Meeting of the Board
4 – 6 April 2017
Songdo, Incheon, Republic of Korea
Provisional agenda item 11(e)

GCF/B.16/07/Add.05

14 March 2017

Consideration of funding proposals – Addendum V

Funding proposal package for FP042

Summary

This addendum contains the following three parts:

a) A funding proposal titled "Irrigation development and adaptation of irrigated agriculture to climate change in semi-arid Morocco" submitted by AFD;
b) A no-objection letter issued by the national designated authority or focal point; and
c) Environmental and social report(s) disclosure.

The documents are presented as submitted by the accredited entity, and national designated authority or focal point, respectively.

Table of Contents

Funding Proposal

Version 1.0

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Contents

Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

A.1. Brief Project / Programme Information			
A.1.1. Project / programme title		Irrigation development and adaptation of irrigated agriculture to climate change in semi-arid Morocco	
A.1.2. Project or programme		Project	
A.1.3. Country (ies) / region		**Morocco**	
A.1.4. National designated authority (ies)		**Ministry of Environment**	
A.1.5. Accredited entity		**Agence Française de Développement (AFD)**	
A.1.5.a. Access modality		☐ Direct ☒ International	
A.1.6. Executing entity / beneficiary		**Executing Entity**: Ministry of Agriculture and Fisheries – Direction de l'Irrigation et de l'Aménagement de l'Espace Agricole (Directorate of Irrigation and the Development of Agricultural Areas) DIAEA - Office Régional de Mise en Valeur Agricole du Tafilalet (Regional Office of Agricultural Development of Tafilalet), ORMVAT **Beneficiary**: Kingdom of Morocco	
A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☒ Medium (50<x≤250)	☐ Small (10<x≤50) ☐ Large (>250)
A.1.8. Mitigation / adaptation focus		☐ Mitigation ☒ Adaptation ☐ Cross-cutting	
A.1.9. Date of submission		Modified version submitted on january2017 of initial Funding proposal submitted on 07/08/2015	
A.1.10. Project contact details	Contact person, position	Zacharie MECHALI, Project Task Team Leader (TTL) Laura BUIS, co-TTL	
	Organization	**Agence Française de Développement (AFD)**	
	Email address	mechaliz@afd.fr ; buisl@afd.fr	
	Telephone number	+33 153444149/4681 / +33 625572915	
	Mailing address	5 rue Roland Barthes 75012 Paris, FRANCE	

A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

- ☐ Energy access and power generation
  (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Low emission transport
  (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Buildings, cities and industries and appliances
  (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- ☐ Forestry and land use
  (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

- ☒ Most vulnerable people and communities
  (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)

☒ Health and well-being, and food and water security
(E.g. climate-resilient crops, efficient irrigation systems, etc.)

☒ Infrastructure and built environment
(E.g. sea walls, resilient road networks, etc.)

☒ Ecosystem and ecosystem services
(E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Project / Programme Executive Summary (max 300 words)

Please provide a brief description of the proposed project/programme, including the objectives and primary measurable benefits (see investment criteria in section E). The detailed description can be elaborated in section C.

The project intersects several national strategies: the overarching *Plan Maroc vert* (Green Morocco Plan, GMP), the Irrigation Extension Programme (160 000 ha planned for a total investment amount of 21,5 billion Dirhams) and the agriculture resilience and water preservation strategy. It is aligned with Morocco's adaptation strategy for 2020 as described in its INDC.

The project area, the Boudnib Valley, is located in the semi-arid Tafilalet region (see map in **Annex 1** and photos in **Annex 2**), in the South-East part of the Kingdom, characterized by a high vulnerability to the effects of climate change (increased temperatures and water scarcity). The local population relies on oasis-based agriculture along the Guir wadi (intermittent river); it has been severely affected by several years of draught as well as by the irregularity of the wadi which has caused destruction of fields and houses. Most of the oasis farmers rely on agriculture combined with other activities (daily labor) in Moroccan cities and sometimes further (medium or long term migration). Recently, a new economic dynamic has changed the situation on the ground: investors coming from other areas of the country, bringing high financial and technical capabilities, have developed relatively large scale farms for the production of quality date (*madjhool* variety) and olives. These investments take place outside the oasis areas and are permitted by the exploitation of groundwater (pumping). This economic dynamic, new to the region and largely supported by the State, will benefit the local population through job creation (qualified and unqualified labor) as well as the stimulation of a local investment dynamic in similar, smaller scale investments for the production of quality dates, highly valued on local and international markets.

The sustainability of this dynamic depends on both the long term preservation of the underground water resources (in the context of increased aridity) as well a balanced development between highly profitable agriculture outside of the oasis and subsistence agriculture inside.

Building on the opportunity created by the construction of a new dam upstream of the Boudnib Valley, the project's purpose is to secure the benefits and development potential of the current economic dynamic on the date value-chain, increasing the resilience of a highly vulnerable area with regard to climate change. The project is organized in three components:

C1: Connecting to the dam and transfer of surface water to the Boudnib Valley [45,6 MEUR]

C2: Building the climate - resilience of oasis communities through a holistic approach [12,5 MEUR]

C3: Cross-cutting sustainability measures (technical assistance, groundwater preservation, environmental and social impacts management) [8,3 MEUR]

C4: Project Management [2,4 MEUR]

The detailed breakdown of costs is available in the term sheet. The overall cost of the project is 76 MEUR including contingencies (7,2 MEUR), financed as follows (i) AFD will provide a senior concessional loan of 40 MEUR, as well as 1 MEUR grant; . (ii) the Kingdom of Morocco will contribute in the amount of 15 MEUR (iii) the GCF contribution, 20 MEUR, allows essential component 2 to be integrated in the project, and contributes to the "soft" component of the

project (C3). As the infrastructure in C1 will have a high adaptation impact for the oasis-based agriculture (improved and regularized access to water), it is also proposed that the GFC co-finance the transfer of the surface water from the dam, in order to reduce the financial burden of this investment for the State.

A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	29th September /2016
Expected financial close (if applicable)	
Estimated implementation start and end date	Start: 01/06/2017 End: 01/06/2022
Project/programme lifespan	5 years

B.1. Description of Financial Elements of the Project / Programme

Please provide:

- *an integrated financial model in Section I (Annexes) that includes a projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale; and a sensitivity analysis of critical elements of the project/programme*

An internal rate of return analysis has been completed and is presented in **Annex 10**. It shows an Internal Rate of Return (IRR) of 20% for the 5 000 ha irrigation scheme that will receive water from the dam, thanks to the present project. The provision of surface water (as an alternative to groundwater) and appropriate regulations regarding pumping in the water table, will allow the private sector investments to reach maturity over a 20 years period without depleting the underlying water resources.

- *a description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance*

The project's financing relies on an appropriate mix of:

- a concessional loan (40 MEUR) mainly allowing to reach the level of investment required to deliver quality "adaptation" infrastructures in order to secure the agricultural activity in the Boudnib Valley including the oasis and the private larger scale investments (31 MEUR of 40 MEUR)
- grant resources (21 MEUR) mainly directed to longer term investments in the oasis aiming at building their resilience in the face of climate change and allowing their population to be included in the ongoing economic transformation, and at the necessary technical assistance (4,5 MEUR) to deal with the participatory component of the intervention in the oasis as well as the project's contribution to groundwater management and preservation(16 MEUR of 21 MEUR)

- *a breakdown of cost estimates analysed by sub-component in local and foreign currency and a currency hedging mechanism:*

  For example, under the component of drilling activity for a geothermal exploration project, sub-components would include civil engineering works, drilling services, drilling equipment and inspection test.

Breakdown by activities:

Component	Sub-component (if applicable)	Total Amount	Currency of disbursement	Total Amount	Local currency
Component 1: Connecting to the dam and transfer of surface water to the Boudnib Valley)	**Sub-component 1: implementation and management of the irrigation infrastructure** - Adduction pipeline, - Distribution network to oases and larger scale farms - PPP Feasibility and preparation study - Tendering process for selection of the PPP contractor	45.6	million euro (€)	501.6	Million Dirhams (MAD)
Component 2: Building the climate - resilience of oases communities through a holistic approach	**Sub-component 2.1: Adaptation of hydraulic infrastructure and water management inside the oases** Rehabilitation of seguias and khettaras (irrigation network) **Sub-component 2.2: Mobilization of water resources from intermediary basins** **Sub-component 2.3: Adaptation of the oasis-based agricultural and social systems to climate change** - restauration of agricultural land	5,3 3,3 3,9	million euro (€)	137,2	Million Dirhams (MAD)

		- promotion of new techniques (climate-smart agriculture) - diversification and storage of agricultural produce - empowerment of women groups within the oases - social and educational activities					
	Component 3: Cross-cutting sustainability measures	**Sub-component 3.1: Technical Assistance** - Support to the implementation agency - Provision of technical advisory services to farmers - Management of groundwater resources **Sub-component 3.2: Groundwater management investments** Exploratory drilling and piezometric surveillance **Sub-component 3.3: Environmental and Social risks Management** **Sub-component 3.4: Knowledge building**	4,5 1,8 1.5 0.5	million euro (€)	91.3,1	Million Dirhams (MAD)	
	Component 4: Project management		2.4	million euro (€)	26.4	Million Dirhams (MAD)	

Contingencies		7,2	million euro (€)	79,2	Million Dirhams (MAD)
Total		**76**	million euro (€)	**836**	Million Dirhams (MAD)

Breakdown by expenditure type:

Component	Sub-Component	Expenditure type	Amount (M EUR)	
component 1: Connecting to the dam and transfer of surface water to the Boudnib Valley	Sub - Component 1.1: implementation and management of the irrigation infrastructure	Goods	0	45,6
		Works	43,3	
		Staff, services, studies and training	2,3	
Component 2: Building the climate - resilience of oases communities through a holistic approach	Sub-component 2.1: Adaptation of hydraulic infrastructure and water management inside the oases	Goods	1	5,3
		Works	4	
		Staff, services, studies and training	0,3	
	Sub-component 2.2 : Mobilization of water resources from intermediary basins	Goods	0,5	3,3
		Works	2,8	
		Staff, services, studies and training	0	
	Sub-component 2.3: Adaptation of the oasis-based agricultural and social systems to climate change	Goods	0,8	3,9
		Works	1,7	
		Staff, services, studies and training	1,4	
Component 3: Cross-cutting sustainability measures	Sub-component 3.1: Technical - assistance	Goods	0	4,5
		Works	0	
		Staff, services, studies and training	4,5	
	Sub-component 3.2: Groundwater management investments	Goods	0,6	1,8
		Works	0	

		Staff, services, studies and training	1,2	
	Sub-component 3.3: Environmental and Social risks Management	Goods	0	1,5
		Works	0	
		Staff, services, studies and training	1,5	
	Sub-component 3.4: Knowledge building	Goods		0,5
		Works		
		Staff, services, studies and training	0,5	
Component 4 Project management	-	Goods		2,4
		Works		
		Staff, services, studies and training	2,4	
Contingencies				7,2
total				**76**

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing	**(a) = (b) + (c)**	76	million euro (€)		
(b) Requested GCF amount	(i) Senior Loans		million euro (€)	( ) years	( ) %
	(ii) Subordinated Loans	.....	Options	( ) years	( ) %
	(iii) Equity	.....	Options		( ) % IRR
	(iv) Guarantees	.....	Options		
	(v) Reimbursable grants *	.....	Options		
	(vi) Grants *	20	million euro (€)		
	** Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in section E.*				

	Total requested (i+ii+iii+iv+v+vi)	20	million euro (€)	

	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
(c) Co-financing	Senior Loans Grant Grant Options	40 1 15	million euro (€) million euro (€) million euro (€) Options	AFD AFD …… ……Government of Morocco…… ……	(20) years (6) years	0.8-1,2% ( ) % ( ) % IRR	seniorOptions Options Options
	Lead financing institution: AFD						
	** Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.*						

B.3. Fee Arrangement

The requested Accredited Entity Fee is eight per cent (8%) of the total GCF Proceeds.

.

B.4. Financial Market Overview (if applicable)

In the case of this project, the hydraulic PPP involved is considered as a delegation of a public service (water management) to the private sector particularly in this case where Moroccan government contributesto 90 % of the project cost (including concessional loan and grants): there is therefore no market rate for this type of PPP – it is merely a transfer of assets to the private sector to enhance the efficiency of their management and to ensure the sustainability of irrigation water service infrastructures..

To date, only one hydraulic PPP is operational in Morocco in the Guerdane area (East of Agadir), the costs of which can be used as a partial benchmark. The Guerdane project (90 MEUR) aims to deliver water from a dam (45 Mm^3/y) to 670 farmers in a 10 000 ha irrigated area. Unlike the Kaddoussa PPP, the design, construction and management of the entire infrastructure is entrusted to the private operator.

	Total cost/ farm (000 EUR)	Infrastructures cost/ farm (000 EUR)	Total cost/ Ha (000 EUR)	infrastructures cost/ Ha (000 EUR)	% State contribution
Guerdane	133,4	133,4	8,9	8,9	48%
Kaddoussa	38	28,3	15,2	11,3	93%

The higher *Total cost* and *Infrastructures cost* in the Kaddoussa project results from the inclusion of soft and socioeconomic activities (component 2 and 3 of the present project) that do not exist in the Guerdane project. The present project's choice to invest more in the resilience of the existing forms of agriculture (oases) explains the higher cost / ha but, at the same time, it improves its cost/farm, illustrating the inclusiveness of our approach. The cost of infrastructure/ha is similar in both cases, demonstrating the present project benchmarks adequately with similar investments.

Finally, the contribution of Morocco government is substantially higher in Kaddoussa (93 % vs 48% - including concessional loan and grants) which characterizes the specificity of the associated PPP, rather a delegation of a public service, than a profitable enterprise. This is explained by (i) the fact that part of the water will be delivered to the

entrance of each perimeter of oases without counterpart since it is to compensate historical water rights acquired on the water resource of the Guir basin. Water distribution, operation and maintenance of irrigation networks within the oases will be provided by the irrigation associations in each oasis as it did before the project. to the oases and (ii) that the private operator will deliver part of the water necessary for the extensions and therefore the profitability of the PPP is only marginally affected by that of the agribusiness investments downstream. The infrastructure transferred to the private sector remains a **Public Good**, destined to improve the situation of oases agriculture and to alleviate the pressure on the deep aquifer.

Please fill out applicable sub-sections and provide additional information if necessary, as these requirements may vary depending on the nature of the project / programme.

C.1. Strategic Context

Please describe relevant national, sub-national, regional, global, political, and/or economic factors that help to contextualize the proposal, including existing national and sector policies and strategies.

It is now widely recognized that the Mediterranean region, of which Morocco is part, is a hot spot for climate change, one of the regions that will be most affected in the coming years. According to the IPCC, a rise in temperatures of 2 to 3 ° C is expected in the Mediterranean region by 2050 and from 3 to 5 ° C by 2100. Summer precipitation could decrease by 35% on the southern shore and 25% on the north shore by the end of the century.

Morocco is already facing major problems of water stress, desertification, loss of biodiversity and extreme climatic events such as floods and droughts that will be aggravated by climate change.

Climate change threatens to impact the Moroccan economy and will exacerbate the divide between subsistence/rain fed and commercial/irrigated farms. Since the 1960s, temperatures in Morocco have increased by 0.16°C per decade, and future increases are expected to be even higher than the average global temperature increases. Precipitation is already decreasing, with a 30 percent drop since 1970. The impacts of climate change are difficult to predict, but the Government of Morocco (GoM) cannot afford to ignore them. **The World Development Report (2010) places Morocco among the countries that, at a worldwide level, will suffer the most due to the negative effects of climate change on agricultural yields**. Swings in precipitation already have strong repercussions on the Moroccan economy. Droughts are extremely costly: the 1994/95 drought caused agricultural GDP to fall by 45 percent and GDP to fall by nearly 8 percent. Smallholders are particularly vulnerable to climate change. Commercial farmers have technical know-how and financial resources to cope with the new adverse climate conditions, but small farmers have no means to buffer them.

The *Green Morocco Plan* (GMP) is an ambitious government strategy designed to make agriculture a driving force for equitable economic growth. Launched in 2008, the GMP has the goal to double agriculture's value added within a decade. It is based on two Pillars and various transversal actions. Pillar I targets commercial farmers and supports their integration into the world economy: the GoM has recently signed various free trade agreements, culminating in the recent "Advanced Status" awarded by the European Union. Pillar II is focused on the inclusion of subsistence farmers into domestic markets: it aims to overcome the dualistic nature of Moroccan agriculture by creating the conditions in which smallholders in marginal areas can thrive. The transversal actions include a comprehensive overhauling of the sector's structure in terms of cropping patterns, irrigation water saving, land tenure, agricultural taxation, and institutional and structural reforms. The originality of this strategy relies on:

- its articulation on 2 Pillars targeting respectively the already productive and "well off" agribusiness firms with a mix of non-concessional tools and subsidies (1st Pillar) and smaller scale family farming with a more concessional and detailed support system (2nd Pillar);
- the "aggregation" approach aiming at bridging the two Pillars through technology transfer, contract farming (agreements with larger estates for sales and storage of dates produced by small scale farmers, nucleus-plasma model), etc. in order to accelerate the modernization of agriculture and create win-win situations on the field;
- The integration of sustainable development dimension (and a focus on preservation of scared resources)
- the promotion of agricultural produce at national and international level (marketing);

Realizing that climate change risks jeopardizing the impacts of the GMP, the Ministry of Agriculture, with support of World Bank, the GEF and SCCF (Special Climate change Fund), has undertaken a project to Integrate Climate change adaptation in the GMP.

For example, Morocco has decided to adopt a proactive water savings program for irrigation, to create an agricultural fund that encourages the adoption of agricultural practices resilient to climate change, to develop a climate index

agricultural insurance, to experiment new agricultural practices, etc.

Moreover, optimization of water resources is a major issue for the country and a national water policy has been adopted by government in 2009. This policy's main focuses are (i) demand-side management with proactive measure's on promotion of water saving technics particularly in irrigated agriculture through the support of public investments to modernize collective irrigation networks and voluntary financial incentives for the adoption of drip irrigation techniques at the farm level and water pricing to cover sustainable cost of water and (ii) supply-side management mainly focused on the mobilization of new water resources and equipment of new irrigated perimeters,.

The region of Tafilalet, in which the project area is located, is a main contributor to Morocco's date production, which is a key commodity for this Arab country as well as neighboring countries and at sub-regional level. Morocco currently produces 90 000 tons per year over 48 000 ha, making it the 8th producer worldwide. Half of this production is commercialized on the national market, 30% is consumed on the farm and 20% is turned into animal feed. The country imports about 30 000 tons every year to reach its national demand of 120 - 150 000 tons (8 to 15 kg/person/year): this represents around 150 million euros.

The GMP aims at reaching a national production of 160 000 tons by 2020 in order to substitute current imports, but also to become a net exporter. This target will be reached by the plantation of an additional 17 000 ha of palm-trees. This dynamic has already been initiated on the King's impulse and has resulted in an increase in the production in 2013 (100 000 tons[1]).

Additionally, this strategy focuses on the production of quality dates, in particular of the Madjhool variety which have been characterized under the protected geographical indication "Dattes Madjhool du Tafilalet". These dates can reach up to 20 EUR/kg on the local market (against 5 EUR/kg for standard varieties). **Annex 3** presents key data regarding the date international market.

Incentives on the date value-chain (subsidies, access to palm tree plants, etc.) has resulted in private sector investments in relatively large plantations (100 – 500 ha) in the Tafilalet region, one of the major date production basin in the country (currently 2 000 ha are planted). These plantations, which should reach a total of 5 000 ha over a period of 5 years, currently rely on the use of underground water (aquifer) for irrigation and the current trend of extension (additional 500 ha/year) may lead to unsustainable levels of pumping. This is particularly true in the context of climate change, whereby aridity and water demand from cultivated crops will increase (due to higher temperatures). This situation (new investments and climate change) has direct bearings with the future of the oases and its inhabitants: the extension of new labor-based plantations will create employment and an economic dynamic on the date value-chain that could benefit the oasis population ; climate change will increase stress on the oasian cultivated ecosystem and the frequency of extreme climatic events, such as strong and localized precipitations resulting in severe flooding from the Guir wadi and destruction of cultivated land and housing.

In this context, the Ministry of Water and Energy has decided to build a multipurpose dam upstream of the Boudnib Valley where the oases and agribusiness extensions are located, which should produce 30 million m^3[3] / year (4 years out of 5). **The Ministry of Agriculture and Fisheries has been charged, within the framework of the current project, to ensure the sustainability of the agriculture downstream of the dam, as a response to the constraints described above, by building a Public Good infrastructure increasing the resilience of oases agriculture and alleviating the pressure on the deep aquifer.**

C.2. Project / Programme Objective against Baseline

Describe the baseline scenario (i.e. emissions baseline, climate vulnerability baseline, key barriers, challenges and/or policies) and the outcomes and the impact that the project/programme will aim to achieve in improving the baseline scenario.

A detailed description of the baseline is available in the Principal Diagnostic Report presented in **Annex 4**.

Oasis agriculture is the only form of production in the Guir valley of the Tafilalet region, performed on the banks of the

[1] (http://faostat3.fao.or1g/browse/Q/QC/E)

river (oued) which provides for the only source of water available for gravity irrigation. In the Guir valley, oasis based agriculture is concentrated within 7 schemes distributed along its course, which constitute the Oued Naam Rural Commune. All the households of this commune, beneficiaries of the project, base their livelihood on agriculture in relatively small fields inside the oasis (this agriculture brings an estimated income of 2000 EUR/ha/year for holdings between 0,1 and 0,5 ha); the male population seeks additional income in neighboring cities, mostly in construction work.

Oases are historically linked to the caravan trade economy, as areas for subsistence agriculture for the Bedouins involved in national and transnational commerce. They rely on relatively complex hydrological networks and social rules for land, trees and water management which are still a reality today and therefore constitute both an economic and cultural heritage locally and for Morocco. Agriculture in the oasis is based on vertical intensification and the use of crops association allowing for a maximization of the use of limited quantities of land: this is also a patrimonial aspect of the oases, in terms of cultivated biodiversity. Finally, oases are a form of livelihood and a social environment, of which women constitute the primary inhabitants and stakeholders: men are often migrating temporarily or long term to generate additional income. Indeed, if this form of agriculture is particularly adapted to a necessary confinement within the boundaries of the irrigable areas along the river, it is also characterized by an extreme fragmentation of the holdings (as a result of time and heritage rules) and, in fact, the oasis (despite its sophistication and cultural importance) is now more of a poverty trap than an enabling environment for farmers who wish to improve their livelihood. Further, **the last ten year's successive droughts and proliferation of the *bayoud* (palm tree lethal disease) – all considered a consequence of climate change- have led large parts of the local population to migrate towards the main cities (or across the Mediterranean) and give up agriculture altogether.**

In this context, a younger population and returning migrants emerge as a new category of stakeholders seeking to invest in agriculture projects outside of the oases (where land is no longer available), in the so-called *regs* and using underground water. This extension dynamic, outside but near the oasis, is also a replica of a larger scale investment dynamic further in the valley, where modern estates are being developed.

New investments have developed in the area opening agricultural fields outside the oasis areas, on the flat stone desert plain that extends on tens of thousands of hectares on both sides of the river (these desert areas are called *regs*). This strategy is part of a broader view to "keep alive" the semi-arid areas of the country, first impacted by the climate change.

These investments resulting in the creation of date palm tree farms ranging between 100 and 500 ha, are made by agribusiness farmers, which come with relatively high levels of capital, a strong support from the State and high technical and practical knowledge of precision irrigation. These farms are situated in a different ecological context than the oasis agriculture, but nevertheless in the same territory, and rely on underground water (through deep wells).

Therefore, the main existing systems of the baseline, on which the project intends to act are:

(a) System 1: Oases schemes (800 to 1 000 ha), characterized by complex hydraulic systems constrained by their nominal capacity (size and efficiency of the seguias, khettaras), as well as availability of water – free of charge - in the wadi; cropping systems, complex as well, are partly modular and adapt to these constraints;

(b) System 2: Extensions (4 000 ha) / agribusiness farms pumping in the aquifer, which are already in place – not funded by the project and not made possible by access to surface water (substitution).

As it is, system 1 is stressed by irregularity of access and poor hydraulic efficiency; system 2 by costly and non-sustainable access to groundwater. The project aims at increasing the resilience of these systems, with regard to their baseline fragilities, and to increase their resilience / ability to cope with predicted additional climatic stress.

In particular, estimation of demand for oases schemes is based on the nominal capacity of their hydraulic systems (it is not feasible to restructure the schemes – too costly on a financial and social level), rather than on plant demand (ETP): for a given efficiency of the system, cropping systems will therefore have to adapt to a higher ETP, as a result of CC. Nevertheless, it is estimated that regularization of the water resource (through piping), as well as rehabilitation of the existing schemes will more than compensate the effects of climate change in the medium term (efficiency alone will be

increased by 20%).

In the case of extensions, increased ETP due to CC will affect these systems, by increasing water demand/pressure on the aquifer and, at the end line, decreasing yields (which are maximized today). The project seeks to increase the resilience of this system by providing an alternate source of water and governance tools in order to bring it towards its equilibrium point.

Furthermore, the project preparation has demonstrated that the fragilities identified in the baseline will be aggravated by climate change and the project will act on the existing systems to increase their resilience and ability to cope with the future;

(i) the project's approach is to act both on the nature of supply (surface water against groundwater) and on the demand of existing systems. For both extensions and oases, facing the challenges of climate change will require evolutions in their cropping systems (with the support of the project), as a response to caped water resources: use of groundwater is regulated by Water Law and will be managed under an aquifer contract and enforced by "water police"; use of surface water will depend on availability in the dam, existence of a surplus after extraction of the drinking water quantities and delivery to oases schemes, and compliance with a list of criteria guaranteeing the efficiency of the use of water (namely by substituting it to ground water) ;

(ii) increase in demand due to CC, which will translate in ~80 Mm^3/year against a possible 50 - 60 Mm^3 available (with the project) show that it will not be possible to mitigate 100% of the impacts of CC; the two systems will probably suffer; but, (i) the 10 Mm^3 allocation for the oases represents the full capacity of the systems and its increased efficiency, by the project's action (roughly 15%), should cover the anticipated increase in ETP ; (ii) yields will decrease in system 2, but less rapidly and, in our initial analysis, in an economically sustainable way over a 20 y period in the "with project" scenario.

The construction of the Kaddoussa dam upstream the Guir wadi will allow the production of 30 million cubic meters of surface water every year for agricultural purposes. Component 1 of the project aims to build the irrigation scheme and define its management to allow transfer and delivery of this water (in priority to oases communities and to larger scale farmers) and ensure quality water service throughout the year. The surface water provided by the dam is an opportunity to tackle two issues key to the sustainability of the current economic transformation of the Boudnib Valley: (i) preserve oasis-based agriculture and enhance its resilience to climate change (i.e. secure its economic and social existence alongside more modern of agriculture); (ii) substitute a scarce and patrimonial groundwater resource by surface water collected in the dam.

Component 2 of the project aims at enhancing the resilience of vulnerable populations in the oases through a holistic approach which combines i) modernization of oases hydraulic infrastructure and water resources mobilization, ii) agro-economic development, such as adaptation of agriculture to CC activities, promotion of oasis-based production or vocational training and iii) environmental and social development activities that will be elaborated through a participatory planning process. This component will revitalize the oasis, allowing communities to take part of the new economic dynamic of the region and benefit from new job opportunities, which will reduce economic migration, promote return of migrants.

Crosscutting measures will be implemented in component 3 to guarantee the sustainability of the investments by contributing to groundwater preservation particularly through the establishment of an aquifer contract in the area and, to provide technical and economic advisory services to farmers in order to improve irrigation practices and promote climate-smart agriculture. This component will also enable farmers who want to invest outside the oasis to be technically supported in the structuring of a profitable project, thereby recreating opportunities for inhabitants of the oases.

Note: the Kaddoussa dam is anterior in its design and in terms of implementation schedule to the present project and to AFD's involvement in the area. It is funded by grant resources from an Arab Fund. It is considered a multi-purpose dam, since 3 Mm^3 will be used for drinking water and the rest for agriculture. Its implementation is not the responsibility of

the Ministry of Agriculture but that of the Ministry of Water and Energy. For these reasons, it has not been included in the scope of the present project, which focuses on the use of the agricultural water to increase the sustainability of the agriculture downstream of the dam, in the context of its vulnerability to climate change.

C.3. Project / Programme Description

Describe the main activities and the planned measures of the project/programme according to each of its components.

The description hereunder will limit itself to component and sub-component levels: details regarding activities and expected results are available in Feasibility study/ACTION PLAN presented in **Annex 5.**

Component 1: Connecting to the dam and transfer of surface water to the Boudnib Valley

Sub-component 1.1: Delivery of the transfer and irrigation infrastructures

A 63 km adduction pipe will be built between the dam and the last oasis along the Guir wadi, as well as distribution pipes to serve:

- 800 to 1 000 ha of existing oasis areas with a regularized access to water resource (available most of the year rather than only when the wadi is flooded) and free of charge, delivered to the head of the oasis irrigation network;
- 4 000 ha of extension areas outside oases including different sized farms (between 5 and 500ha) and including both small scale and agrobusiness developers. These extensions exist and are currently pumping in the deep aquifer.

The map in **Annex 1** describes, as an indication at this stage, the organization in space of the areas downstream of the dam and 2 types of service areas from the adduction pipe: oasis and extensions. Technical details on the infrastructure and its implementation are presented in the Infrastructure Design Study, in **Annex 6**.

The transfer and distribution pipelines along the wadi will have the immediate effect of protecting the oases from the violent floods of the Guir wadi which frequently destroy the traditional irrigation infrastructures and housing of the area's population. This infrastructure will provide long term security and resilience in the face of growing uncertainty and violence of climatic events (overflowing of the wadi) in the future.

Further, the oasis areas which traditionally take water free of charge from the wadi (only when water is flowing, 10 to 15 times a year), using diversion thresholds, will benefit from a quality water service (every day instead of a few times a year) amounting in the volumes necessary to irrigate the crops (10 out of the 30Mm^3 of the regularized volume of the dam) from the adduction pipe and through the installation of an outlet at the head of the oasis hydraulics network. This will allow for regular access to water (year-long, 4 years out of 5), and will constitute a vast improvement with regard to the baseline situation. This water service will be delivered free of charge and will de facto be subsidized by the State.

As regards the extension areas (located outside the oases), the dam's water will be accessed in accordance with criteria determined by the Public-Private Partnership framework (see below), which will determine the management terms and conditions of the irrigated infrastructure.

Management of the irrigation infrastructures downstream of the Kaddoussa dam will be entrusted to the private sector within the framework of a Public-Private Partnership (PPP).

The adduction pipe and irrigation infrastructure are expected to be built over 2 years, which will allow for structuring the PPP in parallel. At this stage, several options are possible (leasing, BOT, with different levels of financial contributions from the private sector) and will be looked into within the framework of a “PPP feasibility and design study” whose international bidding process is currently being prepared. This study is planned over 12 months and its cost, EUR 800,000, is supported by the Moroccan State. AFD’s no-objection will be requested at each key step of the process.

Component 2: Building the climate resilience of oases communities through a holistic approach

The servicing of the oases located along the wadi (and tomorrow along the adduction pipe) from the dam's water will secure and regulate the access to water of these cultivated areas. This offers opportunities for improving the efficiency of water use and, hence, the agricultural productivity within the oases. Indeed, the oasis areas are vulnerable in many

ways: economically, due in particular to the deterioration of their irrigation schemes and poor access to training and inputs; socially, due to their confinement situation, high levels of periodic short term or longer term migrations. This situation hinders the capacity of oasis farmers to take full advantage of the economic development underway in the area, and of the opportunities it represents for a more stable local economy. Improving this situation calls for a holistic approach to supporting oases, through an open and participatory community planning process (with a focus on the economic dimension of agriculture production, but opening as well on issues of gender and social development).

The project's area includes 7 oases (see map in **Annex 1**) representing a total area of approximately 1,000 ha and a population of 5,000 people. The project will work to improve the resilience of these oases to climate change, to protect their economic activity and allow them to plug into the current dynamic context of the date palm industry and conserve their social and ecological heritage.

Sub-component 2.1: adaptation and modernization of oasis hydraulic infrastructures

The irrigation networks in the oases are in a deteriorated condition (particularly due to the floods in Guir wadi and given that these are clay pipes) or do not work properly. The rehabilitation and modernisation of these networks will improve the efficiency (+ 15%) of the agricultural systems, thus contributing to the preservation of the oasis-based economy and its hydraulics heritage and biodiversity. These works will include the rehabilitation of the distribution canals within the oases (seguias) and of the draining works of the surface water (*khettaras*), foundations of the oasis-based hydraulics. The initial dimensioning of these works was carried out within the framework of the feasibility process and will be completed by detailed technical studies during the project.

The farmers in the oasis will be supported to organize in Water Users Associations (WUAs), which will serve as community representing bodies throughout the participatory process in addition to their role in managing and maintaining the network and delivering water service.

Sub-component 2.2: Mobilization of water resources from intermediary basins (aquifer refill)

Operation of the khettaras (drainage systems), a main hydraulic feature of oasis irrigation, depends on the state of the alluvial water table which, itself, will be impacted by the building of the dam and the subsequent limitation of the wadi's floods. The project will build infrastructure along the wadi to slow down the flow of intermediate watersheds water contributions in order to enhance its underground penetration, as a contribution to the alluvial water table.

Reinforcing the flood-protection structures during the project will preserve the investments made within the oases in case of violent floods before the finalization of the dam's works.

Sub-component 2.3: Adaptation of the oasis-based agricultural and social systems to climate change

Improving resilience in the oases is a process involving both economic and social/gender dimensions. This process will take place through a community planning methodology, as a means to empower the oasian communities and promote a balanced dialogue with the public administration. Oasis Development Plans will be drawn-up through a participatory approach (performed by ORMVAT with support of the technical assistance and civil society) and will define the adaptation actions to be taken in a given oasis. These plans will basically contain economic and agricultural actions, as well as community development/social/gender actions (see below).

A preliminary analysis of the needs in the oases conducted during the feasibility process shows that, on the economic/agricultural side, the following actions are likely to come up in the planning process:

- Adaptation of agriculture to CC through the rehabilitation of palm groves and agro-ecological intensification (e.g.: rejuvenation of the palm groves, crop rotation, plant breeding, organic fertilization techniques);
- Rejuvenation of the palm groves to introduce the Madjhool variety and thus allow the oasis populations to benefit from the current economic dynamic;
- Promotion of oasis-based farm produce and by-products (quality and certification: cumin, henna, dates, olive oil, storage);
- Protection of the oasis ecosystems and the fight against desertification (planting of hedges protecting against

silting) and their opening up.

Analysis of the social situation in the oasis communities, with a special focus on gender, has been done within the feasibility/action plan and E&S risk assessment processes. The detailed results of this analysis are presented in the corresponding documents.

Inclusion of women in the project activities should be done relies on a participatory & community driven process allowing the *agents* to make decisions in terms of their own values and goals ; particularly when it comes to water management.

This process of empowerment (during which stakeholders become *agents of change*) cannot be skipped, nor is it relevant to design activities based solely on the wellbeing of one particular agent (in this case women), as their individual wellbeing (physical, emotional) is generally only one of the goals pursued by agents[2] involved in more complex social networks. In any case, it is not in the AE's power or role to make decisions as to new sets of rules/behavioral schemes for women or to presuppose how women should assume new roles in their communities, with regard to water, livestock, palm tree groves management… It is also the AE's responsibility, vis-a-vis the integrity of the process mentioned above (by which decisions and ideas are community-generated), to avoid predefining how gender issues will be dealt with in this project, before the stakeholders/agents have had sufficient time and space to express themselves.

The time and resources necessary to bring about meaningful participation of the different agents of a community, particularly the women in the context of Morocco, is not compatible with the format of project preparation: it is, in and of itself, a full project activity to assess gender issues, in the context of the society in which they take place, and design appropriate and sensible actions.

Annex 7 provides more details in the projected gender-related activities.

Regarding economic development, the project aims at improving employability (answering demand in agribusinesses large estates) and diversification of revenue through vocational training and technical support to project initiators. This action will particularly target women from the oasis communities.

This sub-component will work to include in the planning process (also used to identify the hydraulic and agricultural activities) the possibility of identifying and financing social development and employability activities, to the extent of the project's capacity (at this stage, tentatively, such activities would not exceed 15% of the total cost of the oasis development plan). These activities will include cultural and social development aspects as well as favoring the conditions for decent employment of women (technical training, capacity building on labor rights, etc.) in particular in the large estates.

Component 3: Crosscutting sustainability measures

This component includes specific and crosscutting measures to guarantee maximal performance of the project and sustainability of the investments which will be made. These measures have three specific objectives:

(i) Support the Executing Agency in reaching the highest standards of performance with regard to infrastructure delivery, as well as community development and participatory approaches;
(ii) Contribute to groundwater preservation, namely with the **establishment of an Aquifer Contract** (management rules formalized between users and the State as the regulating body) for the Boudnib groundwater;

[2] For the purposes of the capability approach, agency primarily refers to a person's role as a member of society, with the ability to participate in economic, social, and political actions. Therefore, agency is crucial in assessing one's capabilities and any economic, social, or political barriers to one's achieving substantive freedoms. Concern for agency stresses that participation, public debate, democratic practice, and empowerment, should be fostered alongside well-being.

(iii) Implementation of the Environmental and Social Management Plan (ESMP) – see documents in **Annex 8**.

Sub-component 3.1: Support to the Executing Agency

This sub-component is essentially an International Technical Assistance package directed at supporting the Executing Agency (ORMVAT) in the implementation of the project, providing expertise and manpower for the following missions:

(a) Follow-up and monitoring of the infrastructure contracts and implementation of works;

(b) Community development in the oases, participatory planning methods, social development approaches, adaptation of agriculture to climate change;

(c) Provision of technical and economic advisory services to farmers (small, medium and larger scale), future water users of the irrigation scheme, in order to enhance the quality (technical, financial, environmental) of the investment projects and to improve irrigation practices and promote climate-smart agriculture;

(d) Aquifer management and models;

(e) General monitoring and evaluation, including of the ESMP.

The technical assistance will be recruited through an international bidding process and will be carried out through the duration of the project. Detailed profiles required through this TA are presented in the project's Feasibility/Action Plan in **Annex 5**.

Sub-component 3.2: Contribute to groundwater preservation and to the establishment of an Aquifer Contract in the area

All forms of agriculture present in this semi-arid region, and particularly outside the oases, rely or will rely on a combined management of two resources (surface and groundwater), the availability of which will vary during a given year and inter-annually. Periods of scarcity and of relative abundance, heterogeneity of users and needs call for regulation tools necessary to ensure the sustainability of the exploitation of these resources.

More generally, groundwater, as a common and pooled resource, is subject to the "tragedy of the commons", which leads to overexploitation, potentially non-reversible. Such a scenario, apart from the patrimonial loss (for future generations) it causes, also endangers the private and public investments made in the area. Aquifer contracts are one way of setting-up rules and regulations, constraints, inclusion and exclusion criteria for the use of water, from a bottom-up perspective: i.e. extracting each individual water user pumping on the aquifer from the prisoner's dilemma in which he is trapped, by making information on the situation of the aquifer available and organizing a debate and a decision making process with regard to the future of the resource under exploitation (for more on this, see E. OSTROM; http://www.onthecommons.org/magazine/elinor-ostroms-8-principles-managing-commmons).

Aquifer contracts are part of Morocco's Water Law and are currently implemented in a number of irrigation schemes in the country. This project will build on this experience to apply this approach to the Boudnib aquifer and irrigation scheme. Apart from an important participatory process and dialogue amongst the water users, to which the project will contribute, an important aspect of an Aquifer Contract is an increased knowledge of the situation of the underground resource. Therefore, this sub-component will include an important modelling dimension based on new investments for deep measuring, as well as engineering of an aquifer model.

The Ministry of Energy, Mines, Water and the Environment and the Agence de Bassin Hydraulique of Guir-Ziz - Rhesis have the lead on the overall process of the Aquifer Contract; the project will allow the Ministry of agriculture and the ORMVAT to contribute effectively to this process.

Sub-component 3.3: Environmental and Social risks Management The project will finance ESIA supplements, based on IFC's safeguard policy, during inception phase. The rationale for a two-step implementation of the ESIA is presented in the term sheet as follows:

Implementation of this project involves several dimensions: infrastructural, institutional and social – environmental. Putting them jointly in motion requires to fine tune the sequence in which the preparation and inception take place. In

particular, the fact that the irrigation scheme will be managed under a PPP delays the availability of important information as, of course, to the management of the infrastructure but, as well to its final design. The rules and criteria of entry of water users in the scheme will be partly determined with the private sector; who is “in” and who is “out” will determine where the pipes run. This has several consequences and among them, the fact that the ESIA process can only be completed once there is more clarity as to the PPP framework. Nevertheless, it would not be possible to wait for the PPP design to launch the tendering for the works on the primary irrigation network: this type of sequencing would generate massive delays that would, in fact, discourage the private sector; further, the tendering process for works can only take place once the financing for the project, as a whole, is secured (as per Moroccan legislation).

Therefore, it is typical for this type of operation to adopt a programmatic approach by going as far as possible during preparation phase – far enough to decide on financing- and to plan an inception phase, the results of which can be considered as conditions prior to first disbursements.

It is the AE’s proposal to operate in this manner for this project, defining a 6 to 12 months inception phase (following the signing of the financial agreements with AFD and the GCF), during which, namely, the PPP design will take place, the ESIA completed and the ESMP updated (see under for more details on disbursement conditions).

The project will also finance the implementation of the ESMP, elaborated according to AFD and GCF guidelines. This will cover the costs of (i) a dedicated team linked to the Project Implementation Unit (Cf.C.7); (ii) mitigation measures of negative impacts and monitoring of their results, (iii) the due diligence system; (iv) the compiling and treatment of grievances, as well as the information generated by the consultation and dialogue processes.

The full Log Frame for the project is presented in **Annex 9**.

Sub-component 3.4 : Knowledge building

The processes of inclusion of vulnerable populations and preservation of underground water resources through adequate infrastructure and adequate institutional tools, which the project aims to support, need to be monitored and studied during the duration of the project. This will be done through traditional monitoring and evaluation tools (mid-term and end-line), but also calls for a more in-depth analytical capacity, mobilizing research tools in hydrology, sociology and institutional aspects.

AFD has set up and funded the Scientific and Technical Committee on Agricultural Water (STCAW, www.comite-costea.fr) which brings together the French expertise (mostly research institutes and irrigation operators in France) in the field, in order to promote cross-cutting dialogue between institutions and generate analytical and capitalization work on AFD-funded projects in the field of irrigation.

It is proposed to use this analytical vehicle and the research capacities it allows to mobilize, by making this project a study case of the STCAW: research teams from public entities such as CIRAD and IRSTEA will provide analytical work on the establishment of the Aquifer Contract and the hydrological situation of the aquifer. This work will be cofinanced between the funds of the present project and that of the STCAW (0,1 - 0,2 MEUR).

Component 4: Project management

Represents the costs of management incurred by ORMVAT et DIAEA throughout the life of the project.

C.4. Background Information on Project / Programme Sponsor

Describe project/programme sponsor’s operating experience in the host country or other developing countries.

The Directorate of Irrigation and the Development of Agricultural Areas (DIAEA) of the Ministry of Agriculture is responsible for the project coordination and is AFD’s main counterpart at central level.

This Directorate, created in 2009, aims to implement the policy of the Ministry of Agriculture in the field of hydro-agricultural development. The DIAEA is in charge of the hydro-agricultural resources management (planning and monitoring), the promotion of water irrigation, the promotion and the regulation of public-private partnerships (PPP),

irrigation schemes, land and pasture.

At local level, the implementation of the project will be transferred to the ORMVAT, which will also rely on strong partnerships with other institutions (in particular the ABH) for some of the activities of the project.

The ORMVAT, created in 1966, is a public organization financially independent and under the supervision of the ministry of agriculture. The ORMVAT is responsible for agricultural development in the Tafilalet Region through the organization of farmer's vocational training, the promotion of efficient irrigation systems and the realization of land consolidation works. The ORMVAT has notably overseen the rehabilitation of irrigation systems in many oases in the region (delegated to specialized companies through public tender or in partnership with beneficiaries) and implemented economic and social development activities (diversification projects income, crafts, woman capacity building and training) in partnership with rural communities, farmers organizations, NGO's and youth promoters.

The River Basin Agency Guir-Ziz-Rhéris (which overlooks water management in the project area), created in 2009, is a public institution under the supervision of the ministry of energy, mines, water and environment. Its main tasks are the assessment, planning and management of water resources, the monitoring of water resources (quality and quantity), the collect of financial charges and the maintenance and operation of hydraulic structures.

Describe financial status and how the project/programme sponsor will support the project/programme in terms of equity, management, operations, production and marketing.

Not applicable

C.5. Market Overview (if applicable)

Describe the market for the product(s) or services including the historical data and forecasts.

Morocco produces approximately 90,000 tons of dates a year over 48,000 ha, making it the 8th largest date producer in the world. National production is mainly intended for the domestic market (50%), for self-consumption (30%) and for cattle feeding (20%). To respond to domestic demand, the Kingdom imports 30,000 tons of dates a year from Tunisia or Algeria (approximately EUR 90 million in value).

The Green Morocco Plan has set the objective of increasing date production to 160,000 tons by 2020 so that national production can replace imports but also to export abroad at least 10,000 tons/year by 2030. These objectives will be reached through the planting of 17,000 hectares of date palms. To this end, the State has signed a contract with the *Fédération Interprofessionnelle Marocaine des Dattes* (FIMADATTES - Moroccan Inter-professional Date Federation) for a term of 10 years. The impact of these national policies is already being felt (national production exceeded 100,000 tons in 2013[3]).

Apart from seeking higher production quantities, Morocco is also seeking a position of strength on the Madjhool date market which benefits from the best prices on the national market (up to EUR 20/kg in retail) and international market (up to USD 12/kg): as a large part of the irrigated area downstream of the dam are planted in Madjhool dates, the project will contribute to a sustainable increase in production of this quality date (around 40 000 additional tons/y).

Provide the key competitors with market shares and customer base (if applicable).

Provide pricing structures, price controls, subsidies available and government involvement (if any).

The government is involved in subsidizing the extension investments (first pillar of the GMP), at a rate of approximately 50%.

[3] (http://faostat3.fao.or3g/browse/Q/QC/E)

C.6. Regulation, Taxation and Insurance

Provide details of government licenses or permits required for implementing and operating the project/programme, the issuing authority, and the date of issue or expected date of issue.

Permits will be needed to secure access to land for small and larger scale investors for the establishment of their plantations. These permits will be issued following a bidding process managed by the Agriculture Development Agency (ADA) and the Ministry of Interior.

Permits for drilling and maximum debit for deep wells are delivered by the ORMVAT and the regional Hydraulic Basin Agency.

Describe applicable taxes and foreign exchange regulations.

There will be no taxes applied on the grants. On the loan, taxes (20%) will be supported by the Government. Fluctuation of exchange rate impacting negatively the cost of the goods to be purchased in local currency will be covered by contingencies and, if insufficient, by the GoM.

Provide details on insurance policies related to project/programme.

The state is its own insurer for the infrastructure.

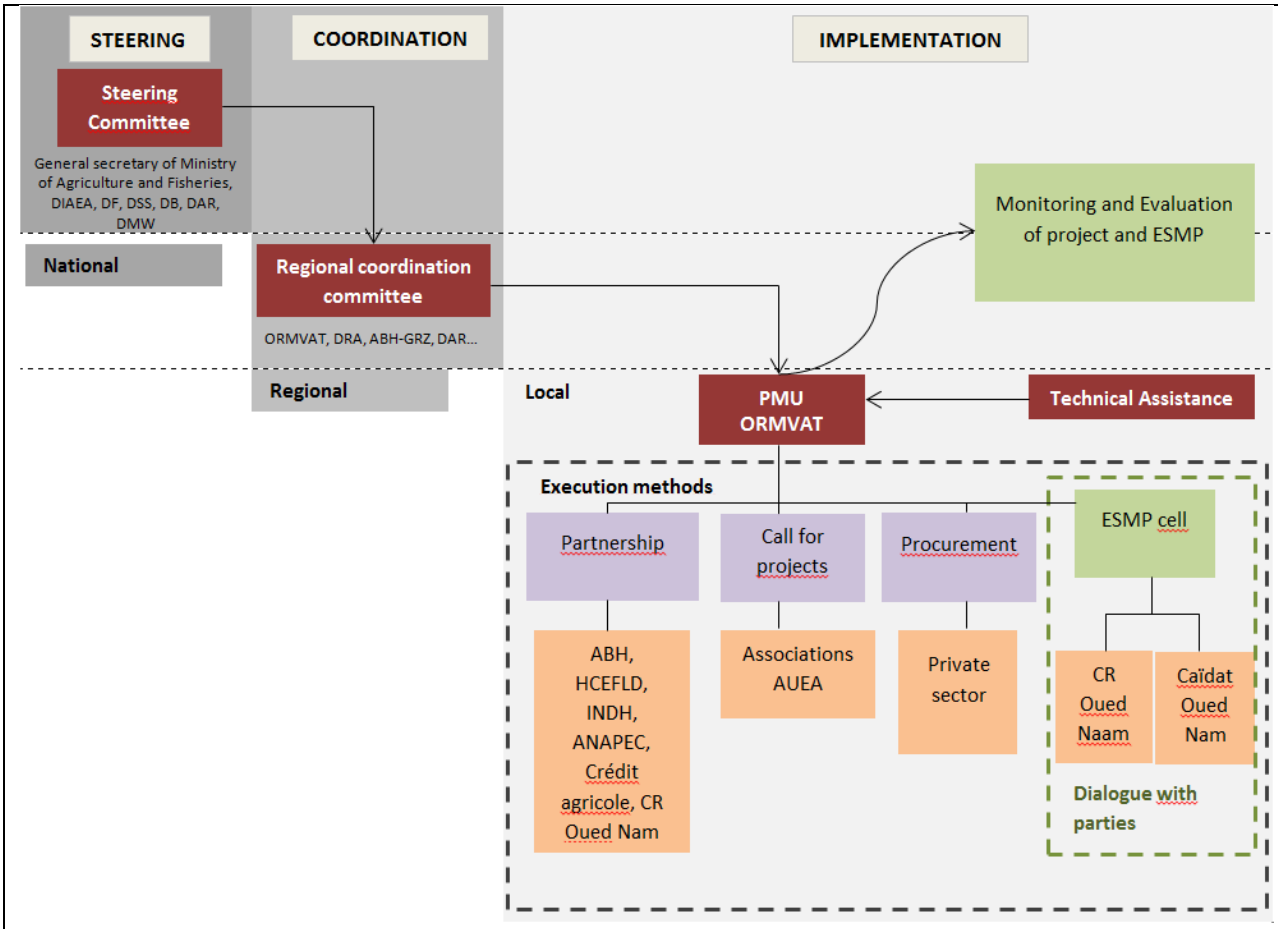
C.7. Institutional / Implementation Arrangements

Please describe in detail the governance structure of the project/programme, including but not limited to the organization structure, roles and responsibilities of the project/programme management unit, steering committee, executing entities and so on.

Project management is performed by the Ministry of Agriculture and Marine Fisheries (MAPM) and its Directorate of Irrigation and the Development of Agricultural Areas (DIAEA). This project management is delegated to the ***Office régional de mise en valeur Agricole du Tafilalet*** **(ORMVAT), which will ensure the overall coordination of the programme , supported by strong technical assistance recruited within the framework of the programme.**

The main project implementation partners will by the DRPE at central level, the *Agence de Bassin* at local level, the *Office National de Conseil Agricole and the Agence Nationale pour le Développement des Zones Oasiennes et de l'Arganier, the local authorities (in particular, the Municipalities)*.

The financial management and procurement will be centralized with the Executing Entity.ORMVA-TF has a long history of implementing similar projects in the area, including donor-funded. AFD's mandate is to rely on national agencies for project implementation and, if necessary, build their capacity through TA: this strongly links to the sustainability of the project after completion. Such a support will be provided mainly for implementation of C2 and C3. AFD will be part of the discussion with the Ministry of Agriculture and ORMVA-TF for the establishment of the PMU and its staffing.



Steering committee

The steering committee oversees the activities of the project as a whole (Action Plan and ESMP). It is in charge of approving the annual work plans and their budgets, the progress reports as well as the reports on the results achieved, both in terms of the work and the activities and the environmental and social actions. It will also ensure the Project is in line with the sectoral policies and government programs. It will meet at least twice a year, and each time that it is deemed necessary by its chairman. This committee can be created by ministerial decree.

The Steering Committee, chaired by the Secretary General of the Ministry of Agriculture and Maritime Fisheries, is composed of different stakeholders, including:

- The Ministry of Agriculture, Directorate of Irrigation and the Development of Agricultural Areas (DIAEA) as Contract Owner of the Project;
- Ministry of Agriculture, Directorate of Strategy and Statistics (DSS);
- Ministry of Agriculture, Finance Directorate (DF);
- Ministry of Economy and Finance, Directorate of Budget (DB);
- Ministry of the Interior, Directorate of Rural Affairs (DAR);

Delegated minister in charge of water resources (DMW)

Regional Coordination Committee (CRC)

The CRC is the coordinating body of all the activities of the Project (Action Plan and ESMP). It controls and approves the tasks performed by the PMU and its technical assistance team, namely: the provisional versions of the annual work plans and their budgets, the progress reports and reports on the results achieved, before presentation to the Steering Committee. It will meet four times a year, and each time that it is deemed necessary by its chairman.

The Regional Coordination Committee, chaired by the Regional Director of Agriculture, is composed of different stakeholders, including:

- The Regional Office of Agricultural Development of the Tafilalet region, through its Director and the Coordinator of

the PMU;
- Regional Directorate of Agriculture (DRA);
- Guir Rheris Ziz River Basin Agency (ABH-GRZ);
- Province of Errachidia, Directorate of Rural Affairs (DAR);
- Regional Council of the Tafilalet;
- Rural town of Naâm Wadi;
- Urban town of Boudnib.

Project Management Unit (PMU)
The management and the local supervision of the project are the responsibility of the Project Management Unit (PMU). This unit is attached to the Director of the ORMVA-TF, which is responsible for the management of the project at the local level. This Unit is the central body for the implementation of the project. Training in project management will be provided for by the technical assistance which is part of the PMU. The Project Management Unit will be in charge of implementing all the activities of the Project and of processing all the monitoring data. It will also coordinate all the fiduciary activities, the procurement and contracts, quality control, and will establish agreements with all the structures involved in implementing the components, sub-components and measures of the ESMP.
An operational manual will be developed by the PMU, with support from the TA and will be submitted to AFD's approval.

Among its duties, the PMU must integrate the environmental and social management of the project as a main, full-time duty and therefore assign the human, material and financial resources that it needs to enable it to fulfil its duties.
The PMU will be composed of staff assigned by the DRA and the ORMVA-TF, namely:
- a Coordinator of the Project and head of the PMU;
- A procurement and financial management officer;
- An engineer responsible for the environmental and social management in particular the plan for the acquisition of land to establish the pipeline (component 1) and the drilling of boreholes to monitor the aquifer (component 3);
- A rural engineer in charge of monitoring the construction work.

Partners
The approach of the project consists of promoting partnerships in the implementation of planned actions which do not fall within the specific remit of the ORMVA-TF:

- **The local communities**, in particular, the municipality of Oued Naâm, constitute a key partner for implementing the activities related to the adaptation of the oases to climate change. They are an essential partner for implementing activities related to protecting the environment, improving the quality of life of the inhabitants of the oases, and even social development.

- **The local authorities** play an important role in the implementation of any project in their territory. They enable establishing a direct link with the people. They support the citizens in knowing their rights and obligations in accordance with Article 27 of the New Moroccan constitution giving the right of access to information to all citizens. They therefore play a central role in the implementation of the project and in establishing dialogue and communication with the stakeholders.

- **Other public partners**: National Agency for Development of Oases and Argan tree Areas (ANDZOA, integrated projects in the oases), National Office for Agricultural Advisory (ONCA, advisory services to farmers, vocational training), National Agency for Promotion of Employment (ANAPEC, training, support of project promoters), National Institute for Human Development (INDH, income generating activities, social/cultural/environmental activities),

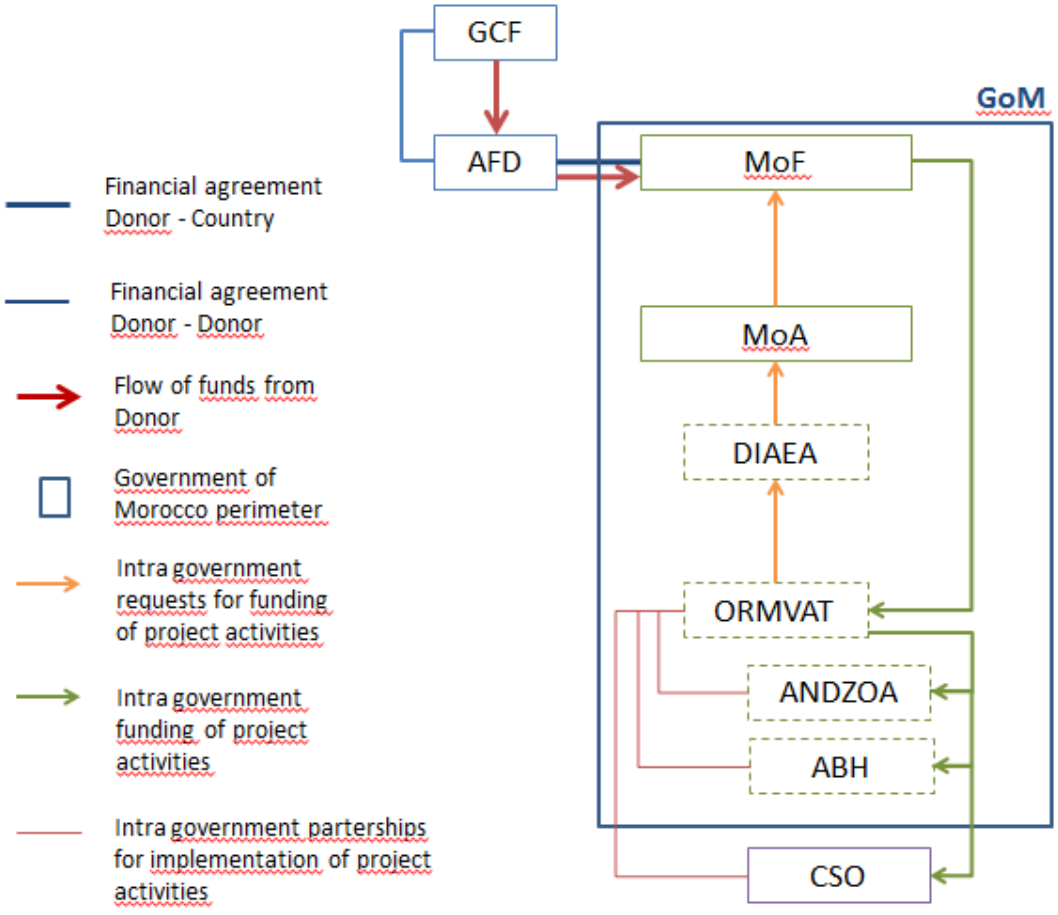
Project promoters
For the actions under sub-component 2.3, the project will involve professional partners or partner associations for co-implementation:

- **WUA and agricultural cooperatives**: The WUA will namely be responsible for water management inside the oases and will be the point of contact with the water service management company for any issues relating to management of the irrigation. The agricultural cooperatives may support projects related to agricultural production, to enhancing the value of the products, to the services upstream and downstream, or to any other

income-generating activities;

- **Associations**: These associations are potential partners for all the activities planned by the project. These associations have several assets, including that of being able to raise and manage financial resources to invest in community development actions;

- **Social, cultural and environmental associations**: The local social, cultural and environmental development associations have demonstrated their capacity to implement projects in the sectors of education, health, the environment, and culture. These associations will be mobilized through a “call for project” approach, managed by ANDZOA.



Describe construction and supervision methodology with key contractual agreements.

The delivery of the water distribution infrastructure (including a 63 km pipeline from the dam to the scheme) will take place under several contracts recruited through an international tendering process. All of these contracts and related bidding documents will receive prior non objection from AFD and the supervision of works will be performed by the Office Régional de Mise en Valeur Agricole du Tafilalet (ORMVATF).

Describe operational arrangements with key contractual agreements following the completion of construction. If

applicable, provide the credit analysis of key counterparties of key contractual agreements and/or structural mitigants to cover the counterparty risks.

The irrigation scheme, after construction, will be managed by a private entity under a Public-Private Partnership (PPP) framework. The Government of Morocco will finance the feasibility study of the PPP, which will detail the technical, institutional and financial arrangements to be fitted into the final contract between the State and the private partner.

C.8. Timetable of Project/Programme Implementation

Please provide a project/programme implementation timetable in section I (Annexes). The table below is for illustrative purposes. If the table format below is used, please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed.

Results		Activities		Years of implementation					
				2017	2018	2019	2020	2021	2022
1.1.1	The main conduit and the oasis connections are made	1.1.1.1.	Recruitment of technical assistance						
		1.1.1.2.	Execution studies						
		1.1.1.3.	Expropriation						
		1.1.1.4.	Execution of works						
1.1.2	The terms of connection and management are defined	1.1.2.1.	Validation of reference terms for the structuring study						
		1.1.2.2.	Structuring study and project devolution						
1.1.3	Users are connected to the network	1.1.3.1.	Operator selection						
		1.1.3.2.	Subscription						
		1.1.3.3.	Works execution						
2.1.1.1.	The séguias are resized and rehabilitated	2.1.1.1.1	Workshop for the prioritization and validation of work to perform						
		2.1.1.1.2	Topographic and specific surveys						
		2.1.1.1.3	Execution of works						
2.1.1.2.	The conveyance capacity of the khettaras is improved	2.1.1.2.1	Workshop for the validation of works to perform						
		2.1.1.2.2	Conducting studies						
		2.1.1.2.3	Execution of works						

Results		Activities		Years of implementation					
2.1.2.1.	New séguias are concreted		Pm						
2.1.2.2.	The plots that were no longer served are levelled	2.1.2.2.1	Workshop for the prioritization and validation of work to perform						
		2.1.2.2.2	Conducting studies						
		2.1.2.2.3	Execution of works						
2.1.2.3.	Oasis banks are protected	2.1.2.3.1	Prioritization and validation of work to perform						
		2.1.2.3.2	Conducting studies						
		2.1.2.3.3	Execution of works						
2.1.3.1.	Users are informed and initiated	2.1.3.1.1	Study trips						
		2.1.3.1.2	Classroom training						
		2.1.3.1.3	Legal documentation						
2.1.3.2.	The AUEA are created and the intervetion programmes are validated	2.1.3.2.1	Preparation of AG						
		2.1.3.2.2	Convening and holding AG						
2.1.3.3.	The officers of AUEA and their agents are set up	2.1.3.3.1	Member Training						
		2.1.3.3.2	Staff training						
2.1.3.4.	AUEA financing plans and action plans are approved	2.1.3.4.1	Development of action plans						
		2.1.3.4.2	Preparation of financing plans						
2.2.1.1.	Maintenance works agreements are validated by users	2.2.1.1.1	organization of workshops						
		2.2.1.1.2	Validation of agreements by AUEA						

Results		Activities		Years of implementation					
2.2.1.2.	The rehabilitated facilities are functional	2.2.1.2.1	Studies						
		2.2.1.2.2	Works						
2.2.2.1.	Maintenance agreements are validated by users	2.2.2.1.1	Feasibility studies						
		2.2.2.1.2	Organization of workshops						
		2.2.2.1.3	Validation of agreements						
2.2.2.2.	Two new works of mobilization intermediate basins waters are installed	2.2.2.2.1	Studies						
		2.2.2.2.2	Installations						
2.3.1.1.	Building a shared vision of the area and its issues is initiated	2.3.1.1.1	Workshop of foresight						
		2.3.1.1.2	Presentation and communication to stakeholders of the results of the workshop						
2.3.2.1.	Seven oases development plan is established	2.3.2.1.1	Study of thorough elaboration of possible actions						
		2.3.2.1.2	Collaborative definition workshops of action programme per oasis						
		2.3.2.1.3	Support project formulation for agriculture						
		2.3.2.1.4	Consolidation and validation of oasis development plan						
2.3.2.1.	The seven oases development plan is executed	2.3.2.1.1	Execution Program						
		2.3.2.1.2	Execution & Financing						
2.3.3.1.	An action program is developed	2.3.3.1.1	Pre-identification workshop						
		2.3.3.1.2	Additional studies						

Results		Activities		Years of implementation					
		2.3.3.1.3	Drafting and validation of action programmes						
2.3.3.2.	The action program is executed	2.3.3.2.1	Validation and signing of partnerships.						
		2.3.3.2.2	Launch tenders						
		2.3.3.2.3	Execution & Financing						
2.3.4.1.	Young project leaders skills are strengthened	2.3.4.1.1	Identifying potential training modules						
		2.3.4.1.2	Development, validation and programming of modules						
		2.3.4.1.3	Signing partnership agreements and trainers contracts						
		2.3.4.1.4	Execution and financing						
2.3.4.2.	The personal and social development of women is encouraged	2.3.4.2.1	Identifying needs						
		2.3.4.2.2	Defining personal development actions and social priorities						
		2.3.4.2.3	Programming and validation						
		2.3.4.2.4	Execution & Financing						
2.3.4.3.	Basic services necessary to female employment are strengthened	2.3.4.3.1	Identifying needs						
		2.3.4.3.2	Develop a potential program of actions for strengthening basic services						
		2.3.4.3.3	Signing partnerships and recruitment						
		2.3.4.3.4	Execution and financing						
3.1.1.1.	The Project Management	3.1.1.1.1	Definition of the main tasks						

Results		Activities		Years of implementation					
	Unit (PMU) is reinforced to monitor hydro-agricultural developments	3.1.1.1.2	Identification and recruitment of profiles						
3.1.1.2.	The Project Management Unit (PMU) is reinforced to ensure activities for adjustment to climate change	3.1.1.2.1	Definition of the main tasks						
		3.1.1.2.2	Identification and recruitment of profiles						
3.1.1.3.	The Project Management Unit (PMU) is reinforced to ensure the implementation of the E&S Management Plan	3.1.1.3.1	Definition of the main tasks						
		3.1.1.3.2	Identification and recruitment of profiles						
3.1.2.1.	Agricultural project owners are informed and their needs determined	3.1.2.1.1	Information campaign						
		3.1.2.1.2	Installation of an information desk						
3.1.2.2.	The operators of the date value chain have access to training and individual counselling	3.1.2.2.1	School in the fields						
		3.1.2.2.2	Personalised counselling						
3.1.2.3.	The operators of the vegetable sector have access to personal training and counselling								
3.2.1.1.	The heterogeneity of the Senonian is established	3.2.1.1.1	Conducting drilling						
		3.2.1.1.2	Logging record for each drilling						
3.2.1.2.	A spatial distribution map of	3.2.1.2.1	Execution of a pumping test campaign						

Results		Activities		Years of implementation					
	the transmissivity of the Senonian is made available	3.2.1.2.2	Preparation of the spatial distribution map of the transmissivity of the Senonian						
3.2.1.3.	The numerical model is suitable as a support tool to decision-making	3.2.1.3.1	In-depth analysis of the relevance of the tool						
		3.2.1.3.2	Selecting an appropriate numerical model for the project						
3.2.2.1.	The site is provided with a regular piezometric monitoring system	3.2.2.1.1	Optimized operation of pumping testing equipment						
		3.2.2.1.2	Strengthening the network with additional piezometers						
3.2.2.2.	The piezometric monitoring system is modernized	3.2.2.2.1	Piezometers of complete stations of automatic acquisition						
		3.2.2.2.2	User training and maintenance costs						
3.2.3.1.	The information system of River Basin Agency (ABH) Guir-Ghris-Ziz allows regular monitoring of water table in the project area	3.2.3.1.1	Formatting monitoring data						
		3.2.3.1.2	Post online with public access and dissemination of information to provincial, regional and local institutions						
3.2.3.2.	Updating the PDAIRE of Guir-Ghris-Ziz takes into account the options of "joint management" of surface water and groundwater in the plain of Boudnib and the valley of Guir	3.2.3.2.1	Contribution to updating the PDAIRE						
		3.2.3.2.2	International seminar on joint management in arid areas						
		3.2.3.2.3	Tripartite agreement						
3.2.3.3.	Contribution to the process of preparing the water table	3.2.3.3.1	Support for the preparation of the water table contract						

Results		Activities		Years of implementation					
	contract launched by ABHGRZ	3.2.3.3.2	Reinforcement of stakeholders skills involved in the water table of contract						
3.3.1.1.	The different components for the implementation of the E&S Management Plan are funded	3.3.1.1.1	Implementation of the "E&S Management Plan Cell"						
		3.3.1.1.2	Setting up the diligence mechanism						
		3.3.1.1.3	Commissioning measures to mitigate impact						
		3.3.1.1.4	Grievances mechanism						
		3.3.1.1.5	Programme for monitoring and updating the E&S Management Plan						
		3.3.1.1.6	Process of dialogue with stakeholders						
3.4	Knowledge building (including mid-term evaluation)								
4	Project Management								

D.1. Value Added for GCF Involvement

Please specify why the GCF involvement is critical for the project/programme.

The current trends in the project area will lead to a relatively pessimistic scenario, whereby patrimonial (i.e. necessary for future generations) underground water resources may be depleted due to an unsustainable agribusiness investment scheme and oases remain as marginal and disappearing socioeconomic and ecological systems. The trends leading to this scenario (described in C.1 and C.2) are accentuated and accelerated by climate change due to:

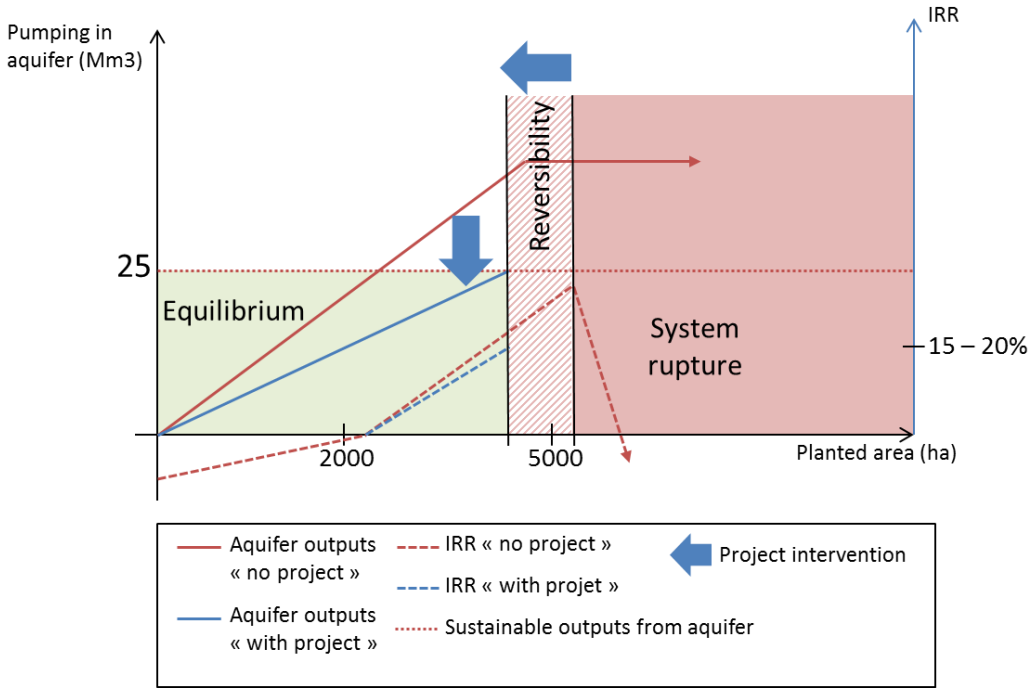
- The high level of climatic vulnerability of oases, because they are dependent on irregular access to surface water. Increased aridity and plant demand for water and higher levels of irregularity of the wadi's spates, due to climate change, will have cumulative negative impacts on agriculture productivity and overall ability of the oasis system to sustain demographic growth and human development;

- The acceleration of the mobilization of underground water resources, because of increasing plant demand in the context of climate change.

The adaptation rationale of the project builds on the future availability of surface water, upon completion and filling of the dam, in order to:

- Target the most climate vulnerable by securing regular access to water for agriculture (compare to baseline of increased scarcity and irregularity of access) and promoting development through more efficient and adapted water infrastructure, as well as socioeconomic activities aiming at increasing the attractivity of these oases;

- Put into place the appropriate institutional and legal frameworks, by which these additional and renewable resources (surface water) directly alleviate the pressure on the underground aquifer, thereby reversing the overexploitation trend :



Reaching these outcomes will require a mix of :

- Relatively classical, but costly, solutions involving the transfer and delivery of surface water to oases and agricultural extensions, thereby protecting the oases from flooding and destruction in the context of climate change, as well as improving regular access to water for agriculture and alleviating the pressure of agriculture on underground resources;
- Targeted solutions for the oases, considered most vulnerable to climate change, through the delivery of a holistic development package; as well as specific actions for underground resource preservation, in the context of climate change, through appropriate institutional arrangements ("Aquifer Contracts", capacity building of the River Basin Agency) and investments (resource control and monitoring equipment).

The GCF's involvement will mainly allow development and funding of the targeted solutions towards oases and improved water management.

Initial assessment of vulnerabilities in the oasis communities (see Diagnostic report) shows several areas on which the project may have an impact: protection against floods; improved access to employment; overall resilience of the communities through social and economic empowerment. These aspects will be dealt with through a community driven process that will plan and implement solutions identified at the local level with the population.

Regarding the involvement of the project with the agricultural extensions, the proposed solutions intend to act on the baseline scenario (4 000 hectares, privately invested, coming into production in the coming years with no alternate water resources and proper institutional framework for management of scarcity) by increasing the sustainability of an economic dynamic downstream of the dam, and thereby securing its positive impacts at micro (employment) and macro (import/export of dates) level. In practical terms the project will allow the hydrological (bring the pumping levels to 25 Mm3/year, renewability threshold of the aquifer) – economic (completion of the investment projects and long term impacts) – human (inclusion of the oases) system to find its balance.

The combination of these approaches in a single project is novel in the context of Morocco and is considered characteristic of a new generation of adaptation projects using the "water" entry point, combining "adaptation infrastructure" + "inclusiveness measures" + "improved water management". It is proposed that the GCF also contribute to the financing of the transfer infrastructure, which is considered an adaptation infrastructure, namely because it will result in the protection of the oases against flooding.

D.2. Exit Strategy

Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the GCF and other sources, taking into consideration the long-term financial viability demonstrated in E.6.3.

The project's sustainability relies on two dimensions:

- Its total inclusion in a long term public policy, the Green Morocco Plan. Most of the activities planned within the project are in line with this policy's implementation rules and will therefore be pursued after project closure. For the innovative dimension of the project (a holistic approach to irrigation development), it will contribute to a change process already in place within the Ministry of Agriculture;

- The establishment of a PPP with a long term contractual framework (20 years) will guarantee the management of the irrigation scheme after project closure.

The nature of the PPP in the context of this irrigation scheme is particular: it relies on the assessment that private sector involvement will increase efficiency in the management of water and associated infrastructures and, thereby,

decrease associated costs for the State and the farmers; rather than on internal high levels of profitability to be expected by the private sector. The PPP is rather a delegation of a public service to the private sector, to which will be attached a number of conditions regarding tariff and eligibility to water, that shall guarantee inclusiveness and sustainability of water use. These conditions may lower profitability levels.

In particular, the oasis population has a free right of access to the water of the Guir for the gravity irrigation of the oases. This pre-existing right (Royal Decree) cannot be canceled and the oases population will have priority access to the first 10 million m^3, corresponding to the full capacity of the oasian systems. The water users in the oases will be organized in water users associations, in order to act as counterparts of the private operator of the scheme. Operation and maintenance costs will be covered by the public budget, as they are now, through the ORMVAT.

In this section, the accredited entity is expected to provide a brief description of the expected performance of the proposed project/programme against each of the Fund's six investment criteria. Activity-specific sub-criteria and indicative assessment factors, which can be found in the Fund's Investment Framework, should be addressed where relevant and applicable. This section should tie into any request for concessionality made in section B.2.

E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's investment framework.

Impact potential

Contribution to increased resilience of:

- **Most vulnerable people and communities** through i) the promotion of an inclusive development and climate smart agriculture: providing an enabling environment for both highly technological and capitalistic investments as well as smaller scale modernized investments by local farmers practicing traditional agriculture and ii) the revitalization of oasis through the development of economic, social and environmental activities;
- **Health and well-being, and food and water security by** taking into account the environmental and social dimensions (including gender issues) of development and by securing the water supply throughout the year in oases;
- **Infrastructure and built environment** through the development of adequate and innovative "water technologies" to maximize the mobilization and the efficient use of the resource (transfer of surface water resources, precision irrigation scheme) and through the renovation of oases traditional irrigation schemes;
- **Ecosystem and ecosystem services** by implementing adequate and innovative water institutions providing rules and regulations for the management of scarce water resources (both underground and surface), by contributing to the establishment of an aquifer contract.

The programme's approach is integrated as "water" intersects issues of agriculture performance in the context of climate change, and associated well-being issues, design and implementation of adapted infrastructure, as well as the preservation of oases ecosystems. These cross-cutting impacts will concern a set of direct beneficiaries: 5 000 people living in the oases; as well as a part of the larger population of the Boudnib valley (extension farmers, agricultural inputs provider, date traders, etc.) estimated at 10 000 people.

The main impact indicators and the rationale for their elaboration is presented in the table below:

Indicators	Value	Unit	Assumptions
Number of family farms supported by the project	1 300	Farms	It is considered that all families/farms living in the 7 oases, as well as existing oases-extensions will be impacted by the project (1 000 households), either through improved water service (C1) or community development actions (C2) + 200 new extensions of local farmers + 100 agribusiness extension farms.

Population benefiting directly from improved access to water services for agriculture.	5 500	People	This is the population involved in family farming in the oases (1 000 (ref. above) x 5 = 5 000) + the families of the extension farmers (500) involved in small scale extensions
Population empowered by the project (capacity building, improved employability, improved psychosocial situation, ability to design and implement an investment project)	2 000	People	Focus groups organized during the feasibility process have allowed to identify, at this stage: - 140 women willing to invest in a value chain project (transformation of agricultural goods for sale), - 560 other women having a less clear idea of the way they could benefit from the project but that will be supported in expressing their needs; - 200 young promotors, willing to invest in small scale palm tree (date) extensions, on the model of the agribusiness schemes; - 875 men expressing needs in terms of agricultural training.
Total agricultural area impacted by the project	5 000	Hectares	Oasis (1 000) + extensions (4 000)
Indirect beneficiaries	10 000	People	100% of Boudnib population benefiting from increased trade and economic activity due to the dynamic on the date value-chain.
Other indicators / indirect impacts:			
Quantities of groundwater saved due to substitution by surface water.	20	10^6 m^3/year	Starting when the dam is full (2020)
Amount of foreign currency savings through reduced import of dates nationally	400 000 000	USD	Value of dates securely produced during the time of project (40 000 T)

produced			
Employment generated by the economic dynamic in the Boudnib area	7 500	Equivalent full time positions	Surveys amongst the large and smaller scale farms, implemented during feasibility, show that: 2 full time jobs/ha are created over 3000 ha of large scale farms = 6000 jobs 1 full time job/ha over 1000 ha of small scale extensions = 1000 jobs + 0,5 full time employment/ha for the oasis : 500

See B.4 for benchmarking with similar projects.

When applicable, specify the degree to which the project/programme avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.

E.1.2. Key impact potential indicator			
Provide specific numerical values for the indicators below.			
GCF core indicators	*Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation only)*	*Annual*	
		Lifetime	
	Expected total number of direct and indirect beneficiaries (reduced vulnerability or increased resilience); number of beneficiaries relative to total population (adaptation only)	*Total*	5 500 direct beneficiaries 10 000 indirect beneficiaries
		Percentage (%)	100 (Boudnib municipality population)
Other relevant indicators	*Examples include:* • *Expected increase in the number of households with access to low-emission energy* • *Expected increase in the number of small, medium and large low-emission power suppliers, and installed effective capacity* • *Expected increase in generation and use of climate information in decision-making* • *Expected strengthening of adaptive capacity and reduced exposure to climate risks* • *Others*		
Describe the detailed methodology used for calculating the indicators above. Household surveys and focus groups in oases; public consultations; data collected at Ministry and ORMVAT level; bibliography. See Action Plan in **Annex 5.**			

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

Describe expected contributions to global low-carbon and/or climate-resilient development pathways through a theory of change for scaling up and replication (e.g. in terms of multiples of initial impact of the proposed project/programme).

Increased water scarcity in semi-arid rural areas of the Southern Mediterranean, as a consequence of climate change, threatens economic life in these territories and, more specifically, the promotion of a balanced and sustainable agriculture development. In the medium term these effects of climate change will either result in the disappearing of agriculture all together and of the associated livelihoods; or **will generate polarized and conflict prone territories where only those with access to large amounts of capital will be in a position to mobilize scarcer resources (for example by deep well pumping), while the others remain impoverished**.

In Morocco, agriculture in semi-arid areas is relatively well represented by the latter model where large estates, highly capitalistic, coexist with very small scale agriculture performed in oases, along the rivers (wadis). Combining the issues of climate change, and its effects on water resources, with those related to the social and economic stability of remote rural areas (and/or of the peripheries of large cities receiving incoming from these areas), this bipolar model appears weak in terms of sustainability.

The project intends to test a new model for development downstream of a water storage infrastructure based on an integrated approach and its three pillars:

- Transfer surface water and build an efficient irrigation water distribution infrastructure to insure “more crop for the drop”;
- Ensure an inclusive access to surface and underground water making sure that the local communities benefit both from the public investment and from the technological transfer allowed by the presence of agro business investors;
- Promote climate-smart agriculture within the oases and extensions (improving water efficiency of cropping systems, introducing drought resistant varieties, increasing added value per unit of land and per drop, promoting crop rotation and diversity);
- Creating and securing self-regulating institutions, in which users take responsibility for the management of a common-pool resource, in this case water.

This is a shift towards a more holistic approach to improving the adaptation of agriculture and rural territories to climate change, through irrigation development; it breaks from a more classical approach focusing on infrastructure.

This approach and the tools it will develop will constitute a “package” that could be easily replicable in other irrigation schemes of the country. In particular, this holistic approach to water management for agriculture in an environment of increased scarcity may also reveal as an important tool to conflict prevention and stabilization of poor rural areas.

E.2.2. Potential for knowledge and learning

Describe how the project/programme contributes to the creation or strengthening of knowledge, collective learning processes, or institutions.

Linking water technologies, inclusiveness and water institutions is a novel approach that will generate knowledge and learning related to the development paradigm in semi-arid areas of Morocco. In particular, research teams will be involved in the analysis and evaluation of the processes generated by the project, in the field of water institutions. Further, the project aims at developing adequate tools aimed at increasing the knowledge and the monitoring capacity of the situation of water resources underground. In particular, hydrological models will be developed for the deep water table of Boudnib.

As example, the project should provide insight to public and private stakeholders on:

- The use of Aquifer Contracts for self-regulatory institutions dedicated to scarce water management;
- The feasibility of promoting technology transfers in irrigation between ex-smallholders and agribusiness “top notch” investors;
- The appropriate technical and financial tools to promote smaller scale climate-smart investments around an agribusiness nucleus

A knowledge/capitalization component is included in the project in order to document how the more holistic approach tested through this project is replicable, and eventually up-scaled in larger areas (see above, description of sub-component 3.4).

The PMV provides an effective strategic framework for coordinating the activities of different financing institutions in the area of agricultural irrigation improvements. As noted above, the investment needs are huge and the support and engagement of multiple financing institutions is needed. The GCF is already beginning to play an important role in the implementation of the PMV and a number of Accredited Entities (AEs) are preparing major irrigation projects under the umbrella of the PMV, which is ensuring that these are designed and implemented in a coordinated fashion and with strong national ownership. For example, this currently includes:

• Morocco’s national Agricultural Development Agency (ADA), which is responsible for monitoring the implementation of the national agricultural strategy, linking with private or social investors, and promoting and managing the implementation of the aggregated model, providing linkages between the different partners. ADA has recently been accredited as an national AE of the GCF and is expecting to receive GCF Board approval in October 2016 for a project ADA’s project supporting the development of argan orchards in degraded environments in the Souss Massa Draa river basin, which will include irrigation improvements in the project area.

• Agence Française de Development’s (AFD) proposed project in the Guir river basin which focuses on water distribution from the Kaddoussa dam and adapting oasis-based agriculture to the impacts of climate change by supporting the adjustment to the use of new water sources and associated technical support.

• EBRD’s proposed Saïss Water Conservation project (this project) in the Sebou-Saïss river basin which focuses on water resource conservation through a transformative water transfer system together with institutional and governance improvements to facilitate private investment in modern irrigation technologies and community involvement in water resource management.

The effective coordinating function of the PMV is demonstrated by the way in which the above EBRD and AFD project proposals have been set up to cover different river basins, under the overall oversight and leadership of MAMF. Each of these projects is being implemented in a different river basin, under the guidance of MAMF and under the framework of the PMV. This is in line with best international practices in water resources management (e.g. the EU Water Framework Directive) which require water resources to be managed and governed at the river basin level under an over-arching national framework. There will therefore be no overlap between the three projects in terms of physical works, water resources used (e.g. rivers, aquifers) or institutional partners (e.g. specific river basin authorities and PIUs/OPDs). AFD will ensure that ADA and EBRD are invited to future consultation events, and information sharing on the level of specialized CSO teams is ongoing and will be deepened.

In addition, AFD has held discussions with ADA and EBRD on how to align further the implementation of the three projects, including by ensuring that lessons learned and knowledge generated will be shared with the MAMF to ensure that the MAMF can more easily replicate activities, and benefit from these. Project missions will be carried out jointly wherever possible and with the participation of MAMF. Where full joint missions are not possible, one representative each of the other agencies will be involved.

Assessment factor: Contribution to the creation or strengthening of knowledge, collective learning processes, or institutions

E.2.3. Contribution to the creation of an enabling environment

Describe how proposed measures will create conditions that are conducive to effective and sustained participation of private and public sector actors in low-carbon and/or resilient development.

The perspective of presenting this project to the GCF has made possible a much more ambitious approach to irrigation development in semi-arid / oasis areas. From an infrastructure based approach, the preparation phase and alignment on GCF's investment criteria has allowed to move to a more holistic approach. This is a reflection of the public sector's understanding of the broader role it has to play in increasing the resilience of semi-arid territories, prone to be strongly impacted by climate change. This role goes beyond the delivery of adaptation infrastructure (for water transfer and irrigation development), and includes socioeconomic development of local communities, including reduction of gender inequality, as well as groundwater preservation.

Describe how the proposal contributes to innovation, market development and transformation. Examples include:

- *Introducing and demonstrating a new market or a new technology in a country or a region*
- *Using innovative funding scheme such as initial public offerings and/or bond markets for projects/programme*

Furthermore, the Public-Private Partnership for the management of the irrigation scheme will reflect this holistic approach. The sourcing of the related expertise, through international tendering, will result in technological transfers towards the public sector, as well as the local private sector likely to be involved in the PPP.

E.2.4. Contribution to regulatory framework and policies

Describe how the project/programme strengthens the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities, promote development of additional low-emission policies, and/or improve climate-responsive planning and development.

The project's contribution to the management of the aquifer (namely by the promotion of an Aquifer Contract) will put into perspective the existing regulations and policies in the water sector. In particular, the country's groundwater pricing regulations will be challenged in order to induce substitution of this resource by surface water. Moreover, the technical assistance to be provided on these issues (aquifer contracts, groundwater preservation) will provide knowhow on these matters and produce useful empirical data to improve policies.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

Describe environmental, social and economic co-benefits listed above, including the gender-sensitive development impact. Examples include:

- *Economic co-benefits*

Total number of jobs created: 7 500 through the creation of new small scale plantations and daily works in larger industrial farms
Amount of foreign currency savings :400 000 000 USD through reduced import of dates nationally produced

The project will have economic co-benefits at two levels:

- Through the preservation of existing forms of agriculture and self-employment in the oases, thanks to an improved access to water and rehabilitation of the irrigation network inside the oases: 5 500 people;
- By securing irrigated agriculture and new extensions outside the oases (4 000 ha) directed to the production of 40 000 T of dates/year, creating USD 400 000 000 worth of produce. These extensions will furthermore generate the equivalent of 6 000 full time qualified and non-qualified jobs.

- *Social co-benefits:*

Oases communities are a unique social feature of pre-Saharan Morocco. The project's component 2, funded by the GCF, will directly improve the livelihood of the population in the oases, not only on a purely economic level, but also in social aspects. The Oasis Development Plans will include a social development component that will improve the living conditions of 5 500 people.

- *Environmental co-benefits*

They include: (i) preservation of oases biodiversity (1 000 ha of oasis preserved); (ii) preservation of groundwater resources (20 000 000 cubic meters/year).

- *Gender-sensitive development impact*

1 000 women will benefit from sub-components 2.3.4.2. and 2.3.4.3. of the project. Please refer to **Annex7**, which details the project's approach to gender.

E.4. Needs of the Recipient

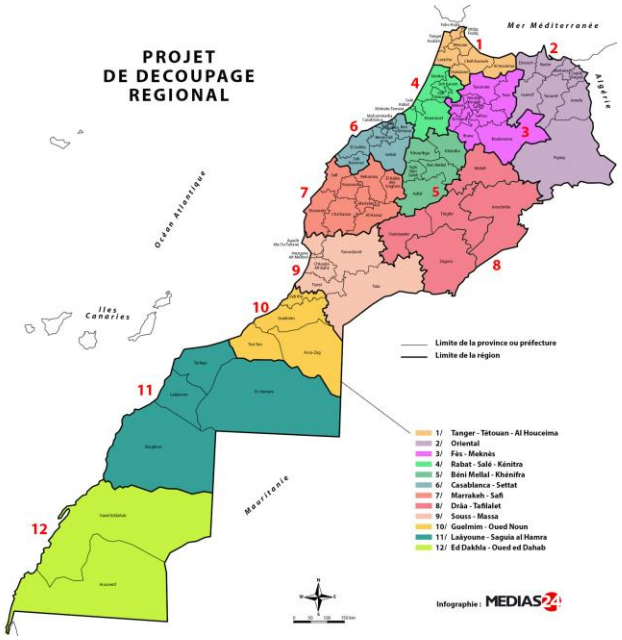
Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

Describe the scale and intensity of vulnerability of the country and beneficiary groups, and elaborate how the project/*programme addresses the issue (e.g. the level of exposure to climate risks for beneficiary country and groups).*

Vulnerability to climate change

Morocco, with a land area of 710 850 square kilometers, is located in north Africa between the Atlantic Ocean (to the west) and the Mediterranean Sea to the northeast, and is bordered to the south by Algeria and to the southeast by Mauritania. Morocco sits between two climatic zones: temperate in the north and tropical in the south. To the west, the anticyclone of the Azores and the Saharan depression form great spatial as well as temporal climate variations. Rainfall in the north can be as high as 2 meters per year, while in the desert south, average annual rainfall is 25 mm per year. The country has four major geographic regions: the coastal planes; the hills to the north that are parallel to the Mediterranean Sea; the hills to the center that include the Middle Atlas, High Atlas and Anti-Atlas; and the desert hills.



The latest 2050 climatic projections in Morocco indicate a progressive increase in aridity due to scarcer rainfall (- 15 to 20%) and the increase in average temperatures (+ 4 to +6 °C) which will generate an increase in evapotranspiration of more than 8%.

Vulnerability of Morocco economy and population linked with the vulnerability of agriculture sector

The projections also indicate reduced agricultural yields and crop failures from longer drought periods. This means that surface water resources will become less available, while the agricultural crops' needs will increase, thus increasing the pressure on underground water.

Climate change poses a significant threat to Morocco's water and environmental resources, which are already under extensive pressure from population explosion, industrial growth, tourism development activities and agricultural extension. Agriculture's value added to GDP has undergone significant fluctuations due to weather conditions from 28% in 1960 to 14% in 2007 and 16% in 2009.

The study on the impacts of climate change on Moroccan agriculture conducted by FAO, the National Institute for Agricultural Research and the National Directorate of Meteorology in 2009 expected a decrease in productivity of the main crops in semi-arid areas by lower yields (-15% for wheat in 2050, 10% for barley), extension of crops on marginal lands and decrease in consumption of fertilizers. This study also shows that the area of distribution of some demanding species in water (corn, sunflower, beans, olives) or of species affected by rising temperatures (fruit tree species needing cold) could move. **The reduction in the availability of surface water and aquifer recharge could also affect the performance of irrigated agriculture**. Finally, note that these are the areas most suitable for agriculture today (North and Central West) that will experience the most significant falls in crop yields.

Agriculture is important to the country's economy and food security; it is practiced on 67% of the total area land, employs about 41% of the population and, in 2009, contributed 16% to the total GDP. Agriculture consumes over

83% of harvested water, but water scarcity and irregularity are major hindrances to its development

Thus, climate significantly influences the Moroccan economy[4]. **The World Development report 2010 classified Morocco among the countries that will suffer the most due to the negative impacts of climate change on yields. As illustration, the 1994/95 drought caused agricultural GDP to fall by 45% and GDP to fall by 8%.**

Smallholders are particularly vulnerable to climate change. Morocco has a large rural population, with over 40 % of a total population of 33,848,282 living in rural areas (HCP Morocco 2014.), which is highly dependent on natural resources (agriculture, animal husbandry and biomass energy) and, thus, very vulnerable to the impacts of climate change.

Vulnerability assessment at local level:

The Project area is composed of the rural municipality of Oued Naâm and the urban municipality of Boudnib and characterized by a fall in the rural population by 0,7% per annum between 2004 and 2014, while the urban population continues to slightly increase at a rate of 1.4% per annum. Oued Naâm consists of 7 oasis schemes distributed along the Guir course.

Change in the population of Boudnib and Oued Nâam between 2004 and 2014

Urban Municipality (MU), Rural Municipality (CR)	2004		2014		AAGR
	Total	Households	Total	Households	
BOUDNIB (MU)	9,867	1,828	11,373	2,350	1.4
OUED NAAM (CR)	5,709	1,000	5,340	1,044	-0.7

The whole area is characterized by a very low employment rate (Oued Naâm : 35,6%, Boudnib : 28,8%), especially for women (ON: 24,4%, B : 5,6%) and a high illiteracy rate (ON: 45,3% and 40,3% for women, B: 31,6% and 40,3% for women).

4 http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=MAR&ThisTab=Dashboard

Population structure for the Oued Naam commune

Group of age	% of the population
0-4 y	13,5
5-9 y	10,1
10-14 y	9,3
15-19 y	8
20-24 y	7,2
25-29 y	6,5
30-34 y	6,9
35-39 y	6,7
40-44 y	5,7
45-49 y	5,1
50-54 y	4,8
55-59 y	3,8
60-64 y	3,2
65-69 y	2,8
70-74 y	2,6
75 y and more	3,8

.

Population structure according to age and sex

	Male	Female
Less than 6 y	51,48	48,34
From 6 to 14 y	50,27	49,69
From 15 to 59 y	44,27	55,65
60 y and more	42,12	57,69

Literacy rate by sex :

	Masculin	Féminin
Taux d'analphabétisme	30.7	49.9

Agriculture is the main economic activity in the region (70% and even close to 100% in oases) and the major source of income. In this regard, the project area is experiencing a general transformation dynamic following the concentration of agricultural investments (in recently created modern palm tree groves).

Oases suffer from agricultural decline, due to economic and social opportunities offered elsewhere and factors blocking development in these areas such as the degradation of local farming and non-farming infrastructures.

Agriculture in oases is adapted to a necessary confinement within the boundaries of the irrigable areas along the river and consists at plot level of a three layer vertical stratification: cereal and alfalfa; fruit trees; date palm-trees. It is characterized by a high level of complexity of property and usage rights (of water, land, trees) and by an extreme fragmentation of the holdings (as a result of time and heritage rules). Holdings rarely exceed 0,5 ha/farmer. This system allows a balance between subsistence production and commercialized goods (some fruits but mainly dates), though competitiveness and monetary income of these farms are very low (estimated income of

2000 EUR/ha/year for holdings between 0,1 and 0,5 ha, and negative gross profit margin). Nevertheless oases fulfill other vital functions for the population of the region: residence, preservation of the landscape, biological diversity and vivacity of the territory. They also play a support role to the extension outside the oases: use of cut-offs from the palms of the oasis for new plantations, mobilization of know-how, etc. Finally, oases (despite their sophistication and cultural importance) are nowadays more of a poverty trap than an enabling environment for farmers that wish to improve their livelihood.

Small extensions (2 to 10 ha on average) have been developing outside the oases over a couple of decades, which are undertaken by local farmers mobilizing both the know-how gained and developed in oasis-based agriculture as well as innovations from the large businesses (where they often work as paid labor). This development is due to the combined effects of the exceptional flood of 2008, modernization constraints inside the traditional oases and measures favoring modern investment through the Green Morocco Plan.

However, this dynamic is often restricted by smallholders' lack of capital, socio-technical network and access to technologies. Income of such projects is consequently low (about 5000 EUR/ha/year with a tree density of 80) and profitability often negative.

Large farms integrated in the date value chain have more recently started developing, promoted by agribusiness farmers from other parts of Morocco, relying on capital-intensive investments (with strong support from the State), advanced technologies, high technical and practical knowledge and standard and strong business models (monoculture, Madjhoul, etc.).

This model is characterized by high income and returns (estimated income of up to 30 000 EUR/ha/year with a tree density of 150 and gross profit margin of 4700 EUR/ha).

The divide between these two classes of farmers threatens the social balance at local level and is potentially a source of future conflicts and overall territorial vulnerability.

E.4.2. Financial, economic, social and institutional needs

Describe how the project/programme addresses the following needs:

- *Economic and social development level of the country and the affected population*

As mentioned previously, the project will secure self-employment (family farming) in oases (5 000 people) through an improved access to water for production and will contribute to the creation of 7 500 new jobs locally, by increasing the sustainability of the economic dynamic underway in the Boudnib Plain. Furthermore, the project will contribute to the country's economic strategy regarding the date value chain and to an increase in date production estimated at 40 000 tons / year (mostly high quality Madjhool). This should bring Morocco close to being the first Madjhool date producer in the world.

- *Absence of alternative sources of financing (e.g. fiscal or balance of payment gap that prevents from addressing the needs of the country; and lack of depth and history in the local capital market)*

As mentioned above, Morocco will be strongly hit by the impacts of climate change on aridity and, as a result, decrease in the area suitable for rain fed agriculture. Facing and anticipating this issue requires extremely high levels of investments in irrigation, water transfer infrastructure, desalinization plants, etc. for which financial support from donors is paramount to sustain the rhythm of "adaptation" investments needed to be ready by 2050, when the full impacts of climate change will be felt. This project is an example of such donor support to this line of investments.

- *Need for strengthening institutions and implementation capacity.*

The institutions involved in this project (MAPM/DIAEA, ORMVAT, ADA, ABH) have strong capacities in general. Nevertheless, the complexity of the holistic approach to irrigation promoted by this project calls for a strong technical assistance, especially for the implementation of Component 2 and 3. Though Morocco has background and knowledge on the establishment of aquifer contracts, international expertise brought on this topic through the TA will be useful.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

Please describe how the project/programme contributes to country's identified priorities for low-emission and climate-resilient development, and the degree to which the activity is supported by a country's enabling policy and institutional framework, or includes policy or institutional changes.

Morocco has been suffering from Climate change, namely in the agriculture sector, for several decades and has been elaborating and implementing national plans and strategies to fight against global warming in various sectors for more than a decade.

As far as Agriculture is concerned, the various strategies are now embedded at the country level in the National Plan to fight Against Global Warming (2009) & the INDC, and at the sector level in the Plan Maroc Vert, as cross-programmes to support the two main socio-economic pillars (see FP). The implementation of such measures and programmes is supported by the State through (i) investment in infrastructures and equipment, (ii) subsidies to farmers, cooperatives and producers' organisations and agro-businesses to encourage irrigation investments and adaptation techniques (Agriculture Development Funds) and (iii) provision of soft support, knowledge transfer, etc to farmers, especially the most vulnerable.

The project will strongly contribute to the national climate strategies and objectives, mainly in terms of adaptation but also in terms of mitigation, as described below:

- Irrigation of new lands in semi-arid areas thanks to the Kaddoussa dam, to enable the development of a high added-value crop is planned by the national Irrigation Extension Programme. This programme aims at increasing irrigated agriculture surfaces all over the country (+ 160 000 ha by 2020), while improving water distribution's efficiency, value of water, crop yield, and farmers' income.
- Provision of surface water, combined management of water resources, and mobilization of water from intermediary basins will contribute to the preservation of underground water resources, as stated in the National Water Strategy adopted in 2009 and in the INDC, in a zone where agro business investors are already increasingly making use of the latter.
- Use of modern irrigation techniques and corresponding advisory services which will be provided to the project's beneficiaries will help them use water more effectively, as targeted in the National Water Saving Programme for Irrigation.
- Plantation of palm trees in arid areas is a component of the National Action Plan Against Desertification, which targets 2,9 M new trees by 2030 (cost amounting to 3,23 M MAD), to improve both soil structure and composition & water retention capacities and stock carbon (contribution to the mitigation component).

Oases are identified as vulnerable zones to be preserved in the INDC and the GMP through the implementation of specific agricultural, social, economic and environmental measures, which the project takes into account:

- The canalization of the wadi will protect them from floods which can be devastating for villages & infrastructures, gardens and local heritage, as well as from droughts since regular water service will be ensured.
- Introduction of new species and new agricultural techniques, rehabilitation of trees, diversification of crops, etc., will improve oases resilience to climate change, biodiversity, inhabitants' income and life conditions. It will thus reduce rural exodus and help preserve valuable ancestral practices.
- Plantation of hedges will stop land erosion.

The project will as well contribute to meet the objectives of the two main GMP pillars.

Within the 1st pillar of the GMP, sub-programmes concerning the 20 main value-chains in Morocco were actually elaborated targeting structuration, enhancement, competitiveness improvement and fair distribution of added-value. And as stated in FP C1, dates are one of the 20 products to be promoted. The Dates Programme aims at reaching a national production of 160 000 tons by 2020 in order to substitute current imports, but also to become a net exporter. This target will be reached by the plantation of an additional 17 000 ha of palm-trees. Additionally, this strategy focuses on the production of quality dates, in particular of the Madjhool variety which have been characterized under the protected geographical indication “Dattes Madjhool du Tafilalet”.

Eventually, the project will provide soft support (technical as well as farm management and financial & banking advice) to project-holders willing to develop agricultural, namely palm-trees, activities in the area. This will help agro-businesses but also small and medium promoters design and implement sustainable farming projects, resilient to climate change and efficiently natural resources.

E.5.2. Capacity of accredited entities and executing entities to deliver

Please describe experience and track record of the accredited entity and executing entities with respect to the activities that they are expected to undertake in the proposed project/programme.

The AFD Group operates in Morocco since 1992, and at this date, the country is the largest recipient of AFD’s funding (€ 2.5 billion exposure in 2014) worldwide.
AFD operates and supports national strategies in various sectors (education, agriculture, energy, water sanitation, transport, etc.), with a focus on:

- Enhancing human capital through inclusive education ;
- Supporting the modernization of SMEs;
- Development of rural territories;
- Management of natural resources in the context of climate change;
- Promoting renewable energy and energy efficiency.

In the rural development sector, AFD is currently funding the 2nd pillar of the Green Morocco Plan (50 MEUR) – Morocco’s overarching strategy for agriculture development. In this context, there has been extensive field and analytical work by AFD and the Agency for Agriculture Development (in charge of implementing the GMP) directed to better supporting a more business oriented family agriculture in the more environmentally and economically vulnerable areas of the country.

AFD also supports:

- The National Program of Rural Roads to open up isolated areas and facilitate market access to producers;
- The Crédit Agricole du Maroc (main agricultural bank) to enable farmers without bank guarantees to access credit;
- A sub-component of the GMP focusing on the adaptation of agriculture to climate change through i) the mapping of climate evolution and agriculture, ii) agricultural experimentation and iii) the creation of a climate index agricultural insurance

AFD has been supporting irrigation development in the country for more than 20 years, mainly in the Moyen Sebou valley, with a total amount of financing of EUR 154 M. Two projects implemented by the Office Régional de Mise en Valeur Agricole du Gharb (ORMVAG) in the 1990s aimed at rehabilitating existing equipments and extending the irrigation network, focusing on the improvement of the ORMVAG and the water-users management capacities and thus the technical performances of the waterservice. The project, currently under implementation in the Moyen Sebou region, has contributed to the elaboration of a unique approach of involvement of water users (farmers) in the management of the irrigation scheme (distribution of water and infrastructure maintenance). AFD’s extensive experience in the field of irrigated agriculture all over the world and, in particular in the MENA region – including Morocco will be of high value for the implementation of this project. In particular, AFD’s knowledge and experience on irrigated infrastructure delivery (building on France’s know-how in the field), participatory water management

(development of water users associations, aquifer contracts) and family farming development will be directly injected in this project.

E.5.3. Engagement with civil society organizations and other relevant stakeholders

Please specify the multi-stakeholder engagement plan and the consultations that were conducted when this proposal was developed.

16 different consultations were organized during the preparation phase of the project with the oases population: 7 targeted men, 7 women, 1 youth and 1 the herders of the area. Detailed outputs of these consultations are presented in the feasibility study/Action Plan in **Annex 5** and have been used as the basis for the design of component 2, as well as the impacts assessment study.

Consultations included:

- Diagnosis of the population's initial economic and social situation: types of crops cultivated (almonds, dates, olives, cereals, vegetables…), water use, irrigation system, activity schedule during the year, role of men/women.
- Expected impacts of the dam project in the communities and answers to the questions
- Ideas of projects to improve living conditions in the oases and promote the cultural heritage

As Delegate Contractor of the project, ORMVAT's remit is to ensure implementation of the process of disclosure of information and communications towards the other project stakeholders, the first level of which are the local authorities and the communities concerned. They will make the Stakeholders engagement plan (SEP) their own and implement it.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers; providing the least concessionality; and without crowding out private and other public investment.

The proposed financing structure is a mix of senior loans and grants that will allow tackling both short and medium term objectives related to resilient economic development, as well as longer term sustainable resource management.

The resources provided in the form of loans will help deliver high efficiency irrigation infrastructure directed to the development of more resilient forms of agriculture by stabilizing and securing access to water, as well as promoting an inclusive environment for investment in the palm tree value chain, by the private sector. The loans will follow AFD's rating system.

The grants will help the executing entities tackle the complexity of a holisitic approach to irrigation (technical assistance) as well as financially absorb the costly and longer term components of the overall investment (groundwater management, preservation of oases). In particular, absence of these additional resources and business as usual would have maintained the baseline situation, characterized on the one hand by high vulnerability of oases to water scarcity and lack of economic opportunities and on the other by unregulated use of underground water resources. Costs to improve this situation add-up to those of the transfer infrastructure and become difficultly incurable by the State: it is clear from discussions between AFD and the GoM that without additional grant resources, the holistic approach proposed by the present project would not have been possible.

Please describe the efficiency and effectiveness, taking into account the total project financing and the mitigation/ adaptation impact that the project/programme aims to achieve, and explain how this compares to an appropriate benchmark. For mitigation, please make a reference to E.6.5 (core indicator for the cost per tCO2eq).

As mentioned above, the project proposes a holistic approach to irrigation development as a tool for agriculture adaptation to climate change. It recognizes the insufficiencies of a "hard" approach of infrastructure delivery, in that it will either produce low efficiency resource mobilization or polarized and non-inclusive development patterns. In comparison with such a benchmark, the project will not only facilitate efficient high technology irrigation extension investments, it will also guarantee the inclusivity of these investments (territorial resilience) and design appropriate tools for the management of a scarce resource.

Costs of Kaddoussa project are comparable to other irrigation projects' costs in Morocco. For example, see B.4 for a benchmark with the Guerdane project.

AFD is also supporting a similar project (transfer of water from a dam to a 6,400 ha area located 30km away from the dam and concerning 2,200 farms) in the Moyen Sebou region, close to Fes, and this project's total cost per beneficiary is in the range of EUR 4,000. The total cost per farm is comparable (EUR 460 compared to EUR 420 in Kaddoussa project) and the total cost by ha is even 30% higher.

Eventually, the costs differences are mainly linked to the specific actions targeting oases' environmental and socio-economic resilience to climate change and combined management of water resources, included in Kaddoussa project. Investments in remote areas such as the Boudnib valley may also increase investment costs.

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme) and/or the potential to catalyze indirect/long-term low emission investment.

Total amount of co-financing = 76 MEUR

Fund's investment = 20 MEUR

Co-financing ratio = 3,8

Please make a reference to E.6.5 (core indicator for the expected volume of finance to be leveraged).

E.6.3. Financial viability

Please specify the expected economic and financial rate of return with and without the Fund's support, based on the analysis conducted in F.1.

The economic analysis conducted shows that without the intervention of the project and the Fund's support (no-project situation, see **Annex 10**), the overall system (oases + agribusiness extensions) reaches a breaking point (due to resource overexploitation) before full return on investments: internal rate of return in this scenario is negative. With the Fund's support, targeting the oases and supporting improved groundwater management, the system sustains its economic performance until full return on investments and reaches internal rate of return up to 20% overall (5 000 ha).

Please describe financial viability in the long run beyond the Fund intervention.

Long run viability of the irrigation scheme (management & maintenance) developed through this project is secured by a Public – Private Partnership that will be set up in the course of the project.

Please describe the GCF's financial exit strategy in case of private sector operations (e.g. IPOs, trade sales, etc.).

NOT APPLICABLE

E.6.4. Application of best practices

Please explain how best available technologies and practices are considered and applied. If applicable, specify the innovations/modifications/adjustments that are made based on industry best practices.

The agribusiness estates developing in the area are bringing state of the art drip irrigation equipment and systems. Linked to groundwater management tools and to an inclusive approach to irrigated agriculture, the system developed through this project is representative of a large part of Morocco's future agriculture.

E.6.5. Key efficiency and effectiveness indicators

GCF core indicators

Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)

(a) Total project financing	US$_____
(b) Requested GCF amount	US$_____
(c) Expected lifetime emission reductions overtime	_____ tCO_2eq
(d) Estimated cost per tCO_2eq (d = a / c)	US$_____ **/ tCO_2eq**
(e) Estimated GCF cost per tCO_2eq removed (e = b / c)	US$_____ **/ tCO_2eq**

Describe the detailed methodology used for calculating the indicators (d) and (e) above.

Not applicable

Please describe how the indicator values compare to the appropriate benchmarks established in a comparable context.

Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)

Not applicable

Other relevant indicators (e.g. estimated cost per co-benefit	

generated as a result of the project/programme)	

**** The information can be drawn from the project/programme appraisal document.***

F.1. Economic and Financial Analysis

Please provide the narrative and rationale for the detailed economic and financial analysis (including the financial model, taking into consideration the information provided in section E.6.3).

The financing plan of the project has evolved during the preparation phase due to the increase of the scope of the project and debt management issues, impacting the economic and financial analysis. An up-to-date version of the economic model is now available **Annex 10.**

From discussions between AFD and the Government of Morocco, it appears that without additional GCF grant resources, the holistic approach proposed by the present project would not have been possible. Project preparation was initiated in February 2015, solely on the basis of a 40 MEUR AFD loan and 1 MEUR small grant. The initial design of the project, as mentioned elsewhere in the FP was based on the transfer infrastructure between the dam and the Boudnib Plain, crossing through the oases. At identification and throughout the feasibility process, it became clear to AFD and the Ministry of Agriculture that additional components of action were needed to make this project sustainable: (i) stronger support to oasis development and resilience (economic and climatic); (ii) stronger emphasis on the management of groundwater resources, namely by the establishment of an aquifer contract (and related information systems). Inclusion of these components in the project received technical approval by the Ministry of Agriculture and we initiated discussions with the GCF for additional funding in the form of a 20 MEUR concessional loan.
In view of debt management issues, the Government couldn't accept this financing plan despite their essential character to the sustainability of the project.
The technical preparation of the project was halted between October 2015 and February 2016, during which discussions took place between AFD and the Moroccan Government on ways to resume the process. The only way to continue the project preparation was to shift the contents of the GCF funding proposal from loan to grants, in the same amount. Submission of the corresponding FP and inception of discussions with the GCF on this basis has allowed the overall project preparation to be finalized (and the project to be submitted to AFD's Board). It is worth noting that, at this stage, it is the Moroccan Government's request that the signing of the AFD loan agreement take place only when the GCF funding agreement is granted.

Based on the above analysis, please provide economic and financial justification (both qualitative and quantitative) for the concessionality that GCF provides, with a reference to the financial structure proposed in section B.2.

The actual proposed financing structure is a mix of senior loans and grants that will allow tackling both short and medium term objectives related to resilient economic development, as well as longer term sustainable resource management. The project will be implemented in particularly deprived areas that need strengthening in terms of, dialogue and consultation, and long-term management of their water resources.
The grant nature of the GCF contribution to this project is consistent with the following guidelines:

(i) Grant elements should be tailored to incremental cost or the risk premium required to make the investment viable, or to cover specific activities such as technical assistance;

As mentioned above, GFC funding are tailored to the incremental costs related to implementation of components 2 and 3. These components, key to the overall sustainability and adaptation impact of the project, would not exist, if not for GCF's financial contribution in the form of grants.

(ii) Seeking the right level of concessionality, so as not to displace investments that would otherwise have occurred, including for private sector investment;

Private sector investment inside the oases schemes are very low, namely due to the small scale of the holdings (between 0, 1 and 0, 5 ha) and oases agriculture systems brings an estimated income of 2000 EUR/ha/year. Levels of income of the population are low and oases have a public good dimension which falls into national strategies for preservation of these cultivated ecosystems and associated populations. The Government of Morocco seeks grant

resources to fund these strategies and associated projects in the oases: for example the Adaptation of Oasis to Climate Change Project, 10 MUSD for 8 oases (2015-20), funded by the Adaptation Fund.

With regard to the overall infrastructure financing plan, the dam upstream is financed through a grant from an Arab Fund. In this context, GCF funds will add concessionality to an overall costly investment for the State, which has both a short term (allowing current forms of agriculture to be resilient to increased aridity due to climate change) and long term return component (preservation of the aquifer for future investments/generations). The GCF's concessional input in the financing scheme for component 1 (5 MEUR) is related to the longer term and adaptation component of this investment.

(iii) Levels of indebtedness capacity of the recipient should be taken into account so as not to encourage excessive indebtedness;

Global public debt is considered sustainable according to the IMF (80% of the GDP) but is nevertheless on an increasing trend. The global economic crisis having interrupted the State's de-leveraging trajectory, initiated in 2009 and reinforcing the Treasury's debt which has increased to 64% in 2009. The current policy is characterized by a more strict management of public debt to get back in line with the 2009 strategy.

(iv) Structure terms on a case - by - case basis to address specific barriers;

The grants resources will be dedicated to the part of the project that have a low and long-term profitability for which the costs cannot be supported by the current stakeholders: soft investments (technical assistant, training, etc.) and financial support (small scale producers) to carry out the innovative socio-economic development in this area, as well as the structuring of a PPP for the management and maintenance of the irrigation network.

(v) Leveraging of other financing, including public and private financing, seeking to maximize leverage in the case of private financing;

As mentioned above, the GCF funds have a retroactive leverage effect on AFD funds, making possible a more holistic and sustainable project, acceptable to our Board.

(vi) Promote long - term financial sustainability

At the end of the project, the government of Morocco will finance the water management and revitalization of oases activities that will be implemented through GCF fund. Government of Morocco and private investors (by paying fees for water) will finance the infrastructure scheme maintenance.

F.2. Technical Evaluation

Please provide an assessment from the technical perspective. If a particular technological solution has been chosen, describe why it is the most appropriate for this project/programme.

The irrigation techniques promoted through this project are *state of the art* in terms of efficiency (comparable to Israeli or Californian systems[5]): they are particularly adapted to the semi-arid situation of the project area and will play a key role in the sustainability of the project as long as the regulatory aspects to be developed in Component 4 are in place.

F.3. Environmental, Social Assessment, including Gender Considerations

Describe the main outcome of the environment and social impact assessment. Specify the Environmental and Social Management Plan, and how the project/programme will avoid or mitigate negative impacts at each stage (e.g. preparation, implementation and operation), in accordance with the Fund's Environmental and Social Safeguard (ESS) standard. Also describe how the gender aspect is considered in accordance with the Fund's Gender Policy and Action Plan.

Main outcomes of the ESIA and ESMP:

Due diligence process:

ESIA has been conducted by independent consultants and experts (environmental, social and procedures experts) selected through an international call for tender. ESIA has been done thanks to the following procedures, according to the Terms of Reference of the study, IFC Performance standards which are applied by GCF, and best due diligence practices:

- Reviewing existing information:

ESIA is based on deep analysis of environmental and social area and project information. Regarding the project information, ESIA is based on the information gathered in the diagnosis reports (**Annex 4)** and the infrastructure design study (**Annex 6**). Regarding the project area information, ESIA is based on official documents about the population and local agriculture (Official Population census, official agricultural reports) and IUCN species status. It is also based on research documents about local flora and fauna and palm trees and oases agriculture. All sources and bibliography can be found in ESIA report.

- Site visits and stakeholders and communities meetings:

ESIA experts have implemented several site visits during the process of the assessment. They have checked onsite fauna and flora, and met all stakeholders and communities. All reports of these meetings and focus groups can be found in the ESIA Annexes, as well as the interview method.

- IFC requirements scanning and applicability for the project:

An entire review of IFC Performance Standards has been done to identify their applicability in the context of the project (section 4.2 of the ESIA).

ESIA summary and key environmental and social issues and impacts:

The ESIA has studied the initial state of environmental and social components of the project, the impacts (positive and negative) specific to PDIAAI-CC, interactions with the dam and the cumulative impacts with the dam. Impacts

[5] See : http://www.haaretz.com/israel-news/business/.premium-1.709082

have been analyzed for each step of the project realization: “Works” and “Operating” phase.

Concerning the initial state of environmental components, the section of Guir wadi interested by the study is part of the South Atlas domain. Constituted by the basins of Errachidia and of Boudnib (GCIM, 2015), it is divided into two relief sectors. The uneven part in the North, to ksar Tazougart, looks over the Boudnib plain in the axis of which the Guir water source curves to take a West-East direction. This plain has a morphology of regs, outcropping of flat rocks covered in gravel and stones and, in the bed of the watercourse, sand-limestone sediments (Ramsar, 2015). The sector is dominated by the following plant species: Hammada scoparia, Salsola vermiculata. The Boudnib plain is dominated by the following species: Hammada scoparia, Zyziphus lotus and Anabasis aphylla.

Only some parts of the wadi show wetlands that shelter diversified flora and fauna. These places are found where the underground wadi water comes to the surface (Saheli oases) or when a dam has been built (e.g. Tizougarine, Ghaba…). Thanks to the presence of water, tall grasses such as Phragmites and woody flora (tamarisk and laurel), wetlands attract many terrestrial insects, aquatic or semi-aquatic (many species of insects have been observed: damselflies, dragonflies, truxales, etc.) and are a place of drinking and hunting for bats and other mammals (a Rüppell's fox was found dead in a wetland). The presence of turtles in the wetlands seems important since numerous specimens of Pond Turtle (mauremys leprosa) have been observed. It is also proven that the resurgences of the water source help with the feeding of aquatic invertebrates (underground crustaceans, amphipods, aquatic oligochaetes, etc.) first link in the wadi's food chain. The biodiversity of stygobites (underground species) is rich in the Tafilalet. In the study area numerous species have been observed in a well in Tazougart (Boughrous, 2007). Grey herons and egrets feed from the crustaceans in the wadi, these birds are species indicating potential resurgences. Unlike hepertofauna and insects, the presence of avifauna is however relatively low. The wadi is not a habit rich in fish.

Outside wetlands, fauna is rare, potential IUCN red list endangered species present in the region have not been seen for several decades (e.g. striped hyena, hyaena hyaena, cape hare, lepus capensis). Only the golden jackal can be seen, but is classified as “minor concern”.

Concerning the social components of the initial state, the analysis allowed to identify: (i) cultural heritage through, for instance, historical fortified villages, the “ksours”, irrigation water management and infrastructures (“khettaras”), (ii) different forms of land ownership between private land in the oases and collective land on the plain area (rented or not), (ii) several key social groups, such as women, young men, nomadic and semi-nomadic breeders. Focus groups sessions with these key social groups have permitted to understand livelihood conditions of the people, their understanding of the project and their expectations regarding to the project components and their impacts.

Also, a deep analysis of the institutional framework of the project is given, from supervising ministries to local administrations ORMVATfs.

The PDIAAI-CC is a unique project. It includes in its definition through several subcomponents and specific objectives of the Action Plan, measures that enable mitigation of negative impacts and enhancement of positive impacts of the irrigation scheme downstream dam Kaddoussa identified in the ESIA.

In that respect, the ESIA did not identify any major negative impacts due to the Project that could not be mitigated or compensated. The main impacts are associated with the accumulation of impacts between the Project and the Kaddoussa dam because a section intersecting the surface water intakes of Guir Wadi will be created.

Also, the project will lead to many benefits for operators of traditional oases securing water supply and through the implementation of the Action Plan.

Key impacts of the Project, which are concentrated in the operating phase, taking into account the synergy effects between the components of the Project is given in the table below.

Impacts during operation phase	Significance of the impact and probability
Impacts on hydrological continuity: creation of a shorted section	Importance of cumulative impact between the Kaddoussa dam and Saheli: major Probability of occurrence of the cumulative impact: strong
Impacts on volumes mobilized annually: increase and securisation	Importance of the cumulative positive impact: major Probability of occurrence of the cumulative impact: strong
Hydrogeology impact: reducing the recharge of the alluvial aquifer	Importance of the impact (interaction): medium Probability of occurrence of the impact (interaction): strong
Hydrogeology impact: release of pressure on the Senonian aquifer,	Importance of the positive impact (interaction): medium Probability of occurrence of the impact (interaction): medium
Impacts on wetlands and the wadi ecosystem: Wetlands shrinking, impact on wildlife	Cumulative impact significance: medium Probability of occurrence of the cumulative impact: strong
Impacts on gender (vulnerable population): disruption of domestic activities related to the river, possibilities of implementation of activities based on the demands of women	Importance of the impact (interaction) (fears of women): medium Probability of impact occurrence (interaction): these are fears (and expectations) and therefore the probability is medium.
	Importance of the positive impact (interaction) (expectations of women): medium Probability of impact occurrence (interaction): these are expectations and therefore the probability is medium.
Impacts on the uses of the Guir wadi and associated economic activities (traditional and semi nomadic oases): Securing the supply of agricultural water of oases downstream of the Kaddoussa dam	Significance of positive impact: medium Probability of occurrence of the impact: medium
Impacts on the uses of the Guir wadi and associated economic activities (traditional and semi nomadic oases): Reduction of the purifying role of Wadi Guir	Cumulative impact significance: medium Probability of occurrence of the cumulative impact: strong
Impacts on the uses of the Guir wadi and associated economic activities (traditional and semi nomadic oases): Reduction of Wadi inputs profitable to nomadic and semi-nomadic farmers	Cumulative impact significance: medium Probability of occurrence of the cumulative impact on semi-nomads: strong

Changing the water management at the Wadi Guir oases	Cumulative impact significance: medium Probability of occurrence of the cumulative impact: strong
Support of oasis farmers to change management of irrigation water in traditional oases	Significance of positive impact: medium Probability of occurrence of the impact: strong
Temporary cut of agricultural water supply in the traditional oases	Importance of the impact (interaction): major Probability of occurrence of the impact (interaction): strong
Impacts on traditional water infrastructure: Reduction of the supply of the khettaras by the alluvial aquifer	Cumulative impact significance: medium Probability of occurrence of the **cumulated** impact: medium
Impacts on traditional water infrastructure: Improving agricultural production in the oases, khettaras supply	Extent of the positive impact: major Probability of occurrence of the impact: strong
Impacts on economic activities outside the traditional oasis: Securing the supply of agricultural water	Extent of the positive impact: major Probability of occurrence of the impact: strong

Following this table, some key E&S issues are to be addressed to allow minimizing impacts and optimizing the implementation of the project and resilience of the beneficiaries to climate change. These issues can be considered as risk factors for the success of the project (see section G.2).

First issue is to ensure that oasian people are well trained to manage their new surface water (Water users association). Second issue is that the distribution network needs to be built according to the communities' demand, especially coming from women (see action plan section 2.3 for more details). A high level participation of the beneficiaries will be undertaken to implement these inclusive local investment projects. Third issue is the implementation of water storage infrastructures (section 2.2 of the Action Plan) along the intermediate basin down Kaddoussa dam for environmental protection (wetlands saving) and optimize water savings.

Finally, if an aquifer contract is not established and signed by all stakeholders, the long term sustainability of water withdrawals (both surface and underground) is threatened. But the project can only be a support, through its technical assistance, to the public authority in charge to implement this contract, which is the water basin authority.
See **Annex 8** for full E&S impacts study and ESMP.

Environmental and social risk category of the proposed project following the GCF ESS definition : B

ESMP summary

The ESMP has been elaborated following IFC standards, ensuring a feasible implementation of its mitigation and enhancement measures and their monitoring, a precise estimation of their costs and transparent and regular intern and extern communication procedures. In that respect, the ESMP is organized as the following:

- The description of the actions implemented and to be implemented within the framework of the ESMP;
- The description of the roles and responsibilities for implementation of the future measures;

- The mitigation/improvement measures for the works phase to be included as Environmental and Social Clauses in the call for tender documentation for the construction firm(s) (Project Manager) then in their binding contract with ORMVAT;
- The mitigation/improvement measures for the operation phase to be implemented by ORMVAT and partners;
- A Summary of the impacts and associated measures, with the roles and responsibilities of project stakeholders, the costs and the period of execution;
- The **Stakeholders Engagement Plan** (SEP). The SEP is a document that presents the commitments of dialogue towards the communities affected and other project stakeholders. It ensures proper dissemination of information and an effective, relevant consultation of these stakeholders to involve them in the decisions that concern them. It follows, in particular, the requirements and recommendations of stakeholder engagement, through paragraphs 25 - 36 of Performance Standard No. 1 of the IFC.

The ESMP provides as well all forms that will allow the implementation team to run mitigation measures, identify new potential impacts and update the project data base (e.g form for handling grievances, composition of the grievance register, Identification sheet of the potential impacts of the activities and micro projects of the PDIAAI-CC…).

The project is shaped in a way that the implementation program (Action Plan), already foresees activities that allows negative impacts mitigation. The following table permits to identify which impacts are mitigated through the Action Plan and which are mitigated through the ESMP:

	NEGATIVE	POSITIVE
Impact importance	Major -	Major +
	Medium -	Medium +
	Weak -	Weak +
	Negligible	Negligible

See **Annex 8** for full E&S impacts study and ESMP.

International waters:

The Guir basin is a cross-border basin shared between Morocco and Algeria. For that matter, the Guir basin may be subject to the Convention on non-navigational uses of international watercourses, adopted by the Assembly General of the United Nations on 21 May 1997 in New York, and which came into force on 17 August 2014. This convention offers States neighbouring cross-border watercourses tools to cooperate and manage such water sources with an integral approach, and defines a reference framework of the negotiation of local agreements. This agreement is based on two main principles as follows:

- "equitable and reasonable use" of water resources (Article 5) and,
- "obligation not to cause significant harm" to other States of the stream. (Article 7).

The status of this international convention is as follows:

- Adoption by the UN General Assembly on 21 May 1997 in New York
- Morocco acceded to the convention in April 13, 2011
- Setting Force of the convention in August 17, 2014.
- Algeria has not acceded to the Convention.

In the context of the Guir basin and at the stage of the detailed design and impact studies, the downstream impacts of the construction of the Kaddoussa dam and of the development of the irrigated area downstream were evaluated as non- significant (with controlled basin area of 7% with regard to the whole river basin and it is over 200 km upstream of the Moroccan-Algerian border: only exceptional spates cross the border) and, therefore, the notification procedure has not been considered as a requirement of the Convention (with reference to article 7, paragraph 2). Furthermore, it

has to be noted that to date, the Guir basin does not yet have an international treaty laying out the procedures for consultation and negotiation between the neighbouring states as to the issue of managing the water resources of the Guir basin.

Gender action plan:

Analysis of the social situation in the oasis communities, with a special focus on gender, has been done within the feasibility/action plan and E&S risk assessment processes.

Inclusion of women in the project activities will be done during the beginning of the project, at it relies on a participatory & community driven process allowing the *agents* to make decisions in terms of their own values and goals ; particularly when it comes to water management.

These issues are complex and need time for a meaningful dialogue to take place between agents.

The process of empowerment (during which stakeholders become agents of change) cannot be skipped, nor is it relevant to put forward standard activities or activities based solely on the wellbeing of one particular agent (in this case women) - as their individual wellbeing (physical, emotional) is generally only one of the goals pursued by agents[6] involved in more complex social networks.

In any case, it is very important that all agents/stakeholders have had sufficient time and space to express themselves to allow decisions and ideas to be community-generated. The objectives is that all these agents be part of the decisions as to new sets of rules/behavioral schemes for women or to presuppose how women should assume new roles in their communities, with regard to water, livestock, palm tree groves management, etc.

A gender specialist will be recruited in the technical assistance team and will be completely dedicated to this issue from the beginning of the project implementation.

Annex 7 provides more details in the projected gender-related activities.

[6] For the purposes of the capability approach, agency primarily refers to a person's role as a member of society, with the ability to participate in economic, social, and political actions. Therefore, agency is crucial in assessing one's capabilities and any economic, social, or political barriers to one's achieving substantive freedoms. Concern for agency stresses that participation, public debate, democratic practice, and empowerment, should be fostered alongside well-being.

F.4. Financial Management and Procurement

Describe the project/programme's financial management and procurement, including financial accounting, disbursement methods and auditing.

The project will be disbursed through successive installments, which will be executed by the operating agencies (DIAEA and ORMVAT) The execution of the funds will follow Moroccan public bidding procedures that are very similar to AFD procedures (adjustments are made on very rare occasions).

Nevertheless, in legal terms, the loan agreement states that AFD's bidding procedures prevail over national ones. It is the Borrower's responsibility to take necessary measures to be compliant with AFD's bidding procedures. The following is an excerpt from our standard loan agreement:

Clause 11.5 - Procurement

In relation to the procurement, award and performance of contracts entered into in connection with the implementation of the Project, the Borrower shall comply with, and implement, the provisions of the Procurement Guidelines. The Borrower guarantees that the Implementing Agency will comply with and implement the Procurement Guidelines.

The Borrower shall take all actions and steps necessary for the effective implementation of the Procurement Guidelines.

Projects funded by AFD (loans) in Morocco are submitted to the Ministry of Finance's auditing capacity (Inspection Générale des Finances), as are all other public funds in the kingdom. AFD confirms that the IGF's audit reports are of high quality (verifying compliance with both national and AFD procedures) and often offer a critical view point on the projects' implementation. Using the IGF is both a way to recognize Morocco's sovereignty in scrutinizing the use of public money, as well as giving more force to the recommendations of these reports, which are formally transmitted by the Ministry of Finance to the line ministries.

The project financial management and procurement, including financial accounting, disbursement methods and auditing are detailed in the financing agreement that is being finalized after the Board's approval. It is consistent with the AFD internal procedures that have been approved at the AFD's accreditation from the GCF.

AFD will perform at least one (probably two the first years) supervision mission per year, which will include technical and financial performance review.

G.1. Risk Assessment Summary

Please provide a summary of main risk factors. Detailed description of risk factors and mitigation measures can be elaborated in G.2.

The project is designed to mitigate risks arising from climate change, on the performance and sustainability of agriculture in the project area, in particular: preventing overexploitation of groundwater, ensuring inclusiveness of the economic dynamic, preservation of oasis based livelihoods.

Nevertheless, residual risks remain directly related to the implementation of the project:

- The ability of the aquifer contract, of self-regulatory entities (water users association) and of the regulating State to "solve" the prisoners' dilemma, related to the underground water table is uncertain *a priori*, as any participatory process.
  - ⇨ *A strong TA package will be mobilized to secure this process*.
- The smallholders' capacity to perform highly efficient irrigation systems.
  - ⇨ *ORMVAT and the TA will provide assistance and councelling to the farmers wishing to invest in the date-palm tree production.*
- Water availability in the dam is lower than expected.

G.2. Risk Factors and Mitigation Measures

Please describe financial, technical and operational, social and environmental and other risks that might prevent the project/programme objectives from being achieved. Also describe the proposed risk mitigation measures.

Selected Risk Factor 1

Description	Risk category	Level of risk	Probability of risk occurring
Availability of surface water lower than expected (the dam is not filled to its anticipated level)	Other	Medium (5.1-20% of project value)	Low

Mitigation Measure(s)

Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?

There is little that can be done to directly mitigate this risk. Nevertheless, technical and social measures will be taken to mitigate its effects:

- Aquifer refill systems using intermediary watersheds will be put into place under component 2 (refill of the intermediate alluvial aquifers provides additional shallow water resources for the oases), enhancing the resilience of the oases with regard to the availability of water from the dam ;
- Organization at local level (WUAs and aquifer contract) will allow exceptional measures to be taken in order to maximize water saving (capping of quantities).

Selected Risk Factor 2

Description	Risk category	Level of risk	Probability of risk occurring
Low participation of the local communities in the inclusive development pathway or poor quality of investment projects	Technical and operational	Low (<5% of project value)	Medium

Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level? This risk will be mitigated by the delivery of effective extension services, through the technical assistance.			
Selected Risk Factor 3			
Description	Risk category	Level of risk	Probability of risk occurring
Difficulties in establishing effective aquifer contracts, self-regulatory procedures and regulations by the State	Social and environmental	Low (<5% of project value)	Medium
Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level? Strong technical assistance will provided on this matter.			
Selected Risk Factor 4			
Description	Risk category	Level of risk	Probability of risk occurring
	Select	Select	Select
Mitigation Measure(s)			
Please describe how the identified risk will be mitigated or managed. Do the mitigants lower the probability of risk occurring? If so, to what level?			

** Please expand this sub-section when needed to address all potential material and relevant risks.*

H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework. A full logical framework is provided in **Annex 9**.

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level[7]

Paradigm shift objectives	
Increased climate-resilient sustainable development	The project intends to increase the resilience to climate change of a highly vulnerable area through a new model of development of irrigation perimeter downstream of a water storage infrastructure. This model is based on an integrated approach with three pillars: - Transfer surface water and build an efficient irrigation water distribution scheme to insure "more crop for the drop"; - Ensure an inclusive access to surface and underground water making sure that the local communities benefit both from the public investment and from the technological transfer allowed by the presence of agro business investors – promote climate-smart agriculture; - Create and secure self-regulating institutions, in which users take responsibility for the management of a common-pool resource, in this case water. Promoting a paradigm shift in the use of water, especially in irrigation, these three pillars will secure and boost the development of a great agriculture area based on date production. This approach and the tools it will develop, if proven successful will constitute a "package" that could be easily replicable in other irrigation schemes of the country. In particular, this holistic approach to water management for agriculture in an environment of increased scarcity may also reveal as an important tool to conflict prevention and stabilization of poor rural areas. Finally, this project will intend to demonstrate that the nexus **"Water technologies – Water for all – Water institutions" is a winning strategy and one that could be replicated for the adaptation of agriculture to climate change in arid areas of the Mediterranean**.

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Fund-level impacts						
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and	1.2 Number of males and females benefiting from the adoption of diversified, climate	Census	0	2000	5 500	All oasis farmers and families will benefit from improved access to agricultural

[7] Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

regions	resilient livelihood options					water and from economic and social development promoted through component 2.
A2.0 Increased resilience of health and well-being, and food and water security	2.3 Number of males and females with year-round access to reliable and safe water supply despite climate shocks and stresses	Census	0		5 500 (40% women)	All oasis farmers and families will benefit from improved access to agricultural water and from economic and social development promoted through component 2.
A3.0 Increased resilience of intrastructure and the built environment to climate change	3.1 Number and value of physical assets made more resilient to climate variability and change, considering human benefits (reported where applicable)	Real cost of the infrastructure	0		A secured delivery system of water from the dam = EUR 40 000 000	
A4.0 Improved resilience of ecosystems and ecosystem services	4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change		0	500 ha	1 000 ha	Component 2 is effective.

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Project/ programme outcomes	**Outcomes that contribute to Fund-level impacts**					
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	Water resources (surface and underground) are monitored and controlled at Project area level. The information is spread to local inhabitants.	Mid-term and final evaluations The Water Resources Integrated Development Master Plan (PDAIRE in French) is updated with new rules of "conjunctive use" of underground and surface water in Boudnib plain and Guir valley. The Aquifer Contract exists. Annual reports of the company distributing the water from the dam. Information regarding IWRM is available for literate and illiterate at the water basin	Ancient version of PDAIRE Nascent aquifer contract	New version of PDAIRE Established aquifer contract	New version of PDAIRE Functioning aquifer contract	Aquifer contract and PDAIRE are key regulatory instrument for an appropriate response to climate change variability. Aquifer contract needs to be elaborated with and signed by water users associations to ensure its application. New version of PDAIRE needs to be elaborated under participative approach including all users and institutional organizations (WUA, ORMVAT, ABH, Local Authorities, ONEE…). Those two last points cannot be controlled by the project.

		authority office (Errachidia) and at the Local Authorities office in Boudnib.				
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	Proposed 7.1: Use by vulnerable households, communities, businesses and public-sector services of Fund supported tools, instruments, strategies and activities to respond to climate change and variability (see section 2.3.2 to 2.3.4 of the action plan)	Reports from pre-identification workshop. Reports from trainings of new farming techniques. Action Plan for each oases. New public infrastructures Higher crop production yields in the oases	Current situation of trainings in the oases No action plan per oases Lack of public infrastructure Low yields	New farming trainings realized Action Plans elaborated New public infrastructure Better yields	New farming trainings realized Action Plans implemented New public infrastructure Better yields	The success of these measures relies on the willingness of the farmers and inhabitants of the oases and cooperation of local authorities, which seem to be promising regarding to survey results of feasibility study.
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	Use of IWRM information (aquifer and hydrological situations and uses) in decision-making, by regional and local institutions for development projects.	The Water Resources Integrated Development Master Plan (PDAIRE in French) is updated with new rules of “conjunctive use” of underground and surface water in Boudnib	Ancient version of PDAIRE Nascent aquifer contract No tripartite agreement	New version of PDAIRE Established aquifer contract A tripartite agreement is signed and functional	New version of PDAIRE Functioning aquifer contract A tripartite agreement is signed and functional	In the project area, climate-responsive planning and development is directly related to water resources availability, especially for surface water. Control of the aquifer in respect with the aquifer contract is fundamental. The project cannot control it, since it

		plain and Guir valley. A tripartite agreement between the water basin authority, ORMVAT and the company running the surface water network is signed (see Action plan section 3.2.3.2.3) The Aquifer Contract exists. Water management related to development project of any kind is elaborated regarding to PDAIRE and Aquifer contract rules.				is the water basin authority prerogative.
Project/programme outputs	**Outputs that contribute to outcomes**					
1. Efficient irrigation infrastructure delivered	Use of surface water from Kaddoussa dam by farmers of any kind	Water pipes for irrigation from Kaddoussa dam to each	2 000 ha of unsustainable irrigated		5 000 ha of efficiently irrigated agricultur	This output success relies on several aspects that the project cannot control:

		oases and extensions farm are built	agricultu re from Guir wadi and undergr ound water		e from Kaddous sa dam and undergro und water	- the effective implementation of the aquifer contract -the implementation of the PPP for managing and selling water from the dam -the extension farmers subscription to water purchase contracts with the private partner.
2. Adaptation of oasis agriculture to climate change	*For more detailed information of indicators and means of verification for this important project output, see Annex 5 - Action plan Section 2.2 and 2.3 and its own appendix 9-Logical framework indicators.* Adaptation of oases irrigation infrastructure and its management Adaptation of oases farming systems Protection and enhancement of land ownership Existence of WUA in every oases Water mobilization from the intermediate basin Efficient management of constant surface	New concrete seguias and repaired seguias (Work reports from ORMVAT). Crops irrigation during summer (M&E reports from Technical Assistance). Use of more efficient irrigation and crop techniques within the oases (M&E reports from Technical Assistance). Increased cultivated area (M&E reports from	1 000 ha of oases under flood irrigation manage ment with inefficie ncy.		1 000 ha of oasis agricultur e adapted to climate change	The success of this output relies on the success of WUA trainings related to water management. Indeed, oasian farmers will have to shift from individual and historical water rights to a continued public water distribution based on crop fields water needs.

	water within the oases Better environment and living conditions Reduced gender inequalities and improved employability	Technical Assistance). Reports of WUA meetings Reports of workshop with the Technical Assistance of the project and ORMVAT Action programs/plans of the oases				
3. Underground water regulatory systems in place	The heterogeneity of the Senonian is Established A spatial distribution map of the transmissivity of the Senonian is made available The numerical model suitable as a support tool to decision-making is chosen Piezometers installed and used Piezometers equipped with stations of automatic data acquisition and transmission	Data processing report of log records by Hydrogeologist Results interpretation report including the spatial distribution map of transmissivity Expert report on the analysis of the relevance and opportunity assessment Reports of installations	Unsufficient and unequipped piezometer network Hydrogeological characteristics of aquifers unknown		Global and equipped piezometer network installed Precise knowledge of hydrogeological characteristics of aquifer	This output relies on the effective cooperation of the water basin authority which is a partner of the project.

		by the water basin authority				
Activities	**Description**		**Inputs**		**Description**	
Component 1: Connecting to the dam and transfer of surface water to the Boudnib Valley	**Surface water service for 5 000 ha irrigation scheme downstream**					
Sub-component 1: implementation and management of the irrigation infrastructures			- Adduction pipe, 63 km - Distribution network to oases and larger scale farms - Feasibility and preparation study - Tendering process for selection of contractors			
Component 2: Building the climate - resilience of oases communities through a holistic approach						
Sub-component 2.1: Rehabilitation of the irrigation networks in the oases Sub-component 2.2: mobilization of water resources from intermediary basins Sub-component 2.3: Adaptation of the oasis-based agricultural and social systems to climate change			Rehabilitation of seguias and khettaras (irrigation network) - restauration of agricultural land - promotion of new techniques (climate-smart agriculture) - diversification and storage of agricultural produce - empowerment of women groups within the oases - social and educational activities			
Component 3: Cross-cutting sustainability measures						
Sub-component 3.1: Technical Assistance Sub-component 3.2: Groundwater management			- Support to the implementation agency - Provision of technical advisory services to			

investments Sub-component 3.3: Implementation of the Environmental and Social Management Plan Sub-component 3.4: Knowledge building		farmers - Management of groundwater resources - Exploratory drilling and piezometric surveillance Mid-term evaluation Analytical work	

H.2. Arrangements for Monitoring, Reporting and Evaluation

Please specify institutional setting and implementation arrangements for monitoring and reporting. Please indicate how you will organize mid-term and final evaluations.

Mid-term evaluation (at least one) and annual reports will be elaborated by the Implementing Agency during the lifespan of the project, i.e. between the signing of the financial agreements and the Technical Closing Date (when the project has been fully executed on the ground and all resources have been justified).

Mid-term evaluation and annual reports will highlight any concerns or risks that require the attention of AE and the GCF. In addition, the evaluations/reports should recommend corrective actions in order to ensure that the climate results are delivered as expected.

A final evaluation will be implemented 6 months after project closure and will examine the overall performance of the project against the investment criteria and other evaluation criteria that will be defined in the evaluation guidelines.

The objective of the final evaluations is to learn lessons and apply those lessons in order to upscale and replicate successful projects.

The mid-term evaluation will be financed through the project. The end line evaluation will be financed through AFD's own resources.

Supervision missions headed by a Senior Program Manager will take place twice a year for the first two years, then once a year. *Please provide methodologies for monitoring and reporting of the key outcomes of the project/programme.*

Independent project evaluations will take stock of not only whether and how the project implementation has performed against the agreed outcomes and investment criteria, but also whether and how it has caused unintended impacts and other co-benefits.

Project-/programme-level evaluation reports will be submitted by AEs to the Secretariat.

Evaluations will be guided by the following principles:

(a) Independence and impartiality;

(b) Transparency.

(c) Participation of all the relevant stakeholders (first and foremost local/disadvantaged communities, women and indigenous people);

(d) Adherence to ethical standards within the evaluation with respect for the beliefs, culture and customs of the beneficiaries; and

(e) Credibility.

I. Supporting Documents for Funding Proposal

☒ NDA No-objection Letter

☒ Feasibility Study = Action Plan (**Annex 5**) + Infrastructure Design Study (**Annex 6**)

☒ Integrated Financial Model that provides sensitivity analysis of critical elements (xls format)

☒ Confirmation letter or letter of commitment for co-financing commitment (AFD: provided; GoM: to be provided soon)☒ Term Sheet

☒ Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan

☒ Appraisal Report or Due Diligence Report with recommendations

☒ Evaluation Report of the baseline project = Diagnostic Study (**Annex 4**)

☒ Map indicating the location of the project/programme (Annex 1-3)

☒ Timetable of project/programme implementation

☒ Project/programme confirmation (see the template in Annex I to the Accreditation Master Agreement)

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority

المملكة المغربية
ⵜⴰⴳⵍⴷⵉⵜ ⵏ ⵍⵎⵖⵔⵉⴱ
Royaume du Maroc

Ministère délégué auprès du Ministre de l'Energie,
des Mines, de l'Eau et de l'Environnement,
chargé de l'Environnement

La Ministre

الوزارة المنتدبة لدى وزير الطاقة والمعادن
والماء والبيئة، المكلفة بالبيئة
ⵜⴰⵎⴰⵡⴰⵙⵜ ⵜⴰⵎⴰⵔⵓⵙⵜ ⵖⵔ ⵓⵎⴰⵡⴰⵙ ⵏ ⵜⵥⵎⴰⵇⵜ ⴷ ⵉⵥⵓⵖⴰⵥ
ⴷ ⵡⴰⵎⴰⵏ ⴷ ⵓⴳⵏⴰⵎ ⵉⵜⵜⵓⵙⵎⴰⴳⵍⵏ ⵙ ⵓⴳⵏⴰⵎ

الوزيرة

Rabat 15 July 2016
15 JUIL. 2016

Ms. Hela Cheikhrouhou
Executive Director of the Green Climate Fund
Songdo Business District
175 Art Center daero Yeonsu-gu Incheon
22004
Republic of Korea

Re: Funding proposal for the GCF by Agence Française de Developpement ("AFD") regarding the Irrigation development and Adaptation of Irrigated Agriculture to Climate Change in Semi-arid Morocco

Dear Ms. Cheikhrouhou,

We refer to the project ("the project") Irrigation development and Adaptation of Irrigated Agriculture to Climate Change in Semi-arid Morocco in Morocco as included in the funding proposal submitted by the Agence Française de Developpement ("AFD") to us on 14th t of July 2016.

The undersigned is the duly authorized representative of the Ministry of Environment of the Government of the Kingdom of Morocco, the focal point of Morocco.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project as included in the funding proposal.

By communicating our no-objection, it is implied that:

(a) The government of the Kingdom of Morocco has no-objection to the project as included in the funding proposal;
(b) The project as included in the funding proposal is in conformity with Morocco's national priorities, strategies and plans;
(c) In accordance with the GCF's environmental and social safeguards, the project as included in the funding proposal is in conformity with relevant national laws and regulations.

GREEN CLIMATE FUND

المملكة المغربية
ⵜⴰⴳⵍⴷⵉⵜ ⵏ ⵍⵎⵖⵔⵉⴱ
Royaume du Maroc

Ministère délégué auprès du Ministre de l'Energie, des Mines, de l'Eau et de l'Environnement, chargé de l'Environnement

La Ministre

الوزارة المنتدبة لدى وزير الطاقة والمعادن والماء والبيئة، المكلفة بالبيئة
ⵜⴰⵎⴰⵡⴰⵙⵜ ⵜⴰⵎⴰⵏⵜ ⵖⵓ ⵓⵎⴰⵡⴰⵙ ⵏ ⵜⵣⵔⴼⵜ ⴷ ⵜⵣⵔⴼⵜ ⴷ ⵓⵙⵙⵏⵙⵓ ⴷ ⵓⵙⵙⵏⵙⵓ ⵏ ⵍⵎⴰ ⴷ ⵜⵎⵓⵔⵜ ⵏ ⵓⵙⵙⵏⵙⵓ
الوزيرة

We confirm that our national process for ascertaining no-objection to the project as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the programme.

We acknowledge that this letter will be made publicly available on the GCF website.

Sincerely,

Her Excellency Ms. Hakima El Haité
Minister delegate in charge of Environment

La Ministre déléguée auprès du Ministre de l'Energie des Mines de l'Eau et de l'Environnement, Chargée de l'Environnement

Hakima EL HAITE

Environmental and social report(s) disclosure

Basic project/programme information	
Project/programme title	Irrigation development and adaptation of irrigated agriculture to climate change in semi-arid Morocco
Accredited entity	AFD
Environmental and social safeguards (ESS) category	Category B

Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	2017-02-10
Language(s) of disclosure	English and French
Link to disclosure	http://www.afd.fr/home/projets_afd/changement_climatique/afd-fonds-vert (French) http://www.afd.fr/lang/en/home/projets_afd/changement_climatique/afd-fonds-vert (English)
Other link(s) (English)	http://www.agriculture.gov.ma/pages/focus/projet-developpement-irrigation-et-adaptation-agriculture-irriguee-aux-changements-climatiques-barrage-kaddoussa (at the Moroccan Ministry of Agriculture and Fisheries, date 2016-07-29)
Environmental and Social Impact Assessment (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	2017-02-10
Language(s) of disclosure	English and French
Link to disclosure	http://www.afd.fr/home/projets_afd/changement_climatique/afd-fonds-vert (French) http://www.afd.fr/lang/en/home/projets_afd/changement_climatique/afd-fonds-vert (English)
Other link(s)	http://www.agriculture.gov.ma/pages/focus/projet-developpement-irrigation-et-adaptation-agriculture-irriguee-aux-changements-climatiques-barrage-kaddoussa (at the Moroccan Ministry of Agriculture and Fisheries, date 2016-07-29)
Resettlement Action Plan (RAP) (if applicable)	
Date of disclosure on accredited entity's website	n/a
Any other relevant ESS reports and/or disclosures (if applicable)	
Description of report/disclosure	n/a