

# CBA Morocco Programme Community-Based Adaptation

## Project Proposal MADANIA Cooperative / Ksar Laachoria / CR Fezna

### SUMMARY PROJECT PRESENTATION

<b>Project Title</b>	Enhancing the resiliency of the oasis agrobiodiversity and strengthening the Laachoria community's capacities to adapt to growing climatic variability and intensified droughts, through a strategy of natural resource and endemic species conservation.
<b>Project Site</b>	Ksar LAACHORIA – Rural Commune of FEZNA – Cercle ERFOUD Province ERRACHIDIA
<b>Project Leader</b>	<b>Almadania Farming Cooperative</b> Ksar LAACHORIA – Rural Commune of FEZNA Province ERRACHIDIA
<b>Official Representative</b>	<b>Mr. Abdelmadjid BABAKHOUYA</b> – Cooperative Treasurer Tel: 06 68 30 20 76 / 06 66 11 17 08 / 06 11 57 16 54 Email: <a href="mailto:coop.almadania@gmail.com">coop.almadania@gmail.com</a>
<b>Partner Organizations</b>	<b>Tafilalet Oasis Programme</b> <i>A programme by the Ministry of Habitat, Urbanism and Land-Use Planning (Department of Land-Use Planning) in partnership with the Social Development Agency and UNDP</i>  Contact: Mohammed BADDOU, National Coordinator Email: <a href="mailto:oasis_tafilalet@yahoo.fr">oasis_tafilalet@yahoo.fr</a>
<b>Project Dates</b>	July 2011 – December 2012
<b>Total project cost</b>	2,131,714 DH / 268,477 USD ( <i>exchange rate for June 2011 – 1USD = 7.94 DH</i> )
<b>Amount solicited from the CBA</b>	323,676 DH / 40,765 USD
<b>Co-financing</b>	Community (in kind): 98,700 DH / 12,430 USD  Tafilalet Oasis Programme (in cash): 1,709,338 DH / 215,281 USD
<b>Project Goal:</b>	Strengthen the Laachoria community's adaptive capacities, in the face of intensified droughts and increased climatic variability, in order to exploit these changes while enhancing the resiliency of the local ecosystem, through the implementation of an adaptation strategy based on the protection, the conservation and the resilient management of the local agro-biodiversity.
<b>Brief project description</b>	The fortified village (Ksar) of Laachoria is located in the region of Tafilalet, south of Errachidia, close to a medium-sized city. The community of 2500 inhabitants relies,

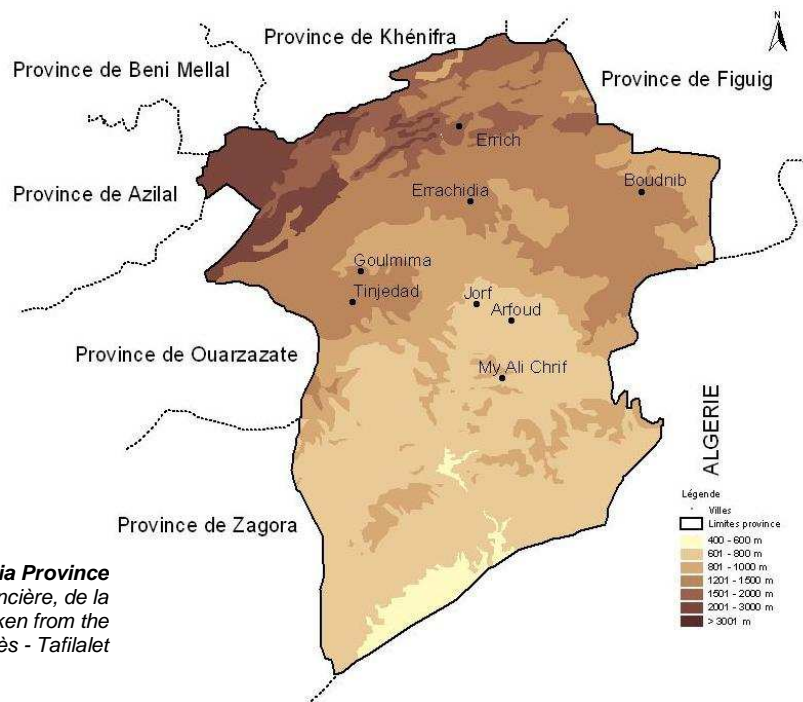
	<p>for their livelihood, on oasis farming and breeding, as well as on funds transferred from emigrated residents, and the salaries of state employees who are numerous in the village.</p> <p>The local climate – arid to semi-arid, has experienced significant changes in the last few decades: increased temperature variability (including within one day), intensified droughts, and increased rain frequency and intensity. These occurrences are expected to develop further in the future, increasingly affecting the local resources in the following manner: increased soil erosion and degradation, deterioration of local biodiversity and impacts on farming and local breeding. Worsening local conditions risk causing a growing exodus and abandonment of local activities, increasing the risk of desertification.</p> <p>The project's goal is to build the oasis ecosystem's resiliency in the face of these climate changes, through a strategy of soil and local agrobiodiversity conservation (palmgrove, aromatic and medicinal plants, and adapted fodder to enhance the resilience of local breeding), supported by community capacity building.</p> <p>The Madania Cooperative, leader of this pilot project, was created precisely following a severe drought. Comprised of 50 members, it experiments and supports agricultural technical innovations while supporting the local heritage, in order to improve oasis living conditions and promote a "return to the land" of the village migrants. It is supported by the Tafilalet Oasis Programme, which aims at combating desertification and poverty (Land-Use Planning Management / Social Development Agency / UNDP Morocco).</p>
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## 1.0 PROJECT RATIONALE

### 1.1 Context of the Project: Community and Ecosystem

#### 1.1.1- Localization of the Site and Regional Context

**Ksar Laachoria**<sup>1</sup> is one of the 7 Ksars constituting the Rural Commune of Fezna (Circle of Jorf), within the province of Errachidia (Meknes – Tafilalet Region, central/eastern Morocco). The province of Errachidia is structured by 3 large geographical entities: the High Atlas mountains, the piedmont and southern Atlas depression, and the **plateaus and plains of the Tafilalet (where the project site is located)**.



South of the city of Errachidia, the pre-desert plain of Tafilalet extends over an area of 60,000 km<sup>2</sup> (almost 9% of the Moroccan territory). It is adjacent to the southern Atlas mountain range and located in the heart of the Ziz river basin. The zone is structured around two principal rivers (*oued*) – the Ziz and Ghris, whose flows vary respectively around 200 and 100 mm<sup>3</sup> during a normal year.

The zone's economy is primarily dependent on oasis farming and tourism<sup>2</sup>. The province of Tafilalet provides close to 1/3 of Morocco's date production, and contains close to 1/3 Morocco's palm grove surface. The province's productive farming surface is less than 1% of the total surface, concentrated along the oueds. Oasis farming promotes the vertical use of space. Since it is adapted to the structural constraints of an arid environment, oasis farming is traditionally organized to maximize rare water and arable land resources, through

<sup>1</sup> Ksar (from the Arabic "qasr," which means castle) is a fortified village typical of the North African oasis architecture. Ksars were built on foothills near the oases, to protect communities from attacks by nomad tribes. Dwellings are also found there, as well as lofts used to store food in anticipation of several successive years of drought.

<sup>2</sup> Mission to develop a synthesis of the strategic studies and programmes with the idea of creating a vision of territorial development in Tafilalet: Report n°1 – Site inventory of the territory of Tafilalet, Riad Bensouiah and Mohammed Aderghal, September 2009

a typical organization of farming in 3 vertical layers. At the heart of oasian farming is the date palm (1.3 million feet in the Tafilalet, according to the ORMVA's numbers), which creates a favorable microclimate for underlying crops: tree cultivation (mainly olive<sup>3</sup> and apple trees), and ground crops (truck farming, cereals – 43,000 ha, fodder, henna).

The region is also characterized by its pastoral activities (55% of the territory: close to 800,000 heads). Breeding is rather extensive (sheep, goats). There is also rearing in stables (9,500 ha of extensive breeding), particularly that of sheep of the local D'man race (25% of the Province's sheep herd). Pastoral farming, an ancestral practice in the region based on transhumance, continues to exist, but it has gone through significant changes: shorter distances travelled during transhumance movements, changes in transportation modes, settlement and/or semi-sedentation of the nomads and the practice of supplementing the herd's nutrition.

The province of Errachidia has over 550,000 inhabitants (2004 Census) and is characterized both by **its low density** (9 inhabitants/km<sup>2</sup>, versus 42 at the national level), and by its **strong rate of ruralism** (65%). The rural population has been regressing however (rural exodus and urbanization), decade after decade, due to the difficult conditions in the rural environment – poor equipment (connection to sanitation networks is not guaranteed, connection to electricity is at 60%; however, 84% of the province had access to drinking water in 2007, versus 57% in 2004), and farm production conditions have become increasingly restrictive.

Emigration and rural exodus is significant, but the efforts provided in the last few years by the institutions and civil society (particularly within the framework of the Tafilalet Oasis Programme) aim to keep the young people in the region (higher learning institutions in science and technology in Errachidia; structuring projects in the zone, development of alternative activities, tourism in particular).

### 1.1.2. Laachoria: Community and Livelihoods

Ksar Laachoria is a small traditional oasis village located 1 km from a paved road linking Jorf to Goulmima. The Ksar is situated between two towns (Jorf and Fezna), where there are a number of infrastructures: health centers (and a hospital in Erfoud 20 km away), school system (elementary, secondary school, lycée), and a post office. Drinking water conveyance is extended practically throughout the entire zone, as well as connection to the electrical network, but evacuation and purification of used water remains a problem because most homes have individual septic tanks, and the waste-water is not purified in the Ksar. The Jorf/Fezna zone is relatively less at a disadvantage (in comparison with the rest of the province) because it is not as enclosed, the poverty level is below 30% (among the lowest poverty rates in the province), and thanks to the presence of health and educational infrastructures nearby.

Located in the Ghris oued basin and close to another oued (Oued Batha), Ksar Laachoria is an oasis belonging to the Jorf palm grove (4,000 ha of traditional and nearly continuous palmgrove that is relatively in good condition). **The Ksar has approximately 2,500 inhabitants of Arab ethnicity (approximately 300 households), whose resources depend essentially on oasis farming and breeding, as well as from funds sent from migrants working in Morocco's big cities or abroad.**

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According to the legend, El Madani<sup>4</sup> (which means the "civil") established the village several centuries ago. Accused of a crime in the neighboring village of Fezna, he took refuge with ten members of his family and founded the village of Laachoria (which refers to the number ten, *aachara*). The El Madani family built the village's structures, including the Ksar, the system of Khettaras, which allows for irrigation of the oasis (see below).

In the village of Laachoria, the idea of family remains fundamental still to this day. In fact the Ksar population is currently comprised of three great historic families, which continue to perpetuate ancestral practices, both in the carrying out of oasis farming, and with regard to sociability and solidarity.

**The project itself is based on this notion of family: The Almadania Cooperative is first and foremost a family cooperative created by the members of the Babakhouya family** (historically the El Madani family, which was renamed under the Protectorate). The Babakhouya family therefore represents one third of the

<sup>3</sup> 1.1 Million plants: average annual production of 13,000 tons of olives (source: ORMVA Tafilalet)

<sup>4</sup> The cooperative leading the CBA project has chosen its name in reference to the Ksar's founder.

village population. Ties within the family are very strong, which is shown through considerable solidarity, based on a solid ancestral trust. This family solidarity relates to agriculture, water and land (cooperation and sharing). Moreover, the migrants send funds, which enable the conduct of local activities.

Between the different families, there are ties of cooperation (during life's milestones: birth, marriage, death) and alliances.

Though the three historical families, Arabs, represent the basis of the community, the village has welcomed poor families, who settled over the last few centuries, particularly from the South of Morocco and from Sub-Saharan Africa, with their labor power are their only asset.

The community members explain that there was traditionally great cooperation toward these poor families – donations of food or money, the authorization to pick from the farm plots or have their animals graze there. In the Ksar, there was a space where the poor would come and receive food. These traditions of charity are managed by the Qbila (literally meaning “tribe”, where the main village families are represented) and are based on religious principles (tradition of “diaft nibi,” the prophet’s guest).

These poor people settled and were employed as workers in the village, receiving 1/5<sup>th</sup> of the harvests. Some were able to gain access to property because when droughts occurred, several historical owners left the village and sold their lands.

These practices endured to a large extent, even though the pillars of this solidarity (Ksar, Qbila) are weaker today. The Ksar has fallen in ruin (it will soon be restored), and the Qbila’s authority has been replaced by the central State’s representative. Thus, local generosity has increasingly become an individual act, and less a social obligation.

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The local population lives essentially from farming and breeding; other activity sectors have little presence (no industry, and handicrafts and tourism are concentrated in Erfoud). The Ksar is located near a palm grove, which is typical of the region. Like all palm groves of the Ghris, the one in Laachoria has been affected by drought in spite of the efforts expended by the public authorities to transfer the waters of the Ziz to the Ghris. The population has remained attached to their land and in spite of the many constraints, has perpetuated mainly subsistence-oriented farming on minuscule plots (the average useful farming surface in the Ghris zone is of 0.89 ha per farm).

Local farming is performed over an irrigated perimeter that represents only 3% of the Rural Commune of Fezna’s surface (83% of the commune’s fields are used for cattle-grazing). The principal crop is the date palm: 23,000 trees in 2005 in the Commune, particularly the Khalt variety (a poor quality variety, whose production is mainly intended to feed the herds). The noble varieties of Feggous and Medjool, are also grown in the Commune oasis, and enjoy support from the agricultural extension services, to help them improve production, and develop their value and marketing. The olive tree is also very present – the Moroccan Picholine variety, with 9,500 trees in Fezna (of which 5,800 are productive). Other significant crops are alfalfa (production of approximately 30,000 tons per year over the last ten years, in the Circle of Jorf region), cereals (soft wheat and barley; though production has been decreasing, from 5,490 tons in 1996 to 2,084 tons in 2005, also in the Circle of Jorf), as well as henna and truck farming.

The community of Laachoria also practices breeding, which is both a traditional activity and a way of enhancing the ecosystem. Intensive sheep raising is the main focus, particularly the local D’man race known for its high prolific character (220%) and its capacity for double reproduction. This race numbers approximately 110,000 in the Jorf region. Raising D’man is perfectly suited for the oasis production system. It enables to enhance the value of crop sub-products (straw, wastes from dates, etc.), and the production of manure, which is essential for agriculture. Beef raising is also practiced with a local race, rustic but not very productive.

Local farming is not very productive and does not allow the community to generate sufficient income. The population’s maintenance is explained in large part by significant emigration, and the income deriving from transfers allows the people to survive (the Jorf region is characterized by strong migration; on average, each family has at least one member abroad or in another city in Morocco). But, on the other hand, this migration has provoked a labor deficit for farming and the maintenance of water movement infrastructures (Khettaras and seguias), which have slowly been deteriorating.

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**Women's role in breeding and farming is significant.** They are the ones who are generally responsible for the small herds: collecting fodder, taking care of the animals. And they are the ones taking care of the small truck farming and fruit harvests (gathering the olives and dates). Women from the poorest families are authorized to cut herbs or collect fodder from farmers' plots. This way, they can feed their animals and participate in maintaining the plots. Women are also active in handicraft activities (mats made of palm, sewing). And of course, they are responsible for all domestic work.

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One of the characteristics of the Laachoria community, particularly the Babakhouya family, is the strong representation of **managers and officials**. In fact, a large number of men from the community have completed higher education and reached positions of managers or officials. Some of the them have moved to other cities in Morocco, or even abroad, but many have kept strong ties with the community and have continued to be invested in the local farming and maintaining links with the community.

A new phenomenon has actually been noted – that of a “**return to the earth**,” as cooperative members call it. In fact, for the past several years, several migrants have returned to the village because of a double occurrence: the global financial crisis has had an impact on their living conditions abroad; and on the other hand, the renewed local conditions and perspective of improved farming productivity thanks to projects conducted by the Madania Cooperative have stimulated several people to return to work the land.

These people have brought with them different visions and new ideas that have enriched local living conditions and encouraged the development of activities and new approaches.

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In spite of this, the great majority of the local population remains vulnerable with regard to climate uncertainties and climate change, even if it is difficult to establish a scale of vulnerability in the community. The village's social history is actually interesting and atypical.

Historically, the village was relatively “rich,” with wealthy social classes owning land and even horses (inhabitants mention the “bouridas” of the past, festive celebrations synonymous with wealth and opulence). But with each period of drought, inhabitants were forced to abandon their property and focus on two pillars: the date palm and D'man sheep. Therefore, people who had property were attached to the oasis and gradually became poorer.

On the contrary, those who owned little property had no other choice than to leave the oasis to go and find their fortune elsewhere when droughts occurred. Some became wealthy and then returned to the village.

The social scale therefore became somewhat reversed, particularly because of climate events.

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The project aims to boost collective practices within the community, in order to improve local living conditions. The project's immediate participants are the Cooperative members (Babakhouya family), but results will affect the village's entire population, through the dynamic created and sustainable incomes generated, which will be reinvested in the village.

Particular attention will be given to the women of the community, who belong to the vulnerable groups because of their isolation and lack of alternatives and mobility. One of the project's goals is to promote women's collective involvement and reduce their vulnerability by increasing their knowledge and capacities. Young people will also be the focus, in order to encourage them to remain or return to the village and work the land, which is the capital of the oasis (an oasis that becomes depopulated becomes a dying oasis).

### 1.1.3. Local Ecosystem

#### **Brief topographical and geological presentation of the zone**

The Tafilalet basin is a depression between the High-Atlas in the north, which is adjacent to the city of Errachidia, and the foothills of the Anti-Atlas south-east of Jorf (1,100 m approximately). A vast plateau, the Hamada de Meski (or jbel Ougnane, 1,100 m in altitude on average), falls between the valleys of the Gheris and Ziz.

The Gheris basin has an average slope of less than 1% (oriented from north/west to east/south-east). Jorf is at 830 m in altitude. A few mounds of limestone appear suddenly in the middle of the basin and have probably given their name to Jorf, which means "the cliff." The "Tantana" mountain west of Fezna (Blikoss-Kfifaet) culminates at 926 m, the mountain of Monkara at 880 m; El Gara, east of Jorf and on the banks of the Gheris, measures 829 m in altitude.

The High-Atlas constitutes a physical barrier to the masses of humid air coming from western Morocco, but it acts as the zone's "water tower" thanks to the movement of superficial and underground water resources. Rain falls in the mountains, and then flow according to the altitude gradient toward the plains, where the oases are located. This water is therefore allochthonous.

The High-Atlas mountain range also provide sediments to the plains, since the terraces of alluvial deposits along the Gheris and Batha oueds represent the support from where the palm groves develop.

Jorf is located in the Anti-Atlas region. Its primary areas are covered by Quaternary formations with facies (puddingstone, gravel, silt and alluvions) forming layers whose thickness varies between 5 and 40 m. These alluvions form a significant aquifer.



Jorf Geographic Location (KABIRI, 2004).

#### **Soils**

The most common soils in the region (namely in the palmgroves) are soils that have evolved little, comprised of sand-silt, silt-sand, clay-silt and silt-clay-sand materials with alluvion contributions, with moderate to strong limestone composition and little organic matter. They often rest in depth on the oued gravels or schists, and are exposed to the danger of salinity (even if in Laachoria, the occurrence of salinization has not yet been found).

These are fragile soils that are very vulnerable to erosion caused by run-off from brief but violent rains that scour the arable layers already degraded by anthropogenic action (destruction of the vegetation cover). Furthermore, the soils are threatened by wind erosion and sand-covering.

## **Vegetation**

The project concerns a pre-desert arid ecosystem marked by rocky landscapes and poor soil. Consequently, vegetation formations are poor and scattered. There is however certain vegetation diversity, which has always allowed for pastoral activity, which is one of the pillars of the local economy. The dominant species are annual species, used for grazing: grasses, mustard and miricondia. These species are adapted to drought, salinity and dune instability. The atriplex, for example, characteristic of saline soils and the brush of Tamarix, is the only shrub that tolerates clay soils, conditions of salinity, floods or long periods of drought.

In the heart of this arid and rocky ecosystem, the oases are places for a *riparian* threatened by artificialism and oasis farming. These riparians are made up of pink laurel, tamarix and poplars, as well as reeds (rush and reeds), and jujube.

## **Water**

In the project region, there are underground water resources and surface water.

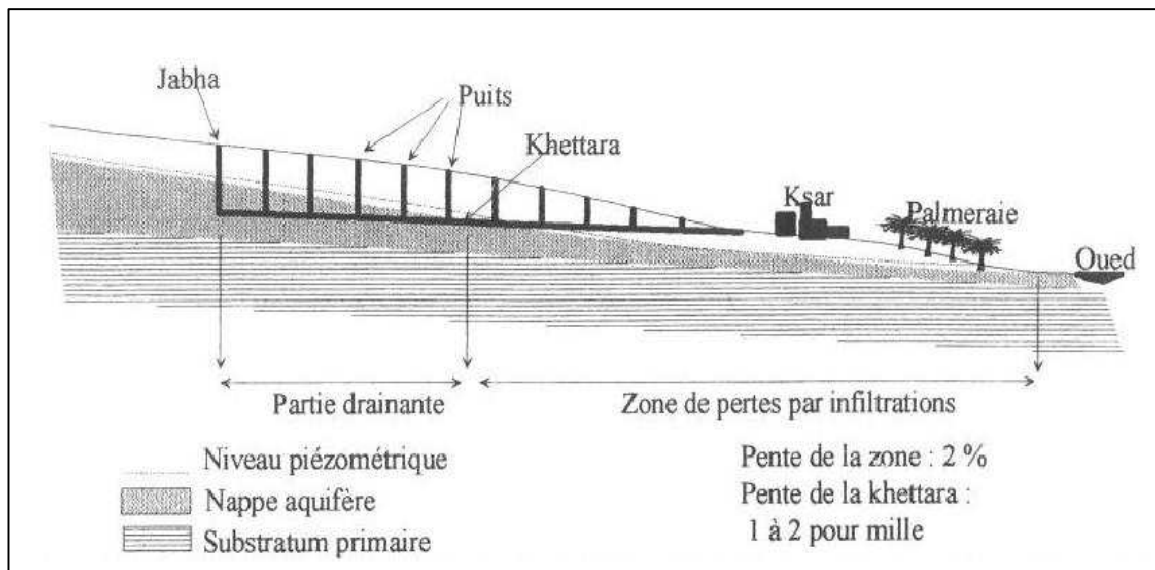
The permanent water resources are the underground water from a Quaternary era alluvial water table, whose floor is located at 30 m deep. This water table is fed by the superficial waters of the oueds' rises in water levels and from flows from the foothills of the Anti-Atlas. The water provided by these oueds are a good quality, not very salted, which allows to reduce the salinity of the alluvial water table. Infiltration from the network of irrigated lands also participates in refilling the water table. The piezometric measures conducted since the 1950s have shown that the water table varies constantly (it can vary from 4 to 5 meters in one same year). Like the other aquifer units in the region, its level has dropped over the last 30 years, as a result of both decreased refilling, and overuse by wells with water pumps (4,500 individual wells in the region of Tafilalet, and 11 stations of group pumping; 60 pumps in the Commune of Fezna) and by the khetaras. Moreover, the water from the table contains increasing levels of salt, at rates nearing 70g/l, which puts the palm groves' ecological balance in peril and has compromised their sustainability.

Superficial water is the water from precipitations and from the rises in water levels from the oueds. It is mobilized by 4 dams in the region. The oueds in the region are temporary rivers, whose flow is conditioned by rainfall (irregular and at times violent) and by the topography of the sloping basin. The project site is focusing on two oueds: Oued Ghris and Oued Batha. Oued Ghris, which drains the High-Atlas mountain range through and extended hydrographic network over nearly 3000 km<sup>2</sup>, flows through the vast Saharan plateaus. The oued has a violent and sudden rise in its level caused by short and high intensity rainfalls. Historic rises in water level were registered in 1965-66 and 1979. Oued Batha's sloping basin is in the Anti-Atlas, which is drier than the High-Atlas. It does not flood often (once every five years on average). Repairs of the Jorf-Tinejdad road in 2003 caused a lot of damage because it crosses the Batha oued. Underestimation of the oued's flow led the road maintenance department to measure inadequately the pipes enabling it to pass under the road. Flooding with moderate flow occurred that year. Since they were unable to flow entirely in these tubes, the waters were deviated by the obstacle formed by the road. They then poured into galleries of the khetaras and severely damaged them. They also destroyed close to 40 homes in the Achouria ksar. This dramatic event had a significant impact on area's history and inhabitants' memory.

## **Managing Scarce Water Resources and Oasis Social Organization**

The civilization of the Tafilalet Oasis depends on the management of scarce water resources and the ingenious systems that have enabled men to adapt to the pre-Saharan arid environment by developing a particular ecosystem. One of the best examples of the genius of oasis civilization is the traditional system of khetaras, draining irrigation galleries built over 400 years ago to ensure the oasis' water supply. It is works of underground water mobilization that wear away at the superficial part of a ground water aquifer and lead the water through gravity toward a palm grove located slightly below, several kilometers away. Khetaras can easily be located through an alignment of cones of debris resulting the digging of wells and galleries, and upon which the cleaning materials are unloaded during maintenance phases. The wells also ensure that the gallery is aerated, and prevent air saturation, which tends to weaken the walls. The technique of mobilizing water through this work is relatively simple.





**Diagram showing how a khattara functions in Jorf (Source: Boisumeau, 2000, p.48)**

Legend :

- |                      |       |  |      |            |      |
|----------------------|-------|--|------|------------|------|
| Jabha                | Wells | Khattara                                   | Ksar | Palm grove | Oued |
| Draining portion     |       | Zones of losses from infiltration          |      |            |      |
| Piezometric level    |       | Slope of the zone: 2%                      |      |            |      |
| Ground water aquifer |       | Slope of the khattara: 1 to 2 per thousand |      |            |      |
| Primary substratum   |       |  |      |            |      |

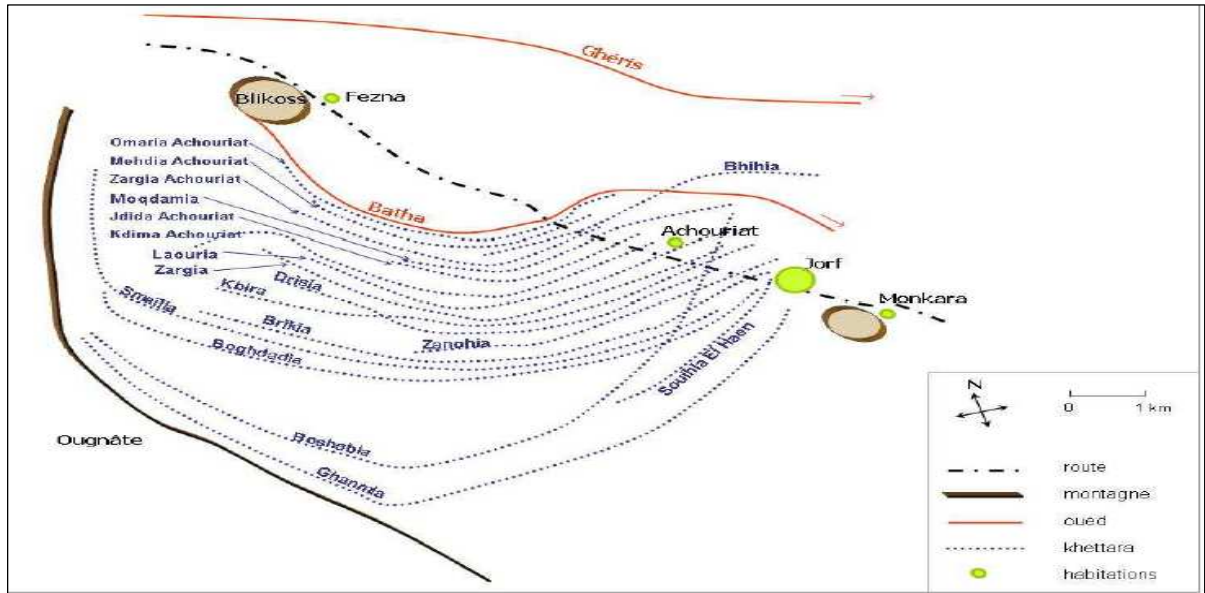
Water appropriation and distribution between oasis inhabitants relies on a complex and ancestral social organization. It is based on notions of water rights and irrigation turn.

The water-right is a user right and an ownership right. The status of entitlement is determined by the possession of a right to water within an irrigation network, acquired either through inheritance or purchase (or even temporary rental). As inhabitants explain it, the right to water is determined by participation in works of construction and maintenance of the khattaras. In other words, **from the time of construction, contribution by the families was measured and valued by the awarding of a previous right: that to irrigation water.**

A group comprised of permanent and temporary users manages the irrigated water, under the supervision of the Khettara Sheikh. Khettara users are responsible for its maintenance. In the project region, distribution of the water from the khattaras is organized following the measure of irrigation time and not measuring water volume as in other oases. The water portion is therefore a variable quantity of water, dependent on the flow delivered by the khattara. Duration of irrigation turn is fixed for a same khattara, but it varies from one khattara to another (from 12 to 20 days). The unit of measurement is called the nouba (between 10 and 14 h, according to the season). Each day is divided into a night nouba (noubal lil) and a day nouba (noubat nhar). The nouba itself is subdivided in half-nouba (nouss nouba), quarter nouba (rabâa), eighth nouba (toumoune), etc. The toumoune, which corresponds on average to one hour and a half, is the unit of time most frequently used by users from the khattaras. They use it regularly to describe the hours of the day, based on the sunrise and sunset. This clearly shows that for centuries, the pace of oasis life has been organized according to water and agriculture (inhabitants speak about a "water clock" whose time is given by the "nzel," which officiates for all the entitled people in a region), and irrigation management represents one of the essential bases of local social organization.

Thus, the techniques of water distribution and irrigation, remain closely linked to the social structures of the communities that shaped them. Actually, the whole originality of the oases stems from its social organization,

which has enabled to ensure survival of oasis society and its adaptation to the multiple influences and exchanges to which it has been subject throughout its history.



**Diagram of the Jorf – Elhaen khattaras galleries (source: participative cartography)**

Unfortunately, most khattaras are in a state of advanced degradation, due to a combination of factors: climatic events (floods); sand-covering; degradation due to aging infrastructures and to an increasing shortage of labor to ensure maintenance (rural exodus); and the drying up of water resources.

The Laachoria Ksar has 6 khattaras, all severely damaged or dried up because of the drought that has been rampant since the early 2000s, which has caused the water table levels to drop. Other water resources are being mobilized to compensate the khattaras' deterioration:

- Water from floods circulating in open-sky canalizations (segouia), whose distribution is conditioned by land ownership. This unequal system gives a strong advantage to those irrigating from upstream, who are first to irrigate. When the first person to irrigate has used the quantity of water wanted, he closes his water tap and the person irrigating downstream opens his. As it goes, infiltration and evaporation reduce the flow.
- Pumped water: numerous pumping stations have been built since the 1950s, individually or collectively. This occurrence, encouraged by farm services, was developed in an anarchic manner, which illustrates the race for water that characterizes today's oases.

Therefore, the current situation of the Ghris valley oases is in full evolution: water resources have been drying up, their quality has been deteriorating, and pressure has been intensifying on oases resources that are already being exploited to their limit. Individualization of oasis society has been threatening the sustainability of water resources through overuse of the water tables and because of ongoing unresolved conflicts. Climate change and its impacts have become part of this already fragile context, and have been amplifying the existing pressures.

## 1.2 Climatic Context and Current Climate Risks

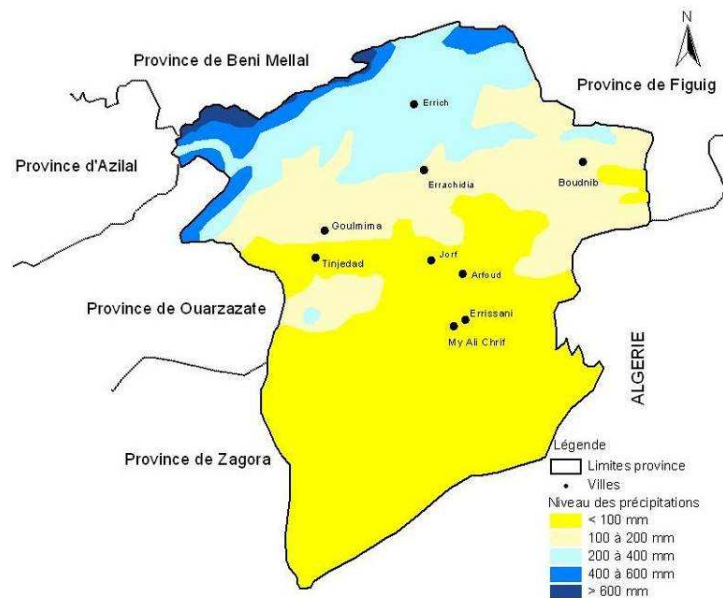
### 1.2.1. Arid to semi-arid climate with strong continental influence, characterized by low and irregular rainfall, and by a strong temperature range.

“What characterizes climatic features in the region is the frequency of extreme thresholds. The extent of ranges of temperatures places the region under the effect of very high maximum averages, and minimum averages below zero. Furthermore, rainfall is deficient on average, but this does not prevent the risks of flooding and problems in terms of excess water (Source: BENSOUJIAH and ADERGHAL, 2009).

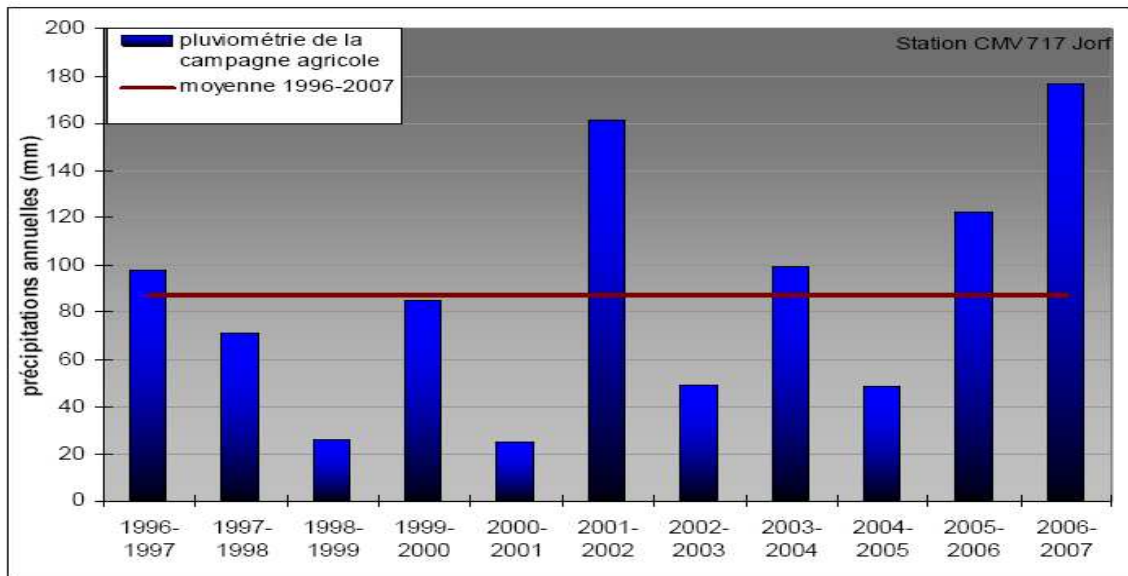
More specifically, in the project zone, (700 to 800 m in altitude), a semi-desertic climate is dominant, characterized by strong temperature ranges and scarce precipitations. Rain falls mainly in the winter and spring. Winters are temperate to cold and summers are marked by strong heat.

**Average pluviometru** varies between 70 and 150 mm (up to 180 mm in a humid year). From 1975 to 1997, inter-annual average rainfall was 89.2 mm. Over the decade between 1996 and 2007, rainfall registered in the Jorf station was 87.4 on average, with a **strong inter-annual variability**: it varied between 21 mm in 2000-2001 to 177 mm in 2006-2007, ie. from less than 30% of the average to more than double the average. Rainfall distribution per month is quite irregular. In Arfoud, 47.5% of precipitations fall in January, February and March, and 12% of rainfall is registered during the summer (June, July and August).

The average annual **temperature** is 20°C. Temperatures are very high in the summer and very low in the winter. In the project region, they can reach 45° i in July and minimum temperatures of down to -2° C in the winter, with frost in December and January (in 1998, -8° C was recorded in Erfoud). The hot season ext ends from June to September, and the cold season falls between December and March. Between these two seasons, there are two periods of transition: fall (October to November) and spring (March to May), which are periods of great farming activity. The local climate is characterized by very high annual and daily ranges (50° and 20° respectively). The temperature range is par ticularly high in December: sunny days and very cold nights.

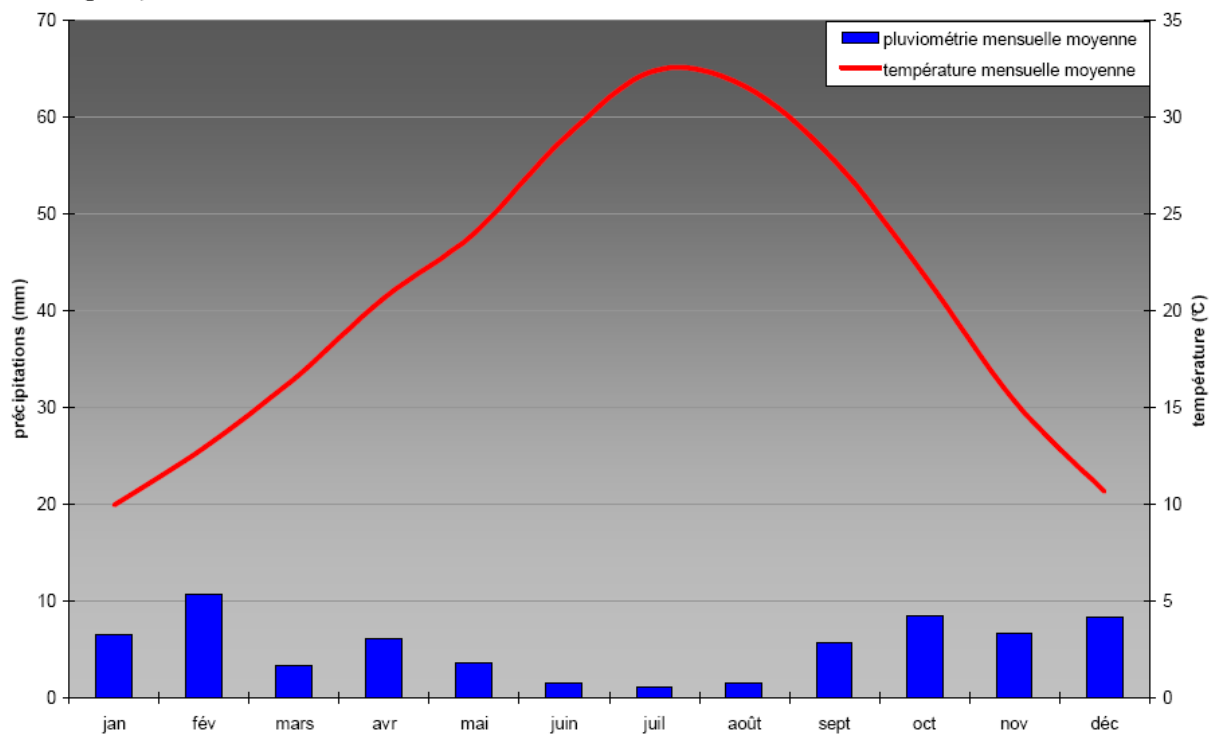


Annual Average Rainfall  
Source: Atlas des ressources naturelles –  
Taken from the SRAT Meknès - Tafilalet



Average Annual Rainfall in Jorf, between 1996 and 2007  
(source: CMV717 .Jorf).

[Legend: - Crop year rainfall  
- Average for 1996-2007  
Y axis: annual rainfall (mm)]



Pluviométrie and monthly average temperatures in Jorf in 2007  
Source: Centre de la mise en Valeur agricole, Jorf, 2007

[Legend: - Average monthly pluviometry  
- Average monthly temperatures  
Y axis: precipitations (mm)]

**The dominant winds are the Chergui and the Sahel.** The Chergui is a wind coming from the north-east. It is hot and dry and blows mainly in March/May and September/October. The region's farmers fear it. The Sahel is a wind from the south-west. It is hotter than the Chergui, but is characterized by its humidity content. These winds provoke sand storms throughout the year, and most particularly in July and September.

Annual evaporation is very high. Under the combined effect of temperatures, winds, dry air and sunshine, it can reach an annual value of 1,800 mm/year (up to 2,500 to 3,000 mm in the south).

### 1.2.2. Current Climate Risks Faced by the Community

During the participative production of a seasonal calendar, community members shared their experience and allowed to identify the climate risks affecting them. Climate change in the project zone is primarily characterized by the accentuation of "basic" local climate characteristics: intensified droughts and sudden climate variations (rains / brutal temperature variations); increasingly unpredictable and violent rainfalls.

#### **Intensified Droughts / Aridity**

The primary climate risk to which the community is confronted is increased aridity and repeated droughts. Poor levels of rainfall, combined with high temperatures, particularly in the summer, and significant evaporation cause structural aridity.

**Droughts have actually always dominated the natural climatic cycles**, extending at times over several years. Testimony by inhabitants indicate that the village's history has been governed by great periods of drought: the 1930s, early 1960s, then by the long drought period of 1973 to 2007, which greatly weakened the community.

Drought episodes have become more frequent, long and intense. The average drop in rainfall and strong perturbation of rainfall cycles have been noted. This has had an immediate effect (intensified drought), as well as side effects (reduced capacity to rebuild water resources, which has had a lasting impact on local ecosystems and livelihoods).

Therefore, even if the inhabitants know how to cope with drought, they find themselves increasingly powerless in the face of this occurrence's intensification and impacts.

#### **Increased Sudden Temperature Variations**

The region is characterized by a strong temperature range, within one year as well as within one day. **Climate change has accentuated and intensified this structural phenomenon.**

Inhabitants have actually noted that temperature variations are increasingly brutal and unpredictable (drop by 40°C in the span of one day, for example). These violent temperature drops or increases are identified by community members as the most significant risk of climate change, because they are **not armed to face it.**

#### **Increasingly Unpredictable and Violent Rainfalls and Storms**

According to rainfall reports, these last few years have seen an increase in annual precipitations. But these precipitations fall in a more unpredictable (not always favorable for crops) and concentrated (devastating torrential rains) manner.

In fact, after three decades of reduced precipitations, inhabitants have noticed a "return of water" in the khetaras since 2007, resulting from storms occurring at the end of spring, in the summer and in the early fall. These rains are violent, sudden, often unpredictable, and destructive.

The alternation between increasingly intense and long droughts / concentrated rains is damaging to the ecosystem and crops. Eroded and dried soils are no longer capable of absorbing these precipitations, which increases land-degradation, and provokes salinization and erosion.

### **Intensified Rising Sands and Desertification**

The zone is one of the regions of Morocco that have been the most affected by sand storms. These winds have always characterized the zone, but their impact has become stronger because of climate change, and because these winds are combined with a more significant alternation of drought / violent rains.

According to recent work conducted within the framework of the Tafilalet Oasis Programme, and by the Universities of Reims, Errachidia and Blida, the situation of the oases of Morocco has gone from being a “crisis situation” 20 years ago, to “a situation that is dangerous for survival.”

These winds intensify sand and dust transportation, with impacts on hygiene (presence of sand in the homes, spread of viruses and bacteria, respiratory problems, ocular problems), environment and economy. The palm groves, a principal obstacle to sand, are favored locations for dune accumulations and formations, which represents a factor conducive to the spread of Bayoud disease. Sand-covering also threatens road infrastructures and water run-off paths.

### **1.2.3. Impacts of Climate Risks on the Ecosystem and Community**

The degradation of the environment in the project zone is linked in part to climate change. The climate changes observed over the last few years (increased temperature, intensified extreme events, changes in the rhythm of the seasons and climatic unpredictability) have aggravated structural phenomena and poor human practices.

The workshops conducted in November 2010 to evaluate the vulnerability allowed to identify the principal local concerns and the impacts of climate change on the community, whose living conditions depend closely on the ecosystem and natural resources. In fact, the oasis environment is structurally fragile and vulnerable, and depends on close interaction between human activity and the environment.

For the inhabitants, the principal sources of vulnerability are the intensified droughts and increasingly brutal temperature variations. These phenomena directly impact the ecosystem and the local living conditions.

#### **Impacts on the Ecosystem**

- Aggravation of wind and water erosion and desertification
- Soil degradation and impoverishment, making it increasingly difficult to maintain and cultivate
- Depletion of the local biodiversity and vegetation cover, namely because of the palm grove's deterioration (linked to reduced water resources and increased drought and sand cover)
- Strong variability of water resources: since 2007, underground resources have been refilled thanks to the increased flooding, but the alternation between periods of drought and periods of floods is becoming increasingly rapid and sudden, which has made the natural resources more vulnerable

#### **Impacts on Infrastructures and Local Economy**

- Infrastructures have been directly affected by climate risks: roads and dwellings have been destroyed by increasingly devastating floods. A flood in early 2003 destroyed a large part of the village of Laachoria.
- Diversion dams and dykes several centuries old have been deteriorating rapidly as a result of the sand-covering (in the project zone, 4 infrastructures have enabled to divert the flood water toward the oasis plots over a theoretical surface of 4,000 ha).

- Water circulation infrastructures (khetaras and seguias) are being threatened by sand-covering and by sudden and devastating precipitations. The community, which has been losing its work force (exodus + increased individualism, also intensified by climate risks), no longer has the labor to maintain these infrastructures, which remain crucial for oasis life, and are being increasingly threatened.
- The increased climatic variability has been affecting local farming and breeding, which are the community's main sources of income: destruction of crops and herds because of sudden temperature variations (one breeder lost 300 sheep in one day after a brutal drop in temperatures); destruction of crops or severe perturbation of the farm production cycle following violent rains falling at the wrong times.
- Overall drop in farm production and productivity, which has caused a direct drop in inhabitants' incomes.

### **Social Impacts**

- Climate change has been directly affecting the resources the community depends on for its survival. Deteriorating natural resources and reduced farm productivity have generated significant economic losses and increased poverty.
- Subsistence farming is no longer enough to feed inhabitants, who are required to purchase their food, in a context of rising market prices. Therefore, with diminished resources, inhabitants have to face increasing expenses, which can lead them to make difficult choices with heavy consequences: exodus, reduced food rations, which adversely affects health, particularly that of the children; children dropping out of school, which affects girls in particular, etc.)
- Local farming has required great investments (in time and money). Climate change has led to significant losses of those investments. The community has several examples of farmers who invested a lot and who, a few weeks before the harvest, lost everything because of a violent and unpredicted rainfall, or because of a sudden temperature fluctuation.
- These economic losses have led the farmers to be discouraged and experience anxiety, which has reduced their motivation and compelled them to leave the village and abandon farming, which is essential for the oasis' survival.
- Climate change has increased the strain on rare resources, and threatened traditional solidarities and methods of resources management. Inhabitants have expressed their fears of the tensions generated by the climate events: until now, the community has managed to remain united in the face of floods and droughts; but in the future, with a decreasing work force and mounting vulnerability, conflicts could emerge and social inequalities could deepen.

### **Vulnerable Groups**

The vulnerability assessment workshop conducted with the women of the village made it possible to note that in the face of climate events, their vulnerability is particularly strong. They feel isolated and claim that they lack capacities and knowledge. They are not mobile and have few opportunities to adapt: "If your husband does not work, you don't eat."

Yet their role is significant both in the family and community. Women represent the core and base of the community, through their daily work in the home (which makes it possible for the man to work outside the home, according to one of the Cooperative's members, who insists of the importance of women's role), and through their involvement in numerous farming activities (harvest, driving the herd, etc.). Their vulnerability also has repercussions on the children, who have become victims of deteriorating resources and family incomes.

Other vulnerable categories are families without rights to water or without wells, who have found themselves in a situation of greater difficulty to irrigate their plots and meet their needs; and, families who don't receive incomes from migration. Indeed, without such external income, life in the oasis would be extremely difficult to sustain nowadays.

#### 1.2.4. Tools and adaptation practices existing in the community: how have inhabitants been reacting in the face of these events prior to the project ?

Within the Laachoria community, there are ancestral adaptation practices and strategies. In fact, it has always had to face a harsh climate. The oases' development has depended on the will to control the elements and climatic events.

These adaptation strategies include the following:

- **Cyclical migration movements** make it possible to gain time. Inhabitants explain that during the last century's great waves of drought, many left to find work in the cities, and would return "when the water returned." But with the intensified droughts of the last few decades, **the rural exodus phenomenon has grown**, and it could on the contrary aggravate the impact of climate change (insufficient labor for local farming and to maintain infrastructures, abandonment of the palm grove, which has accelerated the degradation of the environment and encourages desertification).
- **Farming practices** have been adapted to face climate events:
  - o Traditionally, inhabitants are used to developing their production to its maximum when there is water in the water tables (fruit trees, truck farming, cattle, etc.), but they **limit their activities to the two pillars of the oasis when there is drought** (the d'man sheep and the palmtree / "naja or nakhla"), and abandon non-essential crops or those that consume too much water;
  - o Today, there are several trends: first, individualism, which aims to **optimize yields by focusing on crops with a high added-value**, but that consume a lot of water, which intensifies climate change impacts instead of minimizing them;
  - o A second trend, initiated by the Madania Cooperative, is to experiment with **sustainable methods of using resources** (drip irrigation, organic farming, natural fertilization) on collectivized land, in order to promote both more productive as well as suitable and resilient farming.
- **Volunteer and collective work** are ancestral strategies used to respond to catastrophes and climate events. "**Had sayem**" is a traditional practice of community volunteer work that provides that in case of a severe emergency in the village, each man capable of fasting ("sayem," in the Muslim religion) is obligated to volunteer to participate in the collective work.

This practice is applied to infrastructure construction, repair or maintenance jobs (irrigation canals, etc.), for example following a flood or sand storm. This applies also in the case where a community member requires assistance (home destroyed, field flooded, etc.).

This practice is organized at the community level, and depends on social responsibility (directly tied to religion, as the name indicates). It allows the community to face catastrophes and maintain the local infrastructures (which an individual could not do alone, and community members could not afford if they called on a company).

Most community members share a positive and optimistic outlook, which is based on strong features:

- **The experience and knowledge of the elders:** "Our fathers and grandfathers have gone through the worst. They experienced very difficult moments. But they worked nonetheless and were capable to adapt." Some families lost everything in the past, yet they survived. "We hope that we will not have to experience this in the future, but we must have a positive attitude. We are trying to prepare and maintain our heritage."
- **Local solidarity** is very strong and based on **family ties**. People help and encourage one another. For them, working together makes them stronger. It is actually during the most difficult events that this solidarity became stronger. "The drought problem has allowed us to join together and revive the local solidarity traditions. The cooperative was actually created at the time of a very severe drought – the problem encouraged solidarity. Without the drought, we wouldn't have established the cooperative."



- **Religious traditions** are still vivid and promote cooperation with the poorest (donations of food, authorization to pick from farm plots, etc.).

### 1.3 Future Climate Risks

The forecasts of the Initial National Communication (2001) and Second National Communication (2010) from Morocco to the UNFCCC are as follows:

- Clear trend toward an increase in average annual temperature +0.6°C, +1.8°C and +3,2°C respectively by 2015, 2045 and 2075, with an increased frequency and intensity of the heat waves throughout the country.
- Trend toward a decrease in average annual rainfall: -6%, -13% and -19% respectively by 2015, 2045 and 2075.
- A disturbance in seasonal rainfall (winter rains concentrated over a short period).
- An increase in the frequency and intensity of frontal and convective thunderstorms in the north and west of the Atlas Mountains.
- An increase in the frequency and intensity of droughts in the south and east of the country.
- A reduction in the period of snow cover (a shift of the 0° isotherm to a higher altitude, and the acceleration of snow melting).

Local observations have confirmed these predictions. Inhabitants have indeed observed accelerated climatic cycles and increase drought frequency and intensity. They have also noted significant changes in rainfall patterns, as well as increasing rainfall unpredictability and sudden temperature variations.

### 1.4 Context of the Future Impacts of Climate Change

If climate risks are confirmed in accordance with scientific forecasts, the impacts already noted for several decades will grow stronger in the community:

- Aridity will increase, causing a negative impact on already very weakened ecosystems (desertification, soil and biodiversity impoverishment, reduced water resources).
- Risks relating to extreme events (downpours, storms, etc.) will increase, causing the destruction of infrastructures and crops, and gradual physical and psychological exhaustion of the communities.
- Local farming will be directly affected, and almost impossible to sustain. Farm production will diminish, leading the population to find itself in a critical social and economic situation.
- Food security will be gravely affected and traditional solidarity and resources management structures will be threatened. Abandoning school will become more pressing because families will no longer be able to afford their children's education. This will impact girls first, and therefore worsen gender inequalities in the long term.
- Oasis life will become extremely difficult to sustain, and the rural exodus will increase (which will intensify the spiral of abandonment and desertification, and multiply the challenges of social management in the big cities).

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According to the workshops conducted in the community, the most likely response to the future increase of the already existing impacts would be a **massive rural exodus movement** (climatic migrations), as a consequence of very unfavorable and discouraging local conditions, particularly for the young generations who aspire to more modern and less difficult living conditions than those of their parents.

The recent "return to the earth" phenomenon that started in the village (caused by the global crisis, but facilitated by the dynamics created by the Cooperative) would no doubt be stopped by increasingly severe climate changes. Current responses may not be enough to succeed, and the community could lose its existing resilience capacity. Inequalities in the community could worsen as local solidarity crumbles.

Women's vulnerability would seemingly be aggravated because they do not have the resources or alternative solutions. Most of them could remain in the village, while their husbands go to the city to find work, and would be subject to the full impacts of droughts and floods. At the mention of these future developments, women do not see what they could do. They express a deep sense of discouragement and fatalism: "We will be poorer, but what can we do about it?"

Inhabitants remaining in the village could become more individualistic and develop less sustainable farm practices, over-exploiting decreasing resources in order to curb their losses of income.

Future climate change will magnify the impacts already observed by the inhabitants, and risk harming the "community/ecosystem" relationship, which is at the heart of oasis life. The abandonment of the oasis by its labor force, and erosion of the local collective movement would strengthen the impacts of climate change – desertification would grow worse and have a negative impact on the country overall.

## 1.5 Project Approach

- The **Global Environment Benefits (GEB)** targeted by the project are preventing soil degradation and preserving biodiversity (agro-biodiversity).
- **Baseline threats weighing on the Global Environment Benefits (GEB) in the absence of climate change**

The oasis ecosystem is structurally fragile:

- Natural soil poverty made weaker by man's destruction of the vegetation cover, and impacted by erosion (water and wind)
- Scarcity of water resources, increased by poor management and run-down infrastructures
- Structural aridity

The agro-biodiversity typical of the oasis zone is resilient and suitable for the basic local climate, but has been threatened by the lack of maintenance of the oasis gardens, modified farm practices, and the introduction of cash crops that consume a lot of water. The palm grove in particular has become severely degraded, due to lack of maintenance, the disappearance of local knowledge, and pests such as Bayoud, which has decimated the Moroccan date palm grove.

- **Additional threats caused by climate change**

Climate change increases the zone's aridity, and is an aggravating factor of all basic events, increasing the oasis agro-ecosystem's vulnerability:

- Increasing temperatures and periods of drought have been accentuating pressure on the water resources. These resources are being replenished with more difficulty, which is having a lasting impact on the ecosystem. Evaporation has increased, which puts even more pressure on soils and biodiversity.
- Sudden temperature variations are becoming more frequent and unpredictable, and have been placing the agro-ecosystem (and local economy) under greater stress.
- The increasingly concentrated, sudden and violent rains are making the ecosystem's management uncertain. They generate violent flooding, which are having devastating effects on the soil, crops and herds.
- Alternating droughts and sudden rains have been intensifying soil erosion and degradation. After even longer and severe droughts, the dried and bare soils have become less capable of absorbing sudden falls of heavy rain.
- **Desertification, degradation of the local agro-biodiversity and vegetation cover, deterioration of the palm grove (basis of oasis life), and sand-covering.**

**The vicious circle of degradation**, aggravated in an accelerated manner by climate change, has made local farming even more unproductive, compelling oasis communities either to leave their village, or to turn to cash crops in order to survive. These two alternatives have contributed to intensifying the degradation of the ecosystem and natural resources: the exodus has caused the desertification to increase (the oasis cannot exist without close interaction between man and the ecosystem; without human activity, an oasis would inevitably degrade). Non-sustainable crops contribute to rapid soil deterioration and water resources depletion.

- **Softening the baseline pressures on the ecosystems and GEB**

Within the framework of the Tafilalet Oasis Programme, the Cooperative has developed and implemented a certain number of actions making it possible to minimize anthropogenic and structural threats, by strengthening rational and sustainable water resources, promoting ecological and organic crops, encouraging sustainable maintenance and protection of soil and water resources.

A cultural and eco-touristic development strategy is also being developed to raise the inhabitants' and visitors' awareness about protecting the ecosystem and enhancing the ecological and architectural heritage.

- **Making ecosystems and GEB more resistant to climate change, including climatic variability**

The CBA project aims to secure the global environment benefits in the face of increased climatic variability, intensified droughts and strong rains, and the increasing unpredictability of climate factors.

In order to strengthen the resiliency of the oasis agro-ecosystem, a **strategy of soil, water and agro-biodiversity conservation** will be implemented:

- 5 ha of degraded and eroded pilot plots of lands will be restored, protected and fixated, through the cultivation of resilient and protective plants that are suitable and not very demanding
- Experimentation with hardy aromatic and medicinal plants, to be cultivation in combination:
  - o Marjoram (Oregano family): perennial Mediterranean plant demanding in sunlight and heat, while being resistant to the great cold that characterizes the zone in winter; it is tolerant to sandy soils.
  - o Safflower (Saffron family): Mediterranean plant that grows easily in poor and uncultivated soil.
  - o Caper shrub: perennial Mediterranean bush that has been known and used since Antiquity. Xerophytes plant that is perfectly suited for arid climates; it also tolerates cold.

These plants will allow to regenerate soil degraded by desertification, while establishing a basis for income-generating activities for the community.

- A **mix of resilient fodder** will be experimented, through a combination of Bersim trefoil (winter fodder) and sorghum (summer fodder) that present low water and input requirements. These varieties, which are nutritional for the soil, will provide a durable and resilient alternative to alfalfa, which is currently favored by oases, but whose high demand for water makes it less and less suitable for the local climate context.

The resilient fodder, tested as a pilot project, will enable to protect and preserve water resources, while **strengthening the sustainability of D'man rustic sheep rearing, an essential component of the site's agro-biodiversity**, and basis of the local economy and nutrition. This sheep is one of the pillars of the oasis, and represents a traditional adaptation strategy in the face of drought, because it is particularly resistant and not very demanding, and also has high productivity.

- The project aims to **protect and preserve a resistant and noble palm variety that is typical of the region: the Medjool date palmtree**. Like the D'man sheep, the Medjool date palm is a pillar of the community's adaptation strategies. When droughts have occurred, the community has always focused on these two species, abandoning other less strategic speculations because they were not as resilient. In the context of a deteriorating palm grove, preserving this species is crucial and a priority, because it will become increasingly valued for community adaptation. Without the date palmtree to protect from the sun and draw from the deep water resources, oasis farming, which functions in strata, could not be perpetuated.

Through the **construction of a 300 m<sup>2</sup> nursery, and the collection and conservation of 1000 shoots** of Medjool palms, the community will have a potential for replanting and regeneration of the palm grove that will enable to increase the oasis ecosystem's resiliency and increase the community's capacity to adapt by allowing for the creation of substantial and sustainable income.

- **Benefits for the Community / Comprehension of climate change and adaptation**

The local community depends strongly on farming and breeding for its survival. Therefore, the protection and regeneration of resources and biodiversity are closely related to human activity and its sustainability. At the end of the project, the community will have its lands restored and also acquired valuable and experimented

techniques and species. The project is being supported by a local capacity building and income diversification programme, which will produce immediate results for the community.

Living conditions and the local economy will be improved to last:

- Resilient fodder will allow inhabitants to save their water, which will make their breeding and farming more efficient and profitable.
- Aromatic and medicinal plants (AMP) will provide raw material for new income-generating activities (processing, cosmetics, herb trade, etc.).
- Regeneration and conservation of the Medjool palm will enable to disseminate this highly productive variety, whose fruits are the most expensive in the date market. A date processing unit is already in progress in the community (co-financing from the Tafilalet oasis Programme), to that end.

The project's management and implementation by the Cooperative will promote income generation, of which a portion will be shared among the members and project participants; and another portion will be reinvested into new activities, which will increase sustainability and adaptation.

The project has an experimental vocation and is based on the members of the cooperative, who are pioneers in the village and who have already succeeded in encouraging migrants to return to the village and contribute to revitalizing the oasis. These people are becoming invested in the local farming, contributing innovative ideas and technical knowhow, to supplement their traditional knowledge.

This project aims to support this "return to the earth" dynamic by supporting simple but motivating and lasting activities, because it is based on the community's ecological and technical heritage, while introducing simple and accessible technical (nurseries) and cultural (fodder mix) innovations.

A training / awareness raising programme will accompany all the activities to help make them sustainable and ensure their success with regard to adaptation to climate change: construction and management of a nursery, soil conservation and AMP management, resilient breeding and fodder management. The climate change thematic will be transversal and dealt with in a concrete and pragmatic manner during the different trainings and community workshops on vulnerability assessment. A specific workshop will also be organized on introduction to climate change.

Gender integration in the project is being conducted at all levels and steps. More particularly, women are involved in land restoration and breeding resiliency activities: planting, cultivation, application and use of fodder, income-generating activities, AMP, etc.

- **Replication on a larger scale**

The Madania cooperative already has a certain reputation at the local, regional and national level, thanks to previous successful projects and effective communication provided by the Tafilalet Oasis Programme.

This notoriety, substantiated by a communication and activities plan for the next five years, will allow the project's results to be disseminated.

A specific web-page dedicated to the project will be added to the Cooperative's website and regularly updated by the members themselves, after simple training.

The project will influence the Communal Development Plan which is being developed by the Rural Commune of Fezna. It may also influence regional policies on planning strategies and adaptation to climate change in the Tafilalet region.

Finally, the Cooperative is participating actively in the network of associations and regional and national community organizations, and may influence other communities (horizontal dissemination).

- **Capacity or awareness raising constraints and solutions to overcome them**

The project proponent has the capacity to implement and manage the project. One of the challenges involves effectively mobilizing the maximum number of community members, beyond the Cooperative members. Support

will be reinforced by the CBA team to ensure real inclusion of the largest number in all the project's activities, its governance and the management of its profits.

## 2.0 COMMUNITY OWNERSHIP

### 2.1 Project Development

The project leader is a **community-based organization** that has been gathering the representatives of 40 families from the village of Laachoria for the past five years.

The **participative approach** implemented locally started before the current project, since the Cooperative has been organizing several **awareness raising and mobilization** events relating to the village's problems and issues.

- Awareness raising and training of farmers and cooperative members on valuing the local assets to promote local development.
- Awareness raising of women in the areas of farming and breeding (activity guided by women engineers of ORMVAT – Agriculture extension services).
- Exchanges and awareness raising on aromatic and medicinal plants, local heritage, etc.

Cooperative members have been conducting an important work of mobilizing partners and seeking ideas and technologies (site visits, participation in salons), which has encouraged the local dynamic and mobilized the inhabitants, who are very attached to their environmental and cultural heritage.

From this initial mobilization (which has already allowed numerous ideas to emerge) and with support from its partners, the Cooperative has become committed to an active and inclusive process of putting together the Adaptation project, by associating Cooperative members and the village's women.

Development of the project was conducted through several **mobilization workshops that enabled to assess the impacts of climate change, gather local knowledge and experience, and draw the possible solutions in a participative manner.**

This project is based on lessons from prior experiences by the Cooperative, that have enabled to gather participants gradually, who have become increasingly numerous, and convinced by the **concrete results or previous activities** (land collectivization, drip irrigation, organic farming, mobilization to preserve the local architectural heritage). It also benefits from the strong tradition of community mobilization and involvement.

The project proponent will be responsible for the consideration of the **needs of the community's most vulnerable members**, particularly women, who participated in the project development workshops and numerous informal exchanges throughout the project's preparation. Women are active stakeholders in the project's activities.

Development of the project has also associated and taken the needs of the **village's young people into consideration. This group has been very active in sharing ideas and participated in concrete activities** (farming, maintenance of infrastructures, etc.). In particular, several young people have been a part of the committee working on preparing the project and have contributed their precious technical and scientific knowledge, as well as their capacity to mobilize other young people.

**Development of this project falls within the framework of the Tafilalet Oasis Programme** (UNDP, Land-Use Management, Social Development Agency), and has been developed with the TOP team, consistently with its orientation.

## 2.2 Project Implementation

The project will be achieved with the total and permanent participation of the community members, with at its core, the members of the Cooperative. The project proponent will make sure to integrate a maximum number of participants into the project, so that it can benefit the maximum number of people in the village. The Cooperative's status specifies that all members must contribute in the process of producing the structure. Through its supplemental and diversified activities, the project will enable to integrate even more significantly the population of Ksar Laachoria, because its activities will enable to create additional days of work.

The project's different activities will be entrusted to specific groups that will be responsible for the following:

- Activities related to breeding will be entrusted to women, who will be responsible for their management and benefit from them collectively.
- Women will also be responsible for activities relating to aromatic and medicinal plants.
- For the activities relating to the planting of date palmtrees, the young men will be responsible for them and guided by the elders. Subsequent maintenance of the date palm plants will be conducted according to the traditional division of duties: the men will provide for the care, pollinization, cleaning of the tufts; and women will take care of picking the dates, processing dates as well as palm's subproducts (and add value, through establishment of a small-scale craft unit, through breeding and preparing organic manure).
- The capacity building programme will involve all participants, and aims to promote sharing and communication between the different groups (each community group has knowledge and knowhow to share).

Throughout its implementation, the project will seek to enhance the local knowledge and savoir-faire, and promote inter-generational bilateral communication between young and old. The project depends on the experimentation of a combination of traditional practices and new techniques to enable adaptation, which requires involvement from all.

The project relies on the promotion and restoration of traditional solidarity values and practices, and collective work, in order to mobilize and inhabitants and promote their contribution (see also community contribution table):

- **“Had Sayem”**: this traditional practice of community volunteer work, which provides that in case of a serious problem affecting the village, each man capable of fasting (“sayem” in the Muslim religion) must volunteer to participate in collective work. This practice applies to infrastructure construction, repairs or maintenance (irrigation canals, etc.), for example, after a flood or sand storm. This applies also in the case where a member of the community has a severe problem (destroyed home, flooded field, etc.). This practice is organized at the community level, and is based on social obligation (with direct ties to religion, as the name indicates). It allows the community to face catastrophes or serious events, and enables to maintain the local infrastructures (which an individual alone could not do, and this individual would be unable to pay the community members if they called on a company).
- **“Adoual”**: A practice of local cooperation and solidarity that applies to agricultural work. Several people work for a farmer, who therefore benefits from a larger work force. He shall then return this work force to all those who have helped him. This practice works with small groups, and is based on reciprocity (social obligations). Moreover, the person receiving the group in his field provides lunch.
- **The project will also take inspiration from the ancestral practices that have enabled the construction, and maintenance of khattaras (underground canalizations) for over four centuries**, and upon which water distribution is based. This system of collective work is based on the strict and through monitoring of inhabitants' contribution: only those who have participated in building the khattaras benefit from a right to water. Each owner of a part of water / khattara must provide a certain number of workers, according to his portion in the khattara. This system is based on a regulatory obligation (customary right, applied and monitored by a khattara committee), with a system accepted by all. But also on the fact that everyone requires water in their daily life. It is therefore in the interest of all

that the system be maintained. And since this is about property (as for a house), it is in everyone's interest to participate in its maintenance. **The lessons to be learned from this system is that an investment/contribution (even in kind) is essential to obtain a benefit/right** (as stated by the inhabitants: "Li maafar, mayakul" – if you won't dig, you won't eat). Moreover, it is essential to monitor each individual's specific contribution in order to calculate their rights. The project will be based on principles that guarantee equality and that will allow collective and individual interests to meet. It is the project participants themselves who will reap the benefits.

Particular emphasis is being placed on **the gender approach** promoted by the Cooperative since its creation. Women represent an essential factor in the project's success and sustainability. They also represent a vulnerable group that has not been consulted much, though it is associated in the local projects.

Women have participated in formulating the project, and the Cooperative is responsible for women's effective participation in all the implementation phases: conducting the activities, participating in all the trainings, **empowerment activities, and direct management of the benefits, and integration with all of the Cooperative's decision-making authorities in order to participate in all the decisions (2 to 3 women will be integrated into the Executive Office).**

Throughout the project, the Cooperative will take any measures necessary to facilitate women's participation, taking the cultural context into consideration.

### **2.3 Project Finalization and Sustainability**

The activities will be integrated within the community, as soon as the project is launched. The project proponent will receive support from his partners (CBA, TOP, etc.) throughout the project's implementation, in order to ensure his autonomy by the end of the project.

The CBO is already relatively experienced in the monitoring and achievement of community projects, which constitutes an additional guarantee for sustainability.

A local capacity building programme for adaptation will provide community participants with the tools to continue the project in the future and develop new adaptation activities. The project proponent being a Cooperative, will help capitalize **part of the benefits of the project's activities and reinvest them in favor of community adaptation.** The rest of the benefits will be distributed among community participants, according to their specific contribution.

The project has been developed to meet the double imperative of protecting the local environment and strengthen the ecosystem's resiliency in the long term, and to improve the community's living conditions, through sustainable and durable activities.

The project's activities are being conducted on the Cooperative's test site, on collectivized plots owned by the Cooperative (for 99 years). Thus, the Cooperative will own all the investments, and will guarantee that all the investments made throughout the project will benefit the community members.

The project approach, based on two traditional pillars of the oasis community, guarantees sustainability. Moreover, the Cooperative will have the means to replicate and disseminate the activities, through the community nursery.

**Community participant contributions will be monitored in a manner that respects the following principles, based on local practices and values:**

- Participation is open **to all community members** who wish to be involved; with emphasis on mobilization of the most vulnerable (women, poor families, families with no property, etc.)
- Written **commitment** from each community participant
- **Monitoring of** community members' **specific contribution**, activity by activity
- Community members' concrete participation entitles them to compensation: Cooperative members receive monthly compensation; non-official members receive daily compensation



- Cooperative benefits are distributed according to national cooperative regulations (ODECO), as follows: 2% are dedicated to community events (wedding, funerals, births), 5% are dedicated to training for the community; 46.5% to be reinvested in cooperative projects; 46.5% to be distributed between cooperative “shareholders,” (cooperative members).
- Currently only 3 women are official cooperative members. The project’s goal is to increase women’s participation in all steps of the project, including the cooperative management process and distribution and benefits, by facilitating their access to the Cooperative.

These principles will encourage the community to become involved in the long term, because they will take part only if they find real individual interest in the short or medium term.

Women’s concrete inclusion will promote stronger durability, since women represent the stable element in the household and community. Their integration in decision-making within this project (**goal of at least 2 women as members of the Cooperative’s board**), and the development of incomes directly generated by women will contribute to reducing their vulnerability, and therefore that of their children. It has already been largely proven across the world that incomes generated, more specifically by women directly, have a more consequential and lasting impact on the community. Moreover, during the project, the Cooperative intends to affiliate its members with the Caisse Nationale de Sécurité Sociale, which would be an additional element of sustainability for the project. **A goal has been established to affiliate 25 women to the CNSS by the project’s end.**

Through this social and inclusive process, the Cooperative is resolutely focused on the future and a solid and perennial increase of adaptation capabilities.

The Cooperative will receive support also from a five-year management plan that will enable it to plan its activities and resources according to a development strategy.

## 2.4. Project Contribution to the National Policies:

### National Priority: Adaptation in the Oases

The project falls in line with one of the major national priorities, namely the protection, safekeeping and development of the oases. The oasis region is the focus of several concerted and integrated programmes, in which the CBA project will contribute through the experimentation of concrete and community solutions to adapt to Climate Change.

“Adaptation in the Oases” was the subject of a large side-event during COP 16 in Cancun. Organized by the Moroccan government, it shows the determined commitment to support the most vulnerable to face climate change.

In practical terms, the current CBA project is coherent and an integral part of the following programmes:

- **Tafilalet Oasis Programme** (Land-Use Department / Social Development Agency / UNDP Morocco), whose aim has been since 2006 to fight against desertification and poverty, by protecting and developing the oases in southern Morocco, especially through the **restoration of the oasis agro-ecosystem and its biodiversity**, through the introduction of an agro-ecological process and techniques, and multi-sectional mechanism of economic and ecological development that will engage a gradual recovery process of the lands and spaces currently dried up and abandoned, and thus fight effectively both against the degradation of the oases and increasing poverty of its populations, by providing substantial and durable improvement of farmers’ incomes; **legislative and regulatory consideration** by the State of a method of development that is specifically suited to the oases, where the terms of sustainable development are expressed first and foremost according to the availability of the resources, an absolute condition that must strictly guide any development and land-use option in an arid zone. The Programme emphasizes the **involvement of local governments and local populations (through local civil society capacity building)** and an association with the National Human Development Initiative and with the national strategies.
- **The Programme for Adaptation to Climate Change in the Oases** (Africa Adaptation Programme / UNDP / Ministry of the Environment), whose aim is to generate and reduce the risks of climate change in Morocco’s oasis productive systems, through the introduction of innovative adaptation approaches and the building of local capacities, according to a territorial approach. Dynamic long-term planning mechanisms will be established in order to manage climate change risks. The results expected from the PACC are strengthened leadership and institutional frameworks to regulate the integrated management of climate change, implementation of suitable policies and measures, exploration of financing options that would enable to cover the costs of adaptation and the generation and dissemination of knowledge relevant to adjusting national development processes.

### Promoting Community Adaptation in the Decentralization Process

A regionalization and decentralization process is in progress in Morocco. Its aim is to strengthen the prerogatives and skills of the different authorities: Regional, Provincial, and Commune/Municipality. The goal of decentralization is also to increase the development strategies’ coherence at the different levels.

In this perspective, each territorial entity has been developing a Strategic Development Plan through consultative diagnoses.

The CBA project falls within these territorial strategies, and the project’s experience will influence strategic programming at local and regional levels, through advocacy work conducted by the Cooperative with local elected officials:

- At the communal level: The project will contribute to the **Communal Development Plan**. The elected officials of the Rural Commune of Fezna will be strongly mobilized and informed about adaptation to climate change. The **Rural Commune of Fezna is one of the PACC – Oasis’ 2 experimental communes**, which focuses on integrating adaptation to strategic planning. The project therefore has a strong potential to influence local and national policies through its incorporation with the community

strategy. The Rural Commune is in the process of finalizing its diagnosis. It will soon launch the development of its action plan, in which the CBA initiative for Madania will be integrated, thanks to the support from its partners (TOP, PACC programme).

- At the regional and national level, the project can contribute to the National Land-Use Planning Framework in progress in the Meknes-Tafilalet region, thanks to the **involvement of Land-Use Department, which is intervening in a vertical manner at all territorial levels**, from communal to national.

Volunteer Contribution to the CBA Project												
Project Activities (in which people expect to be contributing in a voluntary manner)	Description of volunteer contribution (capacities, knowledge, savoir-faire, manual work, materials, tools, etc.)	Total number of volunteers mobilized	Women	Men	Elderly persons (over 60 years of age)	Young people (under 25 years of age)	Persons with disabilities	Local	National	International	Expected number of volunteer days	Monetary value of the volunteer contribution, including work and materials (to be considered as co-financing in the budget) – specify method of calculation and monetary unit
Creation of a nursery, Protective planting of Medjool date palm	Labor / Tools Knowledge	6		6	2			6			20d * 6v= 120 vd	120 vd * 150dh (qualified labor) = <b>18 000 dh</b>
Irrigation connection	Irrigation connection materials & irrigated water	4		4	2			4			4d * 6v = 24 vd	24vd * 150 dh= <b>3600 dh</b>  + Connection materials budget = <b>5000 dh</b>
Monitoring and maintenance of the nursery	Labor	2		2	1			2			120 d * 2v = 240 vd	240 vd * 150 dh= <b>36000 dh</b>
Planting & monitoring of AMP / Fodder	Labor / Tools / Maintenance Knowhow	10	1 0								100 d * 10 = 1000 vd	1000 * 70 dh = <b>70000 dh</b>
<b>TOTAL</b>		<b>22 (number at the beginning of the project; throughout the project, more volunteers will become involved)</b>	<b>1 0</b>	<b>12</b>								<b>96 600 dh</b>
<i>For reference:</i> What are the volunteer mechanisms that already exist within the community prior to the CBA project? (for example, traditional mutual assistance mechanisms, associations, etc.) SAYME, ADOUAL, SADAKA, TADAMOUN, TAAOUN (see details page 21)												
<i>For reference:</i> Number of volunteers in the community already engaged in activities for adaptation to climate prior to the CBA project. 19 men, 11 women												
<i>For reference:</i> What are the opportunities or obstacles that can facilitate or prevent people from engaging in volunteer activities?												

## 3.0 DESCRIPTION OF THE PROJECT PROPONENT

### 3.1 Presentation of the Organization, Previous projects, Capacities

#### What is ALMADANIA? How does it operate?

Following a severe drought that fell upon the region of Tafilalet and the oases in particular, several farmers lost their work and sought to abandon their lands and flee the dried up oases.

In this atmosphere of despair, people from the Ksar Laachoria had a completely contrary and defiant attitude, decided to remain in the oasis and even better, to keep working. They proceeded to acquire the abandoned lands to cultivate them. When others gave up, they remained steadfast.

Thus, on June 21, 2005, the Al Madania agricultural cooperative was created by forty farmers from the small village of Laachoria, located in the commune of Fezna – Province of Errachidia.

Today, ALMADANIA represents a real cooperative, comprised of 50 volunteers who accomplish a large variety of farming activities. The 50 ha of land available to the cooperative, and the powerful dynamics of its members represent its key potentials.

ALMADANIA is a socioeconomic entity with deep roots in the Laachoria oasis created by and for the people. It is inspired by the fundamental principles of the cooperative experience and committed to the community, improving farming productivity, and meeting the needs of its members. Its goal is to *create wealth within the oasis through the development of farming activities and job creation, preferably jobs for Cooperative members.*

According to its regulations (statutes), its specific goals are as follows:

- Development of a drip irrigation system;
- Development of production systems;
- Raising and construction of a collective sheepfold;
- Collective use of farmlands;
- Introduction of mechanized farming;
- Collective marketing of products.

#### Management System Guaranteed for Success

ALMADANIA is based on a shared commitment and uses democratic methods within its organization and management. It encourages the participation and integration of people in management and profits in order to develop joint integrated projects whose aim is to achieve social cooperation and personal development.

And 10 founding principles of underlying cooperation:

1. Shared commitment;
2. Democratic organization compliant with the law;
3. Sovereignty of work;
4. Subordinate and instrumental nature of capital;
5. Participative management;
6. Intercooperation;
7. Spirit of partnership;
8. Openness toward other actors
9. Recourse to the knowhow of elders and contemporaries;
10. Training

### **Our Achievements:**

- The gathering of small farm production units to increase profitability, modernization and organization;
- The establishment of an experimental oasis farm;
- The development of abandoned farmlands for farm production;
- The achievement of a study project and equipment of a 15-ha perimeter with drip irrigation, in collaboration with the Tafilalet Oasis Project and ORMVA-TF, and study of a 9-ha extension for the drip irrigation system;
- Digging of a well and its equipment;
- Installation of local irrigation microsystem on the test parcel;
- The achievement of over 30,000 days of work (men and women);
- Planting of olive trees (4,000 olive trees and 2,200 various trees);
- Start of agro-ecological production;
- Start of compost production;
- Start of the integration of Aromatic & Medicinal Plants cultivation;
- Development of the ELOMARIA khattara (heritage water resource): 230 m with small farmers and 205 m with the TOP and work with it on the khattara's continued development (800 m)
- Development of a date processing unit and its equipment by the TOP
- Preparation of a Ksar Laachoria restoration project with the TOP (heritage architecture)

### **Projects Currently Being Prepared (supplementary to the CBA Project)**

- Creation of a public house in relation with the KSAR's activity and potentialities
- Construction of a house for the Cooperative.

### **Development Activities**

Since its creation, the ALMADANIA Cooperative has spared no effort to open up to its environment. Activities were organized to that end:

- 01/03/2007: Organization by ALMADANIA of a training day for farmers, volunteers and civil society. Representatives from the *Inspection Régionale de l'Habitat, de l'Urbanisme et de l'Aménagement de l'Espace* (Regional inspection of habitat, urbanism and land-use planning), the Ministry of Agriculture, the Office of Cooperation Development participated. The theme was: "Local assets as the basis for local development."
- Organization of a morning for women led by women engineers from the ORMVAT in parallel with the training day.
- 26/03/2007: The Cooperative's office organized a welcome to honor a delegation from the *Faculté des Sciences et Techniques d'Errachidia* on the subject of Aromatic and Medicinal Plants (AMP).
- 19/04/2007: The President of the Cooperative, on a visit to the *Salon International d'Agriculture* in Meknès, became familiar with certain farming equipment and techniques.
- 10/06/2007: A delegation from UNESCO made a visit to the Cooperative to produce a documentary film on oasis problems and considered the Cooperative as a solution to the problem of miniature farm plots.
- 29/04/2007: The President of the ALMADANIA Cooperative made a visit to national cooperatives in Marrakech and Essaouira. A report was written on the techniques of Aromatic and Medicinal Plants culture.
- 14/05/2007: The Cooperative's office organized a workshop to study the oases in Tafilalet in favor of an official commission (DAT) to head the project for the preservation of the oases of southeastern Morocco.

- 31/3/2009: The NGO (ABRAJ ALWAHA for development, the environment and heritage) organized a day of study on TERRITORIAL HERITAGE AND DEVELOPMENT in cooperation with the regional inspection of habitat, urbanism and territorial development of Meknès-Tafilalet (NB: the office elements of this NGO are those of the cooperative).

- Welcome of the local, national, international NGOs as well as students, researchers and oasis residents

### **Conclusion**

The interest given by the Tafilalet Oasis Programme to the AL MADANIA Cooperative comes from the fact that this is an integrated development project. It is an initiative by the Cooperative members, who understood that the success of their endeavor begins with land consolidation and the role of women's participation in the effectiveness and sustainability of the Cooperative's activities.

For the Tafilalet Oasis Programme, this Cooperative has been taking actions at different levels to thwart the 5 crises identified by Morocco's Oasis land-use and development strategy, which had been affecting the Moroccan oasis environment. For the TOP, it represents a positive experience that would be advisable to extend to all the Tafilalet oases. It would also be recommended to encourage the territory's farmers and cooperatives to adopt for this type of development. In this way, they can participate in preserving and developing the oases.

## 4.0 PROJECT DESCRIPTION

### Project Goal

*Strengthen the Laachoria community's adaptive capacities, in the face of intensified droughts and increased climatic variability, in order to exploit these changes while enhancing the resiliency of the local ecosystem. This goal will be achieved through the implementation of an adaptation strategy based on the protection, the conservation and the resilient management of the local agro-biodiversity, focusing on a noble and resilient endemic species: the Medjool date palm. This strategy is completed by the restoration of degraded lands and improved use of water through regenerating and water-saving crops. Sustainability is ensured by a community capacity building programme, particularly for the village's women, and improved economic conditions.*

Outcome 1.0	Indicators	Sources of information and monitoring methods
<b>The oasis agro-system's resiliency is strengthened in a sustainable manner to face intensified droughts, through the protection and regeneration of the Medjool date palm, a local species that is resistant to drought, and through supplementary plants that help the soil be regenerated, and consume little water (adapted fodder and AMP)</b>	<i>Nb of significant species protected and rehabilitated</i> <i>Nb of ha of land managed sustainably</i> <i>Nb of innovations or new technologies applied and appropriated</i>	<i>Regular monitoring of activities</i> <i>Reports on the project's activities / Photos</i> <i>Final project evaluation</i>
<b>Output 1.1. A community nursery is created and connected to the drip irrigation network to enable to preserve the noble and endemic Medjool date palm variety, which is the traditional pillar of oasis adaptation.</b>		
<b>Activities towards Output 1.1</b>	<b>Means necessary</b>	
Construction of a nursery with an area of 300 m <sup>2</sup> (eucalyptus structure, plastic and net cover, protective fence)	Materials / Tools Labor	
Connection to the Cooperative's drip irrigation system	Materials / Tools Labor	
Planting of 500 Medjool date palm shoots	Purchase of shoots / transportation	
<b>Output 1.2. 5 ha of deteriorated lands are regenerated sustainably through cultivation of Aromatic and Medicinal Plants and resilient fodder varieties</b>		
<b>Activities towards Output 1.2</b>	<b>Means necessary</b>	



	Sowing and planting of resilient AMP over 3 ha (marjoram, safflower, caper bush)	Purchase and transportation of seeds / plants Tools / Labor Natural fertilization / irrigation
	Cultivation of 2 ha of bersim trefoil and sorghum	Seeds / transportation Natural fertilization / irrigation Labor / Maintenance

Outcome 2.0	Indicators	Sources of information and monitoring methods
<b>Community adaptation capacities are improved through a training and support programme based on resilient management of agro-biodiversity as an adaptation strategy</b>	<p><i>Nb of techniques implemented and appropriated by the community to preserve the agro-ecosystem</i></p> <p><i>Population covered by awareness raising programmes regarding climate change, broken up by gender, and by age (at least 30% of the population in these programmes is women; at least 30% are young people under the age of 20)</i></p> <p><i>Nb of persons participating in capacity building activities (broken up by gender and by age (at least 30% of the population in these programmes is women; at least 30% are young people under the age of 20)</i></p> <p><i>Nb of households benefiting from higher incomes thanks to the project</i></p>	<p><i>Follow-up / Monitoring of the activities</i></p> <p><i>Reports on the activities and on training: Lists of attendance. Nb of participants in meetings, trainings, activities (numbers broken up according to gender and age)</i></p> <p><i>Photos / Testimony by community members</i></p> <p><i>Final participative evaluation / Workshops and individual discussions</i></p>
<b>Output 2.1: A capacity building programme is implemented on the lasting and protective use of the Medjool date palm, AMP and adapted fodder</b>		
<b>Activities towards Output 2.1</b>	<b>Means necessary</b>	
Awareness raising workshops on climate change (1 day – ½ day for men and ½ day for women)	Facilitator / meeting room Teaching materials	
Training for management of the nursery and on the use of date palm shoots (2 sessions of 2 days = 4 days of training / men) <ul style="list-style-type: none"> <li>- Planting, maintenance and conservation techniques for the shoots</li> <li>- Sustainable management of the nursery</li> </ul>	Trainer / Leader Training materials	
Exchange visit at a nursery in Errachidia / Ass. Tangarfa (1 day – 20 people)	Transportation of participants / meals	
Participation by members of the community in a CBA training	Transportation of participants Accommodations and meals	
<b>Output 2.2: Women are trained and empowered to conduct and manage breeding, AMP and resilient fodder</b>		
<b>Activities towards Output 2.2</b>	<b>Means necessary</b>	

	<p>Practical training on breeding and sustainable breeding management for 10 women (4 days)</p> <ul style="list-style-type: none"> <li>- Animal health and reproduction</li> <li>- Daily maintenance of D'man sheep</li> <li>- Nutritional content adapted to the needs and respecting environmental contributions (in order to favor oasis shoots and use resilient fodder)</li> </ul>	<p>Trainer / Female facilitator          Specific data on the needs of sheep          Training room / Material / Equipment</p>
	<p>Travel for study for 10 women – 1 day</p>	<p>Prospection of an interesting site nearby          Transportation / Lunch break          Facilitator / Coordinator</p>
	<p>Training on the cultivation of resilient fodder (2 days)</p>	<p>Trainer / Training material</p>
	<p>Training on the maintenance and optimal use of AMP to restore the soils (4 days)</p>	<p>Trainer / Training material</p>

Outcome 3.0	Indicators	Sources of information and monitoring methods
<p><b>The lessons learned from the project are capitalized, promoted and disseminated in order to be incorporated into the local and regional policies, and reproduced on a larger scale.</b></p>	<p><i>Nb of young people and women involved in the project</i></p> <p><i>Nb of stakeholders (NGOs, local authorities, etc.) committed to the project and benefiting from training on managing the risks of CC and on planning</i></p> <p><i>Nb of communication products developed</i></p> <p><i>Nb of lessons capitalized and disseminated</i></p> <p><i>Nb of policies influenced</i></p>	<p><i>Reports on activities and meetings</i></p> <p><i>Personal accounts (interviews)</i></p> <p><i>Participative workshop / reports</i></p> <p><i>Discussions held during the workshops to promote the project</i></p> <p><i>Evaluation forms completed by workshop participants</i></p> <p><i>Communications products published</i></p> <p><i>Evaluation</i></p> <p><i>Community Development Plan Documents</i></p>
<p><b>Output 3.1. The project's results are monitored and documented throughout implementation, with the involvement of local partners</b></p>		
<p><b>Activities towards Output 3.1</b></p>	<p><b>Means necessary</b></p>	
<p>Monitoring of the activities by a community committee / Documentation of the CBA project</p>	<p>Meeting room / Computer / Camera</p>	
<p>4 Steering Committee meetings involving the partners</p>	<p>Meeting room</p>	
<p>Update of the Cooperative website / Training</p>	<p>Web trainer</p> <p>Documentation of the project as it is being implemented (photos, videos, photostories, interviews, etc.)</p>	
<p><b>Output 3.2 The project's results are evaluated and capitalized throughout the project and disseminated to local and regional actors</b></p>		
<p><b>Activities towards Output 3.2</b></p>	<p><b>Means necessary</b></p>	
<p>Final participative evaluation and capitalization report</p>	<p>Consultant / Meeting room / Transportation</p> <p>Mobilization / Material</p>	
<p>Organization of a regional workshop to promote the project's results</p>	<p>Meeting room / Transportation / Food / Material and supplies</p> <p>Computer and projector</p>	

## 4.2 Schedule

		2011						2012								
		Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
<b>Outcome 1: Ecosystem's resiliency is increased</b>																
Output 1.1	Medjool date palm nursery															
Output 1.2	AMP plants															
	Resilient fodder															
<b>Outcome 2: Improved Adaptation Capacities / Resilient management of the Agro-Ecosystem</b>																
Output 2.1	Climate Change Workshop															
	Nursery management training															
	Exchange visit to nursery															
Output 2.3	AMP training (women)															
	Training on resilient fodder (women)															
	Training on sustainable breeding (women)															
	Women's study trip															
<b>Outcome 3: Lessons learned are capitalized and promoted</b>																
Output 3.1	Monitoring of the activities															
	Steering committee meetings															
	Update of the Cooperative's website															
Output 3.2	Final participative evaluation															
	Final regional workshop on dissemination															

### 4.3 Risks and Obstacles

#### *Obstacles:*

There is a cultural barrier to **women's participation**. Yet, they play an essential role in natural resources management and are extremely vulnerable to the impacts of climate change. They actually participated actively in the project assembly workshops. The association will encourage their concrete participation in all of the project's phases, through the following activities: women's integration in the project's pilot groups (empowerment and decision-making); women will have access to each training session and meeting, through sessions reserved for women, in appropriate locations and with female contributors. They will participate in all the activities and their participation will be valued.

**Women's access to the status of Cooperative member will be increased** (reduced access rights, significant increase of women's incomes enabling them to invest in parts of the Cooperative), which will increase their concrete and decision-making role in the community.

#### *Risks:*

One of the risks affecting the project is in regard to the possible lack of availability of medjool plants in the region, or their poor quality.

Delays in delivering date palm plants, provided within a government programme, may also have an impact on the project.

Finally, the project is subject to climate uncertainties that could have an impact on the implementation schedule.

The Madania Cooperative is enjoying strong support from the TOP/DAT, which is an undeniable asset for the project's success and promotion of the "Community Adaptation" approach. The Cooperative must remain vigilant in order not to become overrun by the numerous projects it has undertaken, and always remain inclusive and attentive to the community's most vulnerable members.

### 4.4 Monitoring and Evaluation Plan

#### 4.4.1 Initial VRA Analysis (Vulnerability Reduction Assessment)

Two workshops were organized on November 20, 2010 to assess community vulnerability. The first workshop (for men) attracted approximately 40 participants (including 6 young women who did not speak) and a few children. The second workshop gathered approximately 20 women and numerous children.

	Men	Women
Q1	2	1
Q2	1	1
Q3	2	1
Q4	4	2
<i>Total</i>	9	5
<i>Average / 5</i>	2.25	1.25
<b>Average / 10</b>	<b>4.5</b>	<b>2.5</b>
<b>Overall average</b>	<b>3.5 / 10</b>	

Local vulnerability is moderate to strong. Factors mitigating vulnerability are the community's positive and pioneering spirit, the experience of tough conditions, and a strong attachment to the village and local heritage, including for people who have emigrated. In spite of this, female vulnerability is more significant than that of men, due to a feeling of isolation and lack of knowledge and access to alternatives.

The workshops' detailed results are presented below.

VRA Form // MEN					
Indicator	Question	Score	Reasons for negative response	Reasons for positive response	How can this score be improved (solutions)
1. Vulnerability of the means of subsistence toward climate change and/or variability	<b>What happens when there is a drought or strong rains? How does this affect your living conditions?</b>	4/10	<ul style="list-style-type: none"> <li>-Strong dependence on natural resources. Crops depend directly on the weather and climate.</li> <li>-Desertification: lands are increasingly difficult to cultivate</li> <li>-Destruction of crops and the herds: one man lost 300 sheep in one day after a brutal variation of temperatures</li> <li>-Decreased local farm production</li> <li>-People have to buy their food, but it is very expensive and they cannot afford it</li> <li>-Reduced incomes</li> <li>-Perturbed local projects: farmers invest a lot and sometimes, a few weeks before the harvest, they lose everything</li> <li>-Discouragement, psychological impact. People lose their courage and their money</li> <li>-Reduced farmer motivation: people no longer want to invest in farming. They are giving up and leaving the region</li> <li>-Exodus + Poverty</li> <li>-Negative atmosphere in the village</li> <li>-Because of poverty, children are removed from school</li> <li>-Life in the village is threatened because it depends on the climate</li> </ul>	<ul style="list-style-type: none"> <li>-In the last few years, with the Cooperative, there has been a return to the land; migrants have returned to the village</li> <li>-There is great local solidarity, and particularly young people are being mobilized</li> <li>-Drought is a tool that brings people together. Without drought, the Cooperative would not have been established. The drought problem has allowed the people to come together and revive local solidarity traditions</li> <li>-This is an opportunity to think about adaptation and prepare for the future</li> </ul>	<ul style="list-style-type: none"> <li>-Diversification of the activities</li> <li>-Develop farming with new technologies such as drip irrigation, in order to use water efficiently and achieve higher incomes</li> <li>-Improve local species that can adapt to drought and heat</li> <li>-Strengthen the ties between land / dates / men</li> <li>-Develop values of cooperation so that young people do not fear climate change</li> </ul>
2. Vulnerability of the means of subsistence to the growing / future risks of climate change	<b>What would happen if droughts and strong rains were twice as frequent? How would you be affected?</b>	2/10	<ul style="list-style-type: none"> <li>-Cultivation could no longer be performed at all</li> <li>-Emigration would increase</li> <li>-A few people will remain to manage the land, but others will leave</li> </ul>	<ul style="list-style-type: none"> <li>-We have already been through the worst, but we have worked nonetheless. We have been capable of adapting to very difficult situations</li> <li>-Our fathers and grandfathers have lived through very tough moments. We hope that we will not have to experience this in the future, but we must have a positive</li> </ul>	<ul style="list-style-type: none"> <li>-Conserve resources as much as possible</li> <li>-Improve our farming techniques</li> <li>-Work on limited surfaces to preserve the earth</li> <li>-Give priority to local resistant species: the d'man sheep and Medjool date palm, and remove unsuitable crops, such as carrots and alfalfa</li> <li>-Support the territory to</li> </ul>

				<p>attitude.</p> <ul style="list-style-type: none"> <li>-We are trying to prepare and preserve our heritage</li> <li>-The Cooperative was actually created at the time of a very severe drought: the problem motivated solidarity</li> <li>-I love my land. It is my heritage. I will do what it takes to stay</li> <li>-We will try to use each drop of water</li> <li>-There is cooperation</li> </ul>	<p>motivate people to return to the land</p> <ul style="list-style-type: none"> <li>-Train / raise awareness</li> <li>-Use the resources and climate change to our advantage (sun and wind)</li> </ul>
<p>3. Magnitude of the barriers (institutional, political, technological, financial, etc.) to adaptation</p>	<p><b>With these changes, what is preventing you from bringing your ideas to life? What are the obstacles and what assets do you have in order to adapt??</b></p>	<p>4/10</p>	<ul style="list-style-type: none"> <li>-Poverty and the lack of financial means</li> <li>-Distance from the administrative institutions</li> <li>-Lack of technical training</li> <li>-Competition on the market, preventing farmers from being able to sell their products at a good price, especially organic products</li> </ul> <p><i>What makes community participation difficult?</i></p> <ul style="list-style-type: none"> <li>-Poverty</li> <li>-Administrative obstacles. Today, we require authorizations to bring people together, therefore it is difficult to use Sayem to bring people to work in the village</li> <li>-The power of Iqabila (= tribe) is reduced today. State authorities have replaced traditional authority.</li> <li>-People have become increasingly individualistic</li> </ul>		<ul style="list-style-type: none"> <li>-Perform small projects to set an example and encourage the people</li> <li>-Support and train community members</li> <li>-Develop partnerships</li> </ul>
<p>Advantages/assets enjoyed by the community (volunteers, skills, commitment, local knowledge, community leadership, etc.)</p>			<ul style="list-style-type: none"> <li>-Solidarity and traditional cooperation are the pillars of the Cooperative, similar to the pillars of a tent</li> <li>-Good organization of the Cooperative and collective work experience</li> <li>-Make the most of sentimental and family solidarity for the projects</li> <li>-Lands were gathered thanks to family ties. This experience has encouraged the people</li> <li>- Sayem: when something affects the village, each man capable of fasting and</li> </ul>		



				<p>therefore working is called upon. It is mandatory and voluntary. Even the rich must work. This concerns mainly the infrastructures.</p> <p>-There is also the Adoual, which is in regard to the fields. It is a form of cooperation between farmers. Each works in the other's fields.</p> <p>-Solidarity during events such as death, marriage or illness.</p> <p>Many religious practices encourage cooperation: donations to others, sharing food, help to the poor (aachor)</p> <p>-It used to be Iqabila (the tribe) that organized local solidarity and the management of problems and infrastructures. Lqabila organizes Sayem.</p>	
4. Capacity and will of the community to continue to manage the risks of climate change	<b>Do you think that with this project you will be able to adapt better in the future? Are you going to continue the activities begun within the framework of this project? How are you going to participate in the project?</b>	4/10	-We have a money problem	<p>-The Cooperative is an example: more and more people want to participate.</p> <p>-In the beginning, I didn't believe in it very much, but now I see the good that the Cooperative has been doing and I want to participate..</p> <p>-We gathered our lands for 99 years, therefore we want the project to last.</p> <p>-Some members of the cooperative are managers, as well as young people.</p> <p>-We have the land, we have the labor, we have the experience and knowledge, and we have the money sent by the migrants.</p>	<p>-Enlarge the Cooperative</p> <p>-Enlarge the plots</p>
<b>VRA Score</b>		4.5/10			
<b>VRA Form // WOMEN</b>					

<i>Indicator</i>	<i>Question</i>	<i>Score</i>	<i>Reasons for negative response</i>	<i>Reasons for positive response</i>	<i>How can this score be improved (solutions)</i>
1. Vulnerability of the means of subsistence toward climate change and/or variability	<b>What happens when there is a drought or strong rains? How does this affect your living conditions?</b>	2/10	-We dig to find water, but we find nothing -People have been leaving to find work elsewhere -We have nothing to eat: "If your husband is not working, you don't eat." -Us women do nothing. We stay home	//	-Women require work, activities and projects -We want to create a cooperative -We require sheep in order to receive an income
2. Vulnerability of the means of subsistence to the growing / future risks of climate change	<b>What would happen if droughts and strong rains were twice as frequent? How would you be affected</b>	2/10	-There would no longer be any dates -We would be even poorer, but what can we do? -We are going to stay home, there is nothing to do	-We are used to it, and with the Cooperative's help, we are going to find solutions -There is cooperation -Owe are going to pray	-Dig wells -Collect water during floods -Plant trees that do not require too much water -We need water at least to drink and do the laundry
3. Magnitude of the barriers (institutional, political, technological, financial, etc.) to adaptation	<b>What is preventing you from being able to face drought? What are the obstacles and what assets do you have in order to adapt?</b>	2/10	-We need help to become organized -Lack of training -We are isolated, we do not do much together -There is less and less solidarity, everyone works alone -There is no volunteerism. When we do something, we receive something in return		
Advantages/assets enjoyed by the community (volunteers, skills, commitment, local knowledge, community leadership, etc.)				-We meet to talk, laugh and cook together -There is solidarity: we give money and food to the poor, we help when there is a wedding, birth or funeral, or when a woman loses her husband.	//
4. Capacity and will of the community to continue to manage the risks of climate change	<b>Do you think that with this project you will be able to face droughts better? Will you be involved in the project?</b>	4/10	//	-We are motivated to work together, even if it is new to us -We mostly want to take care of sheep	//
<b>VRA Score</b>		5/10			

## 4.4.2 Monitoring and Evaluation Plan for the Project

### 1. Monitoring of the Project

#### **Progress reports to be presented every four months:**

Production of a progress report regularly by the NGO: this report will present the project's achievements. It will be produced by the NGO every four months. It will include a narrative report and financial report.

#### **Monitoring of the community contribution:**

For each of the project's activities, a table will indicate the names of the community participants, volunteers, their contribution and the number of days they have contributed.

#### **Visits of the site:**

The CBA will organize at least two visits to monitor and evaluate the project. These visits will coincide with VRA workshops.

### 2. Project Evaluation

#### **Internal Evaluation:**

The association will conduct regular participative evaluations of the project (every 6 months). These evaluations will be conducted by the NGO and will involve the communities and local stakeholders involved. They will consist in the following:

- Assess the degree of achievement of the project's activities (tool to be used: schedule of the project's activities)
- Assess how results and impact indicators have been reached (tool to be used: project's logical framework)
- Identify limitations and define measures to be undertaken to overcome them
- Gather the advice and recommendations of the local community/actors in order to readjust the project

These evaluations will be conducted through enlarged meetings with the community and visits in the field. At the end of these evaluations, the NGO will produce a brief illustrated report.

#### **Final External Evaluation:**

This evaluation will be conducted in a participative manner by a consultant whom the NGO will hire (based on an invitation to bid).

It will rely on community evaluation reports and its goal will be to evaluate the following :

- The project's achievements
- The measurement of indicators
- The degree to which the project's goals have been achieved
- The project's impact on the community (socioeconomic and environmental) based on the indicators defined below
- The project's sustainability
- The crucial evaluation of community adaptation solutions and possibilities of replication / dissemination of the experience

The external evaluation will enable to draw the following:

- The project's strengths and weaknesses
- Lessons learned and recommendations

## List of Indicators to Monitor & Evaluate

The project coordination team will be monitoring the project's activities **continuously**, according to indicators included in the logical framework.

The following groups of indicators will be monitored : Vulnerability Reduction Assessment, the Impacts Evaluation System (IES) and adaptation indicators.

### Measurement of the Vulnerability Reduction Assessment (VRA)

	Approximate planning of VRA sessions	Who organized / will organize the VRA meeting	Who will be responsible for collecting VRA data
Initial	November 20, 2010	Madania Cooperative / CBA Team	CBA Team
Second / mid-course	December 2011	Madania Cooperative / CBA Team	Cooperative (support from the CBA)
Final	November 2011	Madania Cooperative / CBA Team	Cooperative (support from the CBA) + final evaluation consultant

### Measurement of Impact Indicators (IES)

#### (General Environmental Benefits + Living Conditions and Capacity Building)

IES Indicator to be measured	How will it be measured	When will it be measured	Target value to be achieved at the end of the project	Who will measure the indicators
Nb of significant species protected and re-developed	Continuous Monitoring & evaluation  Activity reports / photos	Activity reports every 4 months  + Final evaluation	At least 1 traditional endemic species is regenerated, and at least 2 resilient species are promoted (fodder and AMP)	Cooperative, with support from TOP  + Consultant (final evaluation)
Nb of ha of land managed sustainably	Measure the nb of ha of lands restored  Activity reports from the project / Photos  Final evaluation of the project	Activity reports every 4 months  + Final evaluation	At least 5 ha of deteriorated lands are restored sustainably	Cooperative, with support from TOP  + Consultant (final evaluation)
Innovations implemented successfully to protect the soil and preserve biodiversity	Continuous Monitoring & evaluation of the project  Activity reports / photos  Final evaluation	Activity reports every 4 months  + Final evaluation	3 innovations are implemented and appropriated by the community:  -Nursery and increased use of shoots	Cooperative, with support from TOP  + Consultant (final evaluation)

	Testimony / Website		-Resilient fodder -Regeneration by AMP	
Nb of people who benefited from capacity building	Training reports; attendance lists Activity reports Testimony / interviews	Activity reports every 4 months + Final evaluation	At least 100 people At least 30% of participants are women; 30% are under the age of 20	Cooperative, with support from TOP + Consultant (final evaluation)
Number of young people and women having participated actively in the project (capacity building indicator)	Training reports, attendance lists Activity reports Testimony / discussions	Activity reports every 4 months + Final evaluation	At least 30% of participants are women; 30% are under the age of 20	Cooperative, with support from TOP + Consultant (final evaluation)
Reduced vulnerability of women through capacity building and increased incomes	Activity reports Testimony / discussions	Activity reports every 4 months + Final evaluation	At least 10 women's vulnerability has decreased	Cooperative, with support from TOP + Consultant (final evaluation)
Nb of communication products developed	Activity reports Final evaluation	Activity reports every 4 months + Final evaluation	At least 1 product	Cooperative, with support from TOP + Consultant (final evaluation)
Nb of lessons capitalized and disseminated	Activity reports Reports of Steering Committee meetings Communication products dissemination plan Final evaluation	Activity reports every 4 months + Final evaluation	At least 2 lessons	Cooperative, with support from TOP + Consultant (final evaluation)
Nb of policies influenced	Activity reports Reports of Steering Committee meetings Final evaluation Individual discussions with partners Final workshop report	Activity reports every 4 months + Final evaluation	At least 1 policy influenced	Cooperative, with support from TOP + Consultant (final evaluation)

**Measurement of Adaptation Indicators**

<b>Adaptation Indicators</b>	<b>How will they be measured?</b>	<b>When will they be measured?</b>	<b>Target value at the end of the project</b>	<b>Who will measure?</b>
Project zone population covered by programmes to raise awareness on climate change	Activity reports / Participation in project activities = meetings, trainings, concrete activities (numbers detailed according to gender)	After each activity  Quarterly reports  + Final evaluation	At least 100 persons are convened	Cooperative, with support from TOP  + Consultant (final evaluation)
Success of the sustainable resources management interventions to improve living conditions	Final evaluation  Testimony	Continuous monitoring + Final evaluation	At least 50% of households that participated in the project have expressed that their living conditions have improved  At least 10 new households are motivated in participating in future activities, given the project's success.	Consultant (final evaluation)
Nb of actors (NGOs, groups, etc.) committed to the project and trained for management of climate risks and planning in this area	Participation in workshops / Reports  Individual discussions	Quarterly reports  + Final evaluation	At least 2 NGOs, 1 local government, 3 local and regional partners are committed	Cooperative, with POT support  + Consultant (final evaluation)

## 4.5 Project management

### 4.5.1 - Management Structures

Monitoring of the project will be conducted by a project monitoring Committee that will meet once a month to follow-up on the activities and plan the project's achievement. This committee is comprised namely of the Cooperative's board, which is responsible for the successful achievement of the project's activities, and inclusive mobilization of the community throughout the project (namely integration of young men and women in all steps of the project).

#### **Monitoring Committee**

The project's monitoring committee will be comprised of the Cooperative's board and community members who are participants in the project. This Committee will be created to ensure **gender representation** during the project's monitoring (**at least 2 women will participate in this committee and represent the women of the village; they will be integrated into the Cooperative board and participate in all of the Cooperative's decisions**)

This monitoring committee will organize a **meeting each month to monitor and plan the conduct of project activities**, diagnose possible problems and suggest readjustment.

The participants will produce and sign reports of these meetings and attach them to the Activity reports.

This committee will be comprised of 6 to 8 members who will share the following roles (at least two women will take responsibility within the committee):

- Coordination of the project
- Financial management and financial reports
- "Gender " focal point
- "Young people " focal point
- Responsibility for writing Activity reports
- One leader for each activity

#### **Steering Committee Associating the Project Partners:**

- **1 Meeting every 6 months to define the plan of action** for the project during the semester, based on the project's overall calendar, and **to evaluate the achievements**.
- Participating in this committee: The Cooperative, TOP Programme, RC of Fezna, CBA programme, and associated external services.

A total of 4 steering committee meetings will be organized throughout the project. Participants will produce and sign reports of these meetings and attach them to the Activity reports.

### 4.5.2 - Relationship Between the Project Leader and Its Partners

Each quarter, the project leader is responsible for mobilizing partners for the project's **Steering Committee** meeting (see above).

The **TOP Programme** local team will provide regular support in the field to guarantee a successful achievement of the project's activities and support the Cooperative during monitoring and management of the project.

The **CBA Programme** team will provide support for implementation, monitoring, reporting, capitalization and lesson-sharing, as well as inclusive mobilization of the communities. The team will help to prepare the Terms of Reference for Consultations, Trainings and Workshops. At least two missions will be conducted in the field within the framework of the project, and a national CBA workshop will be organized in Rabat.

## 5.0 PROJECT COST AND FINANCING PLAN

Total Project Cost and Financing Plan (in MAD)								
		Budget Line	Nb of units	Unit Cost (MAD)	Total (MAD)	Amount solicited from the CBA		Tafilalet Oasis Project Contribution
						In cash	In kind	In cash
<b>Outcome 1</b>	<b>The oasis agro-system's resiliency is strengthened in a sustainable manner to face intensified droughts, through the protection and regeneration of the Medjool date palm, a local species that is resistant to drought, and through supplementary plants that help the soil be regenerated, and consume little water (adapted fodder and AMP)</b>							
<b>Output 1.1</b>	<b>A community nursery is created and connected to the drip irrigation network to enable to preserve the noble and endemic Medjool date palm variety, which is the traditional pillar of oasis adaptation.</b>							
	Construction of a nursery measuring 300 m <sup>2</sup>	Materials / Equipment	1,00	60 000,00	60 000,00	60 000,00		
	Connection to the Cooperative's drip irrigation system	Materials / pipes and connections	1,00	5 000,00	5 000,00		5 000,00	
	Planting of 1000 Medjool date palm shoots	Recovery of 1000 shoots in the village	1 000,00	100,00	100 000,00	100 000,00		
	Labor / Achievement and monitoring	Community labor (12 people)	144 days	150,00	21 600,00		21 600,00	
<b>Output 1.2</b>	<b>5 ha of deteriorated lands are regenerated sustainably through cultivation of Aromatic and Medicinal Plants and resilient fodder varieties</b>							
	Cultivation of Aromatic and Medicinal Plants	2000 plants of MARJORAM	2 000,00	10,00	20 000,00	20 000,00		
		70 kg of SAFFLOWER	70,00	60,00	4 200,00	4 200,00		
		2000 plants of caper bush	2 000,00	10,00	20 000,00	20 000,00		
	Cultivation of 2 ha of resilient fodder	100 kg of bersim trefoil seeds	100,00	50,00	5 000,00	5 000,00		
		100 kg of fodder sorghum seeds	100,00	50,00	5 000,00	5 000,00		
	Labor / Achievement & monitoring	Labor (10 people)	100 days	70,00	70 000,00		70 000,00	



<b>Outcome 2</b>	<b>Community adaptation capacities are increased thanks to a training and support programme on the resilient management of agrobiodiversity as an adaptation strategy</b>								
<b>Output 2.1</b>	<b>A capacity building programme is implemented on the lasting and protective use of the Medjool date palm, AMP and adapted fodder</b>								
	Awareness raising to climate change (1 day)	Trainer / consultant	1 day	3 000,00	<b>3 000,00</b>		<b>3 000,00</b>		
	Practical training on managing the nursery and using the date palm shoots (4 days)	Trainer / consultant	4 days	3 000,00	<b>12 000,00</b>		<b>12 000,00</b>		
	Visit to a nursery in Errachidia	Transportation and accommodations for community representatives (20 people)	1 day	100,00	<b>2 000,00</b>		<b>2 000,00</b>		
	Participation in CBA trainings	Transportation and accommodations for community representatives (3 people * 5 days)	5 days	400,00	<b>6 000,00</b>		<b>6 000,00</b>		
<b>Output 2.2</b>	<b>Women are trained and empowered to conduct and manage breeding, AMP and resilient fodder</b>								
	Training on the maintenance and optimal use of AMP to regenerate the soils (4 days)	Trainer	4 days	3 000,00	<b>12 000,00</b>		<b>12 000,00</b>		
	Training on the cultivation of resilient fodder (2 days)	Trainer	2 days	3 000,00	<b>6 000,00</b>		<b>6 000,00</b>		
	Practical training on the conduct and sustainable management of breeding (4 days)	Trainer	4 days	3 000,00	<b>12 000,00</b>		<b>12 000,00</b>		
	Exchange Visit (1 day)	Transportation and accommodations for the participants (10 women)	1 day	100,00	<b>1 000,00</b>		<b>1 000,00</b>		

<b>Outcome 3</b>	<b>The lessons learned from the project are capitalized, promoted and disseminated in order to be incorporated in the local and regional policies, and for larger scale replication.</b>								
<b>Output 3.1</b>	<b>The project's results are monitored and documented as the project is being implemented, with the involvement of local partners</b>								
	Monitoring / Documentation of the project	Camera + memory card	1,00	2 500,00	2 500,00	2 500,00			
	Update of the project's website	Web trainer	3 days	2 000,00	6 000,00	6 000,00			
		Availability of the meeting room & computer with Internet access	3 days	200,00	600,00		600,00		
<b>Output 3.2</b>	<b>The project's results are evaluated, capitalized and disseminated to local and regional actors</b>								
	Final participative evaluation	Consultant	6 days	3 000,00	18 000,00	18 000,00			
	Organization of 1 regional workshop	Availability of workshop room, with a computer and projector	1 day	1 500,00	1 500,00		1 500,00		
		Welcoming the participants (coffee and lunch breaks + files) (50 people)	50 people	100,00	5 000,00	5 000,00			
	<b>Parallel activities conducted by the Cooperative within the framework of the TOP</b>				1 709 338,00				1 709 338
<b>TOTAL BUDGET FOR THE ACTIVITES (MAD)</b>					<b>2 107 738,00</b>	<b>299 700,00</b>			
Provision for unforeseen events (1% of the CBA contribution ) - MAD						2 997,00			
Administrative expenses / management (including translation of reports, etc ). 7% of CBA contribution - MAD						20 979,00			
<b>TOTAL BUDGET AND CONTRIBUTIONS (MAD)</b>					<b>2 131 714,00</b>	<b>323 676,00</b>	98 700,00		1 709 338,00
<b>TOTAL BUDGET AND CONTRIBUTIONS (USD)</b>					<b>268 477,83</b>	<b>40 765,24</b>	12 430,73		215 281,86
<b>% of total budget</b>					<b>100,00</b>	<b>15,18</b>	<b>4,63</b>		<b>80,19</b>
<b>Exchange rate USD (June 2011)</b>					<b>7,94</b>				

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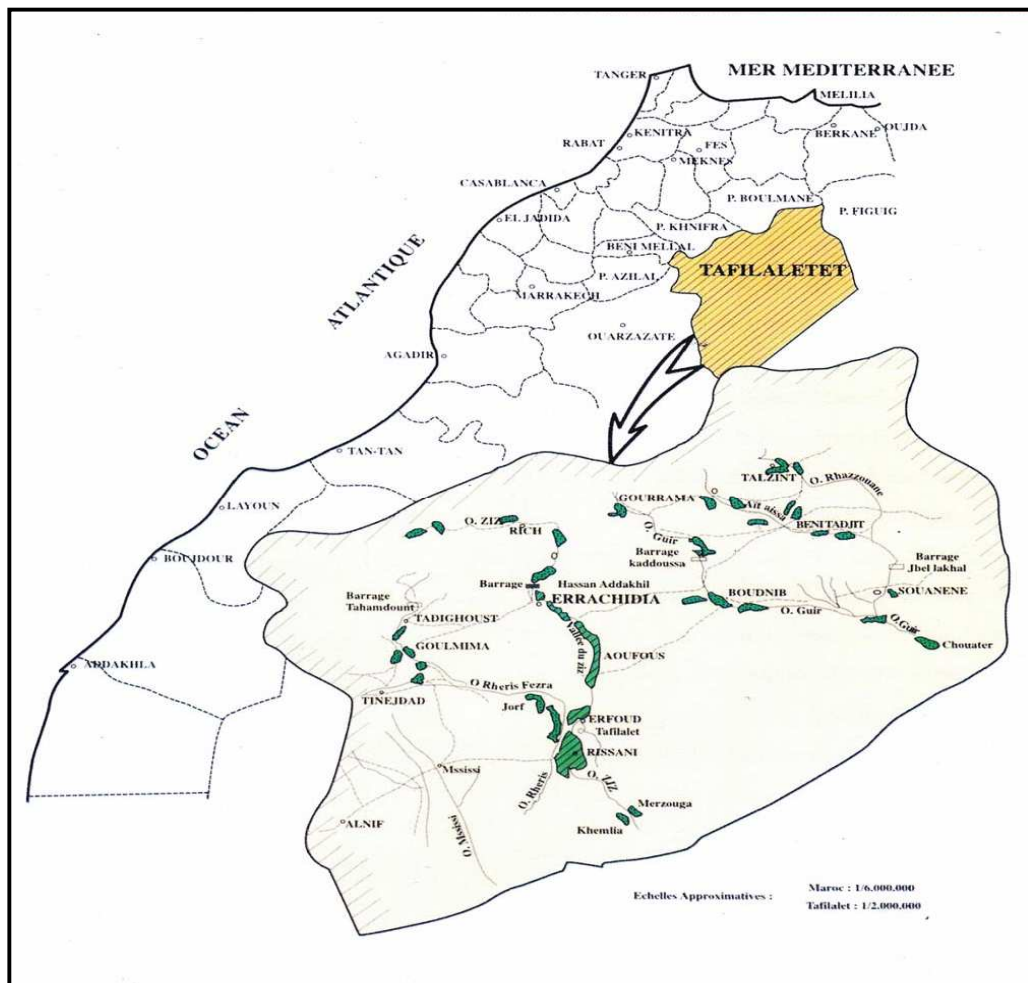
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# Project Zone Localization Map



## ROYAUME DU MAROC



### Opportunités d'investissement du POT dans le projet intégré de la coopérative AL MADANIA

Dans le cadre de son approche de développement territorial durable, le POT a initié et réalisé le projet de développement intégré de la coopérative AL MADANIA, qui est un projet phare dans la mesure où il donne l'exemple d'un modèle de développement agricole exemplaire. Dédié aux agriculteurs oasiens pour le considérer comme modèle, ce projet vise à créer une exploitation viable et pouvant servir de plateforme à un investissement rentable dans un milieu vulnérable.

En effet, à partir de terrains morcelés et éparpillés, ce projet à travers le remembrement réalisé a pu constituer une exploitation de 15 Hectares.

L'alternance de périodes difficiles de sécheresse successives (avec une fréquence forte d'une sécheresse toutes les deux années) a bouleversé le cycle de l'eau rendant l'agriculture comme une activité à haut risque en matière d'investissement. Aussi l'instauration d'un système d'irrigation économiseur d'eau s'avère manifeste d'où l'option choisie pour l'usage de la goutte à goutte.

De même, le choix d'une énergie moins coûteuse et non polluante suit la logique de l'approche du développement durable qui vise à agir sans compromettre l'avenir des générations futures. En effet, les énergies solaire et éolienne suivent cette logique, car disponible, gratuite et préservant l'environnement.

Aussi l'effort d'investissement du POT a été conséquent pour atteindre les objectifs assignés au projet et qui vise à vulgariser les différentes composantes du projet. Dans ce cadre les investissements détaillés du POT étaient comme suit:


- 1- Energie éolienne : 94 680 dhs
- 2- Energie solaire : 171 360 dhs
- 3- Bassin géo membrane et goutte à goutte : 350 000 dhs
- 4- Matériel de valorisation des dattes : 160 498 dhs
- 5- Business plan de la coopérative : 84 600 dhs



- 6- Semences des PAM : 10 000 dhs
- 7- Réhabilitation 250 ml khettara Omaria : 247 800 dhs
- 8- Réhabilitation du ksar Laachouria : 590 400 dhs

Soit un total de : 1 709 338

En plus de ces investissements, il faut noter que les membres de la coopérative ont bénéficié des diverses formations réalisées par le POT dans le cadre de renforcement des capacités de valorisation des produits de terroir (palmier, dattier, olivier, PAM, ... etc.) dans l'organisation des voyages d'échange et de participation aux foires locales, régionales et nationales (Taroudannt, Azrou, Meknès, ... etc.)

  
Le Coordonnateur National  
du Programme Oasis Tafilalet  
Signé : Mohamed BADDOU