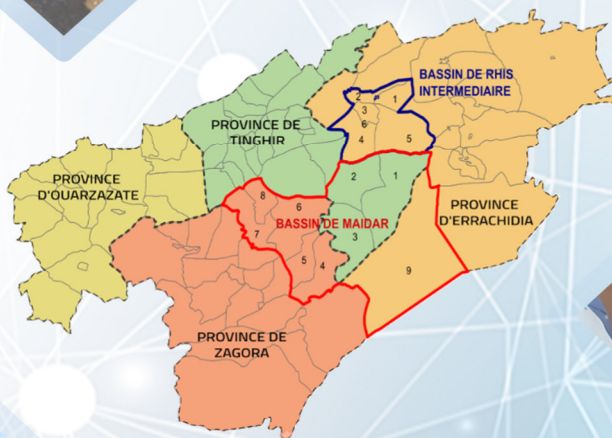




CLIMATE CHANGE ADAPTATION PROJECT IN OASIAN ZONES (PACCZO)

«Technical assistance relating to the final evaluation of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO) financed by the Adaptation Fund»



Summary

1	Project Overview	6
2	Abstract	8
3	Preamble	11
4	Setting and context	12
4.1	General context	12
4.2	National and international context at the time of the final evaluation of the PACCZO	14
4.2.1	Intensification of inflationary pressures of internal and external origin in Morocco ...	14
4.2.2	An unprecedented drought, the worst in 40 years,	16
4.2.3	The second year of the implementation of the new agricultural development strategy (GG 2020-20230)	16
4.2.4	The second year of implementation of the National Drinking Water Supply and Irrigation Program 2020-2027	17
4.2.5	Water context in the intermediate Gheris and Maïder basins, major issues	18
4.3	Mapping of water resources in the Ghéris and Maïder basins	19
5	Presentation of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO)	22
5.1	Consistency and cost of the project	22
5.2	PACCZO intervention logic	24
6	Final evaluation methodology	25
7	Revision of the logical framework	30
8	Evaluation of the PACCZO	33
8.1	Physical and financial achievements of the program as of December 31, 2022	33
8.2	Relevance	37
8.2.1	National and regional context	37
8.2.2	PACCZO internal logic	41
8.2.3	Relevance of the project	41
8.3	Efficiency and performance	45
8.3.1	Efficiency	45
8.3.2	Performance	52
8.4	Efficiency	54
8.5	Effects and impacts	70
8.5.1	Impacts of interventions related to water resources management	70
8.5.2	Impacts of interventions related to improving the living conditions of populations vulnerable to climate change	78

8.5.3	Environmental and social impacts related to project activities and proposed support measures ⁸³	
8.5.4	Grievance management system.....	85
8.5.5	Environmental and social surveillance and monitoring measures.....	87
8.6	Durability.....	91
8.6.1	Institutional sustainability.....	91
8.6.2	Environmental sustainability.....	93
8.6.3	Socio-economic sustainability.....	94
9	Assessment of the project’s contribution to the objectives of the Adaptation Fund.....	95
10	Evaluation of the operationalization of the monitoring-evaluation system (M&E) and knowledge management: design, implementation and use.....	95
11	Exit and sustainability strategy.....	99
11.1	Principles and factors of sustainability.....	99
11.2	Modalities of transition.....	100
12	Rationale for overall result rating.....	101
12.1	Project Performance Rating: rating: moderately satisfactory.....	101
12.2	Overall appreciation rating.....	102
12.3	Partner Performance Rating.....	103
12.4	Overall rating.....	104
13	Lessons learned.....	105
14	Main conclusions of the evaluation.....	108
15	Recommendations.....	113
16	Appendices.....	115
15.1	Annex 1 : Minutes.....	115
15.2	Annex 2: Initial logical framework.....	120
15.3	Annex 3: Project Results Chain.....	124
15.4	Annex 4 : Presentation of project components.....	127
15.6	Annex 5 : Detailed planning of the PACCZO project.....	130
15.8	Annex 6 : Indicator calculation tables by component.....	132

List of tables

Table 1. Project intervention logic	24
Table 2: Schedule of interviews with key actors	27
Table 3. Revised indicators and proposed reformulation as part of the mid-term evaluation	31
Table 4. Risk assessment matrix.....	49
Table 5. Performance measurement framework.....	66
Table 6. Improved rate of access to portable water	73
Table 7. Additional irrigated area.....	74
Table 8. Evolution of irrigation water productivity.....	76
Table 9. Evolution of crop intensification.....	78
Table 10. Estimation of the added value of production.....	80
Table 11. Proposed Common Environmental Monitoring Measures.....	88
Table 12: Sustainability and sustainability factors	99

List of figures

Figure 1. Project’s action area	13
Figure 2 : Brent oil price - October 2022	15
Figure 3. Consumer price index - Source: HCP	16
<i>Figure 4. Map of the distribution of water resources in the PACCZO area, Intermediate Gheris Basin</i>	20
Figure 5. Map of the distribution of water resources in the PACCZO area , Maïder basin.....	21
Figure 6. PACCZO final evaluation process.....	26
Figure 7. Evolution of the groundwater level.....	71
Figure 8. Irrigation water productivity (DH/m3)	76
Figure 9. Valuation of irrigation water (DH/m3)	77
Figure 10. Evolution of the area of crops with high added value	77
Figure 11. Evolution of crop intensification	78
Figure 12. Added value of plant production in DH/ha	81
Figure 13. Proposed grievance handling procedure	86

List of boxes

Box 1. Support for the implementation of Cumin certification – 2017-2019	55
Box 1. Support for the implementation of Cumin certification – 2017-2019	55

Box 4. Raising awareness and strengthening the capacities of actors in the design and implementation adaptation measures.....	61
Box 5. Territorial & Landscape Valorization of Moroccan oases and firefighting.....	63
Box 6. Valorization of date palm by-products and promotion of self-employment in the Jorf areas, Erfoud and Rissani	64
Box 7. Construction of an artificial aquifer recharge structure in oasis areas.....	72
Box 8. Equipment in solar plates of the Tazoulayte well	74
Encadré 9. Equipement d’un forage en énergie solaire.....	75
Encadré 10. Projet Innovant de laverie collective.....	79
Box 11. Equipment of production units for the benefit of rural women.....	82
Box 12. Synergy and complementarity model in the intervention of ANDZOA (PACCZO with another program): case of Oasis Nkob CT Nkob – Province of Zagora	91
Box 12. Synergy and complementarity model in the intervention of ANDZOA (PACCZO with another program): case of Oasis Nkob CT Nkob – Province of Zagora	91

Abbreviations and Acronyms

ABH	: Hydraulic Basin Agency
ABH-GZR	: Guire-Ziz-Rheris Hydraulic Basin Agency
ADA	: Agricultural Development Agency
ANDZOA	: National Agency for the Development of Oasis and Argan Zones
AO	: Tender
AT	: Technical assistance
CC	: Climatic changes
CMV	: Enhancement Center
COFIL	: Steering Committee
CPS	: Term of reference
CT	: Territorial collectivity
CERKAS	: Center for the Restoration and Rehabilitation of the Architectural Heritage of the Atlas and Sub-
CCA	: Agricultural Advisory Center
DDFP	: Production Lines Development Department
DIAEA	: Department of Irrigation and Agricultural Space Development
DPA	: Provincial Directorate of Agriculture
DRA	: Regional Directorate of Agriculture
DSS	: Statistics and Strategy Department
EE	: Implementing Entity (ANDZOA)
GIE	: Economic Interest Grouping
HA	: Hectare
IC	: Consulting engineer
MAPMDREF	: Ministry of Agriculture, Maritime Fisheries, Rural Development and Waters and Forests

ONEE	:	National Office for Water and Electricity
ONCA	:	National Agricultural Advisory Office
ONG	:	Non-Governmental Organization
ONSSA	:	National Food Safety Office
OP	:	Professional Organization
ORMVA	:	Regional Office for Agricultural Development
ORMVAO	:	Regional Office for Agricultural Development Ouarzazate
ORMVATF	:	Regional Office for Agricultural Development Tafilalet
PAM	:	Aromatic and Medicinal Plants
PGES	:	Environmental and Social Management Plan
PTBA	:	Annual Work Program and Budget
PAR	:	Regional Agricultural Plan
PMV	:	Morocco Green Plan
PACCZO	:	Project for Adaptation to Climate Change in Oasis Zones
UV	:	Valuation unit
UGP	:	Project Management Unit
SAU	:	Useful Agricultural Area
TDR	:	Terms of Reference

1 Project Overview

Country	Kingdom of Morocco
Name of the project	Project for Adaptation to Climate Change in Oasis Zones in Morocco (PACCZO)

Key dates

Approval by the Adaptation Fund	Signature	Coming into force	Mid-term assessment	Foreseen completion	Effective completion
14/05/2015	18/05/2015	June 2015	March 2019	June 2020	14 December 2023
First extension (24 months)	Second extension (18 months)	Interim assessment	Loan scheduled closing	Effective closing of the loan	
June 2022	December 2023		December 2020	31 December 2023	

Project funding

Donation from the Climate Change Adaptation Fund	In US\$	9 970 000	% disbursed	96%
	In Dhs	95 000 000,00	% disbursed	96%

Objective of the project

The overall objective is to improve the adaptation capacity of populations in oasis areas to the impacts of climate change.

Specific objectives

- Improve the adaptive capacities of the water sector,
- Diversify sources of income and improve the living conditions of populations vulnerable to climate change in the target areas,
- Improve the resilience of ecosystems in response to climate change and variability,
- Improve the awareness of all stakeholders through knowledge management and sharing,
- Build the capacities of participants in the design and implementation of adaptation measures.

Consistency and areas of the project	
<p>To do this, the project provides for the establishment of new sustainable developments of hydraulic structures and the support of local initiatives for the benefit of young people and women in the sectors of agriculture, tourism and crafts.</p> <p>The PACC-ZO will benefit a population estimated at 40,000 inhabitants, it will focus on two areas that are particularly vulnerable to climate change, presenting different problems that are representative of the area, particularly with regard to water. The rest of the oasis territory will be indirectly impacted by the dissemination of these adaptation models.</p>	
National partners	
Execution entity	ANDZOA
Implementing entity	ADA
Others partners	Ministry of Finance, Ministry of Agriculture and Maritime Fisheries, Ministry of Energy, Water and Environment, department in charge of the environment, Ministry of Tourism, ONCA, INRA, ABH Guir Ziz Rhéris , ORMVAO, ORMVATF, NGOs and Private.

2 Abstract

The Project for Adaptation to Climate Change in Oasis Zones (PACC-ZO) concerns the integration of the climate change component into the entire process of implementing any development intervention in oasis zones. This integration concerns all the components starting from the development actors, passing through the realization of the structuring actions concretizing the adaptation to the CC and arriving at the activities aiming at the promotion of the integration of the gender.

The project concerns the perimeters and the palm groves undergoing increasingly recurrent and severe droughts combined with an increasingly increasing demand for water, and which therefore suffer from the overexploitation of the water tables, in particular in the basins of Ghéris and Maider targeted by PACCZO interventions. This overexploitation results, among other things, in the drying up of springs and khetaras, the drop in groundwater levels and the degradation of ecosystems. It will thus benefit a population estimated at 40,000 inhabitants, present in two areas particularly vulnerable to climate change. While the rest of the oasis territory will be impacted indirectly by the dissemination of these adaptation models.

To achieve these objectives, the project provides for the establishment of new sustainable developments of hydraulic works and the support of local initiatives for the benefit of young people and women in the sectors of agriculture, tourism and crafts. These actions are grouped into five components: 1) Improving adaptive capacities for better management of water resources in oasis areas; 2) Diversification of sources of income and improvement of the living conditions of populations vulnerable to climate change in the target areas; 3) Improved resilience of ecosystems in response to climate change and variability; 4) Improved awareness of all stakeholders through knowledge management and sharing; 5) Capacity building of participants to design and implement adaptation measures.

To implement these components, the project was allocated a budget of **9.97 million dollars (equivalent to 95 million DH)** over a 5 years period allocated by the Adaptation Fund to ANDZOA (project implementation agency) via ADA, an agency accredited by the donor.

The adopted intervention approach based on 3 approaches, namely **the participatory approach**, **The approach** of shares choice on the basis of **complementarity and synergy** and **the territorial equity approach**, has made PACCZO a collective project characterized by the participation of the target population in determining its priority needs and a collective management of actions that converge towards the same objectives and common goals. So, **the project recorded a good level of relevance, carrying out actions that effectively meet the real and urgent needs of the target population**, also inducing **ownership of the project** not only by the institutional organizations citing the ABH-GZR, the ORMVATF, the ORMVAO, but also by the beneficiary populations which is a **solid durability factor** .

At the time of implementation only the products of component 3 that have been reviewed and validated in the PTBA4 based on the results of the mid-term evaluation of the project as well as the capitalization on the achievements of the first four PTBA and on the other hand on the new grievances and needs of the oasis territory observed during the implementation of the project and which have a relationship with climate change.

The main outputs obtained from the project are: i) construction of artificial groundwater recharge and protection structures, ii) construction and rehabilitation of khetaras and seguias, iii) development and certification of agricultural products, iv) development of non-economic agriculture, v) launch and support of small innovative projects, vi) development of measures to combat silting, vii) development of access and interpretation areas are rehabilitated for better accessibility and attractiveness of palm groves, viii) development of water points and equipment are acquired for better intervention against fires ix) training of the actors concerned on depollution techniques, x) establishment of a documentary fund, xi) development of a charter on water and CC , xii) organization of thematic conferences, awareness campaigns, xiii) capacity building of stakeholders through the organization of workshops and visits and study trips, etc. These products were obtained thanks to the combined efforts of the project, its partners, service providers and the active participation of the beneficiaries, which took several forms.

With regard to the methods of execution, it should be noted that **the participatory and inclusive approach adopted**, supported by the assistance of local service providers and deconcentrated and decentralized authorities, was relevant to ensure better ownership of the program by local actors. Despite the **difficulties and constraints encountered**, which affected certain components of the project, namely the delays in the disbursements of the Adaptation Funds, the human and material resource limits of the partners and the restrictions of the COVID 19 pandemic, it is considered **efficient**. The assessment of the level of adequacy between the targeted objectives and the human resources mobilized shows that the set-up of this project was designed in such a way as to ensure close supervision of the activities at all stages of intervention. As to **financial resources** committed to carrying out the actions, the logic of the project was respected, particularly with regard to its concentration around the mobilization of water resources in a context marked by CC (nearly 42% of credits) and also the importance given institutional strengthening (nearly 8%). The setting up of the PACCZO has made it possible to confirm the break with the verticality of the sectoral approach in terms of rural development to instil **a dynamic of consultation and transversal coordination between all the partners of the project**.

The impact of the actions carried out was felt on several levels. The recharge structures built have enabled **rise in groundwater level**, recording a minimum piezometric level of the water table of the order of **11 m/floor**, significantly higher than the target value anticipated by the project (17 m/soil). Consequently, the level of wells and khetaras has been positively impacted; an increase in the water level was felt by the beneficiaries a few days after the passage of the floods retained in the works carried out. **The efficiency of water distribution** was also **improved**, thanks to the hydro-agricultural developments carried out, recording a water productivity of around 4.7 dh/m³, an improvement of 20%.

Furthermore, the works built and the hydraulic structures rehabilitated have positively affected the supply of drinking water and have enabled farmers to expand the irrigated areas. Thus, and now, the project has enabled the **safe drinking water for 615 households** and an **overall increase in irrigated area of 585 ha**.

The project also worked to raise awareness among the population and stakeholders of the effects of climate change and to improve resilience. In this sense, the project has recorded **a surplus of 5,373 households**, relative to the target number, **who have benefited from resilience actions**. This which shows that a large part of the population of the study area is now aware and aware of the effects of climate change.

In addition, the project has induced **positive spinoffs** as well of course **environment and resilience** to climate change and at the socio-economic level in the two areas of intervention. Thus, the project interventions contributed to positive immediate results in terms of agricultural productivity despite the **unfavorable climatic context of recent years**, marked with a **recurring drought**, while the effects in terms of adaptation and resilience to climate change require more time to materialize. Indeed, and in terms of increasing farmers' incomes and developing resilient oasis agriculture, an added value of nearly **22,600 DH/ha** is currently registered, against **24,000 DH/ha recorded in 2019** during the mid-term evaluation, the PACCZO thus made it possible to generate respectively **an added value of plant production per additional hectare of 30% and 42%**. Other actions have also been carried out with the aim of supporting and promoting economic, agricultural and nonagricultural activities, particularly for young people and women. These activities have produced economic dynamism and have thus enabled substantial improvements in the living conditions of the population.

Overall, this is the initiation of a dynamic development of the project area, which will continue to grow and accelerate and gradually become generalized over time. This dynamic identified at the level of the associative and cooperative fabric, is the guarantor of the **reproducibility** and some **sustainability of actions** of the project, provided that it is supported in the immediate future and is the subject of particular concern on the part of the project. This dynamic is also reflected in the intervention of varied, diversified and increasingly intense actors in the project area. It is the result of intense efforts on the part of the project team, which innovated at the technical, institutional, and methodological levels, particularly in the context of capacity building and participation and especially in terms of **partnership**.

As such, if it constitutes a reference, about the context of its design, it has made it possible to draw some very useful lessons for future projects, in terms of management and administration, design of coherence and training.

3 Preamble

The Agency for Agricultural Development (ADA) entrusted NOVEC with the contract No. **11/2022/ADA/DGP/DCS/SS** object of the realization of "technical assistance relating to the final evaluation of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO) financed by the Adaptation Fund".

According to the Terms of Reference (ToR), services to be provided within the framework of this study are divided into 2 phases:

- ❖ **Phase 1:** Preparation of the methodological report (1 month);
- ❖ **Phase 2:** Implementation of the final evaluation (3 months).

This report concerns the implementation of the final evaluation of the PACCZO project. It is declined in 12 chapters:

- **Chapter 1:** summarizes the specific context at the time of the marked final evaluation, from a part, by the intensification of inflationary pressures of internal and external origin in Morocco, and on the other hand, by the drought aggravated by climate change;
- **Chapter 2:** presents the consistency and intervention logic of the PACCZO project;
- **Chapter 3:** defines and develops the methodological approach adopted for the final evaluation;
- **Chapter 4:** presents the revised version of the logical framework;
- **Chapter 5:** explicitly presents the evaluative analysis;
- **Chapter 6:** presents the assessment of the contribution of the project to the objectives of the adaptation Fund;
- **Chapter 7:** presents the evaluation of the operationalization of the monitoring-evaluation system (M&E) and knowledge management: design, implementation and use;
- **Chapter 8:** characterizes the strategy of disengagement and sustainability of the project;
- **Chapter 9:** justifies the rating of the overall result;
- **Chapters 10-11-12:** summarize the lessons, the main conclusions of the assessment and recommendations of the final evaluation.

4 Setting and context

4.1 General context

The Adaptation Fund through a donation of 9.97 million USD to implement the project for Adaptation to Climate Change in Oasis Zones (PACCZO) which will be executed by the National Agency for the Development of Oasis Zones and of the Argan Tree (ANDZOA) as an implementing entity and administered by the Agency for Agricultural Development as a national implementing entity accredited by this Fund.

The overall objective of the project is improving the adaptation capacity of populations in oasis areas to climate change impacts by focusing on:

- Improving adaptive capacities for better management of water resources in oasis areas;
- Diversification of sources of income and improving the living conditions of populations vulnerable to climate change in the target areas;
- Improving the resilience of ecosystems in response to climate change and climate variability;
- Raising the awareness of all stakeholders through knowledge management and sharing;
- Capacity building of actors involved in the design and implementation of adaptation measures.

The PACCZO will benefit a population estimated at 40,000 inhabitants, it will intervene over a period of 5 years in two zones particularly vulnerable to climate change presenting different problems and representative of the zone, in particular with regard to water, The rest of the territory oasis will be impacted indirectly by the dissemination of these adaptation models. These two areas are:

- Intermediate Gheris basin: area located in the intermediate part of a watershed where water resources can still be mobilized to safeguard palm groves with agricultural production potential.
- Maïder basin: area located downstream of a watershed where the availability of water resources must be preserved to ensure the supply of drinking water.

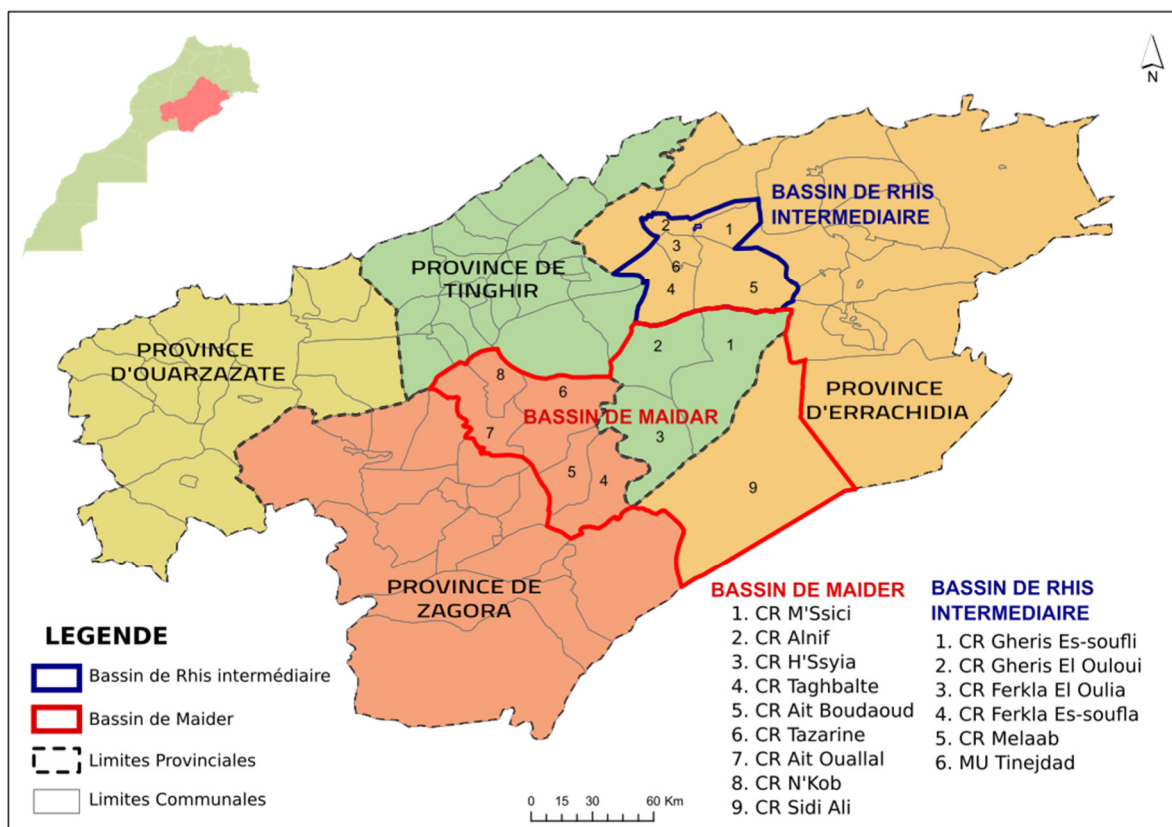


Figure 1. Project's action area

The institutional set-up of the PACCZO project created two entities: the Implementation entity and the execution entity.

- ✓ The agricultural development agency is the "National Implementing Entity" accredited to the Adaptation Fund and is the only interlocutor towards the Fund with the following responsibilities:
 - Transfer of grant funds to the EE for the implementation of project activities on the basis of an annual work plan and budget pre-established by the latter.
 - Ensures the application of the project management procedures manual;
 - Validation of the physical and financial execution reports drawn up by the EE;
 - Transmission of reports on the physical and financial progress of the project to the AF;
 - Validation of supporting documents for expenses relating to project activities and their transmission to the AF to establish calls for funds for the grant;
 - Carrying out supervision missions to inquire about the progress of the project and ensure the proper use of the grant.
- ✓ The national agency for the development of Oasis zones and the Arganier (ANDZOA) is the "Executing Entity" and is responsible for the execution and coordination of all PACCZO activities. Responsibilities include:
 - Ensures that the results obtained correspond to the project documents and related agreements.
 - Implementation of project activities either by itself or through partners through partnership agreements (ABH-GZR, ORMVA's, NGOs, etc.).

4.2 National and international context at the time of the final evaluation of the PACCZO

The preparation of the final evaluation of the PACCZO comes at a crucial moment which coincides with:

- Intensification of inflationary pressures of internal and external origin in Morocco;
- An unprecedented drought, the worst in 40 years,
- The second year of the implementation of the new agricultural development strategy (GG 2020-20230);
- The second year of implementation of the National Drinking Water Supply and Irrigation Program 2020-2027;
- Water context in the intermediate Gheris and Maïder basins, major issues .

4.2.1 Intensification of inflationary pressures of internal and external origin in Morocco

A. The soaring prices of inputs and raw materials at the global level

Since the second quarter of 2020, which coincided with the start of the easing of health restrictions, the prices of most of the major families of "commodities" also called basic products have entered an upward trend which has increased. strengthened during the 2021 financial year, then further accentuated during the first three quarters of 2022 when certain products experienced record price levels.

This rise in commodity prices is the result of a strong imbalance between supply and demand on the markets concerned (**worsening supply chain disruptions**), particularly under the effect of a rapid and simultaneous recovery in global demand, emanating from major importing countries, such as China, the United States and Europe. At the same time, the supply of these products has not been able to keep up with this demand due to the shortage of raw materials and dysfunctions within the value chains, accentuated by the disruptions in maritime transport.

Added to this is a financial factor linked to speculation since investment funds have increasingly positioned themselves on the stock market for raw materials. The abundance of liquidity and interest rates close to 0% probably accentuated this factor.

The other explanatory factor for the surge in commodity prices, particularly oil and wheat, is rather geopolitical in relation to the consequences of the Russia-Ukraine conflict since the beginning of 2022. As such, it should be remembered that Russia is the world's largest exporter of natural gas and the second largest exporter of crude oil. Russia and Ukraine together accounted for nearly 35% of world wheat exports in 2020.

The impressive bullish and bearish movements of crude prices are the typical example of this volatility as illustrated in the following figure:

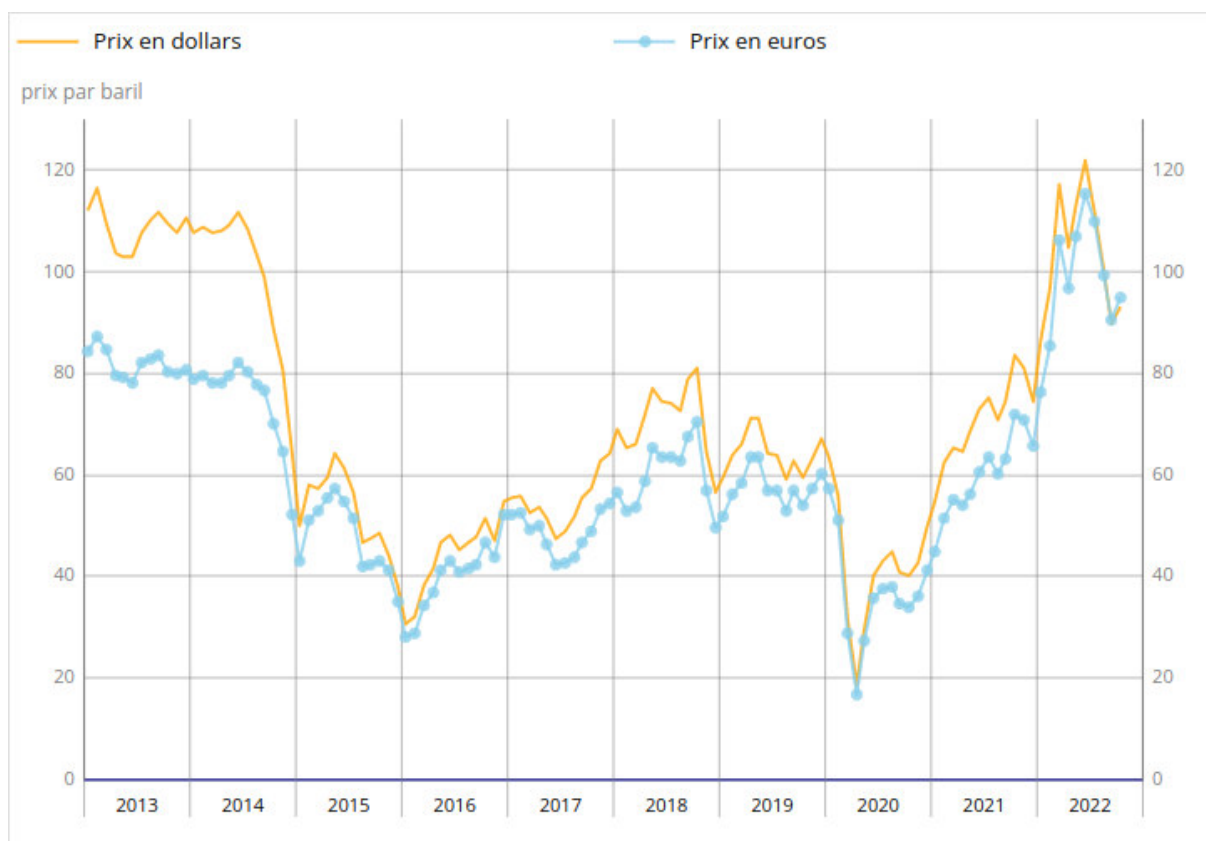


Figure 2 : Brent oil price - October 2022

It shows that the prices of energy materials (oil) increased by nearly 74% between January 2021 and January 2022. This upward trend will be accentuated during the months of March, June and July 2022.

B. Consequences of stagflation on the competitive functioning of national markets

At the national level, Morocco is no exception to the rule, given that its markets operate in a fully liberalized environment and insofar as a good part of the inputs and raw materials are imported, particularly energy and cereals. Indeed, Morocco imports nearly 90% of its energy needs and about half in cereals and consequently, it is quite logical that its markets are impacted by their exposure to the evolution of world prices.

Indeed and according to data from the High Commission for Planning (HCP), the average inflation rate for the first eleven months of 2022 rose sharply to stand at **+6.5% against +1.3% a year earlier, its highest level for 28 years**. This shift is more pronounced for food products whose Consumer Price Index (CPI) exploded from an average that rarely exceeded 1% to almost **+10.6%** and, to a lesser extent, the prices of **non-food products** of **+3.8%** after +1.7% a year earlier.

Groupes	Nov.20	Nov. 21	Nov. 22	Var moy. Jan- Nov.		
				2020/19	2021/20	2022/21
PRODUITS ALIMENTAIRES	102,1	105,1	120,1	1,2%	0,4%	10,6%
1 Produits alimentaires et boissons	101,3	104,2	119,7	1,2%	-0,2%	10,9%
2 Boissons alcoolisées, Tabac et Stupéfiants	122,6	125,5	129,8	0,7%	3,6%	3,4%
PRODUITS NON ALIMENTAIRES	103,1	105,6	110,4	0,4%	1,7%	3,8%
3 Articles d'habillement et chaussures	103,1	106,3	111,7	0,3%	1,9%	4,6%
4 Logement, eau, gaz, électricité et autres combustibles	102,0	102,9	104,1	0,6%	0,8%	1,2%
5 Meubles, articles de ménage et entretien courant du foyer	101,1	103,1	109,7	0,2%	1,0%	4,9%
6 Santé	101,7	101,8	101,9	0,9%	0,2%	0,1%
7 Transport	102,3	109,6	125,2	-1,7%	5,7%	12,3%
8 Communications	103,9	103,6	104,3	-0,4%	-0,2%	0,4%
9 Loisirs et culture	99,3	100,9	106,1	-1,0%	0,7%	4,1%
10 Enseignement	110,3	111,7	116,7	2,7%	1,7%	2,0%
11 Restaurants et hôtels	104,1	105,1	109,9	1,1%	0,9%	2,5%
12 Biens et services divers	104,3	108,7	111,0	1,4%	1,9%	3,5%
Indice général	102,7	105,4	114,2	0,7%	1,3%	6,5%

Figure 3. Consumer price index - Source: HCP

4.2.2 An unprecedented drought, the worst in 40 years,

To the international context marked by the geopolitical tensions observed since the end of February of the year 2022 following the outbreak of the Russian-Ukrainian conflict combined with the worsening of the disruptions in the supply chains, there is an unprecedented drought, the worse for 40 years, which weighs "heavily" on the economy of the Kingdom dependent on its agriculture (14% of GDP).

Indeed, the evolution of droughts aggravated by climate change, generates water shortages which become structural for a large number of hydraulic basins, in particular those of intermediate Gheris and Maïder, by having negative impacts on all water-using sectors, particularly the agricultural sector, and on the sustainability of water resources.

It is clear that the droughts observed in recent decades are the most severe since the beginning of hydro-climatic measures in Morocco, since they have caused drastic reductions in precipitation and annual inflows from rivers. During the period 1971 to 2000, the pluviometric contributions had registered a reduction of the order of 15% compared to those of the period 1961-1990. For the current drought recorded in 2021-2022, the cumulative rainfall, which varies in Morocco between 22 and 329 mm, recorded a significant drop of 47%.

Systematically, drought has a considerable impact on the agricultural sector. Farmers are experiencing the effects of climate change in terms of livelihoods. The drought of the year 2021-2022 has seriously impacted the production of field crops (cereals and legumes), arboriculture and the situation of rangelands. The cereal sector, which concerns more than 65% of farmers, remains the most vulnerable to drought.

4.2.3 The second year of the implementation of the new agricultural development strategy (GG 2020-20230)

Launched at the beginning of 2020, the “Green Generation 2020-2030” strategy is the result of the evaluation of the results of the PMV with all the players in the sector, in particular the agricultural chambers and the interprofessional federations.

This new development strategy for the agricultural sector is based on two foundations concerning the human element and the pursuit of the dynamics of agricultural development.

Indeed, the “Green Generation 2020-2030” strategy aims to prepare the conditions conducive to the emergence of a new generation of the agricultural middle class, through the improvement of income within households active in the agricultural sector, guaranteeing social protection and expanding the targets of agricultural insurance to protect farms against the dangers associated with climate change.

Another axis of this strategy concerns the development of a new generation of young agricultural entrepreneurs, through the mobilization and development of one million hectares of collective land, in accordance with the High Royal Guidelines.

The new strategy also targets the emergence of a new generation of agricultural organizations with the aim of multiplying by five the rate of grouping of farmers, particularly at the level of new generation cooperatives and aggregations to strengthen the independence of agricultural interprofessions so that they can fully play their role in the development, support and execution of part of the budget linked to the agricultural sector.

The “Green Generation 2020-2030” strategy also places importance on producers and consumers. To this end, it will seek to improve the conditions for the marketing and distribution of agricultural products by modernizing 12 wholesale souks, by qualifying the weekly markets, by encouraging innovation, to adapt production to consumer needs, and by intensifying health checks to protect consumers.

All the points go hand in hand with other foundations of the strategy which concern the sustainability of agricultural development and the consolidation of agricultural sectors with the aim of doubling agricultural GDP and agricultural exports by 2030, by maintaining efforts investment, rationalizing aid, supporting the competitiveness of Moroccan exports and accelerating and enhancing the processing of agricultural products, as well as qualifying certain high-potential sectors such as the organic products sector and those of aromatic and medicinal plants.

4.2.4 The second year of implementation of the National Drinking Water Supply and Irrigation Program 2020-2027

Irrigated agriculture now remains vulnerable to these constraints and to the increasing scarcity of water resources in permanent competition with other sectors (drinking water, generation of hydraulic energy, industry, etc.). In these conditions, **water saving** occupies a prominent place in Morocco's new water policy. It considers among its objectives:

- **Encouraging the saving and recovery of mobilized water** (demand management), through:
 - **Massive conversion to localized irrigation.**
 - **Network improvement** distribution and **water supply to irrigated perimeters** (to improve their hydraulic efficiency).
- Continuation of supply management, in particular through:
 - Strengthening the mobilization of conventional water resources (especially surface water) by building new dams.
 - **The mobilization of unconventional water resources, in particular the desalination of seawater** and the demineralization of brackish water.

It is in this context that the Kingdom has drawn up the national priority program for the supply of drinking water and irrigation which will cover the period 2020-2027. It is part of a more global policy whose implementation will extend over the next 30 years (National Water Program 2020-2050).

The program thus tends to limit the impact of climate change and guarantee water security. These objectives, among others, go through the implementation of actions that revolve around five main areas, namely: i) improving the water supply; (ii) demand management and water valorization; particularly in the agricultural sector; iii) strengthening drinking water supply in rural areas, iv) reuse of treated wastewater in the irrigation of green spaces; v) and communication and sensitization in order to reinforce the awareness related to the importance of the preservation of water resources and the rationalization of its use.

4.2.5 Water context in the intermediate Gheris and Maïder basins, major issues

The region is characterized by a semi-desert climate with inter- and intra-annual irregularity. Precipitation generally decreases from the High Atlas towards the South. The most important flow is produced at the level of the mountain range.

The surface water resources of the region are essentially made up of floods. Indeed, the flows in the wadis are essentially generated by floods which are rare and violent and number a few floods per year. These floods are of short duration but produce large volumes of water.

The groundwater potential in the area plays a key role in the region, especially in times of surface water scarcity. These resources consist of groundwater (Quaternary) generally located along valleys characterized by their direct dependence on climatic hazards. Except for the Tafilalet plain, whose area is relatively large, the other quaternary aquifers are characterized by small areas. And deep aquifers which are mainly subdivided from North to South into three well-defined hydrogeological units: The High Atlas, The Cretaceous basin of Errachidia–Budnib And The Anti-Atlas.

The two basins covered by the PACCZO are located as follows:

❖ **Gh ris basin**

The large area of the Gh ris basin is located in the High Atlas from which four main wadis flow: Oued Todgha, Oued Tanguerfa-Ferkla, Oued Gh ris and Oued Tarba.

The downstream course of the Gh ris crosses an arid plain before entering the Tafilalet plain where it flows parallel to the Ziz wadi, which it joins further downstream.

The areas of the main sub-basins are as follows: The upper basin of the Gh ris wadi in Tadighoust: 2,326 km²; The Ferkla wadi basin in Meroutcha: 4643 km²; The upper basin of the Todgha wadi in Ait Boujjane: 639 km²; The overall basin from the Gh ris wadi to L'hmda: 10,016 km².

❖ **Maïder basin**

The Maïder basin is geographically part of the Rh ris watershed in the broad sense, of which it is the main and most extensive of the tributary basins. This region, entirely included in the Anti-Atlas, constitutes both the southern and eastern part of this domain. It is limited to the North by the vast eastern Saghro-Ougnate complex, to the east by the plain of Tafilalet, to the west by the eastern Jbel Bani, and finally to the south and southeast by the Cretaceous hamada of the Kem-Kem.

The Maïder basin is made up of the southern slope of the Jbel Saghro drained by the Taghbalt, Hassaïa, Fezzou and Msissi wadis.

The natural drain of this vast area of hydrographic convergence, the Maïder wadi, finally leads to the Rhéris, a little upstream from the Ziz-Rhéris confluence, at the level of Hassi Remlia. The hydrographic network is located entirely in the Saharan domain. The overall area of the Maïder watershed is around 14,000 km².

These are factors to be considered at the time of the final evaluation of the project to better capture the effects of the PACCZO project on the socio-economic well-being of local communities and the population directly benefiting from the program.

4.3 Mapping of water resources in the Ghéris and Maïder basins

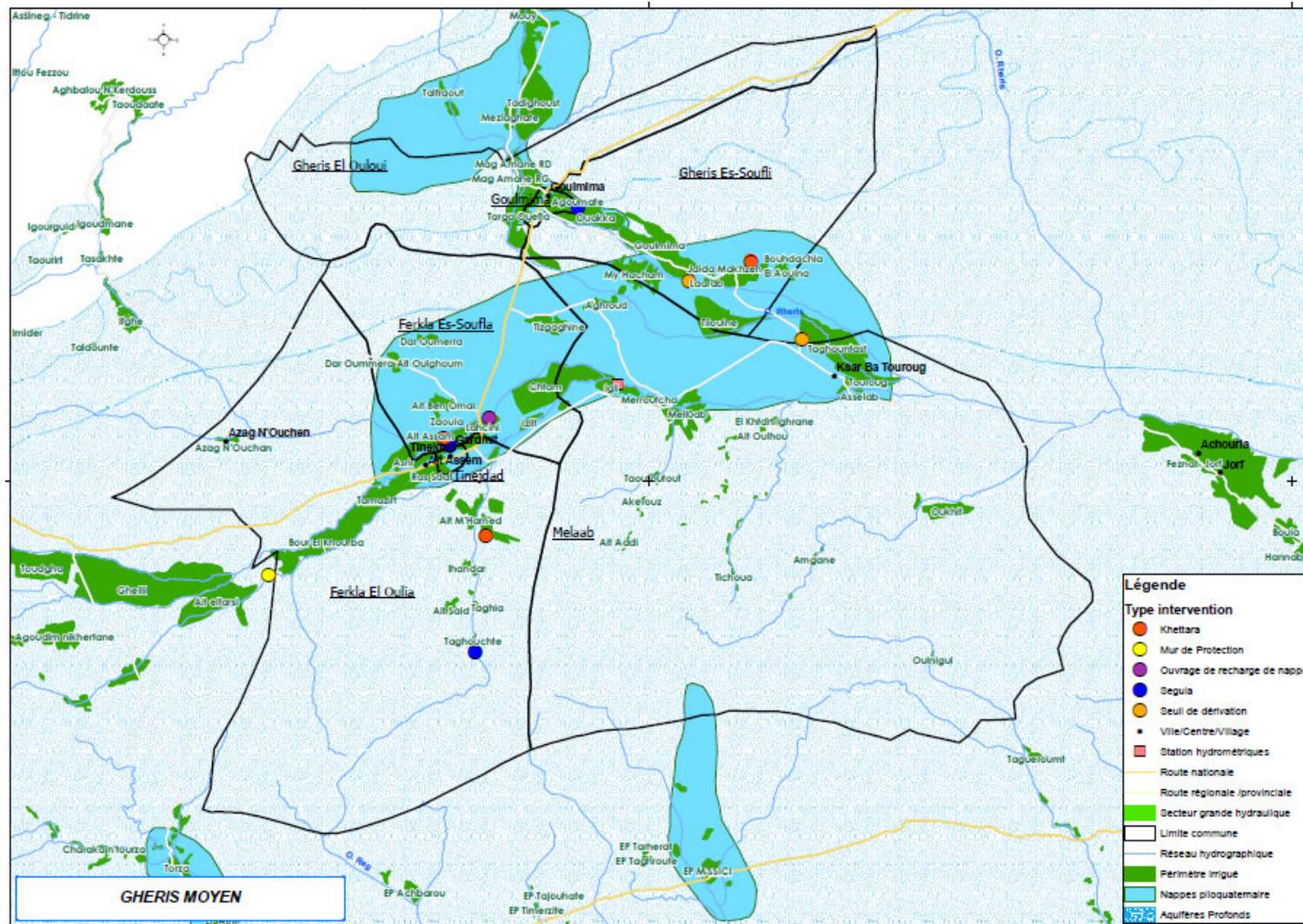


Figure 4. Map of the distribution of water resources in the PACCZO area, Intermediate Gheris Basin

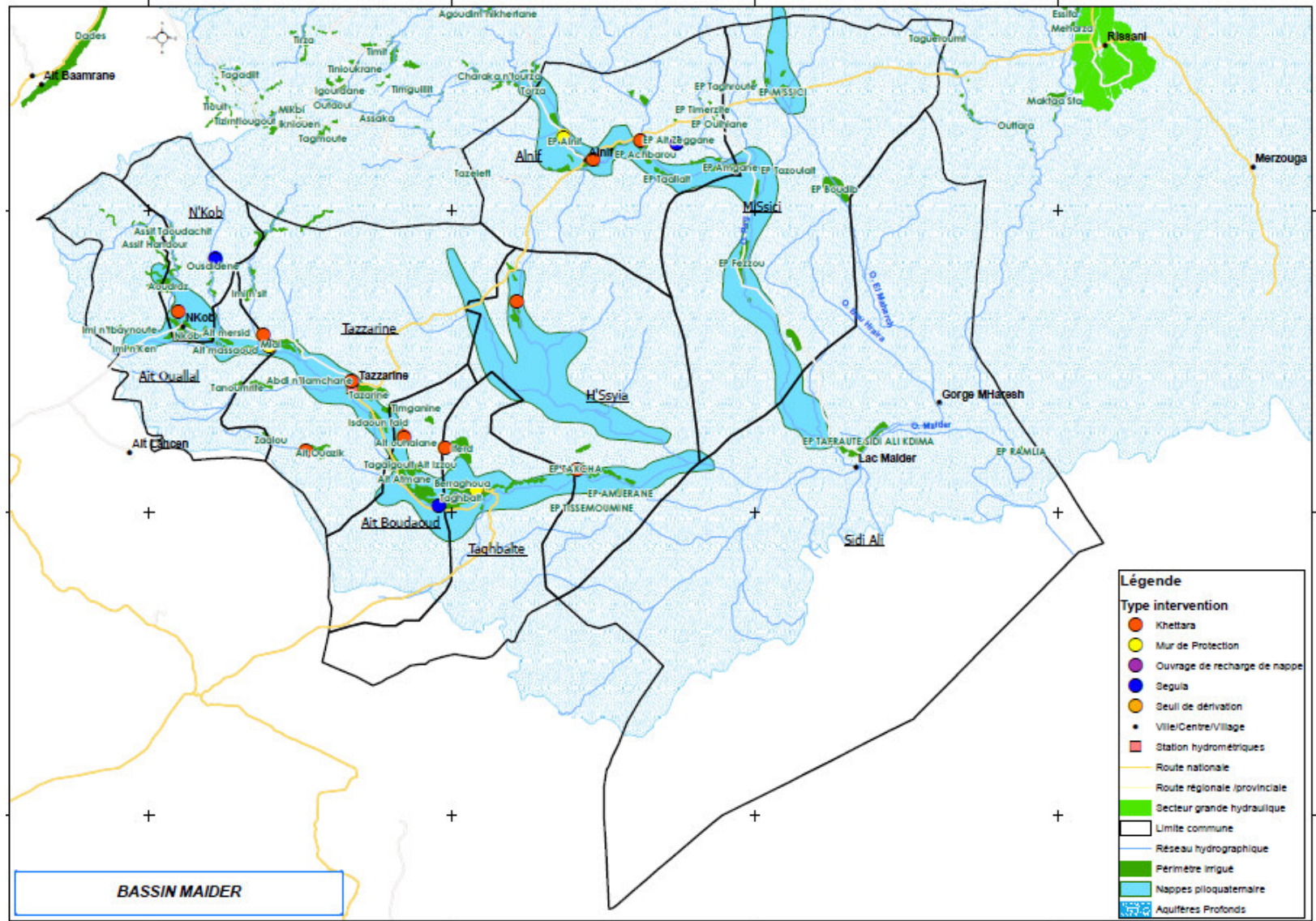


Figure 5. Map of the distribution of water resources in the PACCZO area , Maïder basin

5 Presentation of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO)

5.1 Consistency and cost of the project

The Project for Adaptation to Climate Change in Oasis Zones (PACCZO) was designed and implemented to integrate and provide innovative solutions that could contribute to improving the capacity of adaptation to climate change of oasis populations. Thus, this integration concerns 5 essential components ranging from development actors to activities aimed at promoting gender mainstreaming, through the implementation of structuring actions leading to adaptation to climate change:

- Improving adaptive capacities of the water sector,
- Diversification of sources of income and improvement of the living conditions of the populations,
- Improvement of the resilience of ecosystems in response to CC and variability
- Improvement of awareness through management and knowledge sharing
- Capacity building in the design and implementation of adaptation measures.

To implement these components, the project was allocated a budget of 9.97 million dollars (equivalent to 95 million DH) over a period of 5 years allocated by the Adaptation Fund to ANDZOA (Agency of implementation of the project) via the ADA, an agency accredited by the financial backer.

The summary of costs by component is shown in the following table:

<i>COMPONENT</i>		<i>Cost (\$ US)</i>
Component 1	Improved adaptive capacities of the water sector	4 000 000
Component 2	Diversification of sources of income and improvement of the living conditions of populations vulnerable to climate change in the target areas	1 775 400
Component 3	Improved resilience of ecosystems in response to climate change and variability	1 600 000
Component 4	Improved awareness of all stakeholders through knowledge management and sharing	320 000
Component 5	Capacity building of participants in the design and implementation of adaptation measures	480 000
Sub-Total		8 175 400
Execution charges		947 150
Implementation charges (ADA)		847 450
General total		<u>9 970 000 \$</u>

As a result, component 1, amounting to MAD 35.5 million, is the main component of the project, since it is centered on the mobilization of water resources, and represents nearly 37% of the total cost of the project. Components 2 and 3 total 34% of the total cost of the project with respectively 17.1 million and 15.43 million dirhams. Components 4 and 5, which can be considered as support components, total 7.63 million dirhams, representing 8% of the total project cost.

At the time of implementation only the products of component 3 that have been reviewed and validated in the AWPB4 based on the results of the mid-term evaluation of the project as well as the capitalization on the achievements of the first four AWPB and on the other hand on the new grievances and needs of the oasis territory observed during the implementation of the project and which have a relationship with climate change.

The updated detail by component is presented in the appendices.

5.2 PACCZO intervention logic

To achieve the overall objective of the Project (PACCZO) which is **improving the adaptive capacity of populations in oasis areas to the impacts of climate change**, the logical framework of the latter was planned in: 1) Components, 2) Results, 3) Products and 4) Activities. A total of 52 activities will be carried out in five components.

The logical framework and detailed planning of the PACCZO project are presented in the annex.

Table 1. Project intervention logic

INTERVENTION LOGIC	
I. Overall objective	Improve the adaptation capacity of populations in oasis areas to the impacts of climate change.
II. Specific objective : :	i. Improve the adaptive capacities of the water sector,
	ii. Diversify sources of income and improve the living conditions of populations vulnerable to climate change in the target areas,
	i. Improve the resilience of ecosystems in response to climate change and variability,
	i. Improve the awareness of all stakeholders through knowledge management and sharing,
	i. Build the capacities of participants in the design and implementation of adaptation measures.
III. Intermediate results :	i. Efficient management of water resources.
	ii. Resilient agricultural and non-agricultural economic activities developed.
	i. More resilient oasis ecosystems and preserved heritage.
	ii. Actors sensitized and now aware of the effects of climate change.
	iii. Institutional capacity of stakeholders strengthened.

6 Final evaluation methodology

The methodological principles that we have adopted in the context of carrying out this final evaluation is a participatory approach, focused mainly on the qualitative and quantitative aspects concerning the various actions while taking into consideration the various stakeholders.

The approach was based on the collection of data drawn from documents provided to NOVEC mainly by ADA, ANDZOA and their Technical Assistance, on the one hand, and on data drawn from quantitative and qualitative investigations by means of direct interviews, studies conducted by the evaluation team with potential interlocutors (partners and beneficiaries) on the other hand.

The advantage of an inclusive and multi-stakeholder approach also lies in the opportunity to mobilize the specific skills of each; for example, to collect secondary information, interview other people involved, present information (tables, diagrams, photos, etc.) or reinforce certain aspects of analysis and evaluation.

The context in which the project takes place was also taken into consideration during the process of carrying out this final evaluation. This refers to the period in which the projects to be evaluated take place, as well as the historical perspective of the situation that the initiative has tried to improve and previous trials. In addition, we considered the social, economic or political aspects that may have influenced the activities and the results.

The approach followed to carry out this evaluation obeys a process which starts from the analysis of the logical framework and leads to the determination of the values of the indicators according to a “bottom-up” approach.

The analysis of the logical framework allowed the **clarification of objectives** assigned to program components and identification **resources and responsibilities** to achieve them, on the one hand, and **the determination of the measurable indicators to be retained in consultation with the ADA, the ANDZOA and the partners**. This involves estimating the reference and current values of the selected indicators, the variation of which will make it possible to quantify the socio-economic and environmental impact of the actions carried out, in consultation with the stakeholders concerned. This impact is estimated by comparing the baseline situation and the situation after the project (situation at the time of the evaluation). This involves calculating the difference between the two situations in order to assess the evolution of the value of the indicators at the level of the beneficiary areas.

The logical framework tracing the logical links between PACCZO activities/results and impacts was analyzed in depth before data collection.

The methodological approach that was adopted for the evaluation of the PACCZO took place in several stages:

- Methodological framework and documentary study (mission framework, existing evaluation, documents and reports; existing feasibility studies and TA reports);
- Revision of the logical framework
- Collection of data on project implementation;
- Field visits were made and held in the two targeted basins.
- Working sessions will be held with officials from ANDZOA, ADA, and partner entities;
- Analysis of data collected at the level of the action area;

- Data adjustment and aggregation.

The following diagram shows the entire process followed in this evaluation.

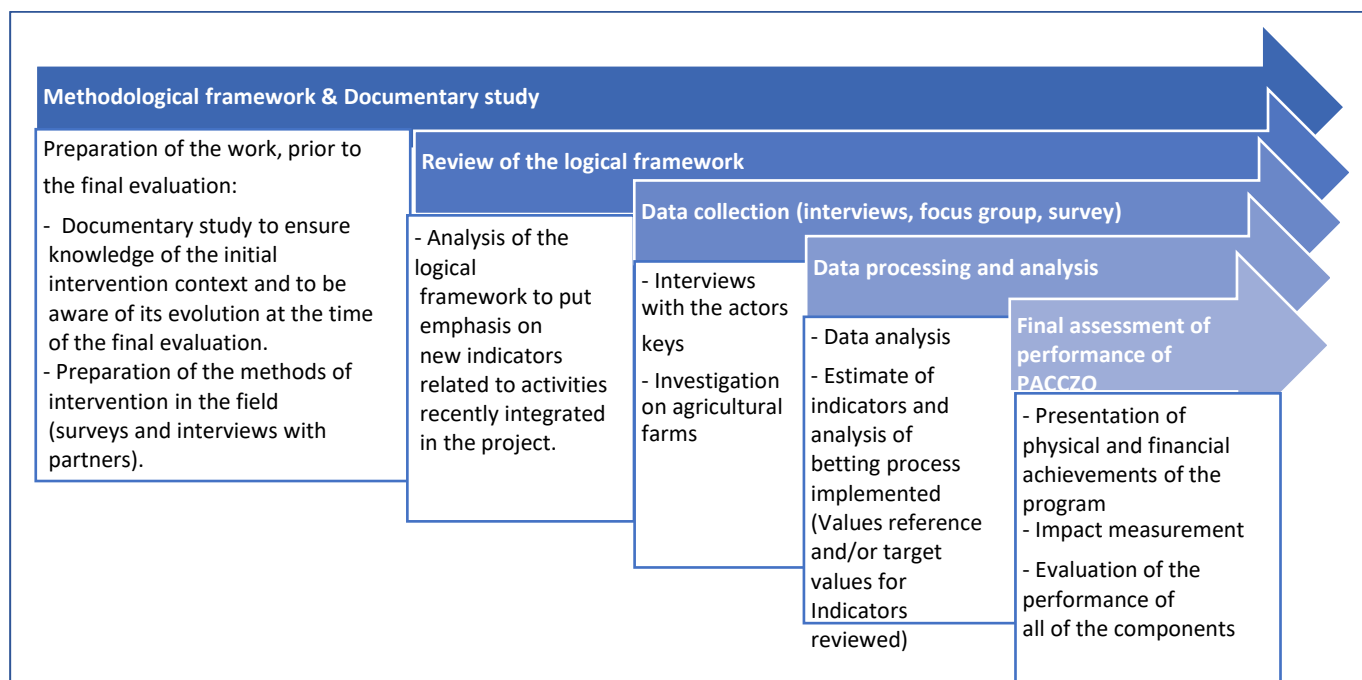


Figure 6. PACCZO final evaluation process

C. Methodological framework and documentary analysis

The methodological framework and planning stage, lasting about four weeks, was a work preparation stage, prior to the final evaluation. It made it possible to become acquainted with all the documents of the preparation phase of the intervention, to structure the mission as such (selection of documents and resource persons to consult) and to identify the information needs.

On July 21, 2022, a first scoping meeting which brought together the entire consultant's team and that of ADA/ANDZOA, was intended in particular to:

- Recall the context of intervention and the overall and specific objectives of the service, the general framework of the mission;
- Trace the first milestones in the planning of the mission of the evaluation team;
- Detail and plan the actions to be taken to facilitate the mission of the consultants;
- Arrange the information needs of the partners (ANDZOA, ABH-GZR and ORMVATF/ORMVAO).

This stage began with a documentary study in order to ensure knowledge of the initial intervention context and to be aware of its evolution, after 6 years of implementation, before carrying out the first field surveys.

At the end of this stage, a second meeting was organized with the ANDZOA team in Rabat on 09/11/2022 to discuss:

- The specific context at the time of the assessment (water stress: regression of precipitation and inflows and its impact on groundwater levels, global situation of soaring prices) and its impact on the target values.

- Program extension (reasons/impacts); Program
- adaptations during the pandemic;
- Exit and sustainability strategy: Sustainability factors; Operationalization of the monitoring-evaluation system (implementation constraints);
- Etc...

Then, on 14 and 15/11/2022, other larger meetings with the staff of the executing entity took place in Erfoud and Errachidia to decide on and prepare the modalities of interventions in the field (surveys and interviews with partners).

D. Interviews with key actors

The evaluation of the available information collected during the documentary study made it possible to identify the necessary additional information. This step consisted of making contact with the partners: the EE, the two ORMVAs and the ABH-GZR, to evaluate the completed actions and diagnose the implementation process.

The purpose of these consultations was to determine the opinion of the various actors on the experience of PACCZO in the field of adaptation to climate change.

In this context, the team in charge of this service has started field visits to the PACCZO intervention zone. To this end, it contacted the key players according to the following schedule:

Table 2: Schedule of interviews with key actors

Actors	Date
The EE –ANDZOA	From 14 to 15/11/2022
ABH Guir-Ziz-Rh�ris	15/11/2022
ORMVA TF	15/11/2022
ORMVA OZ	17/11/2022

F. Farm survey

Collecting the data needed to estimate certain indicators required a survey of beneficiaries. This survey took place in 6 stages (see figure on next page):

- **Step 1** : Sample determination;
- **Step 2**: Development of survey sheets and their validation by the ADA;
- **Step 3** : Training of investigators;
- **Step 4** : Carrying out preliminary surveys with a limited number of staff for the validation of the survey sheet (blank test).
- **Step 5** : Carrying out surveys of the beneficiaries of the actions selected in the sample;
- **Step 6** :Analysis of the surveys and analysis of the data collected.

Concerning the sampling and for the sake of the cost of the monitoring operation (human and material resources), a sample made up of an observatory of about forty farms(**agricultural households**)was decided in common agreement with the EE during the mid-term evaluation. To this sample, and within the framework of consultations with the EE (ANDZOA) and the partners, 28 additional farms were added to bring the total sample to 68 surveyed farms. This update of the initial observatory was essentially justified by the need to integrate the new actions of component 3 (CT Tinjdad), as well as those carried out in the Zagora area (5 CT).

Beyond the human and material constraints raised, the margin of error concerning the selected sample remains acceptable. This stratified sample was proportionately sized according to the following criteria:

Basin	Oasis/perimeter	Choice criteria
Rhéris	<ul style="list-style-type: none"> - Tighfret - Hssini - IZILF 	Perimeters : <ul style="list-style-type: none"> • Completion of works; • Only one flood occurred at least in the perimeter. Agricultural farms : <ul style="list-style-type: none"> • Willingness of the farmer to be part of the observatory; • Farm size; • The dominant production system. • Etc...
Maider	<ul style="list-style-type: none"> - Ait lhbib - Tizi - Alnif 	

This completed sample was carried forward for this final evaluation. Indeed, the survey was carried out in the same areas, the same localities, with the same panel of individuals possibly plus the complement/replacement panel. If it was impossible to carry out the interviews with the same people surveyed during the mid-term evaluation, the choice fell on other people with similar criteria.



The list of observatory farms that were surveyed was provided by the TA team at the end of the January 2020 mission.

G. DATA PROCESSING AND ANALYSIS

The processing and analysis of the survey data was on one of the following 2 survey tools: **SPHINX** or SPSS. However, and in consultation with the study monitoring committee, we recommended the use of the software **SPHINX**, and this for its ease of use and its ergonomics, in particular for its layout of the data entry frame as well as for its simple presentation of the data in the format of cross-tabulations with several dimensions during their extraction in Excel format. The use of the **SPHINX** software would make the presentation of the data collected to the study follow-up committee simpler, as well as the latter's follow-up of the steps adopted in entering and processing the data more practical.

While for the other data collected, the processing relied on the Excel spreadsheet.

Data analysis will be done through the calculation and presentation of effect and impact indicators. These elements will be commented on in the final evaluation report, so as to highlight the results and impacts observed.

The impacts will be estimated via a comparison between the current value of the indicators and their value calculated in the reference situation.

For an indicator T for example, let T1 be its current value and T0 its value in the reference situation. The impact is estimated by $(T1-T0)$ in absolute terms or by $(T1-T0)/T0$ in relative terms (in %). This method, although simple, will make it possible to obtain a suitable estimate of the impact of the project on, in particular, the indicators directly linked to the improvement of the adaptive capacities of the water sector, the diversification of sources of income and improving the living conditions of populations vulnerable to climate change in the targeted areas.

7 Revision of the logical framework

The initial logical framework (see Annex 2) has undergone three revisions so far. A first revision carried out during the study of the reference situation, a second carried out within the framework of the mid-term evaluation of the project and the third during the argumentation and justification of the credit orientations of the **PTBA 4**.

There **first revision** analyzed the objectively verifiable indicators of the results of the project from several angles, with the consultation of the various actors of the project:

- link with local or provincial plans and strategies;
- data collection capacity at the local level (institutional partners, municipal technical services, surveys: farming and perception of climate change, focus groups) and at the project level when the indicators are not available in the national system. This was the case for the water resources management components: the measures and data available on the mobilization of resources are only available on a macro level. However, at the level of the interventions and the consistency of the achievements planned by the project, it is relevant to carry out measures in relation to the rehabilitation and development at the level of the intervention site;
- - Adaptation Fund guidelines and recommendations.

Initially, a diagnosis of the project's logical framework was carried out, in consultation with the project partners, then a verification was carried out to ensure that each indicator was integrated from a results-based management perspective in accordance with FA requirements. Some indicators that do not exist at the local level have been modified while respecting the interest of monitoring the chain of results (effects and impacts). Thus, the project's M&E system relies mainly, but not exclusively, on data collected from the population and professional organizations (survey and focus group) and decentralized institutions (mainly project partners).

Furthermore, and within the framework of **mid-term evaluation (second revision)**, an in-depth analysis of the program's logical framework was carried out in consultation with all the stakeholders, namely the representatives of the operational departments of ANDZOA, the representatives of the ADA, the representatives of the Technical Assistant and the NOVEC evaluation team, during several interviews.

Still considered relevant and up-to-date, no changes have been made to its basic structure except, of course, the revision of the indicators, dealt with later.

It is precisely the consistency and relevance of the objectively verifiable indicators that were analyzed during the interviews.

The specific objective of the project has been broken down into a number of results, which cannot be achieved without carrying out all the activities attached to them. To monitor the achievement of these parameters, objectively verifiable indicators specific to each of them have been defined.

These monitoring indicators therefore mark out the action, measure its progress and make it possible to react (corrective actions) before the result is consummated.

The main criteria that guided the choice of these indicators are as follows:

- ➔ **Selectivity:** they are selected in limited numbers.
- ➔ **Relevance and realism:** each indicator is relevant and realistic. It measures an aspect that is significant and of obvious value to observers and decision makers. It corresponds to a lever for action because setting indicators that do not correspond to truly critical performance factors means dispersing efforts and sowing confusion.
- ➔ **Transparency and reliability:** each indicator is established rationally clearly defined and easily understood, to be communicated unambiguously to the various actors and is unquestionable in its evolution.

Table 3. Revised indicators and proposed reformulation as part of the mid-term evaluation

Indicators	Proposed rewording Source: Evaluation team
Indicator 1: Gain in deficits in the Intermediate Gheris and Maïder basins	Indicator 1: Variation in the groundwater level in the Intermediate Gheris and Maïder basins
Indicator 2: Percentage of households securing their drinking water supply	Indicator 2: Improvement of the rate of access to drinking water from a qualitative and quantitative point of view and on a continuous basis, from the developed and undeveloped water point (khettarat, wells, DWS system, etc.)
Indicator 2': Share of farms securing irrigation water	Indicator 2': Additional irrigated area
Indicator 6: Efficiency of irrigation water networks	Indicator 6.1: Irrigation water productivity Indicator 6.2: Share of areas occupied by high value-added crops Indicator 6.3: Rate of crop intensification (TIC)
Indicator 12: Percentage of households participating in the project having adopted resilience measures	Indicator 12: Percentage of households participating in the project having adopted at least one resilience measure.
Indicator 13: Value added per hectare	Indicator 13: Value added of production

This revised version n° 2 of the logical framework was analyzed in depth within the framework of this final evaluation by the evaluation team and negotiated with all the stakeholders during the various interviews. Emphasis was placed on the new activity indicators recently incorporated into the project under component 3.

The monitoring indicators for the activities proposed for the PTBA4 are recorded as follows:

Component	INDICATOR					
	N° Indicator	Name (indicator)	Calculation methode /formulation	Basics Situation	Recent value	Target
Component 3	1	Longueurs réhabilitées et équipées en éclairage solaire	PV de suivi et Rapports d’achèvement des travaux	2	2	10 km
	2	Nombre d’espaces aménagés	PV de suivi et Rapports d’achèvement des travaux	0	0	2
	3	Nombre de points d'eau aménagés	PV de suivi et Rapports d’achèvement des travaux	0	0	5
	4	Nombre d'AUEAs équipées	PV de suivi et Rapports d’achèvement des travaux et décharges du matériel	0	0	10

The next chapter will be devoted to **the evaluation of the main achievements of the PACCZO (positive and negative, planned or not) in terms of relevance, effectiveness, efficiency, impact and sustainability.** This involves: i) assessing the relevance of program interventions at the time of its formulation in the current context, as well as the efficiency of the overall program implementation process, ii) evaluating the effectiveness of the implementation of the project, i.e. the extent to which the expected objectives were achieved and documenting its immediate results and impacts, iii) Analyzing the prospects and sustainability of the project's achievements after its completion, iv) Identifying and documenting the lessons learned from the execution of the program that will contribute to the improvement of future programs and formulations of the Adaptation Fund and Morocco, and i) Identify the innovations introduced, analyze their relevance and assess their level of feasibility and replicability.

8 Evaluation of the PACCZO

8.1 Physical and financial achievements of the program as of December 31, 2022

The main registered PACCZO products are presented by component:

a) Natural resource mobilization and protection projects

- Construction of 95 seguias over a total length of 34,397 ml;
 - PACCZO: 60 seguias out of 21,190 ml + 8 derivation thresholds
 - Leverage effect: 35 seguias out of 13,207 ml.
- Rehabilitation of 71 Khettaras out of 13,146 ml;
 - PACCZO: 49 khettaras out of 8,800 ml
 - Leverage: 22 khettaras out of 4,346 ml
- Construction of 7 recharge structures including 3 artificial groundwater recharge structures at Tinjdad and 3 structures at Maider and 1 at intermediate Gheris;
- Construction of 36 protective walls over 6,502 ml;
 - PACCZO: 25 walls over 4,450 ml
 - Leverage: 11 walls over 6,502 ml
- Acquisition and installation of 04 piezometers (monitoring of the water table);
- Execution of 4 boreholes: a deep borehole of 650m and 3 boreholes of 90m
- each; Digging of 3 wells of 30m each, for the nomads;
- 4 technical studies prior to hydraulic interventions.

b) Diversification of people's sources of income

Promote agricultural products from the oases: 27 cooperatives and associations benefiting from packaging lots;

- Support for the tourism sector by training the actors concerned;
- Support for 45 small economic projects in the main areas: agriculture, drinking water, environment, crafts and tourism;
- Job creation through the establishment of an incubation model for local projects adapted to the oases (67 operational projects).
- Training on water consumption techniques and conservation techniques: 32 workshops for the benefit of 616 beneficiaries including 22 workshops on water saving techniques for 401 farmers and 10 workshops on the conservation of agricultural products for 215 farmers ;
- Supporting farmer-producers in the process of certification and promotion of henna, cumin and dates.

c) Main studies

- Wastewater management study for 10 tourist structures in the oases and measures to mitigate their negative effects
- Study for the development of a draft charter on water and climate change in an oasis environment
- Study on the experiences of good practices, agro-ecological and conservation techniques (23 good practices and agro-ecological and conservation studies, presented in the form of

technical sheets including 10 experiences dedicated to water saving and 09 experiences dedicated to the valorization of dates).

- Study of identification and promotion of niche tourist products to be developed in oasis areas
- Study on the acacia raddiana (Diagnosis of avenues for valorization of and the methods of organization of the beneficiaries).
- Study of the reference situation (baseline) of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO)
- Two environmental and social impact assessment studies of the activities of the Climate Change Adaptation Project in Oasis Zones (PACCZO) and development of related environmental and social management plans.

d) Improved ecosystem resilience

- Development of two protection and control measures against silting in the areas of Errachidia and Zagora
- Training on depollution techniques for the benefit of the players concerned (398 participants)
- Guided visits to wastewater treatment plants for the benefit of 106 participants.
- Support of Community Services aimed at protecting natural resources through the implementation of small projects concerning the environmental upgrading of schools and their internal layout, contribution to the prevention and fight against fires in oases;
- Development of 4 spaces and 7 water points.
- Equipment of 14 AUEAs.

e) Raising awareness through knowledge management and sharing

- Establishment of a Documentary Fund: inventory and digitization of 2,915 documents.
- Development of a charter on water and CC
- Organization of 6 thematic conferences on water
- Organization of a conference on GIS and remote sensing
- Development of a communication strategy and organization of 8 CC awareness campaigns.
- Organization of targeted awareness-raising actions for pupils in primary schools: 72 workshops in 24 schools for the benefit of more than 26,000 pupils.
- Strengthening of the management monitoring system

f) Capacity building

- Organization of 14 training workshops for 252 participants.
- Organization of 19 workshops and 15 study trips for the benefit of 502 people.
- Realization of 07 visits for the benefit of 106 participants, having for object the techniques which could be introduced in the oases: agro-ecological techniques, conservatories, water recycling, water saving...etc.
- Organization of 28 training workshops in project design and financing for the benefit of 731 participants.
- Organization of 28 training workshops on the implementation and concerted management of projects for 401 people.

g) Financial achievements

- Progress of the financial achievements of the PACCZO project (as of December 31, 2022):

Activities	Cost (MUS\$)	Cost in DH	PTBA 1	PTBA 2	PTBA 3	PTBA 4	PTBA 5
Component 1	4 279 400	43 277 806,36	18 550 416	25 806 00	1 024000		
Component 2	1 729 400	16 671 416	1 500 000	8 247 683,10	5 930 847		
Component 3	1 010 600	9 742 184,00	0,00	1 730 563,60	6 571 200	4 100 000	2 530 000,00
Component 4	366 590	3 533 927,60	400 000	1 302 415,20	1 036 138,80		450 000,00
Component 5	480 000	4 627 200	1 466 635,14	759 654,00	1 014 925,20		
Subtotal (1)	7 865 990	77 852 533,96	21 917 051,14	37 846 315,90	15 577 111,00	4 100 000,00	2 980 000,00
Creation and implementation of the PGES (2)	450 000	4 338 000,00	969 600,00	484 800,00	242 400,00		
Total investment = (1) + (2)	8 315 990	82 190 534	22 886 651	38 331 116	15 819 511	4 100 000	2 980 000,00
Operation	872 950	8 415 238	2 252 936,53	1 733 366,39	1 369 093,92	188 749,84	206 713,56
Total operation + Investment	9 188 940	88 581 382	25 139 587,67	40 064 482,29	17 188 604,92	4 288 749,84	3 186 713,56

Annual Work Plan and Budget No. 5 proposes the continuation of the activities started in AWPB No. 4, and the redeployment of the remaining credits for improving the resilience of ecosystems in response to climate change and variability, through actions to revitalize the oases in the project area.

Thus, the remainder to be paid to ANDZOA relates to the acquisition of fire-fighting equipment" and "the organization of the closing seminar" as well as to meet operating needs related to the project (communication and shift).

- Amounts of payments to ANDZOA :

The total payments made to ANDZOA are **88 581 382 MAD** the last payment was made on December 15 in favor of ANDZOA representing **the totality** of the expected amount.

Payments	Amounts paid to ANDZOA (MAD)	Total (MAD)	% payouts cumulated
Payment 01 (28/10/2015)	25 431 530,00	25431530	29%
Payment 02 (15/09/2017)	39 594 335,00	65025865	73%
Payment 03 (02/08/2019)	16 080 053,60	81105918,6	92%
Payment 04 (15/09/2020)	4 288 749,84	85394668,44	96%

Payment 05 (15/12/2022)	3 186 713,56	88 581 382,00	100%
Total of payments received	88 581 382,00	88 581 382,00	
Total of payments scheduled		88 581 382,00	

8.2 Relevance

Relevance is defined as the extent to which the objectives of the action correspond to the expectations of the beneficiaries and the needs of the territory. Relevance concerns the added value of the project. Is its implementation motivated?

The relevance of a project is mainly based on its design. It concerns the extent to which the objectives envisaged by the project respond correctly to the problems identified or to the real needs.

8.2.1 National and regional context

8.2.1.1 *Problem identification: Vulnerability to climate change*

At national scale

Morocco is experiencing an increasingly difficult situation of scarcity of its water resources. Most of the hydraulic basins experience water deficits, in particular the southern zone of the Atlas, the Souss-Massa, the Moulouya and the Bouregreg. In 2020, the deficit situation will reach six out of eight basins and only the Sebou and Loukkos basins will continue to have a surplus.

The projected climate changes represent a real threat to the socio-economic development of the country. This extreme vulnerability and the need for strategies for adapting key sectors of the economy to the possible impacts of these climate changes represent real challenges for the country's sustainable development.

Climate data recorded in the country during the 20th century indicate a warming during this century estimated at more than 1° C with an accentuated trend over the last 30 years. These data also show a marked increase in the frequency of droughts and floods. Thus we have gone from one drought every ten years at the beginning of the century to five to six years of drought in ten years today.

The studies carried out show a consensus between the projections of the climate models: the climate in Morocco will be hotter and drier during the coming decades, with a drop in average precipitation of 20 to 30% by 2030. This can be translated by a decrease in water resources of nearly 4.4 m³/year assuming a direct correlation between reduced rainfall and water inflows. This is therefore likely to exacerbate the ever-increasing water shortage problems in some parts of the country. These drops in rainfall, combined with increasingly frequent droughts, will have considerable impacts on agriculture, which already consumes nearly 90% of water resources.

At the scale of the PACCZO zone

The effects of climate change and the advent of periods of generalized drought further aggravate this situation in the two basins targeted by PACCZO interventions. Indeed, the threat of drought still hovers over these basins, as in the periods 1980-1985 and 1990-1995 and 1998-2002 during which almost all the watersheds were in a situation of water deficit leading to the overexploitation of water tables in particular in the basins of Ghéris and Maïder. This overexploitation results, among other things, in the drying up of springs/khettaras, the drop in groundwater levels and the degradation of aquatic ecosystems.

8.2.1.2 Identification of real needs

Studies carried out on the potential impacts of climate change on water resources in Morocco have attempted to identify and quantify these impacts with a view to dealing with them in the future. The recommended adaptation measures focus on the water sector, but also target other water-using sectors, particularly agriculture. The proposed measures are spread over the short and long term, but also include urgent measures to be implemented immediately in areas where water resources are already under pressure.

The authorities in Morocco have already launched pilot studies at the watershed level in order to analyze the impacts of climate change on water resources at the level of each basin. The results of these studies should be incorporated into the Integrated Water Resources Development Master Plans (PDAIRE). The projection results will certainly allow the country to define more appropriate adaptation measures. The country has adopted a National Water Strategy aimed at reducing the deficit, better managing water resources and mitigating the future impacts of climate change on water resources. Among the measures envisaged in this strategy:

- Strengthening of the water resources monitoring network;
- Mobilization of new water resources through new dams;
- Promotion of the use of non-conventional resources including the desalination of seawater;
- Artificial recharge of groundwater tables;
- Promotion of water-saving techniques, particularly in the agricultural sector, by integrating them into sectoral plans such as the National Irrigation Water Saving Program (PNEEI) and the Green Morocco Plan (PMV).
- Pursuing efforts to promote participatory irrigation management, particularly in PMH perimeters, to involve and empower users in the management of irrigation networks and the development of water.

The strategy also includes institutional and regulatory measures aimed at improving the integrated management of water resources. Its implementation will certainly help to mitigate the potential impacts of climate change on water resources.

The sectors most affected in the event of a water deficit remain agriculture and drinking water supply:

A. Irrigated agriculture:

Irrigated agriculture now remains vulnerable to these constraints and to the increasing scarcity of water resources in permanent competition with other sectors (drinking water, generation of hydraulic energy, industry, etc.). In these conditions, **water saving** occupies a prominent place in Morocco's new water policy. It considers among its objectives:

- **Encouraging the saving and recovery of mobilized water** (demand management), through:
 - **Massive conversion to localized irrigation.**
 - **Improvement of distribution and water supply network to irrigated perimeters** (to improve their hydraulic efficiency).
- Continuation of supply management, in particular through :
 - Strengthening the mobilization of conventional water resources (especially surface water) by building new dams.
 - **The mobilization of unconventional water resources, in particular the desalination of seawater and the demineralization of brackish water.**

In this context, the Department of Agriculture has developed a strategy **which reconciles water saving and its valorization in irrigated agriculture and** which contributes to the achievement of the objectives of the new water policy.

Thus, this strategy considers the improvement of agricultural income as a sine qua none condition for its success. It is based on improving the irrigation water service, strengthening and adapting the financing and incentive system for water saving, improving agricultural downstream in all its aspects (organization, partnership, cultivation contracts, etc.) and the development of local advice on the design of water-saving irrigation systems and support for improving productivity.

The ultimate objective being the conservation and sustainable management of water resources, the sustainability of irrigated agriculture and the strengthening of its strategic role in the country's food security. This strategy is based on the following major areas of intervention:

- The modernization of irrigated agriculture through the development of large-scale localized irrigation through the conversion of existing irrigation techniques with limited efficiency, in particular gravity. The objective set is to equip with localized irrigation nearly 50% of the total developed area at the national level. For this, the National Irrigation Water Saving Program (PNEEI) is part of the transversal measures of the Green Morocco Plan. It aims to reduce water stress, considered the main factor limiting the improvement of agricultural productivity. This program consists of a massive conversion from surface and sprinkler irrigation to localized irrigation, over an area of nearly 550,000 ha over a period of 10 years.
- The development of water resources mobilized by the dams through the absorption of the gap between the areas dominated by the dams built and the equipped areas, which stands at 108 440 ha.
- Reinforcement of the maintenance and rehabilitation of the irrigation networks of the collective perimeters to ensure better water service and the durability of the equipment.
- The institutional reform of the irrigation sector, particularly large-scale irrigation, in order to improve its competitiveness and its performance and to make the best use of water, and this through the encouragement of public-private partnership for the management of collective irrigation perimeters.
- Pursuing efforts to promote participatory irrigation management, particularly in PMH perimeters, to involve and empower users in the management of irrigation networks and the development of water.

B. Access to drinking water supply :

The supply of drinking water has always been a major source of concern for the population, due to the vulnerability of the climate, marked by years of drought. Therefore, and in order to improve access to drinking water in rural areas, Morocco launched in 1995 the Program for the Grouped Supply of Drinking Water to Rural Populations called “PAGER”.

The objective of this program was to increase the rate of access to drinking water in rural areas to 80% in 2010, and thus make up for the delay suffered by the drinking water supply sector in rural areas before the 1990s , compared to urban areas where the rate of connection to the drinking water network had reached almost 100%.

To succeed in its mission of generalizing DWS in rural areas, ONEE-Branche Eau has built a strategy based on the following unifying principles:

- Drinking water is a right for all citizens;
- The participatory approach with rural populations;
- Partnership with local authorities;
- The sustainability of the drinking water service;
- Priority given to structuring projects and to regions lacking in water resources, while aiming to reduce regional inequalities in terms of access to drinking water.

Thus, the rate of access to drinking water in rural areas reached 97.8% at the end of 2020. These achievements would not have been possible without strong political will and without an appropriate regulatory framework. It is with this in mind that Law 10-95 was promulgated by Dahir No. 1-95-154 of August 16, 1995.

Moreover, the vision of ONEE-Branche Eau with regard to rural DWS extends to other complementary objectives, which constitute the future action plan of ONEE-Branche Eau, and which are revolves around the following 3 axes:

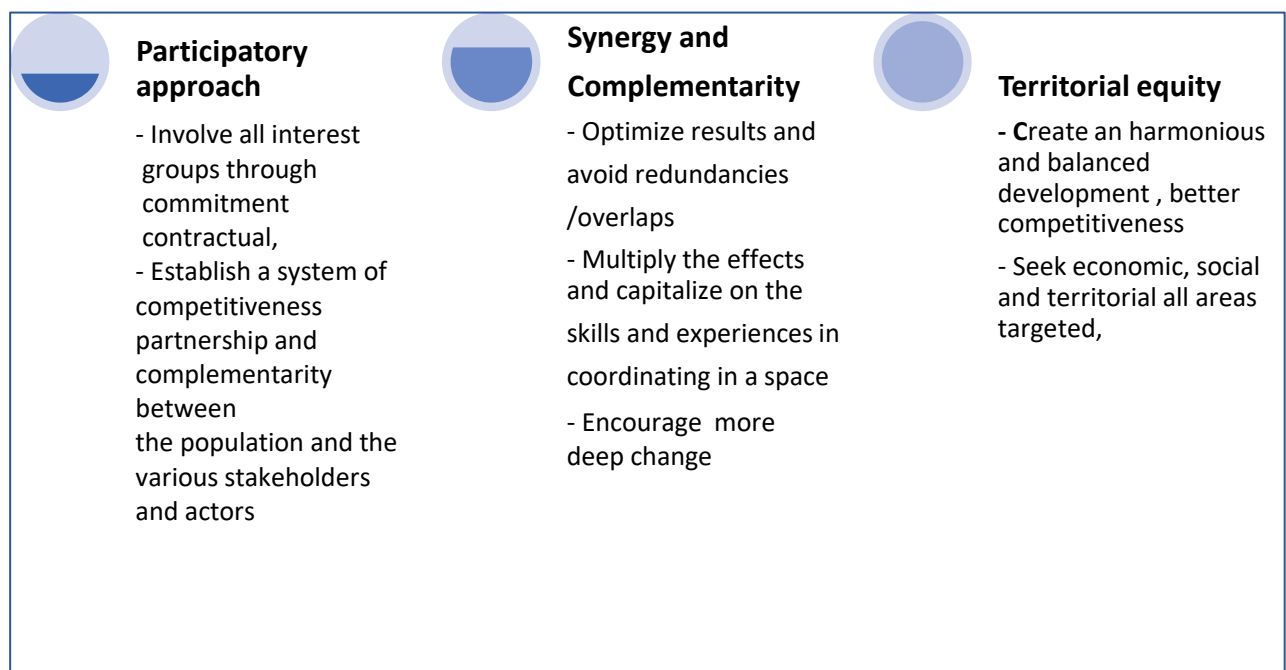
- ✓ **Continued generalization of access to drinking water:** Indeed, the expected access rate of more than 90% remains a national average. Areas will remain below this rate, they are often characterized by the absence of easily mobilized resources, by the dispersion of habitat and isolation. To this end, and with a view to inter-provincial harmonization of its intervention, ONEP has placed this “catching up” action in these areas at the top of its priorities;
- ✓ **Upgrading, aiming to secure and restructure the installations carried out under the old programs:** These are interventions for the renewal or rehabilitation of installations experiencing malfunctions, as well as the continued care of small rural centers which represent development poles for neighboring rural areas;
- ✓ **Development of home connections in the douars:** This action comes in response to the growing demand from the population for individual connections. Indeed, while the most urgent basic service is access to drinking water, some douars wish to further improve their mode of service by opting for home service.

8.2.2 PACCZO internal logic

The main innovation of the project was participatory decision-making with regard to irrigation systems (khetaras, seguias), complementary infrastructure and innovative projects. Thus, many actors have been trained on this approach. The limited availability of qualified staff with good knowledge of the participatory approach was identified as a moderate risk in the design report.

The implementation of the institutional framework and the coordination mechanisms necessary for integrated sustainable development and participatory development at the local and regional level have been carried out within the timeframe initially planned.

The adopted approach seems too adapted to the context of oasis zones. It is based on the following three principles:



8.2.3 Relevance of the project

As described above, the strategy adopted by the Department of Agriculture and Water for the irrigation and DWS sector stems from the objectives set by the new State policy in terms of water management. water resources. Agriculture and access to DWS monopolize the lion's share in the mobilization of water resources. By acting on the saving of water for irrigation, it is undeniable that these programs largely contribute to the achievement of these strategic objectives.

The reduction of water losses is materialized through the developments carried out, upstream, for the extension of irrigated areas and the rehabilitation and modernization of existing infrastructures, and on the plot, by the installation of localized irrigation systems.

➤ *Improving adaptive capacities for better management of water resources in oasis areas*

The oasis areas represent an exceptional natural, cultural and architectural heritage. They occupy 1.5% of the total UAA, with 60,000 ha reserved exclusively for date palms, and account for 6.7% of the rural population and 5.9% of agricultural holdings.

In addition to agricultural activity, the oases are now seeing the development of other activities, in this case tourism and the socio-economic services of the State. Indeed, the discovery by tourists and foreigners of the charm and authentic landscape of the oases of southern Morocco, has participated in the appearance of tourist activity in these regions. However, the decrease in surface water flows linked to climatic hazards and the successive withdrawals of water resources from the oases combined with the introduction of new techniques such as exploitation by pumping, which leads to strong drawdowns of groundwater, especially for agriculture (through powerful motor pumps) determines the accessibility and sustainability of the resource, and therefore hinders related economic activities.

Thus, the palm groves in question are already threatened by the disappearance of springs which constitute the main factor in the sedentarization of the population in this area. Water control in these areas is therefore vital.

It is in this context that the PACC-ZO fits, which aims, in its first component, to improve the adaptive capacities of the water sector. On the one hand, by the joint regulation of underground and surface waters thanks to new hydraulic structures and sustainable protection, namely the construction of works for the artificial recharge of the water table and the construction of protective walls and sills. And on the other hand, by the rehabilitation of obsolete structures to improve the efficiency of water distribution, and this by the rehabilitation of khetaras and seguias. And this, for the purpose of ensuring better management of water resources in oasis areas and thus dealing with the water stress that conditions economic activities and consequently the living conditions of the population.

➤ *Diversification of sources of income and improvement of the living conditions of populations vulnerable to climate change*

The oasis zones constitute a vast territory, covering nearly 32% of the national territory comprising 5 regions, 16 provinces and almost 400 municipalities.

However, these areas face several socio-economic challenges. Indeed, these areas present an alarming deficit in terms of human development, registering a rate of 14.1% of poverty and a rate of 49% of illiteracy¹. In addition, the territory has marked restricted access to basic services, particularly with regard to drinking water, this restricted access which is getting worse and worse given the drying up of boreholes.

Moreover, the territory has significant resources from which it benefits little. It has a rich heritage specializing in typical products such as dates and henna, but it only displays average to low performance and thus yields remain uncompetitive. And it is poorly endowed with suitable accommodation and leisure facilities, which limits its tourist potential.

The second component of the Climate Change Adaptation Project in Oasis Zones addresses these issues and presents actions aimed at improving income and promoting agricultural and tourism development in the oasis zone. Among the actions proposed we cite: support for producers in the process of certifying their products and the promotion of agricultural products from the oases, mainly the two products of the

value added territorial agricultural sectors: cumin and henna, support for small projects local economic and tourism sector players in the accountability of the activity.

➤ *Improved resilience of ecosystems in response to climate change and variability*

Ecologically, the oases are threatened by salinity and silting. These forms of degradation are exacerbated by the harshness of the climate, the scarcity of water, the lack of mastery of irrigation, the overgrazing of spontaneous vegetation and the excessive harvesting of ligneous vegetation in the pastoral zones on the outskirts of the palm groves to cover firewood needs.

The problem of silting became threatening from the 1970s. This threatens homes, cropland, irrigation canals and road infrastructure in the palm groves. Morocco is indeed permanently exposed to the winds coming from the South (Chergui and Sirocco). The protection of the lower Draa Valley, Tafilalet and the irrigated plain of Massa are essential objectives.

In addition, the oases are increasingly weakened by human intervention which has continued to introduce technologies incompatible with the vulnerability of these ecosystems. The construction of dams and the proliferation of pumping stations have caused overexploitation of the oasis ecosystem and brought to critical levels the degradation processes originating from physical factors. Hydro-agricultural developments and the extension of irrigated areas upstream have reduced the progression of floods downstream, causing a remobilization of salts.

To cope with this degradation, the PACCZO, in its third component, includes among these actions the fight against the silting up of habitats and plots by involving the populations, the development of depollution techniques by training the actors concerned and the identification habitats to be rehabilitated and fitted out. In addition, and in order to avoid the aggravation of the situation by human intervention, the PACCZO is committed to supporting community services aimed at protecting natural resources and reviewing the impacts of economic activities carried out at the level of the oases of so that they respect the environmental component.

As part of the justification of the orientations of the appropriations of the **PTBA 4** activity related to constructions using local materials and rehabilitation of ksours, it was argued that, within the framework of the new regional planning policy, which consists of rehabilitating kasbahs and ksours, there was the launch of the Ksours and Kasbahs enhancement program since 2016. A budget of 134 million dirhams has been reserved for this program, including 100 million for rehabilitation. The said project aims to carry out ten pilot operations for the restoration of Ksours and Kasbahs in the oasis provinces, the upgrading of local actors and the strengthening of their capacities. A global intervention strategy in this fabric by 2025.

Hence the decision to redeploy these appropriations in addition the closing seminar of the project in the same component 3 of the project for the enhancement of the oasis heritage through vital environmental activities and highly valued by the beneficiaries and which can provide solutions to problems / phenomena threatening the existence of the oases in particular **recurring fires**:

- Development of access and tracks within the palm groves (rehabilitation, solar lighting, etc.);
- Development of tourist interpretation spaces;
- Development of water points for the fight against fires;
- Acquisition of fire-fighting equipment.

➤ *Improved stakeholder awareness through knowledge management and sharing*

The success of the project requires the involvement of the various stakeholders, namely the implementing entity (ANDZOA) and the executing entity (ADA), the various partners citing the ABH-GZR, the ORMVAT and the ORMVAO. Without forgetting the associations, the cooperatives and the beneficiary population which are concerned by the project.

Thus, the approach taken for the realization of the project is based on three approaches; the participatory approach, the approach of choosing actions on the basis of complementarity and synergy and the territorial equity approach. These approaches will be adopted with the aim of encouraging all stakeholders and beneficiaries to immerse themselves in the programs and achievements of the project, and to ensure a certain consistency between the various actions carried out.

To ensure communication and coordination between the various stakeholders, the PACCZO undertakes in its fourth component to develop a communication strategy and to regularly organize thematic conferences, communication campaigns and seminars.

➤ *Capacity building of actors involved in the design and implementation of adaptation measures*

The success of the project also requires a certain knowledge and mastery of the areas affected by the project by the actors concerned.

Thus and with the aim of strengthening the capacities of the actors concerned by the design and implementation of adaptation measures, various actions are envisaged in the last component of the PACCZO, namely the organization of several training courses on the various modules which affect the project, we cite training relating to climate change and adaptation, training in the project cycle, others in project financing and training in the participatory approach applied to adaptation measures as well as in conflict management and mediation. Among the actions envisaged, we also cite the organization of trips and study courses and the organization of scientific meetings and awareness forums.

By matching the actions envisaged by the PACCZO to the real needs of the population, it turns out that the project responds adequately to the needs identified and undertakes to resolve the constraints that hinder the development of economic activities in the area. The smooth running of the project was also well thought out, in particular by the approach adopted which reflects the participation and involvement of all the actors and the complementarity of the actions carried out, consolidated by the capacity building actions of the actors involved in the design and implementation.

It therefore emerges that the project records a good level of relevance and coherence. Political relevance, first of all, since the protection and development of oases is one of the priorities of Morocco's public policies. And an institutional relevance which is manifested by the approach adopted and the actions envisaged, which also guarantees the success of the project and makes it an exemplary project.

8.3 Efficiency and performance

Efficiency concerns the rational use of the means available and aims to analyze whether the objectives have been achieved at the lowest cost. The efficiency criterion measures the relationship between the various activities, the resources available, and the planned results.

8.3.1 Efficiency

8.3.1.1 *Investments made under the PACCZO*

The analysis of the project budget revealed that the total cost of the project, fixed in the design report, was planned at US\$9,979,000, including contingencies. It was initially divided between the 5 components and the majority of the funds are allocated in the second year of the project (2017) in the amount of 4.2 million USD (i.e. 43%). Project funds represent 83% of the total cost with an amount of 8.3 million USD. However, given the difficulties in carrying out certain components and activities of the project, a reallocation took place in 2020. Thus, the completion date initially set for June 2020, under the financing agreement, has been postponed. twice following the government's request (December 14, 2023).

In order to optimize the management of the project's resources, this extension was seized to operate a reallocation of funds. This consisted in the redeployment of credits in the same component. This reallocation was based on the recommendations drawn from the AWPB-2020, with priorities for the 3 years of extension.

The investments mobilized within the framework of the PACCZO, until now, amount to 88.58 Mdh. Most of the investments were mobilized within the framework of the water resources mobilization component, i.e. more than 41% of the overall amount of the PACCZO to which must be added between 10 to 20% reserved for the aspects of water resources in within the activities of the other components (water charter, monitoring of water resources, training, calls for projects, etc.). Thus the total share of activities dedicated to the mobilization of water resources is globally estimated at 50 to 60% of the total amount of the PACCZO. The rest of the amount is divided between studies and training, support for farmers, support for small local economic projects and the fight against silting and pollution.

A. Investments for the execution of hydro-agricultural development works

These are actions relating to the rehabilitation of khetaras and irrigation water distribution networks and the construction of recharge structures and protection structures of the irrigated perimeters of the oases.

The PACCZO enabled the rehabilitation of 49 Khetaras over a length of 8,800 ml, the construction of 60 Seguias over a length of 21,190 ml and 25 oasis protection walls over 4,450 ml.

The achievements in this direction greatly exceed the assigned objectives, so we can see an achievement rate of 272% for the construction of khetaras and 261% for the construction of seguia.

Admitting, in hypothesis, that the rehabilitation of the khetaras was made with an average of 1000 dh/ml, and that of the Seguias with 500 dh/ml on average, it emerges that the average unit cost adopted for the protective walls is 4,659 dh/ml, and that of the thresholds at 4,924 dh/ml. The cost adopted for a linear meter of protective wall varies between 661 dh/ml and 7,670 dh/ml, and that of the thresholds varies from 1,539 dh/ml to 8,309 dh/ml. The variation in cost depends on the consistency of the thresholds as specified in the works contracts. These average unit costs per linear meter (ml) relating to the components of small and medium hydraulics (Khetaras, seguias and works) are within the range of the real costs applied for the region based on the works contracts of the last 5 years.

In addition, investments in groundwater recharge works were also rated as “efficient”, with all works contracts proving lower costs than regional orders of magnitude. In fact, 7 recharge structures have been built, representing an achievement rate of 175% compared to the number planned.

Similarly, the budget allocated to the acquisition and installation of automatic equipment for groundwater monitoring and evaluation was not completely consumed. The installation of four groundwater monitoring and measurement devices only cost 670 560 dhs compared to the planned 1 076 000 dhs.

The supervision and control of the various works relating to the construction of works and the rehabilitation of the irrigation networks was carried out by technical assistants, who generally did not exceed the allocated budget.

B. Investments for carrying out the studies

The budget mobilized by the studies carried out within the framework of the PACCZO represents 5 to 10% of the amount allocated to each action.

The studies concerning the mobilization of water resources were launched by the partners, namely ABHGZR, ORMVAO and ORMVAT. The majority of these studies were carried out with a budget lower than the planned budget, except for the case of the study of exploration of deep water resources which in its second phase required twice the amount planned.

Studies launched by partners	2016		2017	
	Amount mobilized	Expected amount (agreements)	Amount mobilized	Expected amount (agreements)
Exploration/reconnaissance study by drilling of deep-water resources.	1 803 240	2 000 000	3 200 000	1 400 000
Execution study of the recharge structures in the Maider basin.	609 600	1 000 000	---	---
Feasibility study for the identification of, priority sites for the digging of deep boreholes.	672 000	800 000	720 000	1 110 000
Complete technical study of protective works in priority sites.	---	---	240 000	350 000
Execution study of protection works and irrigation network.	300 000	300 000	---	---

C. Investments for the production of training modules

Several training modules have been programmed with the aim of improving and strengthening the capacities of participants in the design and implementation of PACCZO. The targeted themes relate to climate change (CC) and management aspects of professional organizations.

These training sessions had an attendance rate that exceeded 100%, recording a female presence of 11% and a very good degree of satisfaction. The overall amount mobilized in this direction is 2 Mdh, at the rate of 40,000 MAD/workshop on average, i.e. almost 2,000 MAD/participant.

Training topics	Achievements	
	Dhs/Workshop	Dhs/Participant
Governance of water and sanitation services in the oasis environment facing CC	39 167	1 567
Integrated management of water resources in the face of CC	23 000	920
Project cycle management	41 667	1 667
Project funding	41 667	1 667
Participatory approach applied to adaptation measures	47 500	1 900
Conflict management and mediation	47 500	3 958

D. Investments for the realization of small local economic projects

The support and development of economic activities by financing small innovative projects has been very satisfactory.

Indeed, because of the importance that the oasis population attaches to small innovative projects, the PACCZO has contributed overall to the realization of 45 small innovative projects, compared to 20 small projects planned.

8.3.1.2 Quality of project management

The project implementation arrangements were complex and performance varied from one component to another but was generally very satisfactory. At the project management level, the EMO, the EE and the partners have shown enthusiasm and pragmatism throughout the past implementation period. At the regional coordination level, the CRCs were a privileged meeting place between the technical services of MAPMDREF, and functioned as decision making and problem-solving bodies. Furthermore, the participatory programming teams worked well.

At the implementation level, the EE and the partners with the support of the external TAs implemented the 5 components of the PACCZO satisfactorily and in accordance with the contractual deadlines of the markets thanks to several adjustments which were adopted to overcome institutional and technical difficulties (reallocation, cancellation, etc.). Thus, the project recorded savings during the implementation of some components, this surplus was mobilized to strengthen other components or to replicate actions that had been successful, the case of the rehabilitation of khettaras, the construction of recharge structures and support for small innovative projects. This demonstrates performance, in terms of organization, decision-making and above all involvement.

However, actions have not yet been initiated, namely the studies planned in the third component of the project, which hinders the rehabilitation and development of buildings, and also limits the performance of the project in terms of improving resilience. The monitoring-evaluation system has also not been introduced, but such a system must be integrated from the start in the various components of the project in order to re-examine the assumptions which are the basis of the project, and to take full advantage of these functions, not to mention that its cost will certainly have been reduced.

8.3.1.3 Risk analysis

The analysis of the risks identified during the design phase as well as their assessments lead to the conclusion that the PACCZO project is highly viable. The sensitivity analysis also shows that the main risks and opportunities, which could significantly affect its future viability, are:

- The **institutional risks**: related to the availability of personnel and the influence of interest groups;
- The **technical risks**: linked to the sustainability of project actions (infrastructure, AGR, etc.) and natural resources, in particular water resources;
- The **environmental hazards or natural hazards**: related to climate variability (eg, drought) or climate change;
- The **financial risks**: related to procedures for delegating credits from the Green Fund.

The main risks of the project were analyzed during the formulation phase. The table below presents the updated risk assessment matrix.

Indeed, the analysis shows that the PACCZO risk matrix includes a range of risks ranging from moderate to substantial. Overall, it does not present major risks, given that the project mainly concerns the improvement of the living conditions of vulnerable groups in oasis ecosystems subject to the effects of climate change.

In addition, other economic risks could be integrated into the monitoring matrix, such as **the intensification of inflationary pressures of internal and external origin** in Morocco and technological risks related to agricultural practices and innovative projects. We can then deduce that the improvement and diversification of income sources constitutes an important lever for the sustainability of the project, through the improvement of agricultural and non-agricultural performance, through the search for niches of progress, the generalization of high-performance technologies, the introduction of new activities, with a view to the intensification, diversification and development of agricultural products.

Indeed, on the technological level, the margin of progress in terms of productivity is still wide and certainly allows significant progress.

Table 4. Risk assessment matrix

Kind of risk		Description	Level	Reference situation	Mitigation measures	Completion status
Institutional	R1	The project is likely to suffer the consequences of insufficient personnel and/or a lack of qualified personnel, which will affect some of the project stakeholders.	Moderate	The risk for the Executing Agency (EA) is low, since ANDZOA has already demonstrated its ability to carry out similar projects and appropriate training will be organized for its staff.	Condition: low	Thanks to ANDZOA's extensive experience in managing similar projects, this risk is well under control. Currently, the project is being carried out under good institutional conditions thanks to external technical assistance and EE staff. However, for the partners, they raised the constraint of staff mobilization and its impact on their annual performance.
	R2	The approach advocated by the project risks being reduced or even diverted by local interest groups. participatory	Moderate	Emphasis will be placed on communication and outreach activities with stakeholders (also related to issues of ownership and consumer rights to natural resources) and identify and implement transparent, participatory and inclusive processes for planning and implementation.	Condition: average	The project is managed using a participatory approach that avoids any type of interaction of interests or resistance to project actions.

Kind of risk		Description	Level	Reference situation	Mitigation mesures	
					Completion status	
Technical	R3	À la lumière des expériences passées montrant les difficultés rencontrées dans des projets similaires couvrant géographiquement les zones reculées et défavorisées, les risques liés à la durabilité des actions demeurent possibles.	Moderate to Substantial	L'UGP établira et surveillera le respect des accords en matière de maintenance structurelle, d'équipement et d'acquisitions entre les usagers et leurs représentants avec les gestionnaires de projet.	Condition: average	Project terms of reference clearly specify the challenges associated with the work and services requested. Technical Assistance and EE teams and staff make field visits to monitor achievements.
	R4	Water mobilization structures (work of groundwater recharge, diversion sills) could affect access to resources at certain sites downstream	Moderate	The PGES will anticipate the completion of environmental impact studies before work is carried out on each structure in accordance with the legislation and to the guiding principles of the AF	Condition: low	Coordination and consultations are carried out regularly with the ABH-GZR (Guir Ziz Hydraulic Basin Agency) in order to avoid affecting access to the resources of the downstream sites. The project actions are programmed according to the recommendations of the ESMP (Environmental and Social Management Plan).
Environmental	R5	Adverse climatic conditions could have a negative impact on the success of the project.	Moderate to Substantial	The project aims to increase the resilience of systems in the face of climatic hazards.	Condition: average	The project area has experienced significant adaptations to climate change in the past. The project aims to improve resilience to climate change

Kind of risk		Description	Level	Reference situation	Mitigation measures	
					Completion status	
Financial	R6	Project activities may to be delayed by the funds transfer circuits.	Moderate	IE has extensive experience in managing funds in the form of grants. EI and the Executing Agency will build the capacity of staff assigned to the management financial of the project.	Condition: average	The EMO Implementing Entity and the EE have intervened with the funder to expedite payments. In addition, adaptations have been made to deal with this type of situation (amendment of PBTAs, reallocation, etc.).

8.3.2 Performance

8.3.2.1 Performance of financial management

At this terminal evaluation, the proposed financial management arrangements were found to be satisfactory, with a risk level of “medium” due to the measures undertaken by the implementing entities (ENM) and executing (EE). During implementation, risks were managed through procedures detailed in the Implementation Manual, capacity building, and initially close supervision by the DA and its external assistance.

An adequate control system was in place by the public administration including the EE and implementing partners to ensure the integrity of transactions. This internal expenditure control system guarantees the separation of functions through a number of ex ante control levels, involving three independent players:

- the authorizing officer for the administrative phases of expenditure commitments, certification of services rendered, and issuance of payment orders;
- the financial controller for expenditure control at the commitment stage;
- the paying treasurer for the control of expenditure at the payment stage, and the actual payment.

The main problems were related to the transfer of funds. These problems were partly solved, on the one hand, by the very active follow-up of the staff of the implementing entity and their external assistance, and on the other hand, by the adjustments of the executing entity and partners.

In the context of supply management, and despite the development of the Procedures Manual and the efforts made to provide training programs at central and local levels, regional conditions and procedures relating to supply have proven to be sometimes constraining to effective implementation. Particularly at the local level, many contracts have been unsuccessful, usually due to a lack of sufficient qualified bids or budget overruns. In some cases, three attempts were made before the contract was finally awarded.

8.3.2.2 Partner performance

The performance of the ORMVAs, the ABH-GZR and the other structures that contributed to the implementation of the project can be considered globally satisfactory, as evidenced by the level of physical achievements, the credit consumption rates and the relevance of the majority of components implemented. Generally speaking, the institutional set-up put in place under the program worked well. The steering (COFIL: Project Steering Committee), coordination (CRC: Regional Coordination Committee) and execution (PMU: Project Management Unit) structures have accomplished their respective missions satisfactorily:

A. Partner performance

In addition to the financial contributions of partners recorded at the level of the agreements, human and material contributions have not been accounted for.

Indeed, the Hydraulic Basin Agency mobilized, within the framework of the PACCZO, 9 executives without counting the director and 3 technicians. The Regional Office for Agricultural Development of Tafilalet, for its part, has mobilized 15 executives and 10 technicians from 4 different subdivisions. In

addition, 10 executives and 6 technicians were mobilized at the level of the Regional Office for Agricultural Development in Ouarzazate. We are talking about time spent, vehicles mobilized and means of operation, which rises from the budget of the agency and the offices and which should normally serve the own objectives of each. The mobilization of these human and material resources contributed mainly to achieving the results recorded. However, they can sometimes constitute an obstacle, in particular when it comes to lack of staff, multiplicity of tasks or travel without material motivation, since the executives and technicians of the offices and the basin agency are not pay for travel outside working hours.

B. Performance of the PMU/ADA and its TA

Technical monitoring and support missions carried out by ADA and its Technical Assistance, from 2016 (PMU/ADA: 1 mission per year; AT/ADA: at least one supervision mission per quarter in addition to monthly monitoring activities with ANDZOA), were of capital interest and of good quality from an analytical point of view. They allowed:

- Good understanding, by the various partners, of the basic concepts of the program and its implementation manual;
- The support of the partners concerned by the program in its implementation through the support of the two ORMVAs and the ABH-GZR. This support concerned:
 - Procurement procedures according to the regulations of the Green Fund (preparation of calls for tenders, evaluation of technical offers and award of contracts);
 - Project financial management procedures;
 - The rapid resolution of project management problems in consultation with all the partners concerned by the project (DF of MADRPMEF and Ministry of Economy and Finance etc);
 - The definition, in consultation with the national management of the project, of the methods of execution of certain components of the program;
 - Identification of difficulties and proposal of relevant recommendations to overcome these difficulties and thus allow the acceleration and improvement of the implementation of project activities.

8.4 Efficiency

The effectiveness of the project is defined through the assessment of the effectiveness of its components and activities.

In terms of intervention approach, the participatory approach adopted by ANDZOA for the realization of the PACC-ZO, the foundations and principles of which are based on the participatory approach, synergy and complementarity and territorial equity, has allowed the appropriation of the project both by institutional bodies and by the beneficiary populations.

In addition to the approach adopted, the agreements signed with the partners - between the EE and the ORMVAO, the ORMVATF and the ABH-GZR for the construction and rehabilitation of hydro-agricultural developments, the fight against silting and support for producers in the certification process, and between the EE and the associations, cooperatives and CTs concerned by the calls for innovative projects - have also undeniably contributed to the institutional management of the project and thus to its implementation.

Indeed, the co-financing of the partners for the realization of works and small local projects has led to the direct involvement of the various partners concerned, and has consequently acted on the quality and the way of carrying out the activities in question. This also leads to a kind of assurance of the sustainability of the actions carried out. It should be noted that this question of sustainability was supported by the formal commitment of the beneficiaries. At present, 17 commitments have been made concerning the main projects, namely works, khetaras, seguias, boreholes and water points.

In terms of mobilization and protection of natural resources, the projects undertaken for the construction of new hydraulic infrastructure to better regulate access to surface and underground water, and the rehabilitation of obsolete structures to improve the efficiency of water distribution, recorded:

- ✓ The construction of 60 Seguias over a length of 21,190 ml, compared to the 23 Seguias planned, i.e. a completion rate of 261%;
- ✓ The rehabilitation of 49 Khetaras over a length of 8,800 ml, recording a completion rate of 272%;
- ✓ The construction of 07 artificial groundwater recharge structures, compared to 04 scheduled structures, or 175% of the objective. ;
- ✓ The construction of 25 oasis protection walls on 4,450 ml,
- ✓ The construction of 07 diversion thresholds,
- ✓ Carrying out all the studies prior to scheduled hydraulic interventions,
- ✓ Execution of 4 boreholes: a deep borehole of 650m and 3 boreholes of 90m each;
- ✓ Digging of 3 wells of 30m each, for the nomads; And
- ✓ The acquisition and installation of 04 devices for monitoring and measuring the water table.

It turns out that at the level of the component linked to the water sector, the level of achievement is considered very satisfactory. As shown in Table 11, the indicators show that the actions have exceeded the set objective.

According to the performance results recorded, we are witnessing an improvement that is highly appreciated by all the activities started, in particular those of the recharge structures and which have resulted in a remarkable improvement manifested by an improvement in the efficiencies that can be mobilized at the level of the study area. Indeed, the improvement in water deficit has improved by

24% the security of the population in drinking water and irrigation water and this through the improvement in efficiency (development of Séguia and Khettaras). The indicators of the impacts of these achievements will be discussed and concretized thereafter.

However, difficulties are encountered in the implementation of some actions, the case of the exploration study of deep water resources, and the identification of priority sites for recharge works and protection works. Indeed, these stocks lack bidders, given the unavailability and sophistication of using punching. The same goes for the monitoring and evaluation system, which also experienced a lack of bidders; this market therefore had to be relaunched 3 times, which explains the delay. Now the system is developed and is in the testing phase. All that remains is to speed up its activation and update it.

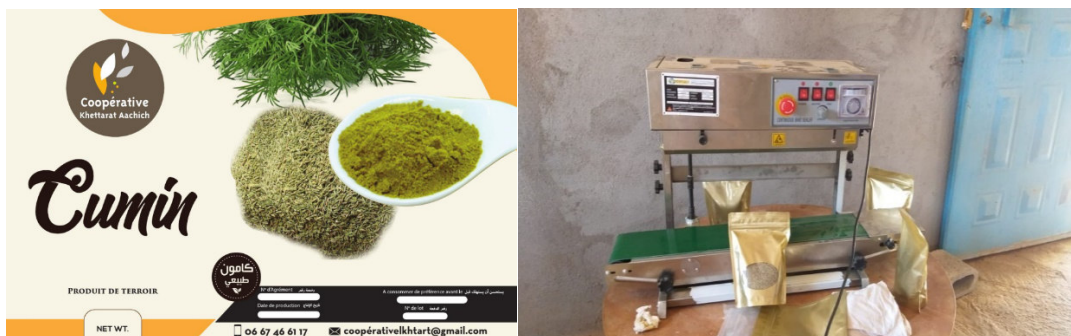
In addition, the allocations for activities related to constructions using local materials and the rehabilitation of kasbahs and ksours, were redeployed after consultation, in order to avoid duplication.

In terms of diversifying sources of income and improving the living conditions of populations vulnerable to climate change, the PACCZO plans to support the promotion of products by developing the certification of four products from the territorial agricultural value chains. At present, three products have been addressed: cumin, henna and dates, farmers are supported throughout the process of certification of cumin producers by ORMVAT and henna producers by ORMVAO. At this level, the financial commitment has reached 100%, however the physical achievements of this activity are still in progress. In this sense, the packaging supplies, kits, flyers, business card and roll up were received and distributed, registering 17 NGOs producing henna and 10 NGOs producing cumin as beneficiaries.

Box 1. Support for the implementation of Cumin certification – 2017-2019

Box 2. Support for the implementation of Cumin certification – 2017-2019

The PACCZO project has given rise to the development of other actions concerning the cumin sector and this within the framework of a Pillar II project of the Green Morocco Plan entitled "Development and promotion of cumin in the Alnif area".



The implementation of these actions was done within the partnership framework aiming for complementarity and synergy between ANDZOA and ORMVATF. Among the activities carried out:

- ✓ Technical and economic feasibility study of a cumin recovery unit in the Alnif area;
- ✓ Identification of the land base that will house the cumin development unit in close collaboration with the beneficiaries and the local authorities;
- ✓ Research agreement with INRA which covers:
 - Development of local cumin seed

- Conduct of experimental trials in order to highlight the interest of localized irrigation on the cultivation of cumin
- Conversion of cumin to organic production as a demonstration by some farmers
- Development of means of combating vascular diseases of cumin, in particular Fusarium wilt, which constitutes a major threat for cumin producers in the Alnif region.

It should be noted that the completion of this project was entrusted to ORMVAO following the new territorial division.

Training and an exchange trip were organized as part of the support program of cumin producers in the certification process



Regarding non-agricultural economic activities, the project records the development of 21 units that are developing in a manner adapted to climate change, compared to 20 non-agricultural economic units planned, ie the achievement of 105% of the objective.

The PACCZO also provides for the training of farmers in conservation techniques, this action has been completed, recording the realization of 32 workshops on 3 different themes for the benefit of 616 beneficiaries, the achievement rate at this level is 77%. The same goes for the development of tourist units that develop in a way that is adapted to climate change, the market is awarded, however the action is not completely completed. At this level, two studies have been carried out, namely the study of wastewater from 10 tourist units and the study of identification and valuation of niche tourism products to be developed, and training of 350 local tourism stakeholders has been conducted.

In addition, 45 small innovative projects have been carried out relating to the main activities of the oases (agriculture, tourism, drinking water, crafts and the environment), in favor of the different categories of inhabitants, in particular women. , young people, craftsmen, farmers and all other actors involved in the main sectors of activity of the oases. The physical achievement rate for this section exceeded 200%.

Box 2. Project funding within the framework of calls for projects

Box 2: Project funding within the framework of calls for projects

Given the importance of calls for projects in improving people's incomes and living conditions, 45 projects were funded over the three years.

The main areas concerned are agriculture, the environment, crafts and tourism.

These activities are very popular with the oasis populations, especially women and young people, because these small projects are considered as generating and employment activities.

In addition, some projects financed by the PACCZO have repercussions on the whole of the entire population of the oasis: AEP, solar energy equipment for wells for collective irrigation, the acquisition of equipment for the fight against fires ...etc.



In terms of studies carried out, the project carried out two preliminary studies; one relates to the reference situation (baseline), and the other relates to the environmental and social assessment impact study and development of environmental and social management plans relating thereto at 56 sites relating to the works hydraulic systems, PMH facilities, protective walls, boreholes that fall within the target areas.

However, ANDZOA has carried out a set of studies, namely the study on the management of wastewater from the tourist structures of the oases and measures to mitigate their negative effects, the study on the experiences of good practices, agro-ecological techniques ecological and conservation, the study on the diagnosis of the current situation of the populations of the acacia Raddiana, the tracks and possibility of valorization of its products and the methods of organization of the beneficiaries, as well as the study of constitution of a documentary fund gathering studies, research and similar concerning oases and climate change in oases. Indeed, this fund has made it possible to collect 2,915 documents dealing with the different aspects of oasis activities. The study for the development of a project of charter on water and climate change in oasis areas and the study to identify and promote niche tourism products to be developed in oasis areas have been completed.

In terms of improving the resilience of ecosystems in response to climate change and variability, the PACC-ZO has initiated actions for the fight against the two main threats to the oasis ecosystem, namely silting and pollution, this component has taken into consideration the preservation and enhancement of heritage through the rehabilitation and development of palm groves and the fight against fires.

In terms of fighting against silting, two protection measures have been adopted under the ANDZOA/ORMVAT agreement, an additional contract (01/2021/OR/TAF) started in 2021 and aims to carry out the mechanical fight against silting at CT Ferkla Soufla and Sidi Ali. The physical progress of said market is 90%. The action undertaken consists of the construction of palm lockers (physical struggle), once the sands have stabilized, the planting of plant species resistant to drought and salinity takes place (generally plantations of tamarix aphylla and atriplexcanescens). These measures enabled the protection of 120 ha against the planned 40 ha.

Box 3. Fight against siltation to improve the resilience of ecosystems in response to climate change and to variability

In oasis areas affected by the impacts of climate change, the occurrence of violent events and the increased risk of silting linked to desertification require better protection of vulnerable structures in order to guarantee their proper functioning (oases, khetaras and irrigation canals, roads...).



More than 17 localities have benefited from the fight against sand encroachment by setting up devices based on date palm fronds as well as gabionnage. The localities that have benefited from these activities are listed in the table above :

Partners	Localization CT and douars and Consistency	
ORMVAO	Ait Boudaoud	Gabion wall of 1242.50 ML: (AMRAD 496 ML / Tazarine site 01 405 ML / Tazarine site 2 350 ML)
	Tazarine	
	Tazarine	
	Ait Boudaoud	Construction of palm fences braided with iron wire.
	Taghbalet	- Left bank on Wadi Tazarine: 6000 ML.
	Tazarine	- Amrad Ct Ait Boudaoud: 6000 ML. - Taghbalet : 12 000 ML.
ORMVAT The fixing of sand dunes by a network of grid in flippers of lozenge form of 6 * 6 ou 6*7	Ferkla El Oulia at the level of the ksours threatened among others sate on 4,110 ml; and Sidi Ali at the level of tafraoute over 19,180 ml Province of Errachidia and Alnif at the level of the ksours ait zeggane over 4,110 ml Province of Tinghir (40 ha).	
	C.T Sidi Ali : At the level of the lghf Nighir zone over 6,200 ml, i.e. 2 ha.	
	C.T Sidi Ali : At the level of the Rass lghf Nighir zone over 4,650 m, or 1.5 ha.	
	C.T Sidi Ali : At the level of the Tafraoute zone over 12,400 ml, i.e. 4 ha.	
	C.T of Alnif : At the level of the Tachoufite ksar over 31,000 ml, or 10 ha;	
	C.T Hssiya : At the Amardoule perimeter, Ksar Elhazbane, over 31,000 ml, i.e. 10 ha.	
	C.T Ferkla Soufla : At the locality Ait Ben Omar on 31,000 ml, or 10 ha.	
	C.T SIDI ALI : At the localities Tazougguarte and Chachite La Maider over 124,000 ml, i.e. 40 ha.	

The project provides for the fixation of 40 ha, currently the devices installed have allowed the fixation of more than 120 ha.



ANDZOA and its partners are committed to carrying out complementary and sustainability actions via a pilot action combining biological control and mechanical control. This involves digging a well and equipping it with solar energy and planting trees suitable for the area concerned (Acacia, Tamarix, etc.) inside the palm palisades installed by the mechanical control mechanism.

Regarding the fight against pollution, the project achieved the objective set in terms of training and visits, recording the training of 398 people, including 41 women, in pollution control techniques, which were almost non-existent in the oasis areas. The topics covered and the visits scheduled are as follows:

- Theme 1: Pollution control and water treatment techniques.
- Theme 2: Phyto-purification techniques.
- Theme 3: Recycling techniques.
- Visits: Organization of guided visits to wastewater treatment plants in the cities of Ouarzazate, Agadir, Tinjdad and Fez.

The actions planned with the aim of preserving and enhancing the heritage concerned the improvement of access to the palmerais by the development of 4 spaces with the rehabilitation and equipment of 8.5 km in solar lighting, i.e. a rate of realization by 85%.

Regarding the fight against fires, the project was carried out in partnership with the Ferkla oasis development and heritage association, and involved the distribution of firefighting kits for the benefit of 14 AUEAs, i.e. a performance rate of 140 %, the development of 4 spaces and 7 water points for the fight against fires.

In addition, training was organized and led by the CIVIL PROTECTION services for the benefit of the professional organizations benefiting from the firefighting and prevention kits. The objective is to allow these actors to have some useful technical skills which will enable them to act in the event of an emergency (triggering of a fire) before the arrival of the civil protection service on site.

In terms of raising awareness, Awareness raising made it possible to reach 29,653 households in the target municipalities informed of the challenges of climate change, ie an achievement rate of 118%. The activities carried out under this component are:

- ✓ Development of a communication strategy and organization of awareness campaigns: organization of 8 awareness campaigns on “the oases of Morocco in the face of climate change”;
- ✓ The organization of 6 thematic conferences on water;
- ✓ Organization of 72 awareness-raising workshops on climate change for the benefit of pupils of the last year of primary school, at the level of 24 schools in the provinces of Errachidia and Tinghir;
- ✓ The establishment of a Documentary Fund (FD) through the inventory and collection of existing data and documents: inventory and digitization of 2915 documents;
- ✓ Strengthening of the management monitoring system: Acquisition and commissioning of 02 servers dedicated to the management of the GIS database at the level of the ABH-GZR, hosting of the ABH-GZR website, acquisition and installation cartographic server license;
- ✓ The development of a charter on water and CC in an oasis environment: for the intermediate Gheris zone and for the Maïder zone, with the constitution and designation of the president and members and the secretariat of the Local Water Council (KEY).

In terms of capacity building participants in the design and implementation of adaptation measures, 108 training workshops on 6 different themes were carried out, recording the participation of 2,178 people. Thus, we are witnessing the completion of 92% of the planned workshops.

Training topics	Project's objectives		Achievements	
	Number of workshops planned	Number of Attendees planned	Number of workshops realized	Number of Attendees helpers
Governance of water and sanitation services in the oasis environment facing CC	12	240	7	175
Integrated management of water resources in the face of CC	20	400	12	300
Project cycle management	12	240	14	252
Project funding	24	720	28	731
Participatory approach applied to adaptation measures	12	240	7	175
Conflict management and mediation	12	144	12	144
The implementation and concerted management of projects	24	384	28	401
TOTAL	116	2 368	108	2 178

In addition to these training sessions, 7 workshops have been scheduled for the benefit of local tourism stakeholders. Three themes were covered in this training:

- Theme 1: Cropping techniques that conserve water.
- Theme 2: water saving techniques.
- Theme 3: Conservation techniques for agricultural products of plant and animal origin.

And still within the framework of capacity building, the PACC-ZO recorded the organization of the international conference "The contribution of new technologies (GIS and Remote sensing) in monitoring the dynamics of the oasis ecosystem and in forecasting natural risks in the face of climate



change and anthropogenic actions”. The conference had a massive turnout, around a hundred national and international participants, which took place from November 20 to 24 at the Kenzi Azghor hotel in Ouarzazate.

In addition, 19 workshops and 15 trips were carried out for the benefit of local actors and partners who contribute to the implementation of PACC-ZO activities. These visits and trips make it possible to strengthen and consolidate the capacities of adaptation to climate change not only of the oasis populations, but also to have the same level of information and training of the public officials involved in the management of the PACCZO. These activities involved 502 participants, 357 managers and 583 beneficiaries involved and trained in the design with enhanced capacities for managing adaptation projects.

Box 3. Raising awareness and strengthening the capacities of actors in the design and implementation *adaptation measures*

As part of improving awareness and building the capacity of stakeholders in the design and implementation of adaptation measures, several activities were organized as part of the climate change adaptation project (PACCZO). The distribution of these activities by modality in the following table:

Modality	Quantity	Number of beneficiaries
Training	108 workshops	2178
Exchange /visit trips	15 exchange /visit trips	583
Awareness campaigns	72 workshops	Students from 24 primary schools

In empowerment of women's participation in the activities and achievements of the project, the analysis of participation shows that women are always present in training, but the level is below the expected rates.

Training on climate change (CC) and aspects of management of professional organizations recorded an average participation rate of women in the order of 11%. The participation rate of women by training topic is as follows:

Theme	Women’s rate of participation
<i>Governance of water and sanitation services in the oasis environment in the face of climate change CC</i>	5%
<i>Integrated management of water resources in the face of CC</i>	9%
<i>Project cycle management</i>	14%
<i>Project funding</i>	14%
<i>Participatory approach applied to adaptation measures</i>	12%
<i>Conflict management and mediation</i>	14%

The training of local actors, who are interested in pollution and the reuse of wastewater, also recorded a participation rate of women from **11%**. Women were also present in visits and trips with a rate of **14%**.

The highest participation rate of women was recorded at the level of support, training and support workshops for the oasis population aiming to acquire professional knowledge in promising trades for adaptation to climate change to promote value-added activities and support job creation and income generation. The rate recorded at this level is **28%**.

Moreover, women have shown strong involvement and a marked dynamism vis-à-vis small innovative projects, in fact more than half of the calls for projects recorded are women's initiatives.

In terms of physical achievements, the project has made remarkable progress in the water sector; all the actions of component 1 have been addressed, the technical studies have all been completed, and the resulting constructions and rehabilitations have been achieved overall. We are thus witnessing achievements that in some cases exceed the assigned objective (the case of rehabilitation of hydroagricultural facilities) and others in the process of being completed.

The second component is marked by the realization of small innovative projects, having known a convincing success, the advancement in the training of the farmers and the valorization and the certification of the agricultural products, the development of non-agricultural economic unit and the development of the activities tourist.

The actions of the third component have made significant progress in terms of improving the resilience of ecosystems through the fight against the main threats, namely silting, pollution and fires. The areas protected against silting, the areas fitted out for the fight against fires recorded performances that exceeded the planned objectives.

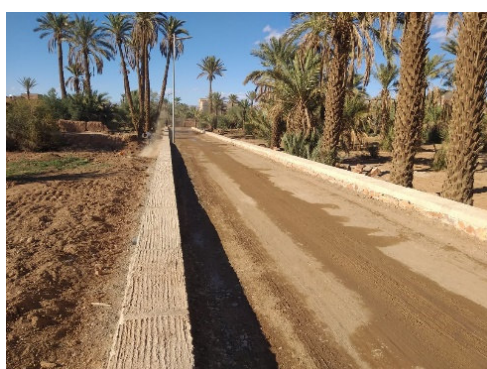
Box 4. Territorial & Landscape Valorization of Moroccan oases and firefighting

For the enhancement of the oasis heritage through vital environmental activities highly valued by the beneficiaries and which can provide solutions to problems/phenomena threatening the existence of the oases, the oasis of Tinjdad has benefited from an integrated development plan and participatory. The main achievements of this plan are as follows:

- Development of 8.5 km of access tracks within the palm groves (rehabilitation, etc.);
- Equipping the tracks with solar lighting (35 lighting poles);
- Development of tourist interpretation spaces :
 - Development of the circuit track over 2.2 km;



- Development of a rest area instead of the Tasbelbat spring;
- 33 nameplates.
- Development of 18 water points and poles for the fight against fires;
- Cleaning of 150 ha of clumps;
- Distribution of 6673 vitro plants (vitro plant);
- Acquisition of fire-fighting equipment;
- Construction and development of the irrigation network and works of art:
 - 1.6 km of seguias;
 - - 225 m of protective walls;
 - - Digging and equipping a borehole.



Ksar El Khorbat located 50 km east of Tinghir in the Oasis of Tinjdad (lower Todgha valley) has benefited from these activities. The secular Ksar is today a tourist attraction with high potential, which is part of the region's ecotourism program. Indeed, part of the Ksar has been transformed into a museum, craft workshops and above all into a lodging which offers a unique experience to spend nights in rooms ingeniously integrated into this authentic Ksar.

In addition to its socio-economic role, the Territorial & Landscape Valorization of Moroccan oases and firefighting project also aims to use ecotourism to preserve the architectural and historical heritage embodied by the Kasbahs.

Box 5. Valorization of date palm by-products and promotion of self-employment in the Jorf areas, Erfoud and Rissani

A project entitled "Valorization of date palm by-products and promotion of self-employment in the areas of Jorf, Erfoud and Rissani" was formulated within the framework of the new agricultural strategy "Green Generation". . This project is for an amount of 18,730,000.00 DH and is spread over a period of 4 years.

Expected objectives of the project :

- Promoting the self-employment of rural youth through support for the creation of service delivery cooperatives and developing them into micro-enterprises;
- Diversification and improvement of farmers' incomes;
- Improvement of date palm productivity by adopting good practices, in particular the cleaning of clumps (increase of 10 to 15%);
- Sustainability of the maintenance operation of the palm groves through the use of the farmers themselves to the operation of cleaning the tufts without the intervention of the State within the framework of the program of restructuring of the palm groves. This is attributed to the value that these by-products will have with the establishment of the unit;
- Valorization of date palm waste and scrap through the production of heating briquettes, biochar, litter and animal feed;
- Contribution to sustainable development through an alternative energy supply to firewood with a view to alleviating the pressure on forests;
- Improved resilience to the effects of climate change and fire mitigation at the oasis level;
- Improvement of livestock productivity in the area, in particular D'Man, through the formulation and production of balanced feed based on date scraps and stalks.

Project component :

- Component 1

The first component concerns support for service provision cooperatives. The specific objective is to make service provision cooperatives active and operational and to develop them into microenterprises likely to respond to the dynamism experienced by the date palm sector in the ORMVATF area of action. To reach this goal, the project foresees 3 activities to know :

- Support for cooperatives in terms of organization, installation, capacity building, training and supervision.
- Equipping service cooperatives with the equipment needed to provide agricultural services for the benefit of farmers, in particular, equipment for cleaning clumps.
- The provision of means of transport (Tractor with trailer) to service provision cooperatives for the collection and transport of biomass (palms, date bunches, etc.) resulting from the operation of cleaning the clumps and carrying out other agricultural services.

- Component 2

The second component concerns the valorization of date palm by-products. Indeed, the cultivation of the date palm annually offers a wide range of organic by-products. However, this deposit is increasingly abandoned or incinerated for fear of the spread of Bayoud disease. This abandonment has led to the accumulation, over the

years, of a significant biomass at the level of the Oasis. This biomass increasingly constitutes black spots of pollution of the oases, very high fire risks, sources of propagation of cryptogamic diseases and pests (Bayoud and white cochineal). However, there are several recycling and recovery techniques for this deposit. Among these techniques, we can cite cattle feed, the manufacture of

firewood and the production of a "biochar" by the technique of pyrolysis. It is in this perspective that this project falls under which plans the installation of a complex of valorization of the by-products of the date palm through the construction and equipment of the valorization units.

These units revolve around valuation options, namely:

- ✓ Firewood manufacturing unit in the form of densified or granulated wood
- ✓ Biochar production unit
- ✓ Livestock feed manufacturing unit
- ✓ Compost production unit based on date palm by-products

It should be noted that the implementation of this project began in 2022.

All the actions under components 4 and 5 achieved satisfactory results in terms of improving the awareness of stakeholders and building capacity.

Table 5. Performance measurement framework

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
Component 1. Improving the adaptive capacities of the water sector	1	Variation in groundwater level	19 m	14 m	11m	17 m	480%	0%
	2	Improved water access rate drinkable	-	615 Households	615 Households	2 540 Households	24%	76%
	2'	Additional irrigated area	-	375 ha	585 ha	400 ha	146%	0%
	3	Number of recharge structures operational	-	3	7	4	175%	0%
	4	Number of dominated perimeters protected	-	2	14	4	350%	0%
	5	Number of feasibility studies carried out	-	4	4	2	200%	0%
	6	Improving the efficiency of irrigation networks	50%	69%	69%	70%	99%	1%
	7	Number of Khettaras	-	23	49 (8 800 ml)	18	272%	0%
	8	Number of Khettaras operational	-	23	49	18	272%	0%
	9	Area dominated	-	95 ha	275 ha	200 ha	137,5%	0%
	10	Length of PMH networks landscaped (number of seguías)	-	18	60 (21 190 ml)	23	261%	0%
11	Area dominated	-	280 ha	310 ha	200 ha	155%	0%	
Component 2. Diversification of income sources and improvement the living conditions of	12	Percentage of households participating in the project having adopted at least one measure of resilience.	20 047	7 913 Households	7 913 Households	2 540 Households	311%	0%
	13	Added value of production	19 000	24 000	22 581	31 000	73%	27%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
populations vulnerable to climate change in target areas	14	Number of farmers trained in conservatory techniques	0	616	616	800	77%	23%
	15	Number of certified products and represented at fairs	-	2	3	4	75%	25%
	16	Number of economic units no agriculture that develop from way adapted to climatic change.	-	21	21	20	105%	0%
	17	Number of tourist units that develop in a manner adapted to the climate change.	-	-	10	5	200%	0%
	18	Number of projects funded		21	45	20	225%	0%
	19	Number of trainings carried out	0	3	4	2	200%	0%
Component 3. Improvement of ecosystem resilience in response to climate change and to variability.	20	Number of oases that reduced threats to the ecosystem and preserve their heritage	-	6	13	4	325%	0%
	21	Number of oases that reduced ecosystem threats	-	2	4	4	100%	0%
	22	Area protected against silting	-	30 ha	120	40	300%	0%
	23	Protective measures applied	1	1	2	2	100%	0%
	24	Area protected by involvement target population	-	30	120	40	300%	0%
	25	Number of actors trained	-	398	398	400	100%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
	26	Types of clearance techniques treaties	-			-	100%	0%
	27	Number of requests for the rehabilitation after project	-	-		-	-	100%
		Lengths rehabilitated and equipped in solar lighting	2		8,5 km	10 km	85%	15%
		Number of equipped spaces	0		4	2	200%	0%
		Number of water points developed	0		7	05	140%	0%
		Number of AUEAs equipped	0		14	10	140%	0%
	28	Construction rehabilitated and used	-	-		>=1	-	-
	29	New construction with traditional materials	-	-		>=1	-	-
Component 4. Improved grip awareness of all stakeholders through the management and sharing of knowledge.	30	Proportion of households in target municipalities informed of climate change issues	20 756	22 867	29 653	25 154	118%	0%
	31	Realization of the charter on water and climate change in the environment oasis	-	1	1	1	100%	0%
	32	Number of conferences themes organized by the Local Water Council	-	3	6	6	100%	0%
	33	Number of mass communication campaigns	-	8	8	4	200%	0%
	34	Number of initiatives of sensitization	-	36	72	50	144%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
Component 5. Strengthening of capacities of participants in the design and implementation measures adaptation	35	Total number of officials and beneficiaries involved trained in design with enhanced project management capabilities adaptation	-	129 resp. 216 beneficiaries	357 resp. & 583 beneficiaries	240 resp. 400 beneficiaries	147%	0%
	36	Number of officials and beneficiaries whose capacities adaptation to climate change have been strengthened	-	287 resp. & 114 beneficiaries	341 resp. & 340 beneficiaries	240 resp. & 400 beneficiaries	85%	15%
	37	Number of training workshops	-	7	14	12	117%	0%
	38	Number of participants.	-	184	252	240	105%	0%
	39	Number of training workshops and travel/internship	-	8 workshops + 10 trips	19 workshops+15 trips	20 workshops & 15 trips	97,5%	2,5%
	40	Number of participants	-	332	502	400	125,5%	0%
	41	Number of managers	-	357	357	240	149%	0%
	42	Number of beneficiaries	-	583	583	400	146%	0%
	43	Number of training workshops in design and financing of projects.	-	14	28	24	117%	0%
	44	Number of participants	-	310	731	720	101,5%	0%
	45	Number of training workshops in design and financing of projects.	-	14	28	24	117%	0%
	46	Number of participants	-	273	401	384	104%	0%

8.5 Effects and impacts

8.5.1 Impacts of interventions related to water resources management

The assessment of the impact of PACCZO actions in terms of water resource management in oasis areas is based on the calculation of various indicators.

The impact of actions related to the improvement of adaptive capacity is felt on the level of the water table, on the improvement of the rate of access to drinking water as well as on the extension of irrigated areas.

While the impact of improving the efficiency of water distribution is similar to the evolution of the 4 indicators; water productivity, water recovery, the share of areas occupied by high value-added crops and the rate of crop intensification. The calculation of these indicators was made possible by the surveys carried out during the execution of the final evaluation.

8.5.1.1 Variation of groundwater level

Following examination of the document on the results of monitoring indicators at the level of the Tinjdad recharge works complex, and according to the history of the measurements of the levels of the water table in relation to the ground at the level of the 3 piezometers on the right of the 7 recharge structures, it turns out that the structures made it possible to achieve a rise in the water table towards a piezometric level in relation to the ground, recording a depth of 8 to 12 m in relation to the ground which is clearly greater than the reference value (19 m/ground) and also significantly higher than the expected target value for the target area (17 m/ground). It should be noted that the duration of observation of the rise in the level of the water table varies from one piezometer to another (between 2 weeks and 6 weeks) from the time of the occurrence of the flood.

It is then concluded that the recharge structures made it possible to reach a minimum piezometric level of the water table of the order of 14 m/ground, clearly higher than the target value expected by the project (17 m/ground), and thus record an achievement rate of 250%. The effect of the works was also felt at the level of the wells and khattaras, where the water level increased a few days after the passage of the floods retained in the works carried out. However, this rise in the piezometric level is limited in time (6 weeks maximum) and thus depends on the duration of the flood.

The following figure shows the evolution of the level of the water table felt after construction of the structures.

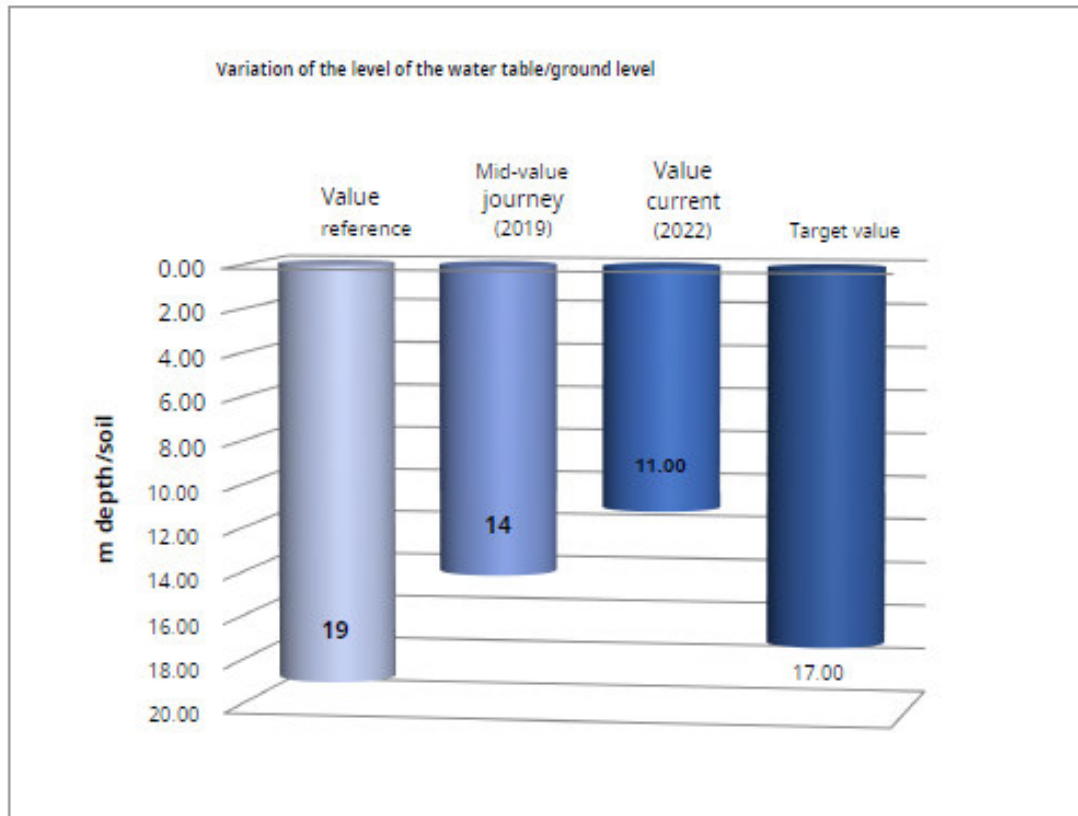


Figure 7. Evolution of the groundwater level

The following box outlines all of the effects felt after construction of the recharge structures and summarizes the testimonies of the beneficiary population.

Box 6. Construction of an artificial aquifer recharge structure in oasis areas

Within the framework of actions for the sustainable development of hydraulic structures and protection for the joint regulation of groundwater and surface water, there was the construction of 23 artificial groundwater recharge structures including i) seven (7) recharge carried out by ANDZOA (PACCZO) ii) three (3) by ORMVATF iii) Sixteen (16) by ORMVAO and iv) three (3) by ABH-GZR.

More than 26 piezometers integrated with a GIS unit have been acquired to monitor the real evolution of the groundwater level on several sites.



The monitoring of the piezometric data of the works carried out in the intermediate Rhéris made it possible to achieve a rise in the water table towards a piezometric level which varies between 8 and 12 m in relation to the ground which is clearly higher than the reference value (19 m/ ground) and also significantly higher than the expected target value for the target area (17 m/ground).

According to the first results recorded following the last flood, we are witnessing:

- An improvement in the level of the water table,
- Water storage for long periods;
- Improved flows of irrigation networks and Khetaras;
- Increase in additional irrigated area;
- Etc..

Following the results induced by the construction of these structures, there is an upsurge in demand for the construction of recharge structures. This achievement constitutes the best jewel of the PACCZO. Indeed, the populations concerned expressed their contentment, they postulate that the water persisted for almost 3 months in the structure, which allowed the aquifer to recharge, thus and just a few days later the effect on the wells and khetaras was felt; the water level to rise to almost 8 meters of water height. A farmer adds: “Before, we didn't take advantage of flood water, but now, thanks to the construction of these works, we take full advantage of it. »



Photo n°1 : Full dam, speed of the flood slowed down, groundwater replenishment



Photo n°2 : Gabion anchor ensuring the solidity of the work



Photo n°3 : Two months after the flood, the upstream of the structure still shows traces of water while downstream, the bed of wadi is dried up.

8.5.1.2 Improved rate of access to drinking water

The various actions carried out, in terms of construction of recharge structures, construction and rehabilitation of khattaras and seguias as well as the equipping of wells with solar energy intended exclusively for AEP, aim to ensure the improvement of the situation. 10% of the population of the project area, i.e. 2,504 households.

At present, the project has served 615 households with drinking water. Thus, the indicator relating to the share of the population supplied with drinking water thanks to the actions of the project is below the targeted objective, there is a deficit of 7.5% of the total number of households to be connected to a drinking water system. drinking water supply.

Table 6. Improved rate of access to portable water

<i>Indicateur relatif à la part de la population desservie en eau potable</i>		
Current value	Target value	Security rate in drinking water
2,5 %	10 %	25 %

Calculation of the indicator:

$$P= 100x N1/N2= 24\%$$

N1: Number of households connected to the AEP: 615 households,

N2: Total number of households in the area: 25,048 households.

8.5.1.3 Additional irrigated area

The water mobilized by the various hydraulic structures (Khattaras, Seguias and sills), built or rehabilitated by the project, allowed an overall increase in the irrigated area of 585 ha, compared to the planned 400 ha.

The additional irrigated area recorded by the Khattaras is 275 ha. However, the area irrigated in addition by means of seguias is 310 ha. The latter exceeds the projected area, this is explained by the increase in the dimensions of the channels (width of the slab and height of the walls) established to better take advantage of flood spreading.

Table 7. Additional irrigated area

	<i>Superficie irriguée additionnelle</i>		
	Current value	Target value	Performance rate
Khettaras	275 ha	200 ha	137,5%
Séguias	310 ha	200 ha	155%

However, faced with a fourth consecutive year of low rainfall (situation of water stress), the reduction in irrigation water allocations hampered the achievement of the targeted objectives in terms of agricultural development (crop intensification rate, productivity and recovery of irrigation water).

The equipping of wells and boreholes with solar energy has also contributed to the extension of irrigated areas and therefore the supply of drinking water. The following boxes present the impact of this equipment.

Box 7. Equipment in solar plates of the Tazoulayte well

Before the advent of the project, only a few old palm trees and tamarixes still survived, which led to the total abandonment of the oasis. The granting of the PACC-ZO contribution used for the deepening of wells, the purchase and installation of the pipeline and the construction of basins stimulated the resumption of agricultural activities: purchase and planting of 800 Fegous shoots and 400 vitro date palm plants irrigated in G to G.

The project addressed a new implementation technique, paving the pond to minimize evaporation, and considered the installation of flow meters for each plot to monitor water consumption.

The impacts resulting from equipping the well with solar energy are as follows:

- Sowing corn, beans, alfalfa, cumin, henna and wheat on 60 ha,
- Very affordable water price: 1.5 dh / ton,
- Establishment of a cash reserve of 5,400 dh for 6 months of operation,
- Creation of a permanent job post (caretaker).

Pictures : *To the left location of the palm grove before PACZZO.*

To the right *Resumption of agricultural activity: planting of young palm trees, normal adult palm foliage, alfalfa, Cumar and corn.*



Project leader : Tazoulayt Association for Culture and Rural Development/CT Mcissi.

- ✓ 30 ha exploited
- ✓ 300 inhabitants & 75 households.

Encadré 8. Equipement d’un forage en énergie solaire

The oasis experienced, before the implementation of the project, a decline of fruit trees and the lack of drinking water supply and consequently the abandonment of the palm grove, recording the emigration of 40 families or 45% of the population.

The equipment of the irrigation borehole with solar energy is responsible for the revival of the palm grove after a total drying up of the Khetaras, following the inability to pay the fuel bills and pay the operator's salary.

The project thus recorded the following impacts:

Reduction of operating costs by 3,000 dh/month,

- Practice of low crops (Corn, wheat and cumin), Creation
- of a permanent job position,
- Sufficient AEP, irrigation of 50% of the palm grove (20ha),
- Limitation of the decline of the arboreal heritage,
- Re-emission of dead trees and practice of some annual crops,
- The money saved will be used for the creation of an equipped borehole and the installation of a device to fight against silting.

Pictures : *To the left* Taken 5 months after the implementation of the project: the vegetation develops (supervision visit of the ADA),

To the right a few months after the implementation of the project



Project leader : Association Ennahda Almamounia / CT Ferkla Essoufla;

- ✓ Beneficiary population: 80 families, 750 inhabitants
- ✓ Area currently exploited 20 ha.

8.5.1.4 Water productivity

The indicator used to assess the efficiency of water distribution is water productivity, which relates total gross production to water consumption. The following table represents the evolution of irrigation water productivity:

Table 8. Evolution of irrigation water productivity

<i>Productivité de l'eau d'irrigation (DH/m³)</i>			
Reference value	Mid-term value	Current value	Target value
3,9	4,7	4,8	5,7

There is an improvement in productivity, recording 4.7 DH/m³ in 2019 and 4.1 DH/m³ in 2022 against a preliminary project value of 4.8 DH/m³. Thus, the objective has been achieved at 45% and 50% respectively.

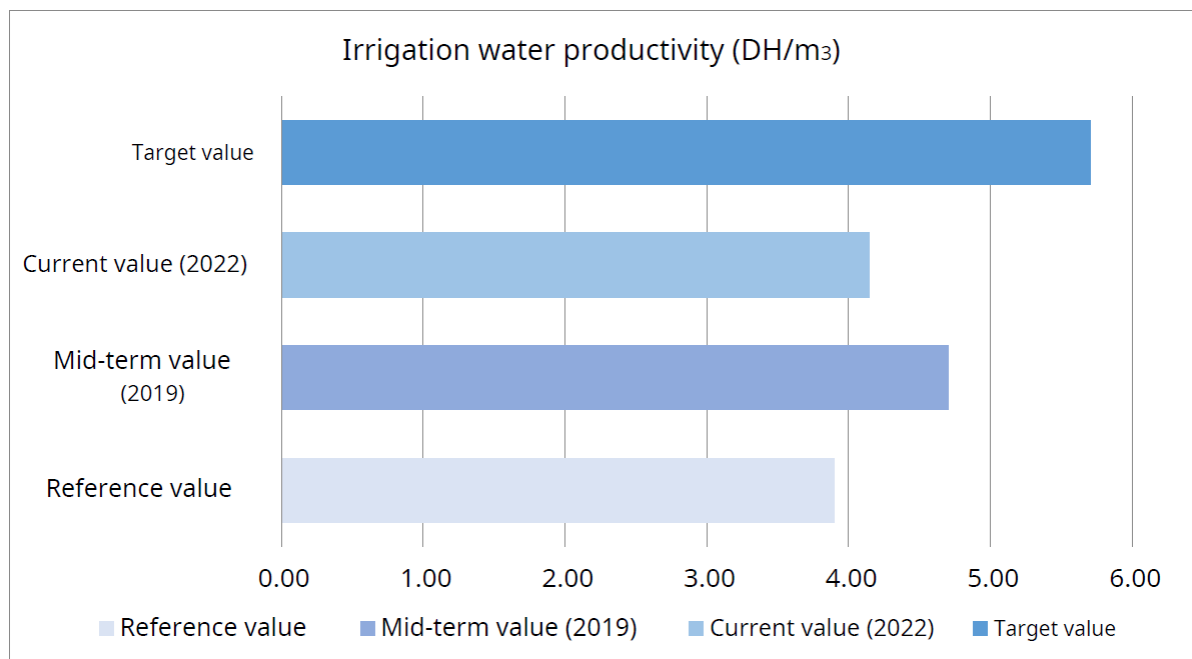


Figure 8. Irrigation water productivity (DH/m³)

8.5.1.5 Water valuation

In terms of wealth created by agricultural water, the PACCZO has enabled irrigation water to be valued in the order of 2.6 DH/m³ in 2019 and 2.8 DH/m³ in 2022. While the project aims for a recovery of around 3.5 MAD/m³, the project is thus at 53% and 64% of the assigned objective.

The evolution of the valuation of irrigation water is presented below:

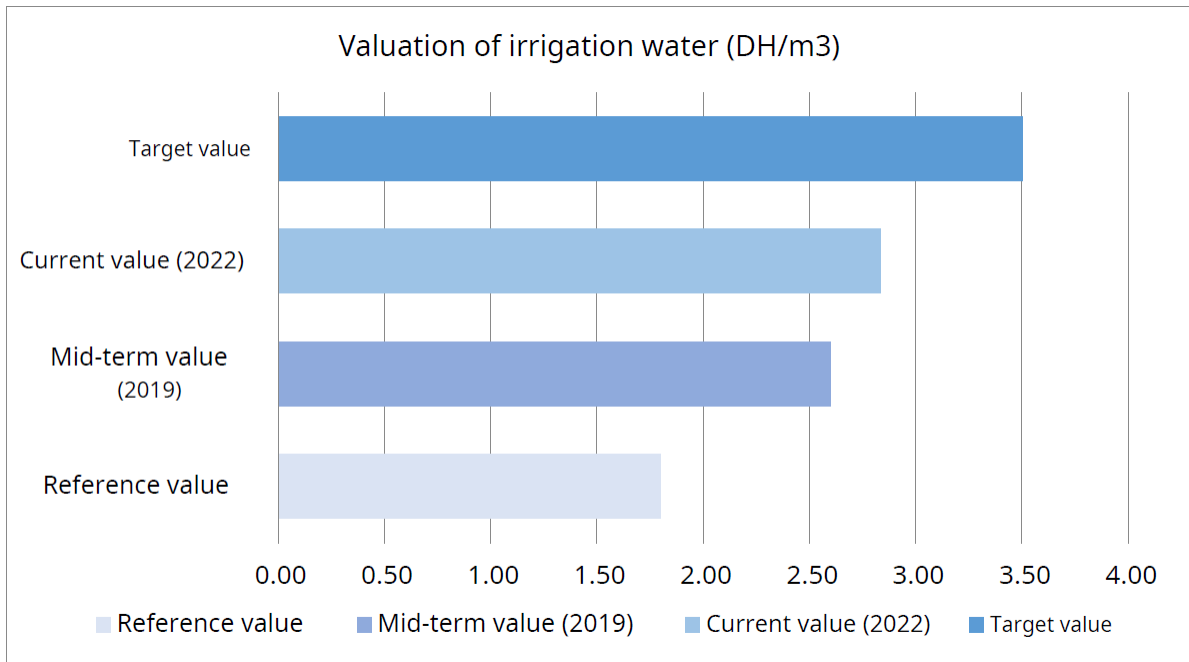


Figure 9. Valuation of irrigation water (DH/m3)

8.5.1.6 Proportion of areas occupied by high value-added crops

The indicator used to assess crop rotation diversification is the rate of land use by high value-added crops.

It turns out that the occupation of the land has undergone a slight transformation, recording the increase in the areas of fodder crops, market gardening and aromatic plants (cumin and henna), in the face of a decrease in cereal crops.

The increase in area allocated to high value crops is illustrated in the figure below:

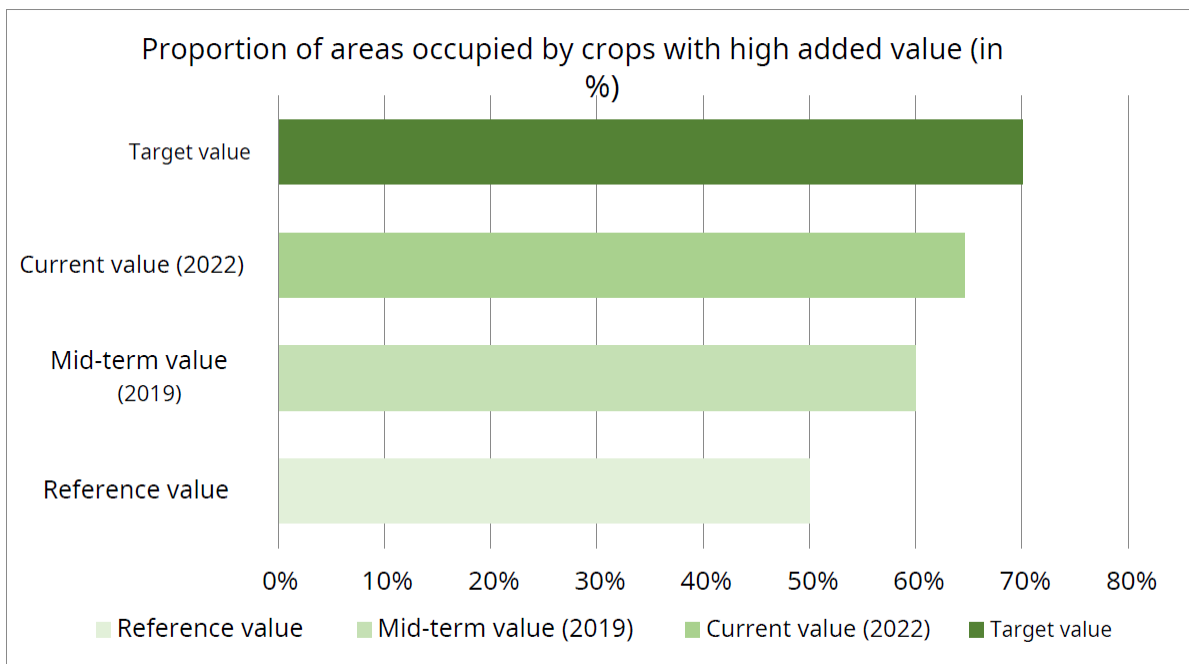


Figure 10. Evolution of the area of crops with high added value

Faced with a target value of 70% of the share of high value-added crop areas, the PACCZO currently records a value of 64.5% against 60% recorded in 2019, a rate hampered by the succession of years of drought.

8.5.1.7 Cultural Intensification Rate (TIC)

The indicator used to estimate the improvement in the availability of irrigation water and the evolution of land use is the rate of crop intensification.

A significant evolution is observed as shown in the following table:

Table 9. Evolution of crop intensification

Cultural Intensification Rate			
Reference value	Mid-term value	Current value	Target value
103%	106%	86,3%	110%

The Cultural Intensification Rate increased from 103% (pre-project) to 106% in 2019, halfway to the target value. In 2022, this rate will drop to 86.3%, which explains the exceptional nature of this agricultural campaign.

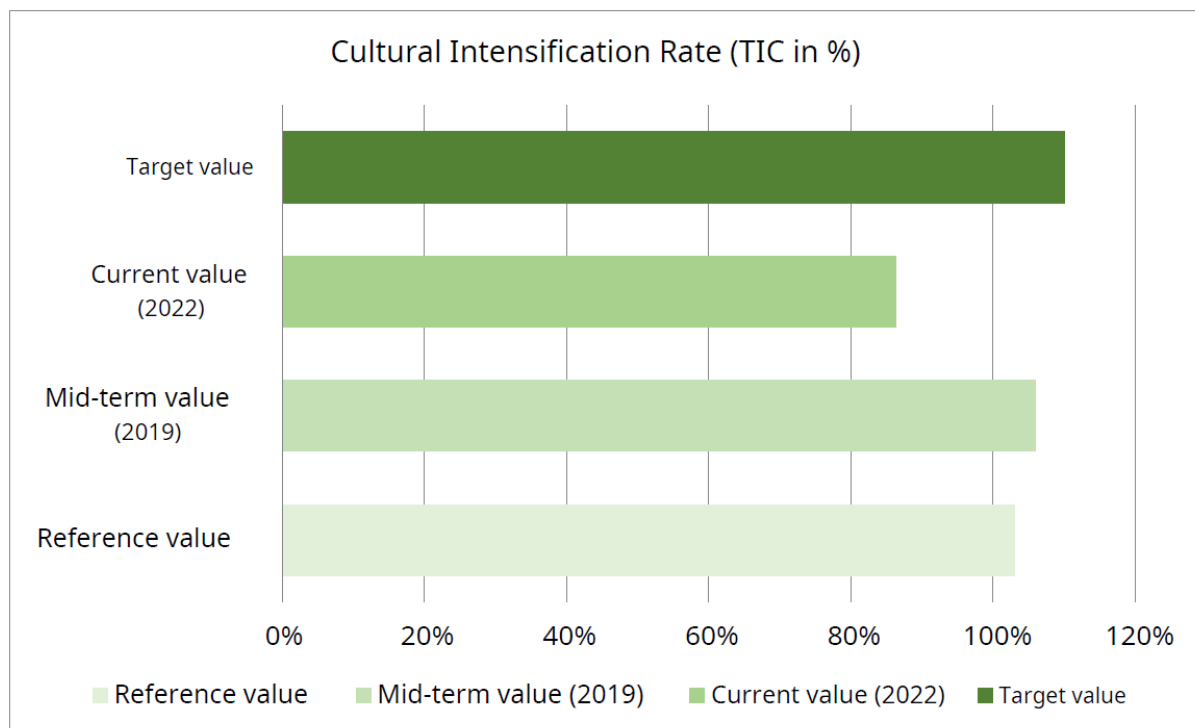


Figure 11. Evolution of crop intensification

8.5.2 Impacts of interventions related to improving the living conditions of populations vulnerable to climate change

In terms of improving the conditions and quality of life of the target population, PACCZO has adopted two approaches, one concerns the development of agricultural activity and the other consists of the

promotion of other non-economic economic activities. agriculture, in order to diversify the income of the population of the oases and thus increase their resilience.

The evaluation of the impact of these actions will be based mainly on the indicator measuring the proportion of households participating in the project having adopted at least one resilience measure and that of the added value of production.

8.5.2.1 Percentage of households having adopted at least one resilience measure

The objective is to improve household livelihoods through diversification and the adoption of more resilient activities. The project has set out to improve the situation of 10% of households in the target area. At present, the number of households adopting at least one resilience measure is 7,913 households, or 31% of households identified in the project area.

The formula adopted for the calculation of the indicator (P) is as follows:

$$P=100 \times N1/N2= 31\%$$

With :

N1: Total number of households connected to a water supply system for domestic consumption or raising awareness on water saving = 7,913 households,

N2: Total number of households (PACC-ZO zone) = 25,408 households.

The project thus recorded a surplus of 5,373 households who benefited from resilience actions. It therefore turns out that a large part of the population in the study area is aware of and aware of the effects of climate change.

By way of example, and in order to materialize the impact of the activities carried out in the direction of improving incomes and resilience, the collective laundry project represents an undeniable success and a striking innovation, recording an improvement in income and well-being of the population while preserving the environment. The box below presents the details of the project.

Encadré 9. Projet Innovant de laverie collective

Box 10 : Innovative collective laundry project

Launched in 2015 by the BOUGAFFER Association for the development and culture of Alnif, Province of Tinghir, the project consists of setting up a collective laundry with the aim of relieving women who took the trouble to wash at edge of the Oued and thus avoid the evacuation of the soapy water in the Oued.

Projet « la mise en place d'une laverie collective » Alnif centre – Tinghir
Croquis réalisé par Youssaf BEN AMAR Président de l'association Bougaffer

This project is an undeniable success, combining impacts that relate to different aspects, namely:

- Improvement of the living conditions of 2,166 beneficiaries in one year of work,
- Creation of 02 permanent jobs,
- Washing of 3,239 blankets, 706 rugs and 5,212 round machine fillings,
- Preservation of the environment by the evacuation of waste water by means of an autonomous sanitation system; the soapy water is no longer poured into the seguia, but treated and reused for the irrigation of the trees planted for the biological fight against the erosion of the banks.
- Net gain of 5,000 dh/month for the association, i.e. 60,000 dh for a working period of one year, programmed for the rehabilitation of the Khetaras and the creation of craft activities for women.
- In project: planning for the creation of a preschool unit.

8.5.2.2 Added value of production

To judge the quality of the efforts made by the PACCZO interventions within the framework of components 1 and 2 in terms of increasing farmers' incomes and developing a small, resilient oasis agriculture, it is necessary to assess the added value of the plant production in the area targeted by the project.

Following examination of the results of the survey conducted in this regard, the assessment of the added value of plant production is estimated below:

Table 10. Estimation of the added value of production

Added value of production (DH/ha)				
Reference value	Mid-term value	Current value	Target value	Rate of achievement
19 000	24 000	22 581	31 000	30%

An added value of nearly 22,600 DH/ha is currently recorded, compared to 24,000 DH/ha recorded in 2019 during the mid-term evaluation. Thus, compared to the pre-project situation, the PACCZO made it possible to generate an added value of crop production per additional hectare of 30% and 42% respectively.

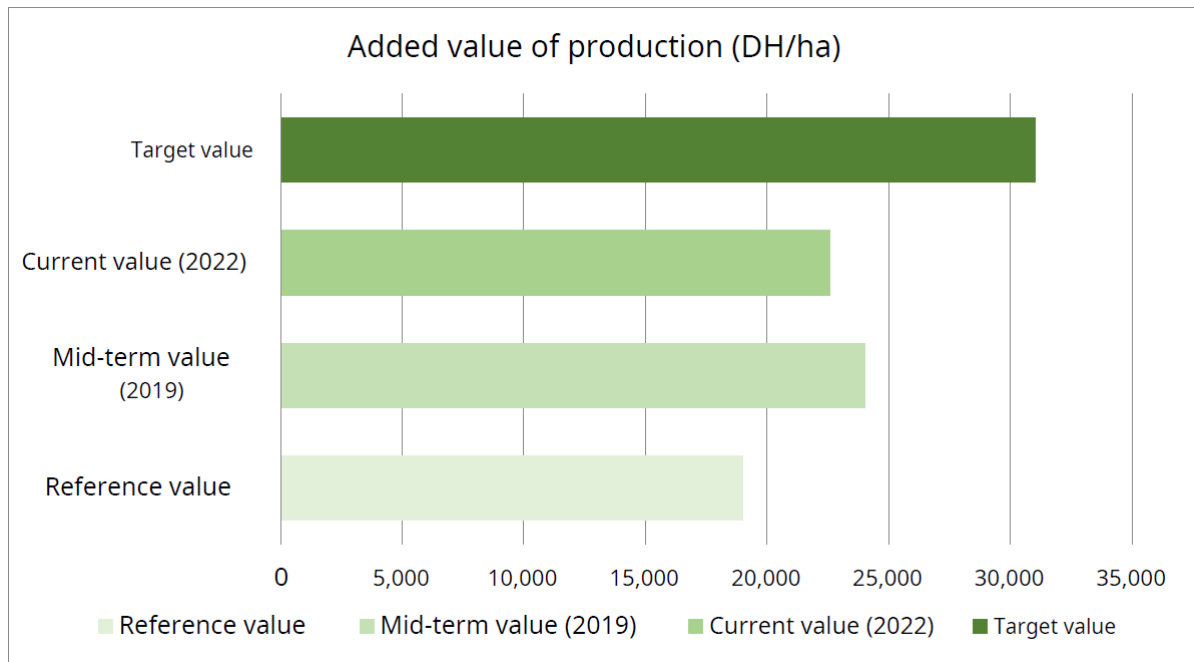


Figure 12. Added value of plant production in DH/ha

In addition, other actions have been taken to support and promote economic activities, particularly for young people and women. These activities have produced economic dynamism and have thus enabled substantial improvements in the living conditions of the population. By way of example, the following box presents the induced impact of equipping production units for the benefit of rural women.

Box 10. Equipment of production units for the benefit of rural women

Box 11 : Equipment of production units for the benefit of rural women

Case 1: Equipment for a unit for the recovery and processing of dates with low market value, Cooperative woman of tomorrow Tighfart.

This is an IGA project for the benefit of 33 women from the locality of Tighferte to improve the income of vulnerable women (widowed, divorced or with insignificant income) who have set up a cooperative.

The project led to a diversification of manufactured products; Before the implementation of the project, the rural women's unit of Tighfarte produced only 2 products, namely bread and date paste. However, after equipping the unit, 5 other types were introduced: couscous, syrup, vinegar and date jam, coffee and date kernel oil, Khol livestock feed and handicrafts.

Thus, the project has improved the living conditions of rural women in Tighfarte, recording a gain estimated at 200 dh/month/woman, which can reach 750 dh during wedding periods and holidays.



Cas

Case 2: Acquisition of artisanal products, couscous and pastries, Izilf Ferklassoufla.

The equipment of the couscous unit resulted in the increase of couscous production from 200 kg to 400 kg, with guaranteed storage.

This project has allowed, among other things, the diversification of products from a single type of couscous to 10 types, in addition to the introduction of pastry, crafts and condiments, which has led to the expansion of the mass of customers. And thus, the improvement of women's income from 350 dh to 700 dh/woman/month, which can reach 1400 dh in July and August.



8.5.3 Environmental and social impacts related to project activities and proposed support measures

This part of the study consists in identifying, describing and evaluating the environmental and social impacts related to the activities of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO). This impact analysis work was done on the basis of the main results of the Environmental and Social Impact Studies (ESIA) and the related Environmental and Social Management Plans (ESMP), carried out within the framework of the said project.

In this regard, it is important to emphasize that the impact identification and assessment matrix, recommended in the context of this evaluation, was developed based on the following data:

- The technical characteristics of the project (interventions and activities);
- Knowledge of the environmental components of the environment;
- Lessons learned from similar projects in general.

The first step consists in identifying, on the one hand, the sources of impact, and, on the other hand, the elements of the environment likely to be affected.

The sources of impact are defined as all the activities planned within the framework of the project and which are likely to directly or indirectly modify or disturb a component of the natural (physical, biological) or human environment. They are mainly related to the two main phases of the project, namely the construction phase and the operation/maintenance phase:

- **Pre-construction phase:** Phase during which, if necessary, land acquisition and studies will be carried out (topographical and geotechnical reconnaissance, etc.), as well as preparation work for the areas necessary for the site (preparation of the right-of-way and access paths, installation of equipment, etc.).
- **Construction stage:** The construction phase is the phase during which the various works are carried out. The realization of the new developments involves a sequence in the progress of the works: mobilization of the teams, preparation of the site, excavation, earthworks, construction, etc.
- **Operation phase:** The operation/maintenance phase corresponds to the operation of the various components of the project and the operation and maintenance of facilities, buildings, etc.

The assessment of the repercussions on the environment is carried out using the method integrating both the nature, duration, extent and intensity of the disturbance of an element of the environment as well as the value of the sensitive element affected.

The overall assessment of the impacts is expressed by the significance of the impact, which makes it possible to make an overall judgment on the probable impact caused to the environmental component disturbed by the project.

In this regard, it is essential to point out that the main environmental and social issues related to the project's activities can be summarized as the following actions:

- Site installation and/or mobile camps;
- Development of access, work areas and materials storage sites; Movement of vehicles and construction machinery;

- Construction/Development of the actual hydraulic structures (Aquifer recharge structure, Khettaras, Seguias and Protective walls);
- Work related to the development of oases through territorial and landscape enhancement;
- Work relating to installations to combat sand encroachment (Installation of palisades);
- Demobilization and restoration of the premises.

Furthermore, it is essential to emphasize that the Project also provides for improvement actions. These are non-physical actions, planned by the PACCZO, represented mainly by training and workshops to communicate on the different sectors directly or indirectly affecting the water sector.

These actions are in fact capacity building actions for the actors involved in the design and implementation of adaptation measures. In fact, the project will bear the cost of concerted management capacity building actions with a view to improving the quality of the identification of actions and guaranteeing efficiency and sustainability in their implementation.

8.5.4 Grievance management system

The Grievance Management System (SGD) of the PACCZO Project has been proposed to allow the establishment of a process of dialogue and interaction between the beneficiaries (men and women) and the various stakeholders (executing entity, partner of Execution) in order to secure the successful implementation of project activities. Its purpose is to strengthen beneficiary participation, guarantee their satisfaction and promote gender equality.

The objectives of the complaints management system were to:

- ❖ Set up, for the benefit of the beneficiaries, a system for expressing grievances while respecting the confidentiality of sensitive opinions, operational at the local level.
- ❖ establish at the level of the administration/project executing entity, a mechanism for handling grievances and develop an early warning tool allowing the management of certain risks, in particular social risks, which may arise during the implementation of the project (management conflicts, reluctance, etc.).

This system aims to provide the beneficiaries of the PACCZO and other stakeholders linked to it, a framework for interaction and a channel of communication with an interlocutor / representative around the inputs and activities of the Project and this by:

- ❖ offering beneficiaries, especially women and young people, the opportunity to express their grievances, opinions, perceptions or quite simply their comments on the activities, and in particular the inputs and activities that concern and affect them.
- ❖ establishing a process for responding to eligible grievances, especially those that are urgent and could (if not resolved) contribute to impacts on beneficiaries.

All complaints can be addressed to one of the main stakeholders of the PACCZO project, namely ANDZOA/ADA and to the other partners, whether during the implementation of the project or after its completion. These grievances can be introduced in different forms (verbal, written) or even expressed by different means of communication such as computers or audiovisual. Said grievances are handled and resolved either locally or escalated.

Once the grievances have been received, they are transcribed into the forms and recorded in a document called the Grievance Management Register - RGD. This process facilitates the follow-up of the grievance, from its receipt to the final settlement.

The diagram below illustrates the proposed complaints management procedure:

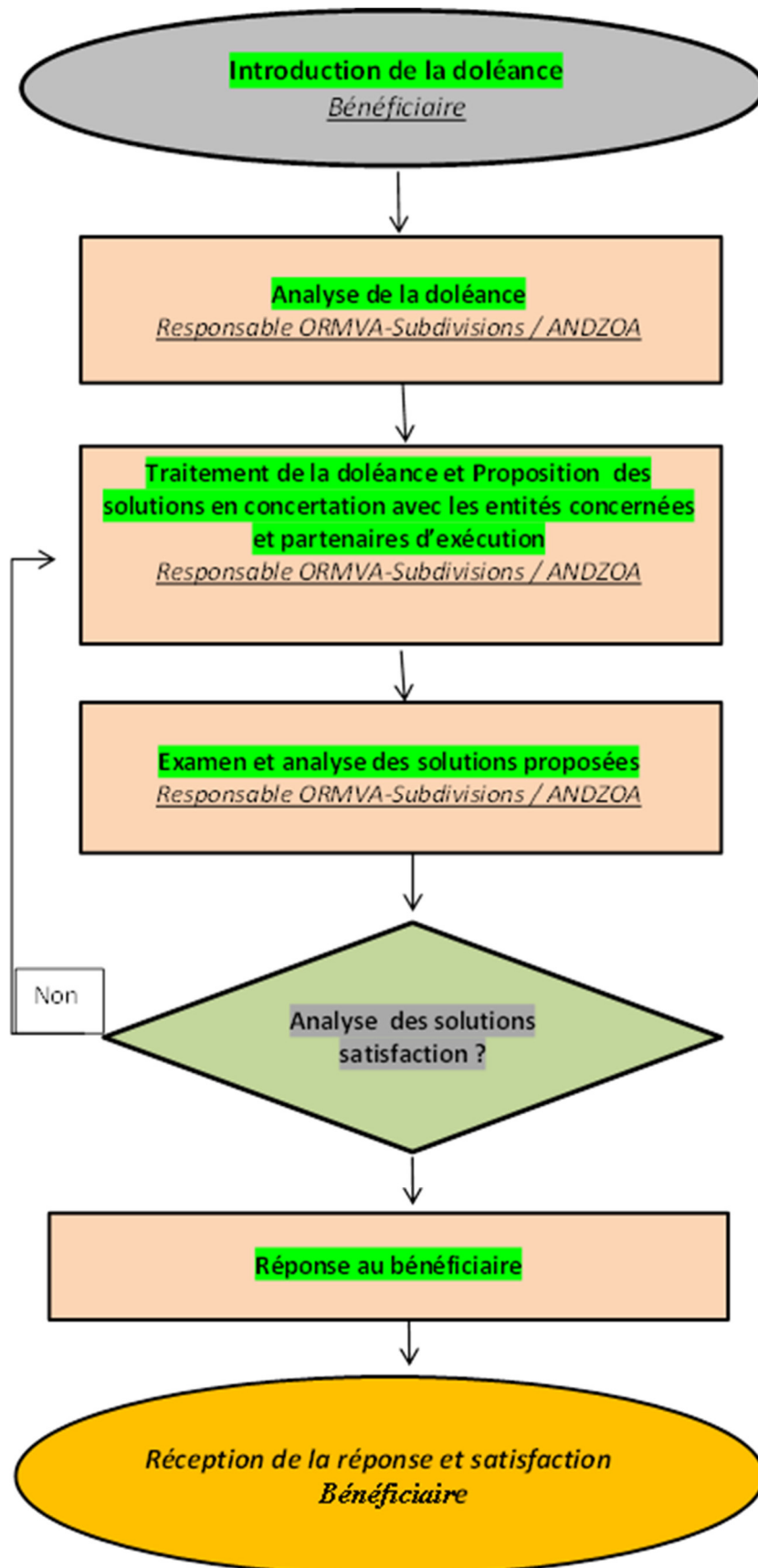


Figure 13. Proposed grievance handling procedure

8.5.5 Environmental and social surveillance and monitoring measures

Environmental and social monitoring aimed to ensure that the various mitigation or amplification measures are fully applied during the work. Activities related to environmental and social monitoring allow:

- ❖ to see to the application of the current and specific mitigation or amplification measures contained in the ESIA and the related ESMP;
- ❖ to carry out inspections on the work site and report all non-conformities to the site manager;
- ❖ identify, with the site manager, the alternative measures to be implemented in order to solve any unforeseen problem that may arise during the work;
- ❖ to ensure that the work is carried out in accordance with Moroccan environmental requirements and the Adaptation Fund.

Verification of the application of these measures will be the responsibility of ORMVA-Subdivisions and ANDZOA. Moreover, several of these measures are supposed to be required from the contracting company, so that it is legally bound to apply them, thus facilitating the work of verifying compliance.

The common environmental monitoring measures proposed are presented in the table below:

Table 11. Proposed Common Environmental Monitoring Measures

Activities	Common environmental and social monitoring measures	Indicators	Frequency	Responsibility	Degree of application
Facilities of worksite	<ul style="list-style-type: none"> ▪ Ensure that the company appoints a person responsible for environmental monitoring of the site for the entire duration of the work, in direct contact with the site manager. ▪ Ensure that working hours are respected and do not interfere with neighborhood activities. 	<ul style="list-style-type: none"> ▪ Availability of environment responsible on the worksite. ▪ Number of hours worked per day. 	Monthly	ORMVA-Subdivisions/ ANDZOA	Generally respected
Excavation, earthwork and drainage of surface	<ul style="list-style-type: none"> ▪ Ensure that any spoil is transported to a site approved by the Competent Authority. ▪ If monuments, coins or antique works of art are discovered during the work, ensure that the work is stopped and inform the competent authorities. ▪ Check that the work does not cause a change in normal drainage conditions and that the restoration of surface drainage is carried out correctly. ▪ Make sure the site is fenced off. 	<ul style="list-style-type: none"> ▪ Development of a record book of the operations of transport rubble. ▪ Change of the normal conditions of drainage. ▪ Installation of a construction fence. 	Monthly	ORMVA-Subdivisions/ ANDZOA	Generally respected
Groundwaters	<ul style="list-style-type: none"> ▪ Ensure groundwater is not polluted due to seepage of contaminants. 	<ul style="list-style-type: none"> ▪ Physico-chemical and biological composition Of groundwater (half-yearly analyzes). 	Half-yearly	ORMVA-Subdivisions/ ANDZOA avec l’appui de l’ABH-GZR	Generally respected
Gear site and traffic	<ul style="list-style-type: none"> ▪ Ensure that the speed limit on the traffic lanes in the site is respected. ▪ - Check that vehicle maintenance is carried out in a place specifically identified for this purpose and in optimal conditions. 	<ul style="list-style-type: none"> ▪ Existence of signs of Speed Limit. ▪ Existence of a place dedicated to cleaning and maintaining machinery. 	Monthly	ORMVA-Subdivisions/ ANDZOA	Generally respected

Activities	Common environmental and social monitoring measures	Indicators	Frequency	Responsibility	Degree of application
Prevention of accidental spills of contaminants	<ul style="list-style-type: none"> ▪ Make sure the fuel tank is placed in a sealed enclosure. ▪ Ensure that any handling of diesel, oil or other contaminants is carried out in a single location on the site. ▪ Check that the Emergency Response Plan in the event of an accidental leak drawn up by the company includes all the provisions allowing rapid and effective intervention. ▪ Ensure that the company has an intervention kit allowing it to act promptly at the source of the leak and to control its spillage, including in particular absorbent materials, shovels and storage drums, personal protective clothing. 	<ul style="list-style-type: none"> ▪ Existence of one waterproof enclosure for fuel storage ▪ Availability of a single place for handling the contaminants. ▪ Availability of an intervention emergency plan and of the means of its implementation. 	Monthly	ORMVA-Subdivisions/ANDZOA	Generally respected, but not in a systematic way
Management of dangerous materials and solid garbage	<ul style="list-style-type: none"> ▪ Ensure that the work site is free of all debris and waste. ▪ Ensure that the company cleans the site regularly and transports debris and waste to an authorized location. ▪ Check that the company segregates solid waste in order to be able to recycle certain materials used in construction. 	<p>Presence of waste scattered around the site.</p> <ul style="list-style-type: none"> ▪ Presence of dumpsters for the waste recyclable 	Monthly	ORMVA-Subdivisions/ANDZOA	Generally respected, but not in a systematic way
Health and security	<ul style="list-style-type: none"> ▪ Ensure that the appropriate signage has been installed at the site access routes. ▪ Ensure that the company has appointed a security officer. ▪ Ensure that temporary toilets are functional and that waste water is treated. 	<ul style="list-style-type: none"> ▪ Existence of signals. ▪ Availability of a security responsible on site. 	Monthly	ORMVA-Subdivisions/ANDZOA	Generally respected, but not in a systematic way

Activities	Common environmental and social monitoring measures	Indicators	Frequency	Responsibility	Degree of application
Demobilization	<ul style="list-style-type: none"> Ensure site is free of construction debris and clean. 	<ul style="list-style-type: none"> Site status. 	Monthly	ORMVA-Subdivisions/ ANDZOA	Generally respected, but not in a systematic way
Local jobs and women participation	<ul style="list-style-type: none"> Ensure that the company recruits local workers. Encourage the employment of local women for positions that do not require specific technical skills. 	<ul style="list-style-type: none"> Numbers of local employees. Number of women employed. 	Monthly	ORMVA-Subdivisions/ ANDZOA	Generally respected

8.6 Durability

The evaluation of the sustainability of the project consists of the analysis of the chances that the positive effects of the action will continue when the external aid will have ended, and that there will be more opportunity to reproduce or generalize the program. on a larger scale.

8.6.1 Institutional sustainability

This is to assess to what extent the synergy created between decentralized structures has enabled the promotion of intersectoral integration?

The approach adopted by PACCZO and the other experiences of ANDZOA have made it possible to promote intersectoral integration thanks to the synergy created between decentralized structures and local actors (executing agencies, partners, external services, provincial councils and regional authorities, local authorities, socio-professional organisations, etc.). Thus, the implementation of these experiments offered the Executing Entity (EE) teams and their partners the opportunity to support the implementation of a development project of this importance, by developing capacities through the training received and especially exercise and practice, to approach the problem of development in a general way, adaptation to climate change and the fight against marginalization and social exclusion in oasis areas.

The integrated project for the protection and development of the Nkob oasis under the CT Nkob (Zagora Province) is a concrete example of this synergy and complementarity in ANDZOA's intervention with other programs in the area (see Box below).

Box 11. Synergy and complementarity model in the intervention of ANDZOA (PACCZO with another program): case of Oasis Nkob CT Nkob – Province of Zagora

Box 12. Synergy and complementarity model in the intervention of ANDZOA (PACCZO with another program): case of Oasis Nkob CT Nkob – Province of Zagora

These are integrated and synergistic interventions to contribute to the safeguarding and development of the Nkob oasis. This project was carried out over the medium term (2014-2020) for the benefit of **4180 inhabitants including 51% women and 49% men 58% young people.**

The targeting of the project site is justified by the following:

- 170 ha of Oasis whose water comes mainly from two khattaras: Tamazirte and Amedoul which khattara come from the Handour wadi;
- Recurrence of drought + degradation of khattaras - low water supply - withering and degradation of the oasis;
- During the rainy season: torrential rains and significant contribution from the Nkob wadi but underexploited due to the absence of reservoir infrastructure;
- Center of 4180 inhabitants suffering especially in summer from frequent cuts in drinking water ;
- Schoolchildren infrastructure requiring environmental upgrading.



The program based on integration, synergy and complementarity between programs and stakeholders, targeted the following three sectors: hydro-agricultural development, education, youth and sport.

The project has induced the following immediate impacts:

Resumption of agricultural activity and rehabilitation of 170 Ha

- Improvement of well levels and khattara flows
- Removal of drinking water cuts during the summer period
- Encouragement of sports practice for the benefit of 200 young people
- Improvement of the schooling conditions of 731 pupils including 341 girls and 18 teachers
- Resumption of agricultural activity and rehabilitation of 170 Ha



In addition to its socio-economic role, the project also aims to contribute to the safeguarding and development of the Nkob oasis.

The participatory approach launched by PACCZO is capitalized on in the project documents (design report, procedures manual, activity reports, etc.), which are already used by other programs. The institutional capital created by the project as part of the integrated and synergistic programming is distributed among the provincial structures set up for the project, the Project Steering Committee (COPIIL), the Regional Coordination Committee (CRC) and the project management unit (PMU). Unless there is a follow-on operation, this institutional capacity is vulnerable to rapid dissipation, although other rural development operations adopting the participatory approach, such as GG projects, development of municipal action (PAC) and INDH programs, will benefit from the experience gained.

8.6.2 Environmental sustainability

Actions relating to the mobilization of water resources for the improvement of access to irrigation water and drinking water constitute a component of great importance for the target population of the project and, therefore, the maintenance and the maintenance of their works and networks should play a central role for the sustainability of the actions that have been put in place.

In this sense, the PACCZO has ensured the sustainability of the actions carried out through the establishment of own models capable of being transferred elsewhere, as a success story of the PACCZO, in order to ensure the sustainability and sustainability of the various actions. carried out.

Indeed, for each work carried out, a maintenance and upkeep agreement was signed by the beneficiaries. This is a prerequisite for any rehabilitation or development, to ensure the involvement and effective participation of the beneficiaries in the various stages of the project from installation to acceptance of the works. Thus, 22 commitments have now been formalized for the main projects of collective interest, namely the khetaras, seguias, boreholes and water points.

In addition, seven agreements were established following the completion of the recharge structures. These agreements were signed between the beneficiaries represented by the groups of AUEAs in the project area, on the one hand, and the institutional actors involved in the process: ABH GZR, ORMVATF /OZ and ANDZOA. It should be noted that the core of the beneficiary AUEAs in question were involved throughout the process of carrying out the works and also participated in the various site meetings with the work monitoring partners.

The effects of the project in terms of replication of successful activities are already being felt, even before the program is completed. We are now witnessing the rehabilitation and construction of 53 Seguias, 45 khetaras and 25 protective walls outside those planned. The project has thus created a dynamic at the level of the oasis zone, and the population is now aware of the effects of climate change and informed of the measures to be adopted to adapt to these changes.

The development of rural (agricultural) roads has made it possible to create tourist circuits and to reduce the cost of supplying inputs and basic foodstuffs, to sell agricultural products more easily and to improve access to social services. such as health centers and schools.

The active participation of local communities in the selection and financing of feeder road projects should contribute to sustaining the investments made by making local communities and authorities more responsible in the management of their local network of tracks. Beneficiaries should be involved in management and operating methods as well as in maintenance, particularly in the context of opening up the Ksours and groups of Ksours.

For all access infrastructure (tracks, structures and others), despite the budgetary problems suffered by local authorities, their maintenance must always remain a priority for elected officials concerned with improving access to ksours. (opening up) and the revitalization and diversification of economic activity in their area of action.

Faced with the insufficiency of the budgetary resources specific to the local authorities, the latter will be able to have recourse to the budgets of the FEC and the contributions of the provincial councils for the rehabilitation and maintenance of the works. Also, with the development of economic activity projected

in the targeted areas, some tracks should be classified by the Department of Equipment which could support their maintenance.

As one of the major constraints observed in the implementation of feeder roads is the multitude of intervention contexts and the associated issues, it is strongly suggested to set up a participatory mechanism for the selection and prioritization of actions to be taken. This could ensure a close association between the actors concerned and improve the level of coordination.

Maintenance costs can be considerably reduced by carrying out maintenance work by teams living near the rural road. This approach allows maintenance in several periods during the year, which helps in the continual treatment of damage, in order to avoid the development of large damage.

8.6.3 Socio-economic sustainability

The actions of diversification of income sources/generators (IGA) have, at this stage of evaluation, produced an announcement effect but very quickly they will show their limit to function, to integrate into the market and generate real income. The low incomes that IGAs generate, barring exceptions that confirm the rule, reveal their difficulty in transforming and evolving into real small businesses (microenterprises).

IGAs can only be complementary to the other basic agricultural activities that are dominant in the oasis zones. IGAs are one more way to diversify the activities of oasis populations. Their development and sustainability depends on their economic viability and should be part of a microenterprise logic and a sector approach to take advantage of the entire value chain. Although much remains to be done, PACCZO has made progress in terms of promoting and supporting women and young rural entrepreneurs within the framework of several activities initiated by the project (rural tourism, livestock, WFP, business teams for example, etc.).

9 Assessment of the project's contribution to the objectives of the Adaptation Fund

The Adaptation Fund was created to finance concrete adaptation projects and programs in developing countries parties to the Kyoto Protocol and particularly vulnerable to the adverse effects of climate change. Since 2010, the Adaptation Fund has committed more than US\$850 million for climate change adaptation and resilience projects and programs, including more than 123 concrete, localized projects in the most vulnerable communities in developing countries. worldwide with 28 million beneficiaries in total. It also pioneered direct access, allowing countries to access funding and develop projects directly through accredited National Implementing Entities.

Morocco is one of these developing countries supported by the Adaptation Fund to strengthen its resilience and its adaptation to these climate changes.

Thus, the PACCZO, the first project designed to mitigate the effects of these climate changes in oasis areas, is fully consistent with the Moroccan policy to combat climate change and the National Strategy for Sustainable Development. The adaptation effort mainly focused on improving water efficiency through the pursuit of irrigation management and agricultural land development activities (PMH, groundwater recharge structures, tracks), resilient economic activities, knowledge management and capacity building. The effects and impacts of the project developed previously testify to better resilience despite the specific extreme context experienced by Morocco in recent years.

10 Evaluation of the operationalization of the monitoring-evaluation system (M&E) and knowledge management: design, implementation and use

A. Monitoring and evaluation design.

The design of the project provided for the monitoring of the physical and financial aspects of the PACCZO activities to be carried out at the level of the two targeted basins with the participation of the communities in the process. It also provided for the monitoring and evaluation of results and impacts, which will be assumed by the ENM, the EE and the partners.

During the evaluation, the definition of the results indicators was complete and conventional. Some outcome and impact indicators were appropriate, but others were either limited in scope or vaguely attributable and difficult to measure. During the mid-term evaluation, more precise indicators were established to measure the results and impacts of the project. As stated before, another revision of the logical framework took place during the preparation of AWPB 4. Thus, new indicators relating to the activities recently integrated into the project under component 3 were defined.

B. Resources mobilized

In accordance with the project design document, the activities were to focus on the establishment of a monitoring and evaluation system for the project. The system was to be designed and harmonized with that of other projects implemented in the fields of biodiversity conservation and management of natural ecosystems. The estimated cost of monitoring and evaluation was around US\$0.075 million (750,000 MAD).

This provisional budget was exceeded by 42%. Thus, more than one million dirhams were spent on the monitoring-evaluation component.

<i>Description of the service</i>	<i>Unit</i>	<i>Quantity</i>	<i>PU HT</i>	<i>Total price HT</i>
Technical assistance for the implementation of the Climate Change Adaptation Project in Oasis Zones (PACCZO).				
Mobilization of a monitoring -assessment specialist	<i>Man/month</i>	12	21 000	252 000
Realization of a Study of the Reference Situation (Baseline) of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO) -03/2017/ANDZOA/DAF				
Realization of a study of the reference situation (baseline)	<i>Forfait</i>	1	438 700	438 700
Design and implementation of an information, management and project monitoring system within the framework of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO) 18/2018/ANDZOA/DAF				
Phase 1: needs convergence study	<i>Forfait</i>	1	66 000	66 000
Phase 2: Adaptation, configuration and deployment of the solution	<i>Forfait</i>	1	132 000	132 000
				198 000
			<i>Total in DH HT</i>	888 700
			<i>Total in DH TTC</i>	1 066 440

The project design required two types of M&E. The first i) regular implementation monitoring to report on inputs, contract progress and outputs. The project mobilized a monitoring-evaluation officer within the framework of the technical assistance of the Executing Entity (ANDZOA), and within the framework of the TA of the National Entity of Implementation (ADA), and the reporting of achievements was done in a moderately unsatisfactory way. Indeed, the platform was not fed in real time to validate its performance, avoid contradictions in the information produced at the level of the various management structures and enable the PMU to produce physical and financial reports on time.

In addition, ii) participatory monitoring of results, starting with a study of the baseline situation (Baseline) was to be conducted at project start-up. This activity was only carried out in the second quarter of 2018, i.e. 3 years after the launch of the project. The time spent allocated to the M&E specialist mobilized within the framework of the TA Executing Entity (ANDZOA) was 12 man/months, sufficient time spent to carry out the tasks assigned to him, among other things in charge of all aspects of monitoring and evaluation and the implementation of operational tools allowing the collection of data at regional and local levels. However, the monitoring-evaluation expert was mobilized only twice during the TA mobilization period to carry out a supervision mission for the monitoring-evaluation of project activities.

The integration of the database relating to the calculation of output and scope indicators was never carried out, and the implementation of the project was coming to an end with little information on the results indicators.

C. Implementation of monitoring and evaluation.

A system of information, management and monitoring of actions of the PACCZO was designed by a consultant but was not implemented at the time of the mid-term evaluation for reasons related to its procurement (twice unsuccessful and the third time passing to the second competitor). The solution implemented was in the test phase at the end of 2019.

The baseline surveys proposed were conducted during the second quarter of the 2018 financial year. EE-ANDZOA and ENM-ADA.

The PMU, which was responsible for all aspects of monitoring and evaluation, did not put in place the operational tools allowing the collection of data at the local and regional levels. After its departure, the piezometric level of the water table was the only range indicator monitored by the ABH-GZR.

In the absence of quality information produced on time, the non-operational M&E system did not play the role of an essential management tool to help in decision-making.

D. Use of monitoring and evaluation.

En attendant l’opérationnalisation du système de suivi mis en place, le suivi et l’évaluation effectués dans le cadre des AT externes ont servi comme outil de gestion, ou d’appui à la prise de décision – améliorant ainsi son efficacité - comme il était proposé dans le document d’évaluation du PACCZO.

Malgré ces difficultés techniques liées à la non-opérationnalisation du S&E, les instances de gouvernance mises en place dans le cadre du projet (COFIL, le CRC et l’UGP) ont joué pleinement leurs rôles d’approuver la programmation quinquennale et les plans d’actions annuels du projet et de la coordination de haut niveau entre les partenaires impliqués

Le suivi et l’évaluation participatifs proposés, qui représentent un élément clé de l’approche participative, permettront de nourrir les connaissances et soutenir l’engagement de la communauté tout au long de la période du PACCZO.

Des efforts devront se faire pour responsabiliser pleinement les partenaires dans le suivi et l’évaluation des résultats du projet, en s’assurant que le système soit étroitement lié au système de S&E de chacun des partenaires.

Pending the operationalization of the monitoring system put in place, the monitoring and evaluation carried out within the framework of the external TAs served as a management tool, or as a support for decision-making – thus improving its effectiveness - as it was proposed in the PACCZO evaluation document.

Despite these technical difficulties related to the non-operationalization of M&E, the governance bodies set up under the project (COFIL, the CRC and the PMU) fully played their roles. to approve the five-year program and the annual action plans of the project and the high level coordination between the partners involved.

The proposed participatory monitoring and evaluation, which represents a key element of the participatory approach, will help nurture knowledge and support community engagement throughout the PACCZO period.

Efforts should be made to fully empower partners in monitoring and evaluating project results, ensuring that the system is closely linked to each partner's M&E system.

A. *Knowledge management*

PACCZO had not established a formal knowledge management strategy at the time of design. Responsibilities in this area have therefore not been formally assigned. However, the executing entity (ANDZOA) and the partners, in particular the two ORMVAs, had quite rich documentation on the activities carried out during these seven years of implementation of their activities. Indeed, several communication media (leaflets, flyers, brochures, films, etc.) have been designed and distributed on a large scale.

11 Exit and sustainability strategy

11.1 Principles and factors of sustainability

The last 3 years of the life of the project were to be devoted to the development of the exit strategy of the Project and its disengagement by consolidating the achievements of the project and by preparing the organizations of beneficiaries to take responsibility for ensuring the sustainability of the investments made, however, the project has not formalized a management transition process in this direction. It is desirable for a multi-stakeholder project to plan in the design report for output in a systematic and consistent way so that output becomes an intrinsic part of the project cycle.

Exit strategy is an approach to evaluating and finding the best ways to complete a project with lasting benefits. It aims to ensure the sustainability of the impacts following the departure of the PMU/Donor.

There is no generic exit strategy. All projects are different, and they need an exit strategy developed specifically for them. The purpose of an exit strategy is not only to maintain the results achieved, but also to ensure further progress towards program objectives. Ideally, an exit strategy sets up a system where the benefits will extend beyond the initial beneficiaries. »

Based on the consistency of the components of the PACCZO, the factors of sustainability and sustainability, indicative and not limiting, are summarized in the following table:

Table 12: Sustainability and sustainability factors

Project Elements	Indicative factors of sustainability
Organizations	Governance Management capabilities Funding
Hydraulic infrastructure (groundwater recharge works, khetaras, PMH) and opening up (tracks agricultural/rural), CES (works to protect and fight against sand encroachment)	Climate-resilient design Capacity for management and maintenance Funding
Agricultural productions : arboriculture (palm date palm, olive tree), henna, cumin, saffron, beekeeping, red meats and milk	Sanitary condition satisfactory upon final acceptance by the producers Technical skills of the producers Access to agricultural advice and other production support services (subsidies, approval, labelling, certification, etc.), cooperation Access to good quality equipment and inputs (reproducers, tree seedlings, swarms, etc.) Reliable business leads
UV, EM, MP & companies	Viable business plan Partnerships / contractual agreements formalized and endorsed Reliable and stable link to the market Capacity for technical and managerial management of the activity Access to financing
Innovations	Suitability for local conditions Accessible and affordable for users Documented profitability and resilience to CC Disseminated through diversified information channels (ICT)

The objective of the strategy of exit and sustainability of the Project of adaptation to changes is to ensure that at the end of the project:

- **Organizations** created or supported by the PACCZO have the capacity to pursue and develop their functions and the services to their members by applying the principles of good governance and gender equality.
- **Physical infrastructure** (*Groundwater recharge structures, irrigation infrastructure, rural & agricultural tracks, SWH facilities, storage or recovery buildings, water points and fire hydrants*) put in place and equipped with the support of the project are appropriate and managed in a transparent manner by structures for which this is the institutional mandate. They have adequate financial and institutional means for their operation and maintenance.
- **Agricultural production** developed the oases targeted with the support of the project are in good sanitary condition at the time of their final reception by the producers. Producers have adequate technical skills, the ability to maintain and develop these productions, access to agricultural advice, quality inputs and support services (approval, labelling, certification, etc.). They are in commercial relations with cooperative organizations, recovery units (UV) or professionals downstream of the sector.
- **Business teams (EM)**, organizational forms managing recovery units (UV) and agricultural VSEs supported by the PACCZO have the technical and managerial capacities to manage their activity independently. They have their own resources or have access via financial institutions to appropriate financial products allowing them to constitute sufficient working capital to carry out and develop their activity at the end of the project and thus provide services to the beneficiaries of the project.
- **The innovations** whether technical or organizational, tested and demonstrated within the framework of the PACCZO are adapted, adopted and disseminated in the project area and beyond, within the framework of a well-defined scaling-up process.

Admittedly, maintenance and upkeep agreements have been signed by the beneficiaries as a prerequisite for any rehabilitation or development, to ensure, on the one hand, the sustainability of the actions, and on the other hand, the involvement and the effective participation of the beneficiaries in the various phases of the project from the establishment to the reception of the works, but the clauses or the provisions stipulated in the agreements signed with the partners and fixing the conditions of financing and support for the targeted

activities do not define the obligations of the partners in terms of disengagement and sustainability. Thus, the obligations of the partners in these agreements are limited to carrying out the actions,

Indeed, and by way of example, no stakeholder is responsible for measuring and monitoring the indicator relating to the improvement of the efficiency of the irrigation network because this obligation has not been specified neither in the commitments of the partners nor of the beneficiaries.

11.2 Modalities of transition

Investments in the mobilization of water resources for the improvement of access to irrigation water (Khetaras, groundwater recharge structures, PMH) have been handed over to the AUEAs, which will be responsible for the operation and maintenance. The government, through ONCA, is responsible for monitoring the strengthening of the technical and managerial capacities of these associations. The PMH experience in Morocco shows that the users are committed to ensuring the sustainability of the

equipment since their livelihoods depend on it and that they will indeed ensure the operation and maintenance, but not necessarily according to methods standards. The operation and maintenance of these programs is in any case simple and low cost, and the risk is low, except in the case of large floods / floods, where the state should normally intervene.

The reflection currently carried out to concretize the convention between on the one hand, the users, the provincial council, and on the other hand, the association of the truckers, is an innovative initiative as regards partnership in the oasis zones involving private actors. The draft agreement aims to cover the cleaning of the recharge works against free volumes.

The access roads have been entrusted to the local authorities, which are responsible for their maintenance. Arrangements and capacity vary by jurisdiction. In most cases, arrangements are in place to use pooled equipment for maintenance, and local authorities are likely to have the resources to finance maintenance operations. In some cases, the Ministry of Equipment will take care of the classification and surfacing of certain tracks/roads. However, there is a risk that local authorities neglect or postpone maintenance. Ongoing monitoring and evaluation (M&E) is recommended.

The preventive maintenance activities of rural tracks/roads could be implemented, with the support of the aforementioned actors, by local micro-enterprises or cooperatives which will be selected through a competitive process during the first years of implementation.

The drinking water installations are entrusted to associations which, within the framework of several previous projects (DRI, PAGER) had shown good performance in terms of operation and sustainable maintenance. However, the project experienced a number of differences from these models. There is therefore a risk that some activities may not be sustainable. Again, ongoing M&E is recommended.

Schools and boarding schools (Dar Talib and Dar Taliba) have been supported, staffed and equipped by the ministries concerned and the program has contributed to the upgrading of their toilet blocks and the acquisition of means of transport. The facilities are reported to be all operational.

Given the impact of the participatory approach and the organization of the populations on the sustainability of the actions implemented, give an important place to these activities by providing more effort in the support and monitoring of the capacity building of members of socio-professional organizations (development associations, AUEA, cooperatives, etc.) in production, management and decision-making techniques with particular attention to the needs of rural women.

12 Rationale for overall result rating

12.1 Project Performance Rating: rating: moderately satisfactory

a) Rating of Relevance

As discussed above (8.3.3), the project objectives remain relevant to the priorities of the targeted oasis area and the Adaptation Fund (AF). Project results are aligned with objectives and cost estimates, and have contributed directly to project results, which are almost entirely attributable to the project. The approach and the activities respond to the needs of the beneficiaries.

Note "**moderately satisfactory (5)**" is based on the fact that, despite the redeployment of credits initially allocated to the activity related to constructions using local materials and rehabilitation of ksours in the same component 3, the project was relevant and achieved its objectives. Thus, the implementation of actions relating to the enhancement of the oasis heritage through vital environmental activities highly

valued by the beneficiaries has been able to provide solutions to problems/phenomena threatening the existence of the oases.

On the one hand, much of the Project's original relevance as a flagship for a new national climate change adaptation program has been swept away by major changes in the policy and institutional environment. On the other hand, the Project foreshadows national integrated development programs (infrastructure, value chains, entrepreneurship, etc.), which, at its closure, can still be a rich source of additional lessons and intervention approaches. The Project provides, in particular, a learning platform on how supporting agricultural growth through a focus on the poor, can be integrated or twinned with the type of Community Driven Development (CDP) support provided by the Communal Charter or Oasis Development Plans).

b) Effectiveness rating

The achievements of PACCZO and its impact on improving the adaptive capacities of the water sector, diversifying sources of income and improving the living conditions of populations vulnerable to climate change in the target areas, on improving the resilience of ecosystems in response to climate change and variability and on improving the awareness of all stakeholders through knowledge management and sharing. Added to this is the introduction of several types of innovation, whether in project management or in technologies for agricultural production and development and for adaptation to change, are sufficiently important for the effectiveness of the replicability at scale is rated moderately satisfactory (5).

c) Efficiency rating

The justified delay in the implementation of some project activities was globally made up thanks to the two extensions of the duration of the project. With a very high rate of financial implementation of the PACCZO budget (100%), average monitoring and evaluation and good knowledge management, despite the departure of technical assistance and some shortcomings in the procurement process | efficiency of the project **is rather satisfactory (4)**.

	Indicators	Score
Project performance	Relevance (a)	Moderately satisfactory (5)
	Effectiveness (b)	Moderately satisfactory (5)
	Efficiency (c)	Satisfactory (4)
Project performance (A)=(a)+(b)+(c)		14

12.2 Overall appreciation rating

The actions of the program have contributed to strengthening the resilience of small farmers to the effects of CC and to diversifying their sources of income despite the difficult economic situation (water stress, soaring prices, restrictions of the pandemic). The impacts of the project are therefore deemed moderately satisfactory (5).

At the time of design, the project had not established a formal strategy for disengagement and sustainability of project actions. Responsibilities in this area were therefore not formally assigned in the agreements with the partners. However, the latter have taken steps to ensure the sustainability of the actions carried out under this project by signing maintenance agreements and setting up an advisory support system through ONCA in order to capitalize the results achieved and the continuation of capacity

building for all farmers, including PACCZO beneficiaries. Thus, the long-term durability is considered satisfactory (4).

	Indicateurs	Score
Global appreciation	Project impacts (d)	Moderately satisfactory (5)
	Durability (e)	Satisfactory (4)
	Global appreciation (B)=(d)+(e)	9

12.3 Partner Performance Rating

It should be noted that the ADA and ANDZOA have played a major role in coordination and implementation between the partners and bringing together the interests of all the stakeholders (elected officials and beneficiaries) in a participatory framework ensuring the sustainability of project activities.

PACCZO has benefited from the continuity and stability of the implementation mechanism provided by the Moroccan government.

Workshops for approving the AWPB objectives and presenting the results were organized on a more or less regular basis by the project governance bodies (COPIL, CRC, PMU).

The project also benefited from high visibility at the national level and at the level of the targeted regions and provinces. He was able to introduce significant innovations in terms of intervention approach (Integration, Synergy and complementarity between programs and stakeholders) and adaptation to climate change.

ADA and ANDZOA have demonstrated proactivity and commitment ensuring the necessary flexibility to adjust the implementation of the project in a difficult context (covid 19 pandemic, drought, inflation).

The government has generally respected the clauses of the financing agreement with the adaptation fund and has shown exemplary responsiveness concerning the units given to the recommendations of the various support and supervision missions.

In view of these considerations, **government performance is rated moderately satisfactory (5)**. ANDZOA has established agreements with several partners including (ABH-GZR, ORMVAT and ORMVAO) to co-finance and support the implementation of PACCZO. The active involvement of these three partners contributed to the achievement of the expected results and to the strengthening of commitments with a view to the sustainability of its achievements. **The performance of the three partners is rated moderately satisfactory (5)**.

	Indicators	Score
Partner performance	Gouvernement (f)	Moderately satisfactory (5)
	ABH-GZR (g)	Moderately satisfactory (5)
	ORMVAT (h)	Moderately satisfactory (5)
	ORMVAO (i)	Moderately satisfactory (5)

Partner performance	20
---------------------	-----------

12.4 Overall rating

The above results in a moderately satisfactory assessment (43)

	Indicators	Score
Project performance	Relevance (a)	Moderately satisfactory (5)
	Effectiveness (b)	Moderately satisfactory (5)
	Efficiency (c)	Satisfactory (4)
Project performance (A)=(a)+(b)+(c)		14
Global appreciation	Project impacts (d)	Moderately satisfactory (5)
	Durability (e)	Satisfactory (4)
Global appreciation (B)=(d)+(e)		9
Partner performance	Gouvernement (f)	Moderately satisfactory (5)
	ABH-GZR (g)	Moderately satisfactory (5)
	ORMVAT (h)	Moderately satisfactory (5)
	ORMVAO (i)	Moderately satisfactory (5)
Partner performance		20
Overall rating = (A)+(B)+(C)		43

13 Lessons learned

The lessons and lessons learned from the experience have largely flowed from the analysis made in the first chapters. This analysis highlighted the strengths and weaknesses of the program in terms of its design, implementation, evaluation and dissemination of its results. Very interesting learning elements were thus identified.

These elements revolve around the following:

- **Approach taken by PACCZO** and other experiences of ANDZOA have enabled the promotion of intersectoral integration thanks to the synergy created between decentralized structures and local actors (executing agencies, partners, external services, provincial and regional councils, local authorities, socio-professional organizations ; etc....). Thus, the implementation of these experiments offered the Executing Entity (EE) teams and their partners, the opportunity to support the implementation of a development project of this importance, by strengthening their planning and monitoring capacities through training and exchange trips on various themes and especially the exercise and practice, to approach the problem of development in general, adaptation to climate change and the fight against marginalization and social exclusion in oasis areas.
- Strategic planning deadlines: The preparation for the implementation of the activities of a project such as the PACCZO (consultation with the beneficiaries, in-depth studies, negotiation and signature of partnerships, etc.) is a phase which generally consumes one time per compared to the duration of the overall execution of the project, which penalizes the progress of physical activities during the first years. However, in the case of the PACCZO, this phase was well thought out, emphasizing the projects already put together (studies available) with all the partners, which made it possible to gain in efficiency from the first years. For future programs, it would be relevant to take advantage of this experience by planning a preparatory phase from the design stage outside the actual duration of their implementation.
- Partnership: This is an approach that must be actively sought and developed, through negotiations on a scientific basis. Indeed, this approach was central to the implementation of PACCZO. The latter sought to establish a multitude of partnership agreements dictated by the complexity of the project itself. ANDZOA's experience with its partners shows that the partnerships signed are effective and have achieved the objectives as planned. Negotiations should therefore be initiated on the basis of the expectations, objectives, contributions of each of the partners on the technical and professional level, in order to finally evaluate the logistical contribution of the partners.
- **Advent of the project** is widely welcomed by the populations of the oases. The elected officials and the population are asking for more. However, just as it contributed to improving the adaptive capacity of beneficiaries (populations of oasis areas) to the impacts of climate change, it created a feeling of frustration and exclusion among non-beneficiaries.
- **The associative and cooperative fabric (TAC):** The program has largely contributed to the dynamics of organizational forms (associations and cooperatives) which have become real interlocutors of the administration in general and shine by their presence on the scenes of local business management. These organizational forms are forging links increasingly solid within the framework of social networks, such as the associative space. Some of these associations and cooperatives have demonstrated their ability to present large-scale innovative projects and to raise significant funds

within the framework of partnership. There is every interest in counting with these organizational forms, listening to them for the setting up and carrying out of future projects and making them real actors of development.

- **The Capacity Building** through training and exchange trips was highly appreciated by the beneficiaries, especially when it focused on new adaptation measures. However, the absence of a monitoring system and reliable evaluation criteria, especially qualitative, deprives the program of valuable knowledge on the effects and the real impact of capacity building actions on the beneficiaries, knowledge that could capitalize and spread.
- **The components and achievements** from the program. The global and integrated approach of the program has led to the programming of certain achievements such as the drinking water supply, groundwater recharge structures, actions to combat silting, and recently the development of tourist interpretations, water points and poles for fire fighting. The success of these achievements is dependent on the modes of intervention of the Department of Agriculture through the activities of PACCZO in sectors that are the responsibility of other ministerial departments. Within the framework of partnership which defines the responsibilities of the various partners. The establishment of a partnership, the signing of an agreement with the supervisory departments, etc., constitute the principles of an approach to be refined in order to gain in efficiency. The Department of Agriculture represented by ADA and ANDZOA will contribute, to the realization of such actions, its knowledge and know-how in terms of raising awareness and mobilizing rural populations, the other departments having to provide logistical support. and finance required. The Department of Agriculture being the facilitator of these actions and not the project manager.
- **The income source/generating diversification actions (AGR)** have, at this stage of evaluation, produced promising results for some and for others an announcement effect, but very quickly they will show their limits in functioning, integrating into the market and generating real income. The low income that IGAs generate, barring exceptions that confirm the rule, reveals their difficulty in transforming and evolving into real small businesses (micro-enterprises). IGAs can only be complementary to other basic agricultural activities. IGAs are one more way to diversify the activities of oasis populations. Their development and sustainability must be part of a micro-enterprise logic and a sector approach to take advantage of the entire value chain. Although much remains to be done, the program has made progress in terms of promoting and supporting young rural entrepreneurs within the framework of the "Startup Oasis" project, which has intervened in the field as a development mediator which aims to identify, facilitate and informational, organizational, technical and financial support for these young rural people to develop innovative projects.
- **The implementation of the various components** must absolutely integrate the training and supervision of beneficiaries, as a process, which is similar to the models of appropriation of innovations. Thus, it must follow the logic of the educational act which gradually makes discover, then understand, then learn and finally memorize.
- **The system information, management and monitoring of actions of the PACCZO:** it was designed and implemented 4 years late (solution implemented was in the test phase at the end of 2019) for reasons related to the award of its contract (twice unsuccessful and the third time passing to the second competitor). This delay resulted in the belated completion of the baseline situation study, which was only carried out in the second quarter of the 2018 financial year. The nature and quality

of M/E information was heterogeneous and limited to results (outputs), not periodically and regularly highlighting the impact and the lessons learned. Delays were also noted in the collection, consolidation and analysis of data, especially after the departure of the technical assistance team.

- Disengagement and sustainability strategy: Admittedly, maintenance and upkeep agreements have been signed by the beneficiaries as a prerequisite for any rehabilitation or development, to ensure on the one hand, the sustainability of the actions, and on the other hand, the involvement and effective participation of the beneficiaries in the different phases of the project from the establishment to the acceptance of the works, however, the project has not formalized any management transition process in this direction. The last 3 years of the life of the project were to be devoted to the elaboration of the exit strategy of the Project and its disengagement by consolidating the achievements of the project and by preparing the beneficiary organizations to take responsibility for ensuring the sustainability of the investments made. It is relevant for a multi-stakeholder project to plan in the design report for output in a systematic and consistent way so that output becomes an intrinsic part of the project cycle.

14 Main conclusions of the evaluation

- **A good level of relevance and coherence boosted by the institutional set-up and the mobilization of the Adaptation Fund (AF)**

The political relevance of the PACCZO project is supported by the operational relevance which is based on the approach adopted to ensure its institutional management. As such, **the path adopted** for the identification and planning of actions (in-depth studies, participatory diagnosis) **was the best way to guarantee** to a large extent the **participation of the target population** determining their priority needs.

The success of this **approach** now shows that even if the content is important, in this case the components of the project, the intervention approach systematically takes over since it is based on **improving the awareness** and the **capacity building for all actors participants** in the design and implementation of climate change adaptation measures.

On the other hand, **the integration** shares is at **focus of the project** which has endeavored to engage the main components related to **adaptation to climate change** in the Oasis Zones of the two targeted basins.

However, some areas of interest could have been programmed in the initial set-up with the aim of further complementing the action of the project in the spirit of the **sustainable development**. These include activities related to capacity building of **organizational forms** (AUEA) in the field of **technical management** networks that can contribute to a better achievement of the socioeconomic development objectives envisaged (**sustainability** water sector adaptation infrastructure).

On **the environmental plan**, the specific objectives of the PACCZO project are in line with the objectives of the national **strategy for the protection of the environment and sustainable development**. The negative impacts of project activities on the environment are insignificant and in all cases **reversible** in their vast majority.

As it concerns **efficiency** of the project, the assessment of the level of adequacy between the targeted objectives and the human resources mobilized shows that the set-up of this project was designed in such a way as to ensure close supervision of the activities at all stages of intervention. Admittedly, certain human insufficiencies of the partners in particular the ABH-GZR and the ORMVAT and the ORMVAO (under-staffed, lack of material motivation, multiplicity of the tasks) as well as the exhaustion of the time spent on technical assistance before the two extensions, have limited the desired level of adequacy, but the statements collected during the interviews with the representatives of the ENM, the EE and the main partners agree unanimously on the importance of the involvement of human resources in terms of participation in the implementation of the project.

With regard to the financial resources committed for carrying out the actions, with the exception of the redeployment justified within the framework of the BTPA4, the logic of the project was respected, particularly with regard to its concentration around the mobilization of water resources in a context marked by CCs (nearly 42% of credits) and also the importance given to institutional strengthening (nearly 8%). The setting up of the PACCZO made it possible to confirm the break with the verticality of the sectoral approach in terms of rural development to install a dynamic of consultation and transversal coordination between all the partners of the project.

- **A high level of physical achievements and supervision of the beneficiaries despite the delays in the payments of the Adaptation Funds and the limits in human and material resources of the partners**

Despite a context marked on the one hand by an unprecedented drought, the worst in 40 years, and on the other hand by the restrictions of the pandemic and the intensification of inflationary pressures of internal and external origin in Morocco, the rate physical achievements is quite high and even exceeds the forecasts for certain components:

h) Natural resource mobilization and protection projects

- Construction of 95 seguias over a total length of 34,397 ml;
 - PACCZO: 60 seguias out of 21,190 ml + 8 derivation thresholds
 - Leverage effect: 35 seguias out of 13,207 ml.
- Rehabilitation of 71 Khetaras out of 13,146 ml;
 - PACCZO: 49 khetaras out of 8,800 ml
 - Leverage: 22 khetaras out of 4,346 ml
- Construction of 7 recharge structures including 3 artificial groundwater recharge structures at Tinjdad and 3 structures at Maider and 1 at intermediate Gheris;
- Construction of 36 protective walls over 6,502 ml;
 - PACCZO: 25 walls over 4,450 ml
 - Leverage: 11 walls over 6,502 ml
- Acquisition and installation of 04 piezometers (monitoring of the water table);
- Execution of 4 boreholes: a deep borehole of 650m and 3 boreholes of 90m each;
- Digging of 3 wells of 30m each, for the nomads;
- 4 technical studies prior to hydraulic interventions.

i) Diversification of people's sources of income

- Promote agricultural products from the oases: 27 cooperatives and associations benefiting from packaging lots;
- Support for the tourism sector by training the actors concerned;
- Support for 45 small economic projects in the main areas: agriculture, drinking water, environment, crafts and tourism;
- Job creation through the establishment of an incubation model for local projects adapted to the oases (67 operational projects).
- Training on water consumption techniques and conservation techniques: 32 workshops for the benefit of 616 beneficiaries including 22 workshops on water saving techniques for 401 farmers and 10 workshops on the conservation of agricultural products for 215 farmers ;
- Supporting farmer-producers in the process of certification and promotion of henna, cumin and dates.

j) Main studies

- Wastewater management study for 10 tourist structures in the oases and measures to mitigate their negative effects

- Study for the development of a draft charter on water and climate change in an oasis environment
- Study on the experiences of good practices, agro-ecological and conservation techniques (23 good practices and agro-ecological and conservation studies, presented in the form of technical sheets including 10 experiences dedicated to water saving and 09 experiences dedicated to the valorization of dates).
- Study of identification and promotion of niche tourist products to be developed in oasis areas
- Study on the acacia raddiana (Diagnosis of avenues for valorization of and the methods of organization of the beneficiaries).
- Study of the reference situation (baseline) of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO)
- Two environmental and social impact assessment studies of the activities of the Climate Change Adaptation Project in Oasis Zones (PACCZO) and development of related environmental and social management plans.

k) Improved ecosystem resilience

- Development of two protection and control measures against silting in the areas of Errachidia and Zagora
- Training on depollution techniques for the benefit of the players concerned (398 participants)
- Guided visits to wastewater treatment plants for the benefit of 106 participants.
- Support of Community Services aimed at protecting natural resources through the implementation of small projects concerning the environmental upgrading of schools and their internal layout, contribution to the prevention and fight against fires in oases;
- Development of 4 spaces and 7 water points.
- Equipment of 14 AUEAs.

l) Raising awareness through knowledge management and sharing

- Establishment of a Documentary Fund: inventory and digitization of 2,915 documents.
- Development of a charter on water and CC
- Organization of 6 thematic conferences on water
- Organization of a conference on GIS and remote sensing
- Development of a communication strategy and organization of 8 CC awareness campaigns.
- Organization of targeted awareness-raising actions for pupils in primary schools: 72 workshops in 24 schools for the benefit of more than 26,000 pupils.
- Strengthening of the management monitoring system

m) Capacity building

- Organization of 14 training workshops for 252 participants. Organization of 19
- workshops and 15 study trips for the benefit of 502 people.
- Realization of 07 visits for the benefit of 106 participants, having for object the techniques which could be introduced in the oases: agro-ecological techniques, conservatories, water recycling, water saving...etc.

- Organization of 28 training workshops in project design and financing for the benefit of 731 participants.
- Organization of 28 training workshops on the implementation and concerted management of projects for 401 people.

a) Financial achievements

- Progress of the financial achievements of the PACCZO project (as of December 30, 2022):

	PTBA 1				PTBA 2			
	PTBA n° 1	Engagement	% Phys.	% Fina.	PTBA n° 2	Engagement	% Phys.	% Fina.
Total investissements	23 086 651,14	23 086 651,14	98%	97%	39 652 400	39 652 400	72%	64%
Charges d'exécution	2 029 184,53	2 029 184,53	100%	100%	1 350 000	1 350 000	96%	78%
TOTAL PACCZO	25 431 530	25 037 645	98%	97%	39 910 000	39 594 335	72%	65%

- Amounts of payments to ANDZOA:

	2016	2017	2018	2020	2022	Total PACCZO
Amounts paid to ANDZOA (MAD)	25 431 500	39 594 335	16 080 053	4 288 749,84	3 186 713,56	81 105 918
Total (MAD)	25 431 500	64 600 234	81 105 918	85 394 668,5	88 581 382,00	--
% of cumulative payments	29%	73%	92%	96%	100%	--

Thus, with these physical and financial implementation rates at completion, it must be recognized that the management of PACCZO adapted well to the changes made to achieve its objectives in terms of: i) Improving the adaptive capacities of the water, ii) diversifying sources of income and improving the living conditions of populations vulnerable to climate change in the target areas, iii) improving the resilience of ecosystems in response to climate change and variability, iv) improving raising the awareness of all actors through knowledge management and sharing, and v) strengthening the capacities of participants in the design and implementation of adaptation measures.

- **A high rate of efficiency and quantitative and qualitative effects thanks to the commitment and coordination of the EE, TA and partner teams**

The PACCZO is distinguished by the involvement and commitment of all stakeholders. Involvement in the effective and institutional management of the project, as well as in the financing of the actions carried out. Indeed, agreements are signed between the EE and the ORMVAO/T and the ABH-GZR on the one hand for the realization of actions related to the water sector and on the other hand between the EE and the associations, cooperatives and CTs for the development of small innovative projects. This technical and financial commitment is partly responsible for the high efficiency rate recorded.

- **Positive impacts despite an unfavorable climatic and economic context (recurrent drought, inflationary pressure)**

The PACCZO has had positive effects on the environment and resilience to climate change as well as on the socio-economic level in the two areas of intervention. Thus, the project interventions have contributed to positive immediate results in relation to agricultural productivity despite the unfavorable climatic context of recent years, marked by recurrent drought, while the effects in terms of adaptation and resilience to climate change take longer to materialize.

- **Encouraging sustainability indices but dependent on the will and capacity of the actors (organizational forms and local authorities) in terms of management of the works**

Actions relating to the mobilization of water resources for the improvement of access to irrigation water and drinking water constitute a component of great importance for the target population of the project and, therefore, the question of sustainability of the networks and structures built is an acute issue.

Indeed, the existing organizational forms (AUEA and others) have shown very encouraging signs to assume their responsibility for infrastructure management by becoming actively involved in the design, monitoring and execution of works. The partnership approach developed by the EE and the partners (ORMVAO, ABH-GZR and CT) with the associations is likely to improve the sustainability of the project's achievements and their management by the local actors directly concerned. The testimonies of the beneficiaries and their representatives and their effective involvement in the technical choices and the arrangements to be put in place are signs of ownership of the achievements and predict their sustainability.

Although the active involvement of the population was supported by commitments signed between institutional actors and beneficiaries and agreements drawn up in this regard, the premature withdrawal of support from partners (ORMVAO and ABH-GZR and CT) after the completion of the project can always call these gains into question.

In reality, the effectiveness of their mission remains largely dependent on their financial capacities, which are overall in deficit. To mitigate the effects that may arise from financing difficulties, farmers and AUEAs will need close supervision by the CCAs, ORMVAO and ABH-GZR with the aim of ensuring permanent technical monitoring of farms. , the main guarantor of the improvement of their income.

Concerning the infrastructure for access to drinking water, despite the budgetary problems from which the territorial municipalities suffer, their maintenance still remains a priority for the ONEE-Branche Eau and the elected officials concerned with supplying the Ksours/douars by this vital resource. In the absence of the budget specific to the communes and the SAEP management units, the communal officials generally have recourse to the budgets of the National Promotion and the INDH for the rehabilitation and maintenance of the SAEP.

In addition, support for small local economic projects has recorded convincing results, marked by the involvement and motivation of the population, and supported by the promotion and support of young rural entrepreneurs within the framework of the "Startup Oasis" project. The appropriation of small innovative projects by the associations, cooperatives and CTs concerned by AAPs is certainly a factor solid durability. Particularly when this appropriation is consolidated by financial contributions from the partners in the achievements. However, the operation of the projects launched requires reinforcement and support in order to be able to monitor the competitiveness of the markets and generate interesting income. The development and sustainability of these emerging projects must therefore be well thought out and must be advanced as soon as possible.

15 Recommendations

In view of the above, and considering the satisfactory performance and the efforts invested in order to adopt better management of the development of oasis areas in a particularly difficult context, the final evaluation invites development actors to continue this action strategy and recommends:

- i) **Pursue and strengthen the regulatory and financial provisions to guarantee the sustainability of the achievements.** To do so, it is necessary to i) develop a strategy or an exit plan that will take charge of the measures taken and to be undertaken by the project to build the capacities of farmers' structures ii) sensitize partners and key players to be more involved in the implementation of the project's disengagement and sustainability strategy.
- ii) **Pursuing the approach adopted by PACCZO and the other experiences of ANDZOA have made it possible to promote intersectoral integration thanks to the synergy created between decentralized structures and the actors local** (Executing agencies, partners, external services, provincial and regional councils, local authorities, socio-professional organizations; etc.). The program must pursue the development of integrated and synergistic interventions to contribute to the safeguarding and development of oases. These interventions have fairly concrete short and medium-term effects on the populations of the targeted territories.
- iii) Pursue the operationalization of the monitoring-evaluation system. Mobilize the necessary resources to feed the application in real time (physical and financial achievements, scope indicators) to be able to validate its performance and avoid possible contradictions in the information produced.
- iv) **Strengthen the local development governance approach adopted during the PACCZO (bottom-up approach in the definition of needs)** to through a better densification of the institutional fabric and the deconcentration of decision-making. Institutional arrangements and methods of implementing project actions should reflect the principles of effective involvement, participation and accountability of all development actors. To do this, it is therefore necessary to design and set up new partnership relations in the spirit of territorial equity and advanced regionalization.
- v) **Support for local authorities in the participatory programming component by capitalizing on planning documents (PAC) and emphasizing adaptation to climate change.**

From 2007, the Ministry of the Interior with the support of several governmental and non-governmental organizations (ANDZOA, ADS, APDN, GLM, AO, APDESPS, FAO, etc.) adopts the commune as the socio-territorial unit basis of bottom-up participatory planning for Communal Action Plans (PAC).

The municipal action plan document, in accordance with article 36 of the municipal charter, must include the following elements:

- A diagnosis highlighting the economic, social and cultural potential of the municipality;
- The priority needs identified in consultation with the population, the administrations and the actors concerned;
- The estimated resources and expenditure relating to the first three years of implementation of the municipal development plan.

Therefore, starting from the idea that this process of developing CAPs will be generalized for all CTs and municipalities with less than 35,000 inhabitants. We recommend that future programs capitalize on the participatory programming carried out as part of the CAMP process and limit themselves to deepening the necessary aspects in relation to adaptation to climate change. Thus, within the framework of the reinforcement of intervention capacities, ANDZOA will be able to support the CTs expressing the need in the elaboration of these planning documents and the implementation of the three-year programs.

vi) Support for pilot projects funded by PACCZO

The small local economic projects have recorded remarkable results, thanks to the participatory approach adopted which induces the involvement and motivation of the population, and to the agreements signed between the EE and the associations, cooperatives and CTs concerned which have encouraged the technical and financial commitment of the partners. The concerted management of projects and their ownership by the beneficiaries partially ensures their sustainability, but does not guarantee it. Indeed, these projects are not sufficiently developed and enriched to adapt to the competitiveness of the market, and will certainly encounter difficulties in being able to operate correctly or even evolve.

In order to take full advantage of the efforts and amounts mobilized in this regard, in the short term as well as in the long term, actions ensuring the sustainability of these projects must be studied and adopted. Among these actions is the support of small projects financed over at least 3 years, or the training of managers so that they can ensure the sustainability of the project in terms of market integration, maintenance and devolution.

vii) Review the terms of the delegated work agreements to make the beneficiaries or their representatives responsible for implementation and maintenance

Within the framework of strengthening the full accountability of populations at the local level in decision-making, implementation, monitoring and maintenance of development actions; we propose to review the terms of the conventions of the delegated MO. Indeed, the funds could be transferred directly to the populations or their representatives (associations, cooperatives, municipalities, etc.) which will make it possible, on the one hand, to avoid many constraints experienced in past experiences in terms of management and mobilization of funds. And on the other hand, to make populations capable of controlling their own development and that they undertake to contribute to the financing of the projects and to maintain the development actions carried out.

Ultimately, this final evaluation supports and recommends the strengthening of the action strategy implemented within the framework of the first period of PACCZO. It reiterates the importance of the participatory and integrated approach, institutional strengthening and mobilization of the AF adopted during this first phase with the aim of achieving development objectives.

16 Appendices

15.1 Annex 1 : Minutes

REPORT
Date : from 09 & 17 November 2022
Location : ANDZOA, ABH-GZR & ORMVATin Errachidia & ORMVAO
Object : Contract n° 11/2022/ADA/DGP/DCS/SS relating to the final evaluation study of the Project for Adaptation to Climate Change in Oasis Zones (PACCZO) financed by the Adaptation Fund
Participants : - Representatives of ANDZOA's operational departments, representatives of partners and the evaluation team (NOVEC)
Objectives of the interviews: - Review of information needs among partners (AT, ABH-GZR and ORMVAT/ORMVAO); - Analysis and prioritization of successful experiences (success stories); - Analysis of the implementation process (difficulties, lessons, future improvements);
<p style="text-align: center;">Consistency of the Project for adaptation to climate change in oasis areas (PACCZO):</p> <ul style="list-style-type: none"> • Component 1: Improving adaptive capacities for better management of water resources in oasis areas. • Component 2: diversification of sources of income and improvement of the living conditions of populations vulnerable to climate change in the target areas. • Component 3: improving the resilience of ecosystems in response to climate change. • Component 4: Improved awareness of all stakeholders through knowledge management and sharing. • Component 5: Strengthening the capacities of actors involved in the design and implementation of adaptation measures. <p style="text-align: center;">Consistency of the NOVEC service:</p> <ul style="list-style-type: none"> • Provide relevant information and data on the actions carried out by the PACCZO project; Analyze the effectiveness of the project through the quantitative results recorded compared to the objectives set; • Judge its efficiency by comparing the means made available compared to the results • Understand its relevance through its realism and its degree of corroboration which are related to its degree of adaptability and its ability to meet the expectations of the population in terms of adaptation to climate change.
<p style="text-align: center;">Conduct of the interview: ANDZOA Rabat/NOVEC (09/11/2022)</p> <p>The specific context at the time of the assessment (water stress: regression of precipitation and inflows and its impact on groundwater levels, global situation of soaring prices) and its impact on the target values</p> <ul style="list-style-type: none"> - Program extension (reasons/impacts); - Program adaptations during the pandemic; - Exit and sustainability strategy: Sustainability factors;

- Sustainability assumptions;
 - Disengagement process;
 - Lessons learned ;
 - Potential for replication and scaling up.
- Financial management performance
 - Operationalization of the monitoring-evaluation system (implementation constraints)
 - Partner performance
 - Analysis and prioritization of successful experiences (success stories). The update of the first list.
 - Contractualization of new agreements with local actors.

Conduct of the interview:: ANDZOA Erfoud & Errachidia/NOVEC (14 & 15/11/2022)

- Focus on collecting the data needed for the final evaluation process:
 - Data on the evolution of the groundwater level in the area targeted by the project; The available shapefiles of all the actions of the project;
 - Data relating to actions in relation to the securing of the AEP;
 - Data relating to the extension of irrigation thanks to the actions of the PACCZO;
 - The list of resilience measures to be taken into account as well as the number of beneficiaries;
- Program extension (reasons/impacts)
- Program adaptations during the pandemic
- Exit and sustainability strategy:
 - Sustainability factors;
 - Sustainability assumptions;
 - Disengagement process;
 - Lessons learned ;
 - Potential for replication and scaling up.
- Financial management performance
- Operationalization of the monitoring-evaluation system (implementation constraints)
- Partner performance
- Analysis and prioritization of successful experiences (success stories). The update of the first list.
- Contractualization of new agreements with local actors.
- Environmental and social impacts related to project activities and proposed support measures.

At the end of this interview, it was decided that:

- The update of the database proposed for the mid-term evaluation survey by integrating the new actions of component 3 (5 to 6 surveys/Tinjdad), as well as those of the Zagora area (10 surveys/5 CT).
- Establishment of a list of resource persons to deepen the qualitative aspects.
- Provision of the evaluation team with available data on the logical framework indicators:
 - Data on the evolution of the groundwater level in the area targeted by the project;
 - The available shapefiles of all the actions of the project;
 - Data relating to actions in relation to the securing of the AEP;
 - Data relating to the extension of irrigation thanks to the actions of the PACCZO;

- The list of resilience measures to be taken into account as well as the number of beneficiaries;
- Environmental and social impacts related to project activities and proposed support measures: the update will be made by the environmental expert.
- Provision of the evaluation team with all the data necessary to deepen the analysis of the monitoring-evaluation system (implementation constraints):
 - The technical assistance market (budget and time spent allocated to the monitoring and evaluation component)
 - The market for designing and implementing the M&E system

Interview procedure: ABH/ANDZOA/AT/NOVEC (15/11/2022)

Presentation of the methodological approach by Mr B. Essadi (NOVEC)

- Objective of the study ;
- Consistency of the services requested in the Contract;
- Reminder of the technical and methodological design with emphasis on the logical framework revision stage;

Analysis of the implementation process with emphasis on the following aspects:

- The specific context at the time of the assessment (water stress: regression of precipitation and inflows and its impact on quaternary aquifers, global situation of soaring prices);
- The methods of communication around the project;
- The set-up and approach to the project
- Capitalization on the PACCZO experience;
- Strategy for disengagement and sustainability (exit): action has been taken on initiatives taken with local actors (CP, users, association of truckers) for the sustainability of works
- Monitoring and evaluation
- Mobilization of other funds for the realization of other works given the expectations of the population
- Etc...

At the end of this interview, it was decided that:

- The ABH-GZR was responsible for sending the supplement to the piezometric monitoring series to ANDZOA no later than Monday 21/11/2022.
- The consultant in consultation with the ABH-GZR will be responsible for estimating and interpreting the value of the indicator. A restitution session will take place remotely to discuss and validate the results.
- As part of the sustainability of the works, the consultant with the support of ANH/ANDZOA will document the disengagement process initiated with all the actors (first agreement signed with the AUEAs and the second in the process of being signed with the CP and the truckers' association).
- The consultant will update Box 7 relating to the documentation of the successful experience "Box 7: Construction of an artificial aquifer recharge structure on Oued Frekla" by emphasizing the damage avoided (from non-action).

Interview process: ORMVATF/AT/NOVEC

Presentation of the methodological approach by Mr B. Essadi (NOVEC)

- Objective of the study ;
- Consistency of the services requested in the Contract;
- Reminder of the technical and methodological design with emphasis on the logical framework revision stage;

Analysis of the implementation process with emphasis on the following aspects:

- The specific context at the time of the assessment (water stress: regression of rainfall and inflows and its impact on groundwater levels, global situation of soaring prices);
- The methods of communication around the project;
- The progress of the 4 conventions
- The setting up and approach of the project (synergy, complementarity and integration, pooling of resources);
- Capitalization on the PACCZO experience;
- Exit Strategy and Sustainability Strategy (exit)
- Monitoring and evaluation
- PACCZO leverage effects (contractualization of other regional agreements)
- Etc...

At the end of this interview, it was decided that:

- 1) Document a successful “success story” experience within the framework of the “Support for the implementation of Cumin certification – 2017-2019” agreement. The proposed site is the "Alnif" perimeter as a site that has benefited from several support actions for Cumin producers:
 - Technical management / Local
 - seeds;
 - Upgrading Units,
 - Equipment (hardware kits),
- 2) Documenting a successful "success story" experience within the framework of the "Development of oases through territorial and landscape development at the level of the intermediate Rhéris basin - 2020" agreement. The proposed site is the "Bour El Khrobat" perimeter as a pilot ecotourism site which has benefited from several integrated actions:
 - Development of access and tracks within the palm groves (rehabilitation, solar lighting, nameplates, etc.);
 - Oasis rehabilitation works and development of the irrigation network (cleaning of clumps, khattaras and seguias and works of art, etc.);
 - Development of tourist interpretation spaces;
 - Development of water points for the fight against fires.

- 3) Document a successful “success story” experience within the framework of the “Fight against silting -2017-2019” agreement. This is an action to ensure the sustainability of the proposed developments (palisades) in the targeted sites (Frekla oulia/Soufla, sidi ali):
 - Organization of awareness-raising workshops for farmers to combine biological control with mechanical control;
 - Development of a well to be equipped with solar energy (action delayed by drought).
- 4) Document a successful “success story” relating to the establishment of a complex for the recovery of date palm by-products (tufts) to mitigate fires.
- 5) Document a successful “success story” relating to a “SMART OASIS” pilot experience as part of the process of sustainability and conservation of the actions carried out in the oases.

Interview process: ORMVAOZ/NOVEC

Presentation of the methodological approach by Mr B. Essadi (NOVEC)

- Objective of the study;
- Consistency of the services requested in the Contract;
- Reminder of the technical and methodological design with emphasis on the logical framework revision stage;

Analysis of the implementation process with emphasis on the following aspects:

- The specific context at the time of the assessment (water stress: regression of rainfall and inflows and its impact on groundwater levels, global situation of soaring prices);
- The methods of communication around the project;
- The state of progress of the 3 conventions
- The setting up and approach of the project (synergy, complementarity and integration, pooling of resources);
- Capitalization on the PACCZO experience;
- Exit Strategy and Sustainability Strategy (exit):
- Monitoring and evaluation

At the end of this interview, it was decided that:

- 1) Document a successful “success story” experience within the framework of the “Support for the implementation of Henna certification – 2017-2019” agreement. The site will be offered by the service SVOP of ORMVAO.

15.2 Annex 2: Initial logical framework

Result	Indicator	Baseline	Target
Project Objective: Improve the adaptability of the Oasis populations to the impacts of climate change	Number of oases inhabitants vulnerable to the adverse effects of climate variability and change	There are no concrete adaptation measures currently being implemented in the project areas	By the end of the project, at least 4000 of the most vulnerable inhabitants in the project area will benefit from the proposed activities to cope with their vulnerability to climate change
Component 1 Improving adaptive capacities of the water sector	Development of water sectors' services responsive to evolving needs from changing and variable climate.	There is evidence on the shortages by basin being updated	At least 10% of households secure their access to water for drinking and irrigation.
Outcome 1.1 Improved joint regulation of ground and surface water through new sustainable hydraulic and protective structure management	Efficiency of mobilization	Available studies indicate the rate water mobilization by basin	Approximately 2 million m3
Output 1.1.1 Replenishment structures for groundwater are built	Number of recharge structures	In the intervention sites, structures for exclusively recharging groundwater do not exist.	4 structures
Output 1.1.2 Structures for perimeters protection are built	Number of irrigated perimeters	Flooding reduces the rate of floodwater mobilization	6 perimeters
Output 1.1.3 Feasibility studies on the exploitation of deepwater resources intended for the dried up palm groves of the Maïder basin are carried out.	Feasibility studies by site	No deep borehole is used in the project zone to reduce the shortage of drinkable water.	2 sites
Outcome 1.2 Vulnerable infrastructure allowing the improvement of water distribution efficiency are restored	Agricultural irrigation efficiency (%)	Efficiency ratios of the traditional networks are below 50% according to APP (Agency for the Partnership for Progress)	70% efficiency
Output 1.2.1 Khattaras are restored	Area irrigated (hectares)	Khattaras to be restored are identified. According to the 2005 PDRT, the restoration will allow the khattaras to pass from 2 to 5 L/s.	200 Ha
Output 1.2.2 Seguias are restored	Area irrigated (hectares)	SMH networks to be renovated are identified	200 Ha

Result	Indicator	Baseline	Target
Component 2. Diversifying income sources and improving the living conditions of populations vulnerable to climate change in the targeted areas	Percentage of households with diversified income sources and sustained climate-resilient alternative livelihoods.	The poverty rate in the zone remains especially high	At least 20% of families have diversified and improved their livelihoods through more resilient activities.
Outcome 2.1 Improved livelihoods of families due to the development of more resilient small scale agriculture	VA/ha	37 000dh/ha (according to APP)	20% increase for an objective of MAD 45000 per ha
Output 2.1.1 Conservation technics are circulated and adopted	Number of trained farmers	The project’s target areas have not received significant training	800 farmers. At least 400 women.
Output 2.1.2 Oasis agriculture products are developed and promoted	Number of products that are certified and are represented in fairs/trade shows	Experiments near the project zones have successfully developed attractive local agricultural sectors (argan, saffron, cheese, olive oil, and cactus).	4
Outcome 2.2 Developed non-agricultural economic activities help increase the resilience of the Oasis population	Number and type of economic units (existing or new) that develop in a manner adapted to climate change.	Experiments near the project zones have successfully developed high value on agricultural sectors	At least 20 economic units
Output 2.2.1 Sustainable and responsible tourism, which faces up to climate change is developed	Number of tourism units that develop in a manner adapted to climate change.	The potential of responsible tourism is undervalued in the project’s implementation zones (compared to the Dadès and Draa valleys).	At least 5 tourism units
Output 2.2.2 Other economic activities, particularly for youths and women, are supported and developed	Projects financed Trainings exist	The existing VSE support programs do not particularly support innovative adaptation projects.	20 projects, at least 50% managed by women 2 trainings
Component 3. Improving the ecosystems’ resilience in response to climate change and variability	Number of oases that have reduced the threats to their ecosystem and preserved their heritage	The MEA/FAO/UNESCO/PACO studies have sounded the alarm	At least 4 oases
Outcome 3.1 Threats reducing the value of Oasis ecosystems are taken into account by municipalities	Number of oases that have reduced the threats to their ecosystem.	Consultation workshops have stressed the importance of the degradation of ecosystems	At least 4 oases participate in a dynamic for protecting the ecosystems
Output 3.1.1 The fight against desertification is organized	Protected hectares	The fight against desertification is already well underway by the Water and Forests Commission, which has however reached a maximum given their current means.	40 ha

Result	Indicator	Baseline	Target
Output 3.1.2 Techniques for environmental cleanup are developed	Number of stakeholders trained	Techniques for cleanup are nearly inexistent in the oasis zones.	400 trained individuals (at least 50% women) with a treatment device installed.
Outcome 3.2 Preserved and Promoted Heritage	Number of solicitations for restoring post-project	Few landowners are currently interested in restoration or construction because they fear that their home will become a museum.	There are solicitations.
Output 3.2.1 Historic constructions are restored for new uses	Restored and used buildings	Restored buildings have a low-valued museum function (empty kasbah)	2 restored buildings used for a new purpose
Output 3.2.2 Traditional techniques and materials are reused for new constructions	New buildings using traditional materials	Currently, only high-end tourism structures use these techniques for new constructions.	2 new constructions
Component 4 Improving stakeholder awareness through the management and exchange of knowledge	Part of the targeted municipal populations are educated on climate change issues	The population has heard of climate change but it remains an abstract concept that has yet to be connected to changes in the area.	60% of households in the project zones
Outcome 4.1 Organized public debate on water and climate change	The importance of communicating on the issue of climate change	Informal debates exist but there is a lack of data and areas for expression needed to reinforce the message.	Media coverage
Output 4.1.1 An assessment of resources in the intermediary Gheris basin and Maïder is carried out	Access to documentation	Several studies and documentation are unavailable	The existence of a documentation library Study on accessible water resources
Output 4.1.2 A local council for water dialogue is operational	Number of thematic conferences organized by the Local Council on water	Debates on climate change issues remain national and centralized	6 regional thematic conferences
Outcome 4.2 Supported and developed local initiatives for communication	Population of targeted groups are educated on the overall issues relating to climate change	Communication/awareness campaigns are not targeted	Targeted content of communication/awareness campaigns
Output 4.2.1 An awareness and communication strategy is developed	Number of mass communication campaigns	The project intervention zones have not had any mass communication activities	4 mass campaigns
Output 4.2.2 A financing mechanism is implemented	Number of funded initiatives for raising the awareness of educated children, emigrants, and tourists	The project intervention zones have not had any targeted awareness activities	50 funded awareness projects

Result	Indicator	Baseline	Target
Component 5 Strengthening the capacities of participants in the design and implementation of adaptation measures	No. of Officials and beneficiaries trained with reinforced capacities in adaptation project management	The project intervention zones have not had any capacity building activities	240 officials 400 oasis beneficiaries, at least 50% women
Outcome 5.1 Consolidated and developed adaptive capacities for climate change	Number of officials and beneficiaries whose adaptability to climate change has been strengthened.	There are major knowledge disparities between stakeholders	240 public service officials 400 oasis beneficiaries, at least 50% women
Output 5.1.1 the managers of public service are informed on the issues of climate change and introduced to adaptability measures for the main sectors	Number of training workshops and participants	Local and public officials have sectorial knowledge and are not well versed in the multi-sectoral effects of climate change	12 training workshops (20 people/workshop) 50 participants for scientific conferences and beneficiary awareness forums
Output 5.1.2 Oasis beneficiaries are trained on innovative adaptability measures	Number of training workshops and travel/internships	The oasis beneficiaries are up to date on adaptation techniques and experiments conducted in neighboring countries.	20 workshops, (20 people/workshop) 15 trips (at least 50% women)
Outcome 5.2 Strengthened coordinated management capacities for climate change projects	Number of officials and beneficiaries whose ability to collectively manage climate change adaptation projects has been strengthened	The stakeholders are not familiar with the dialogue process in managing development projects	240 public service officials 400 oasis beneficiaries (at least 50% women)
Output 5.2.1 The participants (operators and beneficiaries) are trained in the designing and financing of projects	Number of training workshops being designed and funding of projects	The stakeholders are not aware of financing and monitoring-evaluation mechanisms for adaptation projects	12 workshops on the project cycle (20 people/workshop) 12 workshops on project financing (40 people/workshop) (at least 50% women)
Output 5.2.2 The participants (operators and beneficiaries) are trained on the implementation and joint management of projects.	Number of training workshops on the implementation and the coordinated management of projects and the number of participants	The stakeholders are not familiar with coordinated management mechanisms	12 workshops on the participatory approach (20 people/workshop) 12 workshops in conflict management and mediation (12 people/workshop) (at least 50% women)

15.3 Annex 3: Project Results Chain

Component	Result	Product	Activities
1. Improvement of coping skills of the water sector	1.1 Joint regulation of superficial and groundwaters is improved thanks to new amenities structures hydraulics and protection.	1.1.1 Groundwater recharge structures are built	1.1.1.1 : Carry out additional studies of groundwater recharge works in the identified potential sites
			1.1.1.2 : Build structures with the highest potential
			1.1.1.3 : Acquire monitoring equipment (piezometers)
			1.1.1.4 : Ensure monitoring and evaluation
			1.1.1.5 : Establish an agreement for the upkeep and maintenance of groundwater recharge structures
		1.1.2 Perimeter protection works are built	1.1.2.1 : Carry out complete technical studies of the protective works in the identified priority sites
	1.1.2.2 : Build priority works		
	1.1.2.3 : Establish an agreement for the upkeep and maintenance of perimeter protection works		
	1.1.3 Feasibility studies for the exploitation of deep water resources intended for the dried palm groves of the basin of Maïder are carried out.	1.1.3.1 : Carry out an exploration/reconnaissance study by drilling of deep-water resources	
		1.1.3.2 : Carry out feasibility studies for the identification of priority sites and the financial package	
1.2 The works vulnerable allowing improve water distribution efficiency are rehabilitated	1.2.1 The khetaras are rehabilitated	1.2.1.1 : Formalize the commitment of beneficiaries in the rehabilitation operation	
		1.2.1.2 : Carry out the rehabilitation works of the Khetaras	
	1.2.2 The seguias are rehabilitated	1.2.2.1 : Formalize the commitment of beneficiaries in the rehabilitation operation	
		1.2.2.2 : Carry out rehabilitation works on irrigation water distribution networks	
2. Diversification of sources of income and improvement of living conditions of populations vulnerable to change climate in the target areas	2.1 Means livelihoods of families are improved through the development of a small farming more oasis resilient.	2.1.1 Conservative techniques are disseminated and adopted	2.1.1.1 : Carry out a study on the experiments already carried out in the area or in similar areas internationally
			2.1.1.2 : Train new farmers in conservation techniques and promote their dissemination
		2.1.2 Oasis agricultural products are developed and valued.	2.1.2.1 : Supporting producers in the certification process for their products
	2.1.2.2 : Promote agricultural products from the oases		
	2.1.2.3 : Encourage research on endemic species and their uses		
	2.2 No agricultural economic activities are developed to increase the resilience of the population	2.2.1 Sustainable and responsible tourism in the face of the impact of climate change is developed.	2.2.1.1 : Support players in the tourism sector in making the activity more accountable
			2.2.1.2 : Conduct a study on niche tourism products to be developed
		2.2.2 Other economic activities, particularly for young adults and women are developed	2.2.2.1 : Support small local economic projects
2.2.2.2 : Propose training adapted to the context and needs of the oases			

Component	Result	Product	Activities
3. Improved resilience of ecosystems in response to change climate and variability.	3.1 Threats reducing the value of oasis ecosystems are taken into account by the municipalities	3.1.1 The fight against silting is organized	3.1.1.1 : Carry out a study to identify priority sites
			3.1.1.2 : Financially support the mechanical and biological control action of Water and Forests
			3.1.1.3 : Mobilize the populations for the fight against the silting up of habitats and plots
		3.1.2 Clearance techniques are developed	3.1.2.1 : Studying the impacts of economic activities in oases
			3.1.2.2 : Train the players concerned in depollution techniques.
			3.1.2.3 : Support community services aimed at protecting natural resources.
	3.2 Heritage is preserved and enhanced	3.2.3 access and interpretation areas are rehabilitated for better accessibility and attractiveness of palm groves	3.2.3.1 : Develop access and tracks within the palm groves (rehabilitation, solar lighting, nameplates, etc.) including technical assistance.
			3.2.3.2 : Develop spaces for tourist interpretation.
		3.2.4 water points and equipment are acquired for better intervention against fires	3.2.4.1 : Provide water points for firefighting.
			3.2.4.2 : Acquire firefighting equipment.
4. Improved awareness of all actors through the management and sharing of knowledge.	4.1 Public debate on water and climate change is organized	4.1.1 An assessment of water resources in the intermediate Gheris basin and in that of Maider is realized	4.1.1.1 : Establishment of a Documentary Fund
			4.1.1.2 : Strengthening of the water resources monitoring system in the project areas
		4.1.2 A Local Water Dialogue Council is operational	4.1.2.1 : Development of a draft charter on water and climate change in the oasis environment
			4.1.2.2 : Organization of thematic conferences
	4.2 Initiatives local communications and exchanges are supported and developed	4.2.1 An awareness and communication strategy is defined	4.2.1.1 : Development of a communication strategy
			4.2.1.2 : Communication campaign
		4.2.2 A financing mechanism is put in place place	4.2.2.1 : Establishment of the list of partner organizations for awareness-raising actions
			4.2.2.2 : Management of calls for awareness-raising projects
5. Strengthening of capacities of participants in the design and layout	5.1 Adaptation abilities to climate change are consolidated and developed	5.1.1 Heads of public services are informed of the challenges of climate change	5.1.1.1 : Production of training modules relating to climate change
			5.1.1.2 : Participation in scientific meetings and awareness forums

Component	Result	Product	Activities
implementation of adaptation measures		5.1.2 The oasis beneficiaries are trained in innovative adaptation measures	5.1.2.1 : Production of training modules relating to adaptation
			5.1.2.2 : Organization of trips and study courses
	5.2 Capacity for concerted management of climate change projects are reinforced reinforced	5.2.1 Participants are trained in project design and financing	5.2.1.1 : Production of training modules in the project cycle
			5.2.1.2 : Creation of training modules in project financing
		5.2.2: Participants are trained in the implementation and concerted management of projects	5.2.2.1 : Production of training modules in the participatory approach applied to adaptation measures
			5.2.2.2 : Production of training modules in conflict management and mediation

15.4 Annex 4 : Presentation of project components

Component	Presentation
Component 1: Improving adaptive capacities of the water sector	This component consists of improving the joint regulation of ground and surface water through new sustainable hydraulic and protection structures and the rehabilitation of obsolete structures to improve the efficiency of water distribution.
Component 2 vulnerable to climate change in target areas	This component is dedicated to improving the livelihoods of families through two approaches: The development of small-scale conservation and more resilient agriculture, The diversification of sources of income by promoting other non-agricultural economic activities, in order to increase the resilience of the population of the oases. This component also includes the development of income-generating activities for women and young people by improving employability and micro-entrepreneurship.
Component 3: Improved resilience of ecosystems in response to climate change and variability	Faced with the fragility of the oasis ecosystem and its submission to anthropogenic factors of degradation resulting from climate change (encroachment of sand, temperature increase, water shortage, etc.), the project included this component which consists of internalization and integration of these threats reducing the value of oasis ecosystems by municipalities through development plans. The expected result is the preservation of this heritage and ecosystem services through the balance between man and the oasis environment. The products of component 3 were reviewed and validated in the AWPB4 based on the results of the mid-term evaluation of the project as well as the capitalization on the achievements of the first four AWPBs and on the other hand on new grievances and needs. of the oasis territory observed during the implementation of the project and which have a relationship with climate change.
Component 4: Improved awareness of all stakeholders through knowledge management and sharing	This component aims to consolidate achievements, update data and finally disseminate and share knowledge related to climate change in the project areas. This dissemination will be done by organizing a public debate on water and climate change and by developing local initiatives for communication and documentation, and sharing around practices for adapting to climate change. Two main activities are planned, namely: Establishment of a Documentary Fund The project partners represented in the pilot committee and the regional coordination committee will mandate the PMU to launch a consultation in order to create a digital documentation library compiling studies and research on oases and climate change. This documentation library will also include results and lessons learned from the PACC-ZO project. This will guarantee the accessibility of the data to the various local and national actors in order to promote the appropriation of all this knowledge and to increase the effectiveness of future projects.

Component	Presentation
	<p>Strengthening of the water resources monitoring system in the project areas. Quantitative and qualitative monitoring of water resources in the hydraulic basin highlighted by the ABH-GZR. The project will support the ABH-GZR in the project areas through an agreement, which will also include the drafting of specific monitoring reports.</p> <p>A local council for water dialogue is planned. The project will begin the process of creating a CLE (Local Water Council) by drafting a Charter on water and climate change in oases. This charter will be submitted to the partners through bilateral meetings, which will result in a workshop for the approval and constitution of a local water council.</p>
<p>Component 5: Capacity building of participants in the design and implementation of measures adaptation</p>	<p>This component aims to build the capacities of project participants (managers and beneficiaries) in the design and implementation of climate change adaptation projects and measures. Emphasis on two crucial aspects will be made. the aim is to strengthen participants' knowledge of climate change and adaptation and to improve skills in the participatory approach, management of financial partnerships and conflict management.</p> <p>In oasis areas, information and training of public service agents on adaptation to climate change are very uneven, with a concentration of skills acquired around the sites of previous projects. The project aims to fill these information and education gaps in the selected sites (Intermediate Gheris and Maïder), which have not yet benefited from major adaptation interventions.</p> <p>Two activities are planned, namely:</p> <ul style="list-style-type: none"> • Conduct training modules on climate change <p>The project will organize a call for expressions of interest for organizations with the skills to train civil servants. The selected organizations will be consulted on the basis of the terms of reference prepared by the PMU for the execution of the training services site by site. The terms of reference will include an estimate of the number of participants and a preliminary list of training needs. The modules covered will include most sectors impacted by climate change.</p> <ul style="list-style-type: none"> • Participation in scientific meetings and forums <p>According to an annual plan prepared by the Project Management Unit, the project will cover the costs for technical staff to participate in scientific meetings on climate change as well as the costs for local actors to participate in educational forums organized around the oasis areas.</p>

Component	Presentation
	<p><i>Train oasis beneficiaries on innovative adaptability measures</i></p> <p>The populations of the sites selected by the project have adaptation skills inherited from previous generations on the management of scarcity and natural risks. The consultation workshops confirmed that the high risks related to climate change in the sites are well known. The project will expand the technical reference for adaptation in the selected sites (Intermediate Gheris and Maïder) through training and exchange activities:</p> <ul style="list-style-type: none"> ✓ Conduct adaptation training modules ✓ Organization of trips and internships <p>The process of implementing adaptation measures will be greatly facilitated by the project management tools provided by the stakeholders involved and by the financing mechanisms of different partners.</p> <ul style="list-style-type: none"> ✓ Conduct modules on the project cycle ✓ Conduct training modules on project finance

15.6 Annex 5 : Detailed planning of the PACCZO project

Activities	Years of execution				
	1	2	3	4	5
1.1.1.1 : Carry out additional studies of groundwater recharge works in the identified potential sites					
1.1.1.2 : Build structures with the highest potential					
1.1.1.3 : Acquire monitoring equipment (piezometers)					
1.1.1.4 : Ensure monitoring and evaluation					
1.1.1.5 : Establish an agreement for the upkeep and maintenance of groundwater recharge structures					
1.1.2.1 : Carry out complete technical studies of the protective works in the identified priority sites					
1.1.2.2 : Build priority works					
1.1.2.3 : Establish an agreement for the upkeep and maintenance of perimeter protection works					
1.1.3.1 : Carry out an exploration/reconnaissance study by drilling of deep-water resources					
1.1.3.2 : Carry out feasibility studies for the identification of priority sites and the financial package					
1.2.1.1 : Formalize the commitment of beneficiaries in the rehabilitation operation					
1.2.1.2 : Carry out the rehabilitation works of the Khettaras					
1.2.2.1 : Formalize the commitment of beneficiaries in the rehabilitation operation					
1.2.2.2 : Carry out rehabilitation works on irrigation water distribution networks					
2.1.1.1 : Carry out a study on the experiments already carried out in the area or in similar areas internationally					
2.1.1.2 : Train new farmers in conservation techniques and promote their dissemination					
2.1.2.1 : Supporting producers in the certification process for their products					
2.1.2.2 : Promote agricultural products from the oases					
2.1.2.3 : Encourage research on endemic species and their uses					
2.2.1.1 : Support players in the tourism sector in making the activity more accountable					
2.2.1.2 : Conduct a study on niche tourism products to be developed					
2.2.2.1 : Support small local economic projects					
2.2.2.2 : Propose training adapted to the context and needs of the oases					
3.1.1.1 : Carry out a study to identify priority sites					

3.1.1.2 : Financially support the mechanical and biological control action of Water and Forests					
3.1.1.3 : Mobilize the populations for the fight against the silting up of habitats and plots					
3.1.2.1 : Studying the impacts of economic activities in oases					
3.1.2.2 : Train the players concerned in depollution techniques.					
3.1.2.3 : : Support community services aimed at protecting natural resources.					
3.2.1.1 : Develop access and tracks within the palm groves (rehabilitation, solar lighting, nameplates, etc.) including					
3.2.1.2 : Develop spaces for tourist interpretation.					
3.2.2.1 : Provide water points for firefighting.					
3.2.2.2 : Acquire firefighting equipment.					
4.1.1.1 : Establishment of a Documentary Fund					
4.1.1.2 : Strengthening of the water resources monitoring system in the project areas					
4.1.2.1 : Development of a draft charter on water and climate change in the oasis environment					
4.1.2.2 : Organization of thematic conferences					
4.2.1.1 : Development of a communication strategy					
4.2.1.2 : Communication campaign					
4.2.2.1 : Establishment of the list of partner organizations for awareness-raising actions					
4.2.2.2 : Management of calls for awareness-raising projects					
5.1.1.1 : Production of training modules relating to climate change					
5.1.1.2 : Participation in scientific meetings and awareness forums					
5.1.2.1 : Production of training modules relating to adaptation					
5.1.2.2 : Organization of trips and study courses					
5.2.1.1 : Production of training modules in the project cycle					
5.2.1.2 : Creation of training modules in project financing					
5.2.2.1 : Production of training modules in the participatory approach applied to adaptation measures					
5.2.2.2 : Production of training modules in conflict management and mediation					

15.8 Annex 6 : Indicator calculation tables by component

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
Component 1. Improving the adaptive capacities of the water sector	1	Variation in groundwater level	19 m	14 m	11m	17 m	480%	0%
	2	Improved water access rate drinkable	-	615 Households	615 Households	2 540 Households	24%	76%
	2'	Additional irrigated area	-	375 ha	585 ha	400 ha	146%	0%
	3	Number of recharge structures operational	-	3	7	4	175%	0%
	4	Number of dominated perimeters protected	-	2	14	4	350%	0%
	5	Number of feasibility studies carried out	-	4	4	2	200%	0%
	6	Improving the efficiency of irrigation networks	50%	69%	69%	70%	99%	1%
	7	Number of Khettaras	-	23	49 (8 800 ml)	18	272%	0%
	8	Number of Khettaras operational	-	23	49	18	272%	0%
	9	Area dominated	-	95 ha	275 ha	200 ha	137,5%	0%
	10	Length of PMH networks landscaped (number of seguias)	-	18	60 (21 190 ml)	23	261%	0%
11	Area dominated	-	280 ha	310 ha	200 ha	155%	0%	
Component 2. Diversification of income sources and improvement	12	Percentage of households participating in the project having adopted at least one measure of resilience.	20 047	7 913 Households	7 913 Households	2 540 Households	311%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
the living conditions of populations vulnerable to climate change in target areas	13	Added value of production	19 000	24 000	22 581	31 000	73%	27%
	14	Number of farmers trained in conservatory techniques	0	616	616	800	77%	23%
	15	Number of certified products and represented at fairs	-	2	3	4	75%	25%
	16	Number of economic units no agriculture that develop from way adapted to climatic change.	-	21	21	20	105%	0%
	17	Number of tourist units that develop in a manner adapted to the climate change.	-	-	10	5	200%	0%
	18	Number of projects funded		21	45	20	225%	0%
	19	Number of trainings carried out	0	3	4	2	200%	0%
Component 3. Improvement of ecosystem resilience in response to climate change and to variability.	20	Number of oases that reduced threats to the ecosystem and preserve their heritage	-	6	13	4	325%	0%
	21	Number of oases that reduced ecosystem threats	-	2	4	4	100%	0%
	22	Area protected against silting	-	30 ha	120	40	300%	0%
	23	Protective measures applied	1	1	2	2	100%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
	24	Area protected by involvement target population	-	30	120	40	300%	0%
	25	Number of actors trained	-	398	398	400	100%	0%
	26	Types of clearance techniques treaties	-			-	100%	0%
	27	Number of requests for the rehabilitation after project	-	-		-	-	100%
		Lengths rehabilitated and equipped in solar lighting	2		8,5 km	10 km	85%	15%
		Number of equipped spaces	0		4	2	200%	0%
		Number of water points developed	0		7	05	140%	0%
		Number of AUEAs equipped	0		14	10	140%	0%
	28	Construction rehabilitated and used	-	-		>=1	-	-
	29	New construction with traditional materials	-	-		>=1	-	-
Component 4. Improved grip awareness of all stakeholders through the management and sharing of knowledge.	30	Proportion of households in target municipalities informed of climate change issues	20 756	22 867	29 653	25 154	118%	0%
	31	Realization of the charter on water and climate change in the environment oasis	-	1	1	1	100%	0%
	32	Number of conferences themes organized by the Local Water Council	-	3	6	6	100%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
	33	Number of mass communication campaigns	-	8	8	4	200%	0%
	34	Number of initiatives of sensitization	-	36	72	50	144%	0%
Component 5. Strengthening of capacities of participants in the design and implementation measures adaptation	35	Total number of officials and beneficiaries involved trained in design with enhanced project management capabilities adaptation	-	129 resp. 216 beneficiaries	357 resp. & 583 beneficiaries	240 resp. 400 beneficiaries	147%	0%
	36	Number of officials and beneficiaries whose capacities adaptation to climate change have been strengthened	-	287 resp. & 114 beneficiaries	341 resp. & 340 beneficiaries	240 resp. & 400 beneficiaries	85%	15%
	37	Number of training workshops	-	7	14	12	117%	0%
	38	Number of participants.	-	184	252	240	105%	0%
	39	Number of training workshops and travel/internship	-	8 workshops + 10 trips	19 workshops+15 trips	20 workshops & 15 trips	97,5%	2,5%
	40	Number of participants	-	332	502	400	125,5%	0%
	41	Number of managers	-	357	357	240	149%	0%
	42	Number of beneficiaries	-	583	583	400	146%	0%
	43	Number of training workshops in design and financing of projects.	-	14	28	24	117%	0%
	44	Number of participants	-	310	731	720	101,5%	0%

Component	Indicator						Performance rate	To be completed
	N° Indicator	Name (indicator)	Basic situation	Mid-term value	Recent value	Target		
	45	Number of training workshops in design and financing of projects.	-	14	28	24	117%	0%
	46	Number of participants	-	273	401	384	104%	0%