style-type: none"> <li>All plots used for storing construction materials, backfill and excavated earth will be restored to their original condition.</li> </ul>			representatives.	
<b>INCREASE IN THE NUMBER OF OCCUPATIONAL ACCIDENTS</b>	<p>Oblige contractors to contractually provide work teams with training on the degree of risk linked to the works to be implemented.</p> <p>Equip workers with adequate protective equipment</p> <p>Impose sanctions in the event of non-compliance with safety procedures.</p> <p>Provide on-site emergency medical care consistent with the type of injury that might occur.</p> <p>Establish and disseminate an internal procedure that will result in a rapid and appropriate response in the event of an accident.</p> <p>Control the implementation of the different measures.</p>	<p>Contractor: Appoint a security officer for the contractor.</p> <p>Prepare and disseminate safety procedures.</p> <p>Distribute safety equipment.</p> <p>Offer sensitisation sessions to all site operators (internal and external).</p> <p>CRDA: Prepare environmental and social clauses to be included in the STS of the BDs for works implementation contracts.</p>	<p>Carry out daily monitoring of erosion-prone sites.</p> <p>Carry out inspection visits to relevant sites and places under the supervision of the environment officer (weekly).</p>	<p>CRDA Control Mission.</p> <p>Civil society representatives.</p>	<p>Procedure disseminated.</p> <p>All workers have adequate protection equipment.</p> <p>No serious accident occurs during construction.</p> <p>Injured people are rapidly and efficiently provided with care.</p>

**Table 4: ESMP- Works Phase/Environmental and Social Measures for Works in the Water Environment**

<b>POTENTIAL NEGATIVE IMPACTS</b>	<b>MITIGATION ACTIONS - MEASURES</b>	<b>RESPONSIBILITY AND IMPLEMENTATION PROCEDURE</b>	<b>CONTROL, MONITORING &amp; INTERVENTION</b>	<b>RESPONSIBILITY FOR CONTROL AND MONITORING</b>	<b>MONITORING AND PERFORMANCE INDICATORS</b>
<b>WATER POLLUTION</b>	<p>Completely prohibit all wastewater or solid waste discharge into water courses and wadis.</p> <p>Prohibit the storage of materials, fuel, oils and chemical products at the river's edge.</p> <p>Prohibit all storage of waste at the edges of rivers and wadis</p> <p>Prohibit the refuelling of machines on the</p>	<p>Contractor</p> <p>CRDA: Prepare environmental clauses to be included in the STS of the BDs for works implementation contracts.</p> <p>Offer training and sensitisation sessions to all site operators</p>	<p>Contractor: Appoint a security officer for the contractor.</p> <p>Carry out a technical inspection and verification of the state of vehicles and site machinery (before and during construction).</p> <p>Make inspection visits to sites and relevant offsite places on a weekly basis at least.</p>	<p>CRDA Control Mission.</p> <p>Authority responsible for the environment. Representatives of civil society.</p>	<p>ES recruited, trained and operational (resources vehicles made available)</p> <p>No water or solid waste discharge made into the river water</p> <p>No spillage of oil, fuel oil and other chemical products reported.</p> <p>No storage - even temporary - of materials and chemical products reported.</p>

<p>edges of water courses and wadis.</p> <p>Prohibit all storage of waste on the edges of water courses and wadis.</p> <p>Ensure that site machines and vehicles are well maintained, mainly prevent leaks and spillage of oils and fuel oil.</p> <p>Carry out site vehicle and machine maintenance, repair and cleaning operations in specific areas away from the edges of water courses and wadis.</p>	<p>(foreman, workers, deliverers, drivers, etc.).</p>			<p>No discharge of waste made.</p> <p>Number of machines and vehicles not maintained or substandard (oil or fuel oil leaks): None</p> <p>Weekly reports prepared and forwarded to CRDA.</p>
		Carry out regular inspections of the edges of the water courses and wadis.	Authority responsible for the environment.	Inspection report forwarded to CRDA.
		Establish procedures for recording all public claims.	<p>CRDA Control Mission.</p> <p>Authority responsible for the environment.</p>	<p>Complaints registers placed in the municipalities concerned.</p> <p>Number of complaints: None</p>

**Table 5: Environmental and Social Management Plan for the Operational and Maintenance Phase**

Action	Negative Impacts	Mitigation Measures	Responsibility	Budget in TND	Source of Financing
<b>Operation of Rehabilitated Boreholes and New Boreholes Drilled</b>					
<ul style="list-style-type: none"> <li>▪ Risk of over-tapping water resources</li> <li>▪ Destruction of vegetation and deterioration of the countryside during borehole operations</li> <li>▪ Risk of soil contamination as a result of oil leaks from the drilling machine</li> <li>▪ Piling up of earth on the edges of roads when opening up an access path for the drilling machine (access opening for the drilling machine)</li> <li>▪ Release of borehole rinse and disinfection water</li> </ul>		<p><b>Measure 1:</b> Conduct an update study on the results of groundwater use in the project impact area.</p> <p><b>Measure 2:</b> Locate boreholes based on the water table potential.</p> <p><b>Measure 3:</b> Ensure good maintenance and inspection of the drilling machine to prevent oil or fuel leaks on the borehole site; and</p> <p><b>Measure 4:</b> Minimise the vegetation destruction sites and restore the landscape on works completion.</p>	<p>CRDA /Consulting firm</p> <p>CRDA</p> <p>Contractor</p> <p>Contractor</p>	<p>150 000</p> <p>NCC<sup>2</sup></p> <p>NCC</p>	<p>PDPFA Project (Component 1)</p>

<sup>2</sup> The NCM (no-cost measures) identified are measures that do not incur costs for the project or are covered by the CRDA.

			NCC	
<b>Operation of Rehabilitated and Newly Created Irrigated Areas (IA)</b>				
<ul style="list-style-type: none"> <li>▪ The gradual shift from traditional subsistence production systems to more intensive production systems requiring irrigation water will have negative impacts on water resources in the long term.</li>   <li>▪ Pollution by inputs and pesticides</li>   <li>▪ Risk of conflict in the management of the rural infrastructure created</li> </ul>	<p><b>Measure 5:</b> Ensure the availability of water resources when irrigated areas are established and factor in the outcomes of the update study on the results of groundwater use in the project area.</p> <p><b>Measure 6:</b> Apply water-saving irrigation methods such as localised drip irrigation.</p> <p><b>Measure 7:</b> Monitor and control water tables that have high exploitation rates (particularly in Nadhour Delegation).</p> <p><b>Measure 8:</b> Construct water table recharging structures on the tributaries of the Saadine, Nebhana, Khelifa and Khayat wadis.</p> <p><b>Measure 9:</b> Improve soil fertility by manure.</p> <p><b>Measure 10:</b> Prohibit financing the purchase of pesticides under the project, thereby helping to restrict the use of pest control products.</p> <p><b>Measure 11:</b> Establish agricultural development groups (GDA) in the project impact area prior to the financing of any sub-project.</p> <p><b>Measure 12:</b> Involve the GDAs in all implementation processes and provide sub-project financing at the GDAs' request.</p> <p><b>Measure 13:</b> Carry out land regularisation of sites prior to all investment under the project.</p> <p><b>Measure 14:</b> The intervention of the Land Agency must be a prerequisite to any development.</p> <p>As a rule: resolve land tenure problems prior to any intervention under the project</p>	<p>CRDA</p> <p>AFA</p> <p>GDA</p> <p>CRDA</p> <p>Contractor</p> <p>CRDA</p> <p>CRDA</p> <p>GDA, CRDA</p> <p>CRDA</p>	<p>NCC</p> <p>3 500 000</p> <p>NCC</p> <p>1 000 000</p> <p>NCC</p> <p>NCC</p> <p>NCC</p>	<p>PDPFA Project (Component 1)</p> <p>PDPFA project (Component 1)</p>

<ul style="list-style-type: none"> <li>Risk of land tenure disputes linked to claims by families on the land on which irrigated areas are established</li> </ul>		CRDA, AFA	NCC	
		CRDA, AFA	NCC	
<b>Rehabilitation/Modernisation of the Asbestos-cement Water Network<sup>3</sup></b>				
<p>Danger of asbestos-cement for human health under all conditions where it is cut, drilled, sanded, ground, broken, crushed, demolished or moved without precautions</p> <p>Solid waste</p>	<p><b>Measure 15:</b> Prohibit the use of asbestos-cement in the water supply network.</p> <p><b>Measure 16:</b> Require the wearing of personal protection equipment (PPE) when handling asbestos cement.</p>	CRDA ANPE Contractor	NCC NCC	
<b>Operation and Maintenance of Rehabilitated Agricultural Roads</b>				
<ul style="list-style-type: none"> <li>Soil erosion caused during the works as a result of the disruption of the natural drainage network</li> <li>Destruction of vegetation and soil during the earthworks</li> <li>Obstruction of drainage systems</li> <li>Landslides, mudslides and land subsidence during earthworks</li> <li>Risk of causing damage to unknown archaeological sites</li> </ul>	<p><b>Measure 17:</b> In the case of new roads, ensure that the route does not affect humid environments, archaeological sites, and natural ecological zones hosting sensitive wild habitats, forests and areas prone to natural disasters (flooding).</p> <p><b>Measure 18:</b> It is strongly advised to avoid sloping land, unstable soil, drainage and run-off water networks.</p> <p><b>Measure 19:</b> Carry out road maintenance and drainage; badly maintained and drained roads could cause acceleration of soil erosion.</p> <p><b>Measure 20:</b> Avoid works during the wet season</p> <p><b>Measure 21:</b> Preserve and/or restore vegetation on the road edges</p> <p><b>Measure 22:</b> Make provision for an appropriate drainage system</p> <p><b>Measure 23:</b> Design drainage structures that will minimise surface water flow rates</p> <p><b>Measure 24:</b> Make provision for structures that will ensure soil stability (construction of concrete water supply structures in the low areas and</p>	CRDA Contractor  CRDA GDA  Contractor	NCC  NCC  50 000	PDPFA Project (Component 1)

<sup>3</sup> The existing asbestos cement pipes will be abandoned on the spot. No recovery, re-use or storage is planned or authorised outside the places where they are currently buried

	<p>transport drainage water in concrete ditches for sections with <math>\geq 6\%</math> slopes. A gabion structure to protect discharge points and unstable slopes).</p> <p><b>Measure 25:</b> Prohibit the transportation of hazardous products in ecologically sensitive areas</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>CRDA</p> <p>CRDA</p>	<p>NCC</p> <p>NCC</p> <p>NCC</p> <p>NCC</p> <p>NCC</p> <p>NCC</p>	
<b>Operation and Maintenance of Soil and Water Conservation (SWC) Infrastructure</b>				
<p>Control of gullyng and treatment of interfluves</p> <p>Damage caused by the destruction of structures (soil erosion and scouring)</p>	<p><b>Measure 26 :</b> Plan SWC works in coordination with farmers and only allow work on arable land during the period from mid-June ‘post-harvest’ to mid-November ‘commencement of sowing’</p> <p><b>Measure 27:</b> Promote ‘biological treatment by tree planting (e.g. olive and acacia trees) to complement ‘mechanical treatment’</p> <p><b>Measure 28:</b> Sensitisation of farmers to the importance of tilling in the direction of the slope.</p> <p><b>Measure 29:</b> Need to maintain SWC structures to ensure their smooth operation and durability</p> <p><b>Measure 30:</b> Biofix downstream banks</p> <p><b>Measure 31:</b> Revegetation of infilled land</p> <p><b>Measure 32:</b> Treatment and vegetation of the upstream basin</p> <p><b>Measure 33:</b> Limitation of mechanical interventions and promotion of labour intensive manual work</p>	<p>CRDA</p> <p>Contractor</p> <p>GDA</p> <p>CRDA</p> <p>CRDA</p> <p>GDA</p> <p>CRDA</p>	<p>NCC</p> <p>NCC</p> <p>NCC</p> <p>NCC</p> <p>100 000</p>	<p>PDPFA Project</p>

		CRDA	30 000	(Component 1)
		CRDA	30 000	
		CRDA		
		CRDA	NCC	
<b>Operation of Hillside Lakes Created</b>				
<ul style="list-style-type: none"> <li>▪ The risk of the spread of endemic waterborne diseases is often raised</li> <li>▪ The ecological impacts due to the massive gathering of cattle around the newly established water points</li> <li>▪ •Reduced flow of water towards the dams in the area.</li> </ul>	<b>Measure 34:</b> Application of provisions set out in the ANPE specifications determining the environmental measures to be complied with by the owner or petitioner of a hillside lake project (good management practice measures) attached as annex to the ESMP	CRDA Contractor GDA	NCC	
<b>Operation of New Fruit Tree Plantations</b>				
Change in land use.	<b>Measure 35:</b> Implement preservation techniques such as individual tanks appropriate for plantations, especially of olive trees on steeply sloping land.	CRDA Farmers	20 000	PDAI Project (Component 1)
<b>Promotion of Organic Farming</b>				
The non-use of synthetic chemical products, recycling of organic matter, crop rotation and biological control.	<b>Measure 36:</b> Sensitisation and training of farmers on environmental benefits and organic farming methods (4 actions)	CRDA GDA	20 000	PDPFA Project (Component 2)
<b>Development of Plot Irrigation</b>				
<ul style="list-style-type: none"> <li>▪ Pollution by inputs and pesticides</li> <li>▪ Risk of salination and alkalinisation</li> <li>▪ Consumption of pumping energy for irrigation</li> </ul>	<p><b>Measure 37:</b> Promotion of organic farming on irrigated plots</p> <p><b>Measure 38 :</b> Use of manure or compost as soil amendment and fertiliser</p> <p><b>Measure 39:</b> Adaptation of the pumping system to localised irrigation which is less demanding terms of pressure and flow rate.</p>	CRDA GDA	NCC NCC NCC	



<b>Support to Land Consolidation Operations</b>				
Risk of social conflicts	<b>Measure 40:</b> Sensitisation of farmers on consolidation benefits  <b>Measure 41:</b> Application of legal procedures and land mobilisation modalities.	CRDA GDA	NCC	
<b>Support and Strengthen Sensitisation and Extension Operations</b>				
Agricultural extension has been diagnosed as the weak link in the agricultural development process.	<b>Measure 42:</b> Strengthen the extension service at CRDA technical district level in human and physical resources  <b>Measure 43:</b> Sensitisation of farmers on water-saving techniques, rationalisation of pesticide use, enhancement of local produce, NESRI-type indigenous farming and organic farming  <b>Measure 44:</b> Publication of extension materials, including information on environmental and natural resource protection	CRDA  GDA  Communication expert	50 000  NCC  20 000	PDPFA Project (Component 2)   PDPFA Project (Component 2)
<b>Specific Support to Women</b>				
Risks associated with water-borne diseases in the absence of appropriate hygiene.	<b>Measure 45 :</b> Outreach campaign on good hygiene practices  <b>Measure 46:</b> two sessions on areas targeted by IGA.	CRDA, GDA  Women's Association  Consultant	10 000   20 000	PDPFA Project (Component 2)  PDAI Project (Component 2)
<b>Support to Beneficiary Organisations</b>				
<ul style="list-style-type: none"> <li>▪ Lack of competence of GDAs</li> <li>▪ Fragile structures</li> </ul>	<b>Measure 47:</b> Strengthen and diversify GDA activities beyond the sale of water, involving them in the operation and management of IA irrigation facilities, marketing assistance and support to farmers, and forging ties between farmers and financing organisations to build the financial capacity of poor farmers experiencing difficulties in starting up intensive irrigation	CRDA GDA	30 000	PDAI Project (Component 2)

	activities.			
<b>Micro-project Promotion</b>				
Risk of social conflicts that could arise as a result of inequitable access to project resources	<b>Measure 48:</b> Establish a micro-project approval committee in each delegation and provide it with a transparent approval procedure.  Involve the GDAs in that committee.	CRDA GDA	NCC	
<b>Silvo-pastoral Facilities (study)</b>				
<ul style="list-style-type: none"> <li>▪ Risk of conflicts relating to unresolved land tenure problems</li> <li>▪ Risk of depletion of vegetation</li> </ul>	<b>Measure 49:</b> Conduct a study on the land tenure system in forests in the impact area.  <b>Measure 50:</b> Sensitisation of stock breeders on the importance of allowing natural rangeland regeneration.	CRDA Consulting firm	30 000	PDAI Project (Component 2)
<b>Specific Rehabilitation Actions for the Zaghuan National Park</b>				
Temporary disruption of the environment during the rehabilitation works (noise, traffic and waste)	<b>Measure 51:</b> Vehicle speed limit (10 km/h).  <b>Measure 52:</b> Restoration and cleaning of the zone upon works completion.	CRDA Contractor	NCC  NCC	
<b>Strengthening of Soil Laboratory</b>				
<ul style="list-style-type: none"> <li>▪ Water discharge</li> <li>▪ Solid waste</li> </ul>	<b>Measure 53:</b> Collection of waste contaminated by chemical products and treatment in compliance with Tunisian Standard 106 002.  Collection of waste and its transfer to a controlled landfill site.	CRDA Soil laboratory	NCC	
<b>Budget to set aside under the project financing:</b>			<b>5,060</b>	<b>TND Thousand</b>
(Taken from the initial PDPFA investment)			<b>1,686</b>	<b>USD Thousand</b>

## 7. ENVIRONMENTAL AND SOCIAL SUPERVISION AND MONITORING PROGRAMME

This programme comprises the following two components: (i) supervision of site activities during the construction phase; and (ii) environmental monitoring.

**Environmental and Social Supervision Actions and Activities:** The proposed E&S programme is essential and aims to verify that the recommended mitigation measures during the construction phase are implemented and that they produce the expected results. If necessary, the CRDA undertakes to take the necessary measures at contractor level (Contractor and Control Mission) to make corrections and adjustments as required. It should be emphasised that the implementation of E&S actions and activities during the works phase as indicated in the table as well as regular reporting are the responsibility of the Contractor and Control Mission as stipulated for each in the BDs.

**E&S Monitoring Programme:** In the case of PDPFA-GZ, E&S monitoring must be environmental during the construction and operational phases. Some actions and activities will be common to all sub-components. However, there will also be specific supervision activities depending on the type of infrastructure, structure and/or works: *boreholes, rural roads, SWC works and development of hillside lakes and irrigated areas*. These monitoring actions and activities consist in measuring and assessing the project's impacts on certain environmental components and, if necessary, implementing corrective measures. The proposed programme is presented in Table 7 below, which indicates the sampling locations, the frequency of measurements, the parties responsible and the implementing agencies. Reference norms and standards are also indicated. It should be emphasised that implementation of the E&S monitoring actions and activities during the works phase, which fall under the responsibility of the Contractors and/or Control Mission, must be the subject of regular reporting. Therefore, these actions and activities will be included in the BDs as Environmental and Social Clauses (ESC). This is the responsibility of the CRDA, which will supervise the monitoring and implementation of corrective measures.

**Table: Environmental and Social Supervision and Monitoring Programme**

Construction Phase					
Item	Parameters	Frequency	Location	Responsibility Standards	Cost in USD
Air Quality	Nitrogen dioxide (NO <sub>x</sub> ), Carbon monoxide (CO), Ozone and suspended particulates (TSP)	Monthly for the first three months of works and quarterly for the remaining works phase for five successive days continuously	On the edges of the rehabilitated roads in the most polluted areas, in residential or sensitive areas (schools, hospital) in a radius of 5 km around the structures	CRDA, ANPE Contracting parties: Contractor and Control Mission Standard: NT 106.004	30,000
Noise	Noise monitoring will be carried out day and night weekly on the construction sites and the main equipment transportation routes.	Weekly for 2 days and twice a day.	<ul style="list-style-type: none"> <li>▪ Site environs</li> <li>▪ All residential and sensitive areas (schools and hospitals, etc.) up to 200 m from the construction site</li> <li>▪ On the transportation routes for quarry materials and products.</li> </ul>	CRDA, ANPE Contracting parties: Contractor and Control Mission  International standards (WHO, EEC)	9,000
Vibrations	Vibration monitoring will be carried out throughout the different project phases	Continuously or periodically depending on the type of works	<ul style="list-style-type: none"> <li>▪ Dwellings in the vicinity</li> <li>▪ All residential and sensitive areas (schools, hospitals, etc.) within a 50 m radius of the site</li> </ul>	CRDA, ANPE Contractor and Control Mission  International standards (WHO, EEC)	6,000
Water Quality	Hydrocarbons (CT), mineral oil and grease, Turbidity, Conductivity, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD)	Before, during and on completion of the works During the works, 3 times over 8 months – with 2 measurements per day (morning and afternoon)	<ul style="list-style-type: none"> <li>▪ At the level of the water table close to, and upstream and downstream from the construction site (<i>it is preferable to take samples from existing wells</i>)</li> <li>▪ At discharge points</li> </ul>	CRDA, ANPE Contracting parties: Contractor and Control Mission  NT 106.002	35,000
<b>Cost of common E&amp;S monitoring measures during the construction phase</b>					<b>80,000</b>
<b>Operational Phase (common throughout the impact area)</b>					

Item	Parameters	Frequency	Location	Responsibility Standards	Cost in USD
Air Quality	Nitrogen dioxide NO <sub>x</sub> , Carbon monoxide (CO), Ozone and suspended particulates (TSP)	Twice yearly (January and July) continuously for 5 consecutive days	On the edges of rehabilitated roads, in the most polluted places, in residential or sensitive areas (schools and hospital) within a radius of 5 km of the structures	CRDA, ANPE Contracting parties: Contractor and Control Mission Standard: NT106.004	10,000
Noise	Noise monitoring night and day and at weekends.	Quarterly for 2 consecutive days (4 times a day for the first three years of operation).	<ul style="list-style-type: none"> <li>▪ Site environs,</li> <li>▪ All residential and sensitive areas (schools and hospitals, etc.) up to 200 m from the construction site</li> </ul>	CRDA, ANPE Contracting parties: Contractor and Control Mission International standards (WHO)	5,000
Water Quality	Turbidity, Conductivity, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD) Mineral oils and grease, Total carbon	3 times a year for 1 day with 2 measurements per day (morning and afternoon) for the first three years of operation and twice a year thereafter	<ul style="list-style-type: none"> <li>▪ At the level of the water table close to, upstream and downstream from the construction site (<i>it is preferable to take samples from existing wells</i>)</li> <li>▪ At discharge points</li> </ul>	Project owner  Standard NT 106.002	30,000
<b>Cost of common E&amp;S monitoring measures during the operational phase</b>					<b>45,000</b>
<b>Operational phase (specific to structures and facilities completed under the project)</b>					
Item	Parameters	Frequency <sup>4</sup>	Location	Responsibility Standards	Cost in USD
Boreholes	Monitoring of water quality parameters: (pH, Salinity, Alkalinity, Conductivity, Ammonia, total nitrates, Phosphorous) Weed killers and pesticides, BOD, COD, Coliforms	Six monthly	Samples from rehabilitated and newly constructed boreholes	CRDA ANPE, Health Service / Public Health	10,000
Rural Roads	Drainage system established and well maintained Road condition (visual inspections)	Six monthly	On all rural roads at the level of exits, upstream and downstream of road structures	CRDA GDA	10,000 <sup>5</sup>
SWC	Good condition of structures constructed Maintenance of SWC structures (visual inspections)	Six monthly	At the level of all structures and equipment installed and/or constructed	CRDA GDA	20,000 <sup>6</sup>
Hillside Lakes	Monitoring of ANPE specifications	Annually	At the level of all the hillside lakes filled	ANPE CRDA/DRE	
IAs	<ol style="list-style-type: none"> <li>1. Irrigation network in good condition</li> <li>2. Drainage network maintained</li> <li>3. Control of fertiliser use</li> </ol>	Six monthly	At the level of all IAs	CRDA GDA	
<b>Cost of specific E&amp;S monitoring structures and facilities completed</b>					<b>40,000</b>
<b>TOTAL E&amp;S SUPERVISION AND MONITORING PROGRAMME</b>					<b>USD 165,000</b>

<sup>4</sup> In addition to the usual and/or routine analyses carried out by the CRDA and/or State services concerned: DRE, DGGR, ANPE, etc.

<sup>5</sup> Estimated annual maintenance budget for the first three years of operation (2020-2023)

<sup>6</sup> Idem

## **8. PUBLIC PARTICIPATION AND CONSULTATION PROCEDURE**

### **8.1 Notification Procedure**

In terms of public participation and consultations as part of the compensation and resettlement of project-affected persons, in accordance with the procedures provided for under the Bank's ISS OS2, the following stages are involved: (i) dissemination of the ESMP and FRAP/RAP to stakeholders; (ii) information on the preparation of the RAP by sub-project; (iii) Validation of the basic data at the start of RAP preparation; (iv) dissemination of the eligibility cut-off date to the public; (v) dissemination of the compensation principles and scales as stipulated; (vi) participatory socio-economic survey among PAP to become better acquainted with them, pursue a customised information approach, and gather the people's opinions, grievances and desires concerning the project; (vii) discussions with the local authorities and other local actors; (viii) validation and gathering of opinions, concerns of local residents and PAPs on the RAP prepared following the consideration of the FRAP; and (ix) public dissemination of the RAP adopted.

### **8.2 Public Consultations**

The operational approach retained – jointly by CRDA and the Bank - for project implementation is a results-based approach that aims to achieve environmental and social inclusion and sustainability. Therefore, to achieve the expected outcomes and ensure the sustainability of investments, the project will be implemented using a 'participatory, partnership and inclusive' approach involving all stakeholders, especially central government institutions, non-State agricultural actors, professional organisations, specialised institutions, civil society including women's organisations, and the private sector. Implementation of the PDPFA-GZ will require the mobilisation and participation of all stakeholders, including the beneficiaries and project-affected persons under the aegis of the authorities concerned.

As part of the preparation of the EISN, ESMP and FRAP from March to May 2019, public consultations were organised with CDR support and discussions were held with stakeholders. These informed the stakeholders on the project content, allowing them to negotiate such content and have their opinions, concerns and expectations taken into account. These consultations were the subject of reports attached as annex to the original EISN and FRAP reports.

The consultations provided an opportunity for the population to express its approval of, and support for, the project's implementation. However, it would be useful when the project starts, to organise formal public information and consultation sessions to listen to grievances and update the people on the project implementation details. To reach the direct beneficiaries, these sessions will be organised on work sites in the presence of the local, administrative and traditional authorities, and will be open to all persons wishing to be informed, as well as to NGOs operating in the area. The objective is to inform and sensitise beneficiaries to the activities to be carried out, works duration, potential impacts, environmental and social measures, and the people's involvement in managing and maintaining the infrastructure set up.

In the context of EISN and ESMP validation by ANPE, it is also planned to carry out a public survey consisting of informing the stakeholders, including the local communities and project-affected persons on the project's environmental and social impacts, and the handling of possible claims and complaints.

### **8.3 Dissemination of ESMP and FRAP/RAP**

The project ESMP and FRAP summaries will be published on the Bank's intranet site 30 days before the presentation of the documents to the Bank's Board.

CRDA is required to disseminate the ESMP, FRAP and then the RAP to all stakeholders prior to project implementation.

#### **8.4 Stakeholder Engagement Plan (SEP)**

The consulting firm/NGO, recruited to produce and assist with the RAP's implementation will also be responsible for preparing and implementing the Stakeholder Engagement Plan (SEP) aimed at mobilising all individuals, groups of individuals and institutions concerned by aspects relating to involuntary resettlement of people. The SEP dedicated to resettlement is a clarification tool to more effectively manage the interests, fears, motivation and expectations of the different PDPFA-GZ stakeholders. It will lead to the preparation of a structured communication system and proposals for collaboration based on local motivations and competences. The SEP also contributes to increased and better structured interactions between the different stakeholders, and establishes the project's social legitimacy. It is a key governance instrument that will prevent tensions and conflicts, and foster collaboration around project-related activities.

#### **8.5 Complaints and Dispute Resolution Mechanisms**

The establishment and publication of a redress and complaint (grievance) resolution mechanism for PAP and other stakeholders is a fundamental requirement of the Bank's ISS OS2. Therefore, it is planned that CRDA will establish a Complaints and Dispute Resolution Mechanism (CDRM) that will help to receive and facilitate the resolution of stakeholders' concerns and grievances on project performance. This redress mechanism is an efficient, transparent, timely, fair and non-discriminatory system to provide aggrieved parties with information, allowing them to complain. This will help to prevent litigation, encourage the amicable settlement of complaints, thus avoiding legal proceedings and minimising bad publicity to the extent possible. It will also help to avoid/minimise delays in infrastructure works, and ensure the achievement of PDPFA-GZ outcomes and sustainability of operations planned.

The consulting firm/NGO, recruited to produce and assist with the RAP's implementation, specifies the procedures, rules and responsibilities of the actors, especially concerning communication methods and channels, and includes verbal and written options so that groups, individuals and/or socio-professional organisations or structures and others can present: (i) their grievances, dissatisfaction or concerns concerning the nature and scope of project impacts and programme activities and/or the resulting situations (unpredicted/unanticipated); (ii) the procedures organising and regulating the manner in which programme and project staff register, document and ensure the timely communication of grievances. These will guarantee that women and other vulnerable that are consulted, motivated and encouraged to clearly state their grievances; (iii) criteria, rules and procedures which would guide CRDA in considering and forming an opinion on the validity of complaints and grievances received, and sending a formal response to external parties (including the source of the grievances); (iv) the bodies to be established for mediation and the amicable resolution of grievances; and (v) the monitoring and evaluation methods and responsibilities of the grievance resolution mechanism.

This same consulting firm/NGO will also be responsible for facilitating and coordinating this mechanism.

### **9. CAPACITY BUILDING PLAN AND LOGISTIC SUPPORT**

The Zaghouan Regional Agricultural Development Commission (CRDA) will be the project executing agency. CRDA, which represents the Ministry of Agriculture in Zaghouan Governorate, is responsible for the implementation of agricultural and rural development programmes and projects at the regional level. The technical implementation of project activities will be carried out by the different CDRA Departments. The E&S tasks during the site works phase are to supervise the implementation of ESMP-recommended measures and works acceptance. In the operational phase, the tasks entail project environmental monitoring/environmental and social reporting. Other tasks involve coordination of water and soil quality with the analytical laboratories.

The entities concerned and CRDA do not necessarily have adequate physical resources and human resources sufficiently trained and/or experienced in implementing activities relating to the environmental management and control of sites. Material support and technical assistance aimed at building institutional and human capacity is an obvious opportunity under this project. CRDA will establish a Project Management Unit (PMU) that will be responsible for local planning, monitoring/evaluation, the preparation of project annual programmes and budgets, financial management, procurement, the coordination of project activities, preparation of project status and



monitoring reports. CRDA will appoint a professional to the PMU to coordinate the ESMP's implementation. It is also proposed to recruit outreach workers to mobilise the GDAs, SMSAs and EIGs, women cooperatives and rural youths (male and female), and provide them with advice and technical support in good agricultural practices, the structuring of professional organisations, management of small projects as well as in environmental prevention and management.

Moreover, a capacity-building programme has been designed to meet the needs of project stakeholders, namely the CRDA with its regional and local structures, GDAs, the project beneficiaries, private sector and civil society. It is proposed to implement capacity building actions at each level of the programme. Capacity building comprises: (i) an information, education and sensitisation (IES) programme targeting all the actors and covering the themes of environmental protection, natural resource management, and control of water and soil pollution; (ii) a programme to train the main actors and beneficiaries of the PDAI to factor in environmental and social measures that form an integral part of project preparation, implementation and monitoring. The modules of the ESMP and environmental monitoring will be developed and dispensed to the main PDAI actors and beneficiaries; and (iii) technical support to CRDA for the preparation of an environmental and social procedures manual, good environmental practices and environmental monitoring indicators.

In terms of human capacity building, it is proposed to organise training sessions for the different actors in the works carried out by CRDA and Environmental Officers who will be appointed by the Contractor. Technical assistance will be provided to set up the ESMP and mitigation measures proposed to CRDA colleagues. The objective is to build skills to ensure the mainstreaming of environmental aspects in the project cycle, from design to works implementation. The proposed training activities are set out in Table 8:

**Table: Proposed Training Activities**

Training	Targeted Audience	Cost (USD)
Technical assistance to build capacity and prepare standard environmental and social clauses	- CRDA (engineers involved in works monitoring and supervision to be appointed), GDA, NGO - ANPE Regional Representative	8,000
Training on the establishment of mitigation measures, the ESMP, monitoring programme and drafting of works environmental and social monitoring reports	- CRDA (engineers involved in works monitoring and supervision to be appointed), GDA, NGO - ANPE Regional Representative <i>and</i> Environmental Officer (Contractors Environmental Officer)	27,000

In addition to these training courses, the capacity building plan was designed to meet the needs of project stakeholders, namely the CRDA with its regional and local structures, GDAs, the project beneficiaries, private sector and civil society. It is proposed to implement capacity building actions at each level of the programme. The capacity building programme mainly targets stakeholders and beneficiary groups involved in or assigned by the PDPFA-GZ such as: CRDA, ANPE, GDA and SMSA, women's and youth cooperatives, and other NGOs involved in the development and/or protection of the environment. Table 9 below indicates the capacity building actions to be implemented, the intervention themes proposed, the target audience, frequencies and estimated costs:

**Table: Proposed Capacity Building Actions**

Action	Theme	Target Audience	Frequency	Cost(USD)
Information, Education and Sensitisation (IES) Seminar	Environmental challenges, good environmental practices and participatory approach in project ESM	Farmers GDA Private Sector Civil Society	4	25,000
Training Workshops	The environmental and social management plan	CRDA	1	35,000
	ESMP monitoring	CRDA Soil laboratory	1	
	Management of collective facilities	GDA NGO	1	
	Training in the areas of natural resource exploitation and income-generating activities (IGA)	Rural women	2	25,000

	Campaign on the extension of good hygiene practices	Rural women	1	10,000
Preparation of a PDPFA ESM handbook		CRDA GDA	1	10,000
Publication of extension materials	Conservation of natural resources and environmental protection	CRDA GDA	1	15,000
<b>Total Cost of the Training and Capacity Building Plan</b>				<b>120,000</b>

## 10. INSTITUTIONAL RESPONSIBILITY AND ARRANGEMENTS

Project management and supervision fall within the remit of CRDA, which is responsible for project management at the regional level and coordination with its local structures. At the site works phase, these environmental tasks consist of supervising the implementation of mitigation measures recommended by ESMP and works acceptance.

In the operational phase, the tasks involve carrying out project environmental monitoring, environmental and social reporting. Another task would be to coordinate with the water and soil quality laboratories.

On the institutional front, two bodies, in particular must be mentioned: the National Environmental Protection Agency (ANPE), and the Agricultural Land Agency (AFA).

## 11. ESTIMATED COSTS OF MITIGATION MEASURES AND ESMP

The costs of the preventive and mitigation measures, and the cost of the environmental management programme are set out in the table below:

**Table: Estimated Costs of Mitigation Measures and ESMP**

Measure	Amount in USD	Comments
Implementation of the environmental supervision and monitoring programme (travel costs, equipment, etc.)	165,000	Several interventions during the works phase and throughout the project (+ 3 person/months for an international consultant)  Procurement of the necessary monitoring and supervision equipment
Capacity building plan for site environmental monitoring (CRDA engineer, ANPE representative)	120,000	Several interventions during the works phase (3 person/months for an international consultant)
Waste Management Plan	14,500	
Establishment of a complaints management and grievance resolution mechanism (GRM)	45,000	
<b>Total</b>	<b>344,500</b>	

However, the costs of mitigation measures will be covered by, and for the most part included in, the budget of the PDPFA project financed by the Bank, while other measures will be covered by CRDA. It is worth noting that project investments relating to SWC works on water-saving irrigation systems, and water table recharging structures are both key project elements and significant mitigation measures for which the PDPFA project has made provision for investments of about TND 5,060,000, i.e. USD 1,870,000.

## 12. ESMP IMPLEMENTATION SCHEDULE

The indicative schedule for ESMP implementation is indicated in the table below

**Table: Environmental Management Plan Implementation Schedule**

		PROJECT PHASES												
		BD	Prior to Commencement			Works				Operation				
Heading	Parties Responsible		Month			Semester	Semester	Semester	Semester	Year				
			1	2	3	1	2	3	4	2	3	4	5	
<b>ESMP implementation during the works phase</b>														
<b>Updating of PDs, finalisation of PDS and SWC<sup>7</sup> and integration of mitigation measures and EMP into the BDs</b>	Delegated Contracting Authority (DCA) : CRDA, in consultation with ANPE													
<b>Appointment and training of Environmental Officers</b>	Contractor and Control Mission, with support from CRDA and ANPE													
<b>Preparation of the E&amp;S Management and Implementation Monitoring Handbook</b>	Implementation: Contractor Supervision, Control and Monitoring: CRDA, ANPE													
<b>Environmental monitoring of site installation and mitigation measures</b>	Implementation: Contractor Supervision, Control and Monitoring: CRDA, ANPE													
<b>Information disclosure to authorities and the public</b>	CRDA, Contractor													
<b>Safety, Risk Prevention and Management Plan</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE													
<b>Site Traffic Management</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE													
<b>EMP works and mitigation measures</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE													
<b>Site Waste Management Plan</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE													
<b>Environmental</b>	Implementation:													

<sup>7</sup> Environmental and Social Clauses

		PROJECT PHASES															
		BD	Prior to Commencement			Works				Operation							
Heading	Parties Responsible		Month			Semester	Semester	Semester	Semester	Year							
			1	2	3	1	2	3	4	2	3	4	5				
<b>Monitoring and Supervision Programme</b>	Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE																
<b>Consultation and TA to the Environmental Monitoring and Supervision Programme</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE																
<b>HIV/AIDS-STD Education and Sensitisation Campaigns</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE																
<b>Site closure and installation</b>	Implementation: Contractor Supervision, Control and Monitoring: Control Mission, CRDA, ANPE																
<b>ESMP implementation during operational phase</b>																	
<b>Environmental Monitoring and Supervision Programme</b>	Implementation: CRDA, ANPE Technical support evaluation: Consultant																

## 13. REFERENCES AND CONTACTS

### 13.1 References

This Summary was prepared based on the following documents:

TITLES	AUTHOR
Environmental and Social Impact Notice, March-April 2019	Jamel THLIBI, Environmental Consultant
Environmental and Social Management Plan, March-April 2019	Jamel THLIBI, Environmental Consultant
Framework Resettlement Action Plan (PCAR), May 2019	Jamel THLIBI, Environmental Consultant

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