



Atlas Award ID:	00091134	Total Resources:	USD 73,542,726
Atlas Project ID: PIMS #	00096531	GEF:	USD 2,639,726
Pays:	Morocco	UNDP (TRAC):	USD 100,000
Region:	North Africa	Government ADEREE (Grant): ADEREE (In-kind): MAPM (Grant): MAPM (In-kind): MEME (Grant): Private sector GCAM & other banks (Grant): GCAM & other banks (In-kind):	USD 7,216,000 USD 400,000 USD 30,928,000 USD 200,000 USD 3,093,000 28,866,000 100,000
Area of intervention:	Project GEF-Solar Pumping “Promotion of the Development of Photovoltaic Pumping Systems for Irrigation”		
Implementation Institution:	AMEE (Moroccan Agency for Energy Efficiency)		
Intervention areas:	Agriculture, Irrigation, Energy, Renewable Energy	Duration: October 14, 2016 – October 13, 2020	

Mid-Term Review of the Project GEF-Solar Pumping “Promotion of the Development of Photovoltaic Pumping Systems for Irrigation”

Final Report

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ACRONYMS AND ABBREVIATIONS

AMEE	Agence Marocaine pour l'Efficacité Energétique (Moroccan Agency for Energy Efficiency)
AMISOLE	Association Marocaine pour les Industries Solaires et Eoliennes (Moroccan Association for Solar and Wind Industries)
CDN	Nationally Determined Contribution
CNEDD	Charte Nationale de l'Environnement et du Développement Durable (National Charter for the Environment and Sustainable Development)
DRA	Direction Régionale de l'Agriculture (Regional Directorate of Agriculture)
GCAM	Groupe du Crédit Mutuel du Maroc (Crédit Mutuel Group of Morocco)
GEF	Global Environment Facility
MAECRME	Ministry of Foreign Affairs and Cooperation
MAPMDTEF	Ministry of Agriculture and Maritime Fisheries, Rural Development, and Water
MEFRA	Ministry of Economy, Finance and Administrative Reform
MEME	Ministry of Energy, Mines and Environment
METLE	Ministry of Equipment, Transport, Logistics, and Water
ONCA	Office National du Conseil Agricole (National Office of the Agricultural Council)
PEDD	Politique de l'Environnement et du Développement Durable (Policy for the Environment and Sustainable Development)
PNEEI	Programme National d'Economie d'Eau en Irrigation (National Program for Water Saving in Irrigation)
PNPS	Programme National de Pompage Solaire (National Program for Solar Pumping)
PPV	Photovoltaic Pumping
RESCO	Renewable Energy Service Company (entreprises de services d'énergies renouvelables)
SDGs	Sustainable Development Goals
SNPEDD	Stratégie Nationale pour la Protection de l'Environnement et du Développement Durable (National Strategy for the Protection of the Environment and Sustainable Development)
SNDD	Stratégie Nationale de Développement Durable (National Strategy for Sustainable Development)
ToR	Terms of Reference
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar



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1. EXECUTIVE SUMMARY

Table 1: Project Information

Atlas Award ID:	00091134	Total Resources:	USD 73,542,726
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Area of intervention:	Project GEF-Solar Pumping “Promotion of the development of photovoltaic pumping systems for irrigation”		
Implementation Institution:	AMEE (Moroccan Agency for Energy Efficiency)		
Intervention areas:	Agriculture, Irrigation, Energy, Renewable Energy	Duration: October 14, 2016 – October 13, 2020	
Relevant stakeholders	Ministry of Energy, Mines and Environment Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests Ministry of Equipment, Transport, Logistics, and Water Ministry of Economy, Finance and Administrative Reform Ministry of Foreign Affairs and Cooperation Global Environment Facility United Nations Development Program		
Implementation partners:	Ministry of Energy, Mines and Environment Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests Ministry of Equipment, Transport, Logistics, and Water Ministry of Economy, Finance and Administrative Reform Ministry of Foreign Affairs and Cooperation ONCA (National Office of the Agricultural Council) GCAM (Crédit Agricole Group of Morocco) AMISOLE (Moroccan Association for Solar and Wind Industries)		
Alignment with CPD, Strategic Plan, UNDAF and SDGs	The project is aligned with SDGs 2, 7, 13 and 15, UNDP Strategic Plan 2018-2021, CPD 2017-2021, UNDAF 2017-2021 ...		

The Project

The Project GEF-Solar Pumping “Promotion of the Development of Photovoltaic Pumping Systems for Irrigation” is a 4-year project, implemented between 14 October 2016 and 13 October 2020, and co-

financed by the Government of Morocco (up to 41,837,000 USD), private banks (up to 28,966,000 USD), Global Environment Facility (up to 2,639,726 USD) and UNDP (up to 100,000 USD). The project is implemented by AMEE (Moroccan Agency for Energy Efficiency) / Ministry of Energy, Mines and Environment. The aim of the project is to establish a framework conducive to the development of solar pumping and the creation of favorable conditions for its success. It is dedicated to responding to farmers, agricultural cooperatives, agricultural stakeholders at central and regional level, solar pumping sector professionals' needs. The project operates across the country.

Objective of the Mid-Term Review

The purpose of the mid-term review of the Project GEF-Solar Pumping is to assess its overall performance applying the 4 usual mid-term evaluation criteria for projects supported by UNDP and financed by GEF (project strategy, progress made towards achieving the expected results, sustainability, and project implementation and responsive management), and then document lessons learned and good / bad practices, and make recommendations for the rest of the project.

Methodology of the Mid-Term Review

The methodology used consists of three stages: desk review of relevant documents (documents produced in the framework of the project design and implementation; national sustainable development strategy, policy and plan documents; national energy and irrigation strategy, policy, program and project documents; UNDP programmatic documents, the United Nations Development Assistance Framework 2017-2021, and the Sustainable Development Goals), remote interviews with 12 key informants from the Ministry of Energy, Mines and Environment; the Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests; the Ministry of Equipment, Transport, Logistics, and Water; ONCA (National Office of the Agricultural Council); GCAM (Crédit Agricole Group of Morocco); AMISOLE (Moroccan Association for Solar and Wind Industries), and the analysis of data collected and production of the draft report and the final report of the mid-term review.

Main conclusions

Table 2: Summary of Mid-term Review and Performance

Assessment notes:			
1 Monitoring and evaluation	Notation	2 Implementation agency	Notation
Design of monitoring and evaluation at entry	Satisfactory	Quality of implementation by UNDP: implementing agency	Satisfactory
Implementation of the monitoring and evaluation plan	Satisfactory	Quality of execution: executing agency	Satisfactory
Overall quality of monitoring and evaluation	Satisfactory	Overall quality of implementation	Satisfactory
3 Results assessment	Notation	4 Sustainability	Notation
Relevance	Very satisfactory	Financial resources	Likely
Progress made towards achieving expected results	Satisfactory	Socio-economic	Likely
Efficiency	Very satisfactory	Institutional framework and governance	Likely
Impact	Satisfactory	Environmental	Likely
Project implementation and adaptative management	Very satisfactory	Overall probability of sustainability	Likely
Overall score of the project	Satisfactory		
Gender	Satisfactory		

Project Strategy

The project relevance is good, for several reasons. First of all, the project design process was participatory and inclusive involving the solar pumping sector's stakeholders. The latter are also closely involved in the project implementation, as well as in the planning and monitoring in project activities.

Second, the project approach is relevant because its objectives, expected results, activities, stakeholders and beneficiaries were defined or chosen taking into account the results of an in-depth study of the context of solar pumping, but also because the project has a partnership approach that involves the solar pumping sector's public and private stakeholders.

Third, there is a strong correlation between project interventions and the main challenges facing all the stakeholders: the challenge of transforming the solar pumping market from a wider use of diesel and butane to a wider use of solar energy, the challenge of quality control and information / awareness of the solar pumping sector's stakeholders, the challenge of accessing to financial markets and credits, and the challenge of capacity building of stakeholders involved in the solar pumping sector.

Fourth, the project is consistent with both Morocco's sustainable development priorities and Morocco's energy development priorities, UNDP programmatic tools (Strategic Plan 2018-2021 and Country Program Document 2017-2021), the United Nations Development Assistance Framework) 2017-2021, and the Sustainable Development Goals.

In addition, the project is gender sensitive. Of course, only one log-frame indicator out of 19 indicators (around 5%) explicitly refer to women and 4 indicators out of 19 indicators (21%) are disaggregated by sex; however, the project has made efforts to integrate gender issues into the project implementation through: training and capacity building of women farmers; awareness of the general public, including women; strong involvement of women from AMEE (Moroccan Agency for Energy Efficiency) in awareness and communication activities on solar pumping, energy efficiency and sustainable energies (+ 33%); good representativeness of women in project staff (30%); involvement of women in the Project Monitoring Committee (30%); involvement of women in training and capacity building activities (10 to 15%); involvement of women in local awareness workshops (10%); and good representativeness of women in dedicated salons (over 40%).

Finally, all the project log-frame indicators are relevant, and end-of-project targets are "SMART" (Specific, Measurable, Attainable, Relevant, Time-bound). Unfortunately, mid-term targets were not designed.

Progress made towards Achieving Expected Results

The project achievements are satisfactory. While the objective of installing 10 pilot solar pumps has not yet been reached, another key expected result of Product 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed), i.e. "The design and operationalization of a MRV system", has been achieved. Furthermore, 3 expected results out of 5 expected results (60%) of Product 2 (A sustainable implementation framework and standards for solar pumping and "fertirrigation" practices have been developed) have already been achieved, against 67% and 75% respectively for Product 3 (Financial support and incentive mechanisms are identified, designed and suggested to the Ministry of Economy and Finance for adoption) and Product 4 (Capacities of the project beneficiaries in terms of development, implementation and management of solar pumping and "fertirrigation" systems are strengthened).

Most of project activities carried out in 2018, 2019 and 2020 have been successful, contributing to improve the effectiveness of the solar pumping market, favor a better access to financial products and tax incentives, and improve the quality of the supply of solar pumping products and services.

The project implementation and its outputs and outcomes have been positively influenced by factors such as the motivation of project team, the strong commitment of the implementing partners, and the availability of internal and external expertise, whereas it has been negatively affected by some other factors: the late start of project activities, the non-operationalization of the subsidy component of PNPS (National Program for Solar Pumping) and the COVID-19 pandemic.

Efficiency

The project's Output 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed) represents 29% of the total amount of cumulative expenditure (2017, 2018 and 2019), against 25% and 5% respectively for Output 2 (A sustainable implementation framework and standards for solar pumping and "fertirrigation" practices are developed) and Output 3 (Financial support mechanisms and incentives are identified, designed and suggested to the Ministry of Economy and Finance for adoption). The share of Output 4 (Capacities of beneficiaries are strengthened) was higher (36%).

The share of the project management expenses in the total amount of the project expenses is relatively low: 4% in 2017, 11% in 2018 and 3% in 2019. In this regard, if we refer to the standard of "best practices" of GEF projects, i.e. a management fee rate of less than 10%, we can notice that the project is below the standard, except in 2018. For instance, in 2019, for 100 dollars spent, 3 dollars went into "project management fees" and 97% to the project's interventions in the field.

The physical achievement rate in 2018 and 2019 is 30% and 60%, respectively; and the financial achievement rate is 20% and 44%, respectively. The efficiency index (physical achievement rate / financial achievement rate) of the project is therefore 1.5 in 2018 and 1.36 in 2019.

At least two factors negatively impacted the project efficiency: the delay in the implementation of the subsidy component of PNPS (National Program for Solar Pumping) and the delay in the implementation of the project's budget and its induced effect: the postponement of some planned activities. On the other hand, the hosting of the project by AMEE (this allowed the project to save on office rental costs and on technical expertise) and the strong involvement of the institutional partners in the project design and implementation, activity planning and monitoring have positively impacted the project efficiency.

Impact

Among the immediate positive impacts of project interventions on beneficiaries, we can mention the following:

0. Technical capacities building of institutional and professional stakeholders involved in the solar pumping sector (Department of Energy and Environment, Department of Agriculture, Department of Water, farmers, agricultural cooperatives, solar pump installers, agricultural technicians and advisers, finance professionals, etc.) through information, awareness and training.
1. A better transparency and efficiency of the solar pumping market through the improvement of the quality of solar pumps installed, the availability of reliable and relevant information on the evolution and the characteristics of the solar pumping market.
2. Improvements in their financing capacities due to the establishment of 19 solar pumping standards and tax exemptions for solar pumping.

There are at least two possible longer-term impacts of the project's interventions on beneficiaries:

- The fact that beneficiaries, specially farmers, executives and technicians from DRA (Regional Directorate for Agriculture), agricultural technicians / advisers from ONCA (National Office of the Agricultural Council) and technicians from micro-enterprises "Resovert" have acquired knowledge and skills in solar pumping, know-how and skills, they will likely put at the service of the solar pumping industry.
- The implementation of an "experimentation / demonstration / replication" approach through the 10 solar pumping pilot projects. If effective, they will be replicated and, therefore, will contribute to increase the irrigated plots equipped with solar power and national energy production.

Sustainability

Two main hypotheses suggest that the results achieved by the project will last. The question of the sustainability of solar pumps installed does not arise because of their lifespan, more than 20 years, if well maintained. Also, project ownership had already been perceived in the Project Document as a prerequisite for the sustainability of its achievements.

The main risks for sustainability identified in the Project Document are financial, environmental, organizational and institutional risks. The risk situation at the date of the mid-term review is that all these risks are in progress. But anticipatory management measures are integrated into the project implementation.

To these risks, we must add the recent health risk resulting from the COVID-19 pandemic. If the pandemic persists and / or gets worse, it could cause the project activities to stop.

Project Implementation and Adaptive Management

Organizational and institutional arrangements to ensure good governance and effective implementation of the project's interventions were established from the start of the project. A validation workshop of the Project Document was organized and an official launch ceremony was organized on October 1, 2017 with the participation of the members of the Project Steering Committee and all the stakeholders. The project's human and financial resources are managed in accordance with UNDP procedures.

The project interventions are planned and scheduled annually and all the institutional and technical implementing partners are involved in the development of annual work plans. The project has various planning tools: the Project Document and log-frame, internal planning meetings, and planning meetings with implementing partners, etc. It has also adopted a results-based monitoring and evaluation strategy using various tools such as quarterly, semi-annual and annual monitoring carried out by project staff and Project Steering Committee, and external monitoring assessments conducted by the project implementing partners or by UNDP.

Remote interviews with key informants revealed that deliverables, especially annual reports, were produced by the project management team and submitted to UNDP on time. The project annual reports, for instance, provide information on the project achievements, project management and governance, risk management, financial achievement rates, and recommendations.

Finally, internal and external communication tools and activities have been developed: regular staff meetings and regular meetings with the implementing partners. At the same time, the project has developed external communication tools to boost its visibility: participation in exhibitions and forums dedicated to renewable energies and energy efficiency; facilitation of a panel on the evolution of energy efficiency in Africa and in the world; participation in the International Agricultural Fair in Morocco, participation in the Elexpo Exhibition and the Solar exhibition; the design of a graphic charter; the design, creation and production of a video capsule on solar pumping; etc.

Recommendations

Table 3: Summary of key Recommendations.

Recommendations	Addressed to:
<i>Project strategy</i>	
For the rest of the project, continue to promote the participatory and inclusive approach.	Government Steering Committee Implementing Partners Project Management Unit
For the rest of the project, continue to place special emphasis on activities targeting women:	Government

capacity building for women farmers; awareness of women farmers; involvement of women from AMEE in awareness and communication activities on solar pumping; involvement of women in the Project Monitoring Committee; involvement of women in training and capacity building activities and local awareness workshops.	Steering Committee Implementing Partners Project Management Unit
For a similar project, take more into account the gender dimension in its design by defining from the start some gender sensitive indicators and end-of project targets.	Donors (Government, GEF, UNDP, GCAM, Tamwil EF Fellah) Institutional partners
Progress made towards achieving expected results	
For the rest of the project, pay particular attention to key activities that have not yet been implemented, especially pilot projects	Government UNDP Morocco Steering Committee Project Management Unit
Because the COVID-19 pandemic has impacted the project implementation and outcomes (postponement of activities requiring field visits / monitoring, delay in the launch of consultations and studies, etc.) and because the project started with more than one-year delay, think about extending of the duration of the project without additional costs.	Donors (Government, GEF, UNDP, banks) UNDP Morocco Steering Committee Project Management Unit
Efficiency	
For the rest of the project, given that it is difficult to support solar pumping projects without subsidies, operationalize the subsidy component of PNPS (<i>Programme National de Pompage Solaire</i>).	Donors (Government, GEF, UNDP, banks)
Impact	
For the rest of the project, continue to focus on activities with a strong impact on beneficiaries: capacity building of institutional and professional implementing partners, promotion of the quality of solar pumps installed, and technical support and structuring of micro-enterprises "Resovert".	Government UNDP Morocco Steering Committee Project Management Unit
Sustainability	
For the rest of the project, maintain the dynamic partnership / consultation / synergy between implementing partners to make the project achievements more sustainable.	Government UNDP Morocco Steering Committee Project Management Unit

2. INTRODUCTION

2.1. Project Description and Context

✓ Context

In Morocco, climate changes are a real threat, on the one hand, for the environment because of their harmful effects (regular decrease in water availability, irregularity of local agricultural production, intensification of extreme climatic phenomena such as droughts, floods, sea level rise, etc.) and, on the other hand, for poverty reduction and sustainable development because they affect key sectors, namely agriculture, livestock, forests, natural resources, water, natural resources, biodiversity, health, etc. At the same time, climate changes further hamper the development of vulnerable areas such as oases, forests, mountains and the coast, and, therefore, contribute to increasing the vulnerability of people living directly or indirectly from the above-mentioned sectors, especially farmers.

We can understand why the fight against the harmful effects of climate changes is one of the major concerns of the Government of Morocco. This will to counter the effects of climate changes has resulted in the development of a strategy based on two principles: the development and implementation of a policy to mitigate greenhouse gas emissions through the introduction of clean technologies, and the implementation of adaptation policies that prepare the country to cope with these effects. In addition, it gave rise to the development of various sustainable development strategies, policies and plans / programs (e.g., CNEDD¹, SNDD², PEDD³, PANE⁴...). Also, Morocco developed in 2017, its Nationally Determined Contribution (CDN) within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) by which it pledged to reduce its greenhouse gas emissions by 42% in 2030.

The Government of Morocco has also made commitments in favor of the development of sustainable agriculture, the promotion of renewable energies and the rational use of water resources and the use of innovative irrigation techniques. These commitments have resulted in the development and implementation of ambitious strategies, policies, programs and projects aiming at developing renewable energy and irrigation sectors through the promotion of the use of sustainable energy sources, the industrial integration of clean technologies, the creation of green jobs, and the development of sustainable agriculture. Among these strategies, policies, programs and projects, we can mention the following: SNDER⁵, PES⁶, PMV⁷, PEE⁸, PNPS⁹...), and more recently the Project GEF-Solar Pumping “Promotion of the Development of Photovoltaic Pumping Systems for Irrigation”.

¹. Charte Nationale de l'Environnement et du Développement Durable (National Charter for the Environment and Sustainable Development)

². Projet de Stratégie Nationale de Développement Durable 2030 (Project of National Strategy for Sustainable Development 2030)

³. Politique de l'Environnement et du Développement Durable (Policy for the Environment and Sustainable Development)

⁴. Plan d'Action National pour l'Environnement (National Action Plan for the Environment)

⁵. Stratégie Nationale de Développement des énergies renouvelables au Maroc (National Strategy for the Development of Renewable Energies in Morocco)

⁶. Programme Energie Solaire (Solar Energy Program)

⁷. Plan Maroc Vert (Green Morocco Plan)

⁸. Programme Energie Eolienne (Wind Energy Program)

⁹. Programme National de Pompage Solaire (National Program for Solar Pumping).

✓ Project

Developed in the framework of the partnership between the Government of Morocco, through AMEE¹⁰, and the United Nations Development Program (UNDP), the Project GEF-Solar Pumping “Promotion of the Development of Photovoltaic Pumping Systems for Irrigation” is part of PNPS (National Program for Solar Pumping) and, therefore, contributes to its implementation. The main objective of PNPS is to favor the development of institutional, technical and financial tools to support the installation of solar pumps for farmers.

The Project GEF-Solar Pumping is co-financed by the Government of Morocco (up to 41,837,000 USD), private banks (up to 28,966,000 USD), Global Environment Facility (up to 2,639,726 USD) and UNDP (up to 100,000 USD). Its implementation involves both institutional stakeholders (the Ministry of Energy, Mines and the Environment; the Ministry of Agriculture and Maritime Fisheries, Rural Development and Forests; the Ministry of Equipment, Transport, Logistics and Water; the Ministry of Economy, Finance and Administrative Reform; the Ministry of Foreign Affairs and Cooperation, ONCA¹¹) and technical / professional stakeholders (GCAM¹², Tamwil El Fellah, AMISOLE¹³, and so on), as well as Global Environment Facility (GEF) and UNDP. The project quality assurance is provided by UNDP.

The Project GEF-Solar Pumping is a 4-year project (October 14, 2016 - October 13, 2020) aiming to establish a framework conducive to the development of solar pumping and the creation of favorable conditions for its success. Four main results are expected from its implementation:

- Result 1: Solar pumping units with a set of configurations are designed, evaluated and installed;
- Result 2: A favorable framework for sustainable implementation and standards for solar pumping and “fertirrigation” practices are developed;
- Result 3: Financial support and incentive mechanisms are identified, designed and suggested to the Ministry of Economy and Finance for adoption;
- Result 4: The technical capacities of beneficiaries in terms of development, implementation and management of solar pumping and “fertirrigation” systems are strengthened.

The project targets farmers, agricultural cooperatives, agricultural stakeholders at central and regional level, and the solar pumping sector’s professionals. It operates across the country.

¹⁰. Agence Marocaine pour l'Efficacité Énergétique (Moroccan Agency for Energy Efficiency)

¹¹. Office National du Conseil Agricole (National Office of the Agricultural Council)

¹². Groupe du Crédit Agricole au Maroc (Crédit Agricole Group of Morocco)

¹³. Association Marocaine pour les Industries Solaires et Eoliennes (Moroccan Association for Solar and Wind Industries)

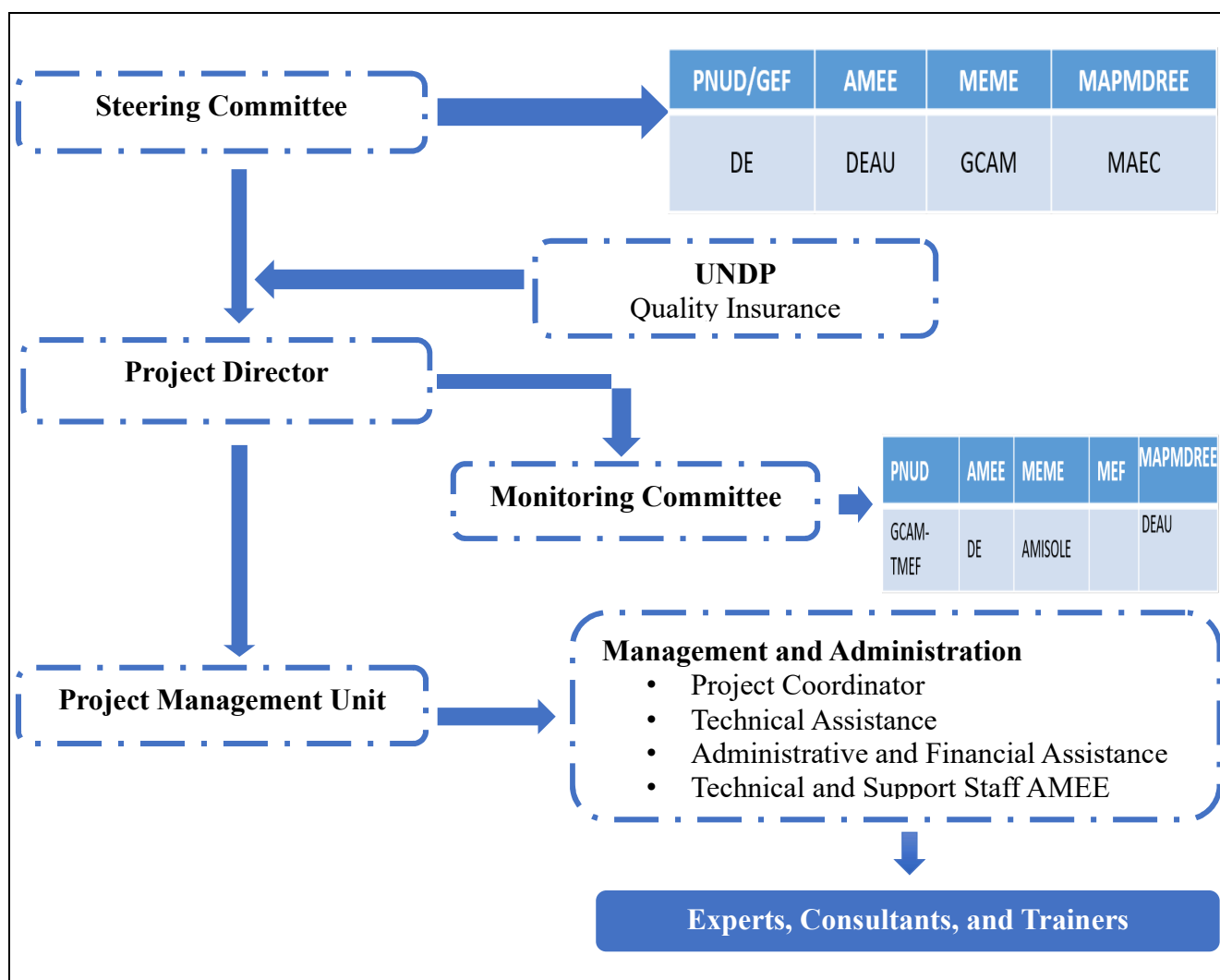
Table 4: Main Stakeholders

Description	Description or example	Role within the project
MEME (Ministry of Energy, Mines and Environment)	Responsible, among other things, for the development and implementation of government policies in the areas of energy, mines and environment	Co-financing of the project up to 41,837,000 USD
AMEE (Moroccan Agency for Energy Efficiency) / MEME	It supports the energy sector's stakeholders to develop inclusive and sustainable solutions to increase energy efficiency	Responsible for the project implementation
MAPMDTEF (Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests)	Responsible for the development and implementation of government policies in the areas of agriculture, maritime fisheries, rural development and forests	Institutional partner
METLE (Ministry of Equipment, Transport, Logistics, and Water)	Responsible for the development and implementation of government policies in the areas of equipment, transport, logistics and water	Institutional partner
MEFRA (Ministry of Economy, Finance and Administrative Reform)	In charge of financial and monetary matters, including credit and external finance policies	Institutional partner
MAECRME (Ministry of Foreign Affairs and Cooperation)	Responsible, among other things, for the development and implementation of government policies in the areas of Foreign Affairs and Cooperation	Institutional partner
ONCA (National Office of the Agricultural Council)	Its leads, coordinates and monitors the implementation of the agricultural advisory strategy at the national level (advice to farmers, support for farmer organizations and other stakeholders...).	Institutional partner
Global Environment Facility (GEF)	It manages financial resources dedicated to actions focusing on transformational change in key systems that are driving major environmental loss, in particular energy, cities and food. It grants subsidies to projects related to biodiversity, the fight against the effects of global warming, water pollution, etc.	Co-financing of the project up to 2,639,726 USD
UNDP Morocco	It supports the Government of Morocco to develop its national development strategies and policies. Also, UNDP ensures the mobilization of the government, civil society organizations, the private sector, donors as well as UN agencies to implement these strategies and policies, etc.	Project quality assurance, monitoring and management of the project budget, monitoring the project implementation... Co-financing of the project up to 100,000 USD
AMISOLE (Moroccan Association for Solar and Wind Industries)	It promotes the interests of enterprises and professionals involved in the renewable energy sector.	Technical partner
GCAM (Crédit Agricole Group of Morocco) and Tamwil El Fellah	Contribute to financing the agricultural sector (for instance, they contribute to financing of the National Solar Pumping Program).	Technical partners Co-financing of the project up to 28,966,000 USD
Farmers and farmer cooperatives		Beneficiaries

Source: Table established on the basis of the Project Document

Finally, a project management structure, including a Steering Committee, Monitoring Committees and a Project Management Unit, has been set up within AMEE (Moroccan Agency for Energy Efficiency).

The Project Steering Committee¹⁴ comprises key stakeholders¹⁵ and is responsible for decisions relating to the strategic management of the project. It approves annual work plans as well as annual reports prepared by the Project Management Unit, monitors and assesses the performance of the project in terms of results and financial disbursements, controls the progress of the project's activities, examines and validates the project's activities and reports, recommends actions and activities that meet the needs and the policy, coordinates inter-institutional relations developed in the framework of the project implementation, and designs and approves an exit strategy during the semester preceding the end of the project.



¹⁴. The Project Steering Committee meets at least twice a year or as needed.

¹⁵. AMEE; Ministry of Energy, Mines and Environment; Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests; Ministry of Equipment, Transport, Logistics, and Water; Ministry of Economy, Finance and Administrative Reform; Ministry of Foreign Affairs and Cooperation, UNDP; and GCAM (Crédit Agricole Group of Morocco)

The Monitoring Committee is responsible for monitoring the implementation of project's activities, evaluating and approving the planning prepared by the Project Management Unit, evaluating the progress of the project with regard to annual work plans, assessing any changes relating to the project design, scope or duration, validating any revisions as well as the formulation of recommendations and proposals to ensure the right progress of the project.

The Project Management Unit comprises a National Project Director and a National Coordinator (He works under the supervision of the National Project Director and under the authority of the Project Steering Committee. He is responsible for the day-to-day management of the project). It is supported by international and national experts for the implementation of some specific activities (e.g., administrative and financial management, monitoring and evaluation, training, technical assistance, etc.).

2.2. Objective of the Mid-Review

The purpose of the mid-term review of the project is to assess its overall performance applying the 4 usual mid-term evaluation criteria for projects supported by UNDP and financed by GEF (project strategy, progress made towards achieving the expected results, sustainability, and project implementation and responsive management), and then identify and document lessons learned and good / bad practices, and make recommendations for the rest of the project.

2.3. Methodology

✓ *Data collection tools and techniques*

The following data collection tools and techniques were used:

- *Desk review of relevant documents*
 - Documents produced in the framework of the project design and implementation: Project Document, annual reports, budgets and financial reports, annual work plans, purchasing plans, minutes of meetings, etc.);
 - National sustainable development strategy, policy and plan documents (CNEDD, SNDD, PEDD, PANE, CDN/UNFCCC...) and national energy and irrigation strategy, policy, program and project documents (SNDER, PES, PMV, PEE, PNPS...).
 - UNDP programmatic documents (Country Program Document 2017-2021 and Strategic Plan 2018-2021), the United Nations Development Assistance Framework (UNDAF 2017-2021) and the Sustainable Development Goals (SDGs).
- *Remote interviews*

Remote interviews were conducted with 12 key informants from the Ministry of Energy, Mines and Environment; the Ministry of Agriculture and Maritime Fisheries, Rural Development, and Forests; the Ministry of Equipment, Transport, Logistics, and Water; ONCA (National Office of the Agricultural Council); GCAM (Crédit Agricole Group of Morocco); AMISOLE (Moroccan Association for Solar and Wind Industries); and project staff.

2.4. Mid-Term Review Phases

- ✓ Inception and desk phase: briefing meeting (by videoconference), desk research and document analysis, and production of an inception report detailing understanding of the terms of reference for the assignment, including a detailed methodology (approach, data collection tools, assessment matrix, work plan, chronogram).
- ✓ Data collection phase: data collection, especially remote interviews with key stakeholders, including data triangulation.
- ✓ Synthesis phase and reporting phase: analysis of data collected and production of the draft report and the final report of the mid-term review.

2.5. Constraints and Limits of the Mid-Term Review

The consultant had planned to travel to Morocco and conduct interviews with key stakeholders as well as focus groups with the project's beneficiaries. Unfortunately, this was not possible due to the Coronavirus pandemic and travel restrictions. So, instead of in situ data collection, interviews with key informants were conducted remotely.

This final report:

- Examines the project achievements.
- Provides a synthesis of the main conclusions, identifies and documents lessons learnt and examples of good / bad practices, and makes recommendations for the rest of the project.

3. ACHIVEMENTS

3.1. Project Strategy

3.1.1. Relevance of the Project Strategy

✓ *Project Design and Implementation*

The Project Document and annual reports do not address the project development process issues. However, according to key informants interviewed, the project design process was based on a participatory and inclusive approach, involving all the project's stakeholders (relevant government ministries, UNDP Morocco, private banks, and the solar pumping sector's professionals). Besides, the project design took into account lessons learned from past and ongoing projects and programs such as PNPS (National Program for Solar Pumping). As mentioned above, the project was designed and implemented to provide an appropriate support to PNPS while responding to the shortcomings identified in this program in terms of approach, technological choices, partnerships, etc. The project also appropriated the concept of NAMA backed by PNPS which was developed as part of a previous project: Project FIRM.

As far as the project implementation is concerned, key informants interviewed also confirmed that all the stakeholders in the project's activities: audit and evaluation of the quality of equipment installed, capacity building activities, the Project Steering Committee meetings and the Project's Monitoring Committee meetings. Institutional partners (Department of Energy, Department of Agriculture, Department of Water, etc.) are particularly involved in the Project Monitoring Committee meetings. These meetings are a framework where implementing partners discuss the rational management of water resources, the adaptation of training programs, the quality of equipment installed, etc.

✓ *Project Approach*

The project approach is relevant, for at least three reasons. First, it is based on an in-depth analysis of the national context of the solar pumping market. Second, the project's objectives and its expected results as well as the choice of the implementing partners took into account the results of this analysis. Third, the involvement of all the institutional and professional partners in the project implementation in order to promote forms of synergy between them.

3.1.2. Project Coherence with the Country Priorities

The project's objective (Establish a framework conducive to the development of solar pumping systems and the creation of favorable technical, financial, organizational and support conditions for its success) is consistent with Morocco's sustainable development priorities, especially those of CNEDD (National Charter for the Environment and Sustainable Development) and 2 of its products: Product 5.3 (Stakeholders' capacities in terms of implementing and coordinating strategies and programs for climate change mitigation and adaptation to climate change and for natural and technological risks management are developed and strengthened) and Product 5.1 (Stakeholders are supported to align national and sector strategies with CNEDD).

The project is in perfect coherence with the specific objectives of SNDD (Project of National Strategy for Sustainable Development) 2030, especially specific objective 22 (Improve the use of water for agricultural

activities and rationalize water consumption), specific objective 23 (Accelerate energy transition and boost the development of renewable energies), specific objective 26 (Innovate to improve the development of sustainable agriculture) and specific objective 29 (Improve the resilience of the agricultural sector to climate changes). The project is also in line with specific objective 44 (Accelerate the outreach rate of renewable energies: 42% by 2020 and 52% by 2030), the specific objective 46 (Develop an energy efficient building market), and specific objective 48 (Develop adequate financial services for the implementation of energy efficiency programs) of SNDD.

The project is clearly in line with Morocco's energy and irrigation development priorities, particularly those of SEN (National Energy Strategy). In fact, SEN aims at strengthening security and availability of clean energy, access to energy at affordable prices, promote diversification of the energy mix and optimization around reliable and competitive technological choices, mobilize national resources thanks to the rise of renewable energies and efficiency energy.

In addition, there is a strong correlation between the project's objective and the objective of PNPS (National Program for Solar Pumping), i.e. the development of institutional, technical and financial to support the development of solar pumping systems in the agricultural sector. This finding is not surprising because the project was designed and launched to provide an appropriate support for PNPS while also responding to the shortcomings identified in this program.

Finally, by favoring farmers and farmer cooperatives' access to solar pumping systems, the project contributes to the implementation of SNDER (National Strategy for the Development of Renewable Energies in Morocco) and its outputs and outcomes. The main objectives of SNDER are, on the one hand, to favor the use of sustainable energy sources, the industrial integration of clean technologies, and the creation of green jobs and, on the other hand, the mitigation of greenhouse gas emissions linked to the use of fossil fuels. This is also the case with PMV (Green Morocco Plan) that aims to make the agricultural sector more effective and sustainable in order to reduce rural poverty. It should be noted that PMV also includes interventions focusing on adaptation to climate change in agriculture, the fight against desertification, energy and water resources saving, and the use of renewable energy for irrigation.

3.1.3. Project Coherence with UNDP Programmatic Tools, UNDAF and SDGs

The project is in coherence with both UNDP Strategic Plan 2018-2021, especially with Effect 1 (Growth and development are inclusive and sustainable, generating productive activities necessary to create jobs and improve livelihoods for the poor and vulnerable households) and the Country Program Document (CPD) 2017-2021 and particularly Axis 2 (Inclusive and sustainable growth, decent work and food security) and Axis 3 (Resilience to climate change, natural disasters and humanitarian emergencies).

Moreover, the project is in line with the United Nations Framework Program for Development Assistance (UNDAF) 2017-2021 and will contribute to Effect 2 "Sustainable development" (Public policies and national strategies in terms of industrial development, environment, and regional planning take into account the principles of inclusive and sustainable economic growth and development) and Effect 6 "Rural development, integrated and sustainable" (National stakeholders implement an inclusive, integrated and sustainable rural development).



Finally, the project supports the Sustainable Development Goals (SDGs) and more directly SDG 2 (“Zero hunger”), SDG 7 (“Affordable and clean energy”), SDG 13 (“Climate action”) and SDG 15 (“Life on land”).

3.1.4. Project Coherence with the Sector’s Stakeholders’ Specific Needs

There is an undisputable correlation between the project’ planned activities and the main challenges facing the solar pumping sector’s stakeholders (see table below): 1. The challenge of transforming the solar pumping market for agricultural irrigation towards a wider use of solar energy as a competitive alternative to diesel and butane; 2. The challenge of quality control and information for stakeholders; 3. The challenge of access to financial services for small farmers and access to good quality products and services; and 4. The challenge of capacity building of the solar pumping sector’s stakeholders.

The project planned activities aim at contributing to overcome these challenges by developing awareness and local technical capacities in solar pumping technology; strengthening the national production capacity of solar pumping equipment; training solar pumping technicians / installers in the design, installation, and maintenance of solar pumping systems; development of pilot projects; designing and providing financial products to farmers in collaboration with private banks; and encouraging the Government to provide relevant tax incentives / benefits for professional involved in the solar pumping sector, etc.

Table 5: The project coherence with the sector’s stakeholders’ specific needs

Key challenges	Activities planned	
	Product	Activity
1. Transformation of the pumping market for agricultural irrigation towards a wider use of solar energy as a competitive alternative to diesel and butane	Product 1: PV pumping units comprising a set of configurations are designed, evaluated, installed and being implemented	1.1. 3,750 small-scale solar pumps installed on a large scale, facilitated through configuration, layout and maintenance protocols
		1.2. Ten pilot solar pumps installed to demonstrate the potential of solar power for larger farms.
		1.3. A final disposal and recycling scheme are studied and a program contract MEME is proposed to reduce the effects of GHG emissions.
		1.4. Development of a program contract between the project and MEME
2. Quality control and stakeholder information	Product 2: An implementation framework and sustainable standards for solar pumping and “fertirrigation” practices are developed	2.1. A model of RESCOs is designed and implemented to support the implementation of PNPS (<i>Programme National de Pompage Solaire</i>).
		2.2. A quality control system is designed and implemented.
		2.3. A “fertirrigation” management tool is developed to inform farmers on the optimal fertilizer dosage in “fertirrigation”; and a cost-benefit calculator is developed to demonstrate to farmers the immediate financial benefits of solar pumps.
3. Financing of solar pumping systems: lack of well-adapted financial products for farmers, lack of tax incentives	Product 3: Financial support and incentive mechanisms identified, designed and suggested to the MEF for adoption.	3.1. Local private banks are able to design and deliver well-adapted financial products to farmers to support the adoption of solar pumps.
		3.2. Relevant tax incentives that strengthen farmers' willingness to acquire PV technology are designed in collaboration with MEF.
		3.3. Options for better alignment of fertilizer subsidies with sustainable “fertirrigation” practices are analyzed and suggested to MAPM and MEF.
4. Capacity building: capacity building of AMEE, PPV professionals, farmers, finance professionals, etc.	Product 4: The capacities of the project’s beneficiaries are strengthened in terms of development, implementation and management of solar pumping and “fertirrigation” systems	4.1. Capacities of selected stakeholders are enhanced thanks to awareness activities, training in business planning, life cycle costs, quality assurance, maintenance, procurement and marketing.
		4.2. The national production capacity of equipment and components is supported by strengthening the production facilities of the local private sector.
		4.3. Technicians are trained in the design, installation, operation and maintenance of solar pumping systems.

Source: Table established on the basis of the Project Document and remote interviews

3.1.5. Integration of Relevant Gender Issues

If we refer to the Project Document, we can notice that gender issues were not enough raised in the project design. In fact, only one log-frame indicator, namely indicator 0.1 (“Number of new partnerships with RESCOs promoted for the provision of improved efficiency solutions energy and / or sustainable energy targeting underserved communities / groups and women”) out of 19 indicators (around 5%) explicitly refer to women. Only 4 indicators out of 19 indicators (21%) are disaggregated by sex.

However, the gender equality approach and principles were integrated into the project implementation through:

- Training and capacity building for women farmers and agricultural advisers;
- Capacity building for agricultural advisors;
- Awareness of the general public, including women;
- Strong involvement of women from AMEE (Moroccan Agency for Energy Efficiency) in awareness and communication activities on solar pumping, energy efficiency and sustainable energies (+ 33%);
- Good representativeness of women in the project staff (30%);
- Involvement of women in the Project Monitoring Committee (30%);
- Involvement of women in training and capacity building activities (10 to 15%);
- Involvement of women (farmers, agricultural advisers) in local awareness workshops (10%);
- Good representativeness of women in dedicated salons (over 40%).

3.1.6. Project Log-frame

The review of the project log-frame indicators and the end-of-project targets shows that:

- All the project log-frame indicators with regard to expected results are relevant. In addition, the end-of-project targets are "SMART" (Specific, Measurable, Attainable, Relevant, Time-bound).
- Mid-term targets were not designed.
- If some log-frame indicators are disaggregated by sex, the end-of-project targets are not. This observation leads us to suggest specific revisions of the log-frame indicators and the end-of-project targets (see table below).

Table 6: Some Log-frame Indicators and End-of-project Targets Reformulated

Indicators and end-of-project targets as outlined in the Project Document				Indicators and end-of-project targets reformulated			
Objectives / products	Indicator	Baseline situation	End-of-project indicators	Objectives / products	Indicator	Baseline situation	End-of-project indicators
Project's objective: Promote the adoption of PPV systems for irrigation	0.1. Number of people (women and men) with improved access to sustainable energy platforms	0	18,750 (3,750 PPV systems benefiting to a 3,750 rural households)	Project's objective: Promote the adoption of PPV systems for irrigation	2.1. Number of people (women and men) with improved access to sustainable energy platforms	0	18,750 (3,750 PPV systems benefiting to a 3,750 rural households), of which x% women and y% of men
	0.5. Number of new partnerships with RESCOs promoted for the provision of improved energy efficiency and / or sustainable energy solutions targeting underserved groups and women.	0	5 RESCOs created and monitored		0.5. Number of new partnerships with RESCOs developed for the provision of improved energy efficiency and / or sustainable energy solutions targeting underserved groups and women.	0	5 new partnerships with RESCOs are developed.
Product 1: PPV units are designed, evaluated, and installed.	1.1. Number of pilot projects, i.e. PPV units) implemented / (women and men)	0	10	Product 1: PPV units are designed, evaluated, and installed.	1.1. Number of pilot projects, i.e. PPV units) implemented / (women and men)	0	10
	1.4. Number of RESCOs created or monitored	0	5		1.4. Number of RESCOs created or monitored	0	5
Product 4: The capacities of beneficiaries in terms of development, implementation and management of associated solar pumping and irrigation systems are strengthened.	4.1. Number of stakeholders whose technical capacities in terms of PV technology, maintenance and marketing are strengthened.	0	400	Product 4: The capacities of beneficiaries in terms of development, implementation and management of associated solar pumping and irrigation systems are strengthened.	4.1. Number of stakeholders whose technical capacities in terms of PV technology, maintenance and marketing are strengthened.	0	400, of which x% women and y% of men
	4.2. Number of technicians (women and men) trained in the design, installation, operation and maintenance of solar pumping systems	0	30		4.2. Number of technicians (women and men) trained in the design, installation, operation and maintenance of solar pumping systems	0	30, of which x% women and y% of men
	4.3. Number of finance professionals (women and men) whose capacities to evaluate solar pumping projects is strengthened	0	40		4.3. Number of finance professionals (women and men) whose capacities to evaluate solar pumping projects are strengthened.	0	40, of which x% women and y% of men
	4.4. Number of stakeholders whose capacities are strengthened in terms of optimal control of "fertirrigation" practices	0	160		3.2. Number of stakeholders whose capacities are strengthened in terms of optimal control of "fertirrigation" practices / women and men	0	160, of which x% women and y% of men

Source: Project Document, Author

3.2. Progress made towards Achieving Expected Results

3.2.1. Level of Achievements of Expected Results

The progress made towards achieving expected results as outlined in the project log-frame are analyzed using 4 Scores: “Score” E (high: achievement rate $\geq 60\%$), M (average: $40\% \leq$ achievement rate $< 60\%$), FN (low or zero: $40\% <$ achievement rate ≤ 0) or NP (the data available do not allow to quantify the level of achievement of expected results).

The project achievements are satisfactory (see table below). While the objective of installing 10 pilot solar pumps has not yet been reached, another key expected result of Product 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed), i.e. “The design and operationalization of a MRV system”, has been achieved. Furthermore, 3 expected results out of 5 expected results (60%) of Product 2 (A sustainable implementation framework and standards for solar pumping and “fertirrigation” practices have been developed) have already been achieved, against 67% and 75% respectively for Product 3 (Financial support and incentive mechanisms are identified, designed and suggested to the Ministry of Economy and Finance for adoption) and Product 4 (Capacities building of beneficiaries in terms of development, implementation and management of solar pumping and “fertirrigation” systems are strengthened).

As far as Activity 1.1 (3,750 small-scale solar pumping units are installed on a large scale) is concerned, we can mention that the development and implementation of 10 pilot projects should be financed on subsidies by PNPS (National Program for Solar Pumping). Unfortunately, the subsidy component of PNPS is still not operational, leading the project team to implement, in early 2020, traceability approaches through data collection with “micro-enterprises Resovert” labeled by the project and local banks that have granted some solar pumping projects.

Table 7: Level of Achievement of Expected Results 06/30/2020

Objectives / products	Indicator	Baseline situation	End-of-project indicators	Level of achievement on 06/30/2020	Target hit	Score			
						E	M	F-N	NP
Project's objective: Promote the adoption of PPV systems for irrigation	0.1. Additional number of tons of CO2 emissions avoided per year (in addition to the baseline scenario and attributed to the project)	0	11,697 tCO2/year Total of 233,940 tCO2 over the 20-year life plan of all pumps	Total CO2 emissions avoided in 2018-2019 = 14,085.36 tCO2	6% compared to the lifetime of the installed system (20 years), 60% compared to the period covered by the follow-up (2 years).				
	2.2. Number of PPV units installed	1,500	3,750	1,880	50%				
	2.3. Fuel saved (tep/year)	2,700 tep/year	4,050 tep/year	-	-				
	2.4. Number of new partnerships with RESCOs developed to improved PPV solutions targeting underserved communities and women.	0	5	3 new partnerships developed between AMEE and 3 Resovert: Souss – Massa, Meknès – Tafilalet and Béni Mellal - Khénifra	60%				
	2.5. Number of people (women and men) having improved access to sustainable energy	0	18,750 (3,750 PPV systems benefiting to 3, 750 rural households)	-	-				
Product 1: PPV units are designed, evaluated, and installed.	1.1. Cumulative power of installed solar pumps - kW	9,560 kW	23,900 kW	The cumulative power of solar pumps installed amounts to 13,163 kW.	55%				
	1.2. Number of pilot solar pumps installed (women and men)	0	10	0 (However, a call for projects was launched; thirty projects were selected; and 47 technical visits of selected projects were carried out).	0%				
	1.3. Availability of a MRV system	No: absence of a MRV system	Yes: a MRV system is designed and operationalized to monitor project progress and GHG emission reductions	A data processing tool for real-time monitoring of energy performance and CO2 savings avoided, has been designed to support the of MRV system. The MRV system protocol for solar pumping is being prepared.	100%				

Objectives / products	Indicator	Baseline situation	End-of-project indicators	Level of achievement on 06/30/2020	Target hit	Score			
						E	M	F-N	NP
Product 2: A sustainable implementation framework and standards for solar pumping and “fertirrigation” practices are developed.	2.1. Number of RESCOs created and monitored	0	5	3 regional networks (comprising 60 micro-enterprises of energy services) have been structured and supported (including 4 new micro-enterprises RESCOs created).	80%				
	2.2. Availability of equipment standardization and labeling procedures for the main components of solar pumping (Yes / No)	No: Lack of equipment standardization and labeling procedures	Yes: Equipment standardization and labeling procedures are adopted and tested.	Adoption in 2020 of 19 solar pumping standards 20 micro-enterprises have been certified as Taqa-Pro solar pumping installers.	100%				
	2.3. Availability of an audit & evaluation system for the quality of solar pumps installed (Yes / No)	No: Lack of an audit & evaluation system for the quality of solar pumps installed	Yes: An audit & evaluation system for the quality of solar pumps installed has been developed.	A quality benchmark for equipment, systems and services related to solar pumps has been developed.	100%				
	2.4. Availability of an information tool on the optimal fertilizer dosage regime in irrigation and the calculation of cost & benefits for farmers (Yes / No)	No: Lack of an information tool on the optimal fertilizer regime in irrigation and the calculation of cost & benefits for farmers	Yes: An information tool on the optimal fertilizer dosage regime in irrigation and the calculation of costs & benefits is designed and is operational	No information tool on the optimal fertilizer dosage regime in irrigation has been developed (However, a technical manual and good practices and management of fertirrigation is under development).	0% (Activities ongoing)				
	2.5. Availability of an updated NAMA concept in support for PNPS (<i>Programme National de Pompe Solaire</i>) (Yes / No)	No: Lack of an updated NAMA concept in support of the National Solar Pumping Program	Yes: The NAMA concept is updated and validated for submission to the UNFCCC NAMA register	The concept of NAMA has been updated and validated. A concept note based on the updated NAMA has been developed and will be submitted to the Green Climate Fund (GEF).	100%				

Objectives / products	Indicator	Baseline situation	End-of-project indicators	Level of achievement on 06/30/2020	Target hit	Score			
						E	M	F-N	NP
Product 3: Financial support and incentive mechanisms are identified, designed and suggested to MEF for implementation	3.1. Number of banks involved in the project	0	4	2 local banks are involved in program financing	50%				
	3.2. Availability of fiscal incentives for solar pumping (Yes / No)	No: Lack of fiscal incentives for solar pumping	Yes: Relevant fiscal incentives are designed in partnership with MEF for adoption.	Fiscal exemptions from solar pumping were adopted in 2019.	100%				
	3.3. Availability of an analysis of different options to align fertilizer subsidies to sustainable “fertirrigation” practices	No: Lack of options	Yes: Different options are analyzed.	A study on appropriate financing mechanisms was conducted.	100%				
Product 4: The capacities of beneficiaries in terms of development, implementation and management of associated solar pumping and irrigation systems are strengthened.	4.1. Number of stakeholders whose technical capacities in terms of solar pumping technology, maintenance and marketing are strengthened.	0	400	20 trainers, 61 ONCA’s technicians / advisors, 15 executives from DRA / Oujda trained. 210 people sensitized on solar pumping.	75%				
	4.2. Number of technicians (women and men) trained in the design, installation, operation and maintenance of solar pumping systems	0	30	59 (2 women, 57 men)	197%				
	4.3. Number of finance professionals (women and men) whose capacities to evaluate solar pumping projects is strengthened	0	40	44 (14 women, 40 men)	110%				
	4.4. Number of stakeholders whose capacities are strengthened in terms of optimal control of “fertirrigation” practices	0	160	285	178%				

3.2.2. Review of the Project Achievements

The assessment of the achievement of the project's activities carried out in 2018, 2019 and 2020 reveals that most of these activities have been successful, contributing to improve the effectiveness of the solar pumping market. For instance, capacity building activities carried out to enhance regional and local stakeholders' awareness on solar pumping and to improve the technical knowledge and skills of the project's beneficiaries through training and monitoring have contributed to the development of a high-quality market. The same goes for activities such as the labeling of micro-enterprises "Resovert", the set-up of "Resovert" networks, and the establishment of a partnership approach.

Sustained efforts made by AMEE (Moroccan Agency for Energy Efficiency) in 2018 and 2019 to identify and design financial support and incentive mechanisms in collaboration with the Ministry of the Economy and Finance and the Ministry of Energy, Mines and Environment, led to the establishment of 19 solar pumping standards in 2020 and tax exemptions for solar pumping. Otherwise, the traceability approach applied at the start of 2020 through data collection from micro-enterprises "Resovert" and local banks (Crédit Agricole Group of Morocco and Tamwil El Fellah) have contributed to strengthen the financing capacities of the solar pumping sector.

The development of procedures to standardize solar pumping equipment, the training and labeling of solar pumps installers, the development of technical guides and standards or the design of Tele- monitoring tools adapted to solar pumping systems have led to a better quality supply of solar pumping products and services, whereas the study on the national solar pumping market carried out in 2018 and 2019 on the basis of surveys of 500 farms, including 277 farms equipped with solar pumping systems, and of 100 solar pumps installers has contributed to a better knowledge of the evolution of the market and its characteristics (strengths, constraints, opportunities, products and services, current modes of financing, etc.).

Table 8: Project Achievements

N°	Activities	Actions	Key outcomes
1	Technical support and quality promotion	Carrying out a strategic study of the national solar pumping market (2018 and 2019)	An inventory was carried out on the basis of surveys of 500 farms, including 277 farms equipped with solar pumping systems, and 100 solar pump installers.
		Preparation for the launch of pilot projects (since March 2019)	A call for projects has been launched; thirty applications out of 100 applications received were selected; 47 technical visits to selected projects were carried out.
		Design and implementation of the TaqaPro label - solar pumping, through the support of small PPV supply and installation companies	A Label “TAQAPRO Label - solar pumping” was designed and is being deployed; Label tests were carried out in 2018 and 2019.
		Development of technical guides	3 technical guides, including a guide on good solar pumping practices in agriculture for farmers have been produced.
		Development of standardization and labeling procedures	Adoption in 2020 of 19 solar photovoltaic standards
		Design of tax incentives in collaboration with MEF	Adoption of tax exemptions for solar pumping in 2019
2	Structuring of the value chain	Support and structuring of micro-enterprises “Resovert”	Micro-enterprises “Resovert” have been structured into 3 large regional networks and more than 60 micro-enterprises have been supported.
3	Capacity building	Training of agricultural technicians / advisers on solar pumping systems and organization of sensitizing workshops for farmers and agricultural cooperatives	61 agricultural technicians / advisers were trained on solar pumping systems; farmers and members of agricultural cooperatives / associations were sensitized.
		Organization of training courses to promote investment in the solar pumping sector for finance professionals	20 representatives within the APSF (including 3 women) and 24 representatives from banks (including 11 women) were trained.
		Organization of information and awareness workshops in different regions on solar pumping in agriculture for regional and local solar pumping stakeholders	Regional and local stakeholders were informed and sensitized on the strengths and opportunities of solar pumping, as well as on the constraints and synergies for the development of the solar pumping sector, quality approaches, good practices, etc.
		Design and distribution of an audiovisual capsule	A Video Capsule has been designed and distributed at various events, exhibitions, dedicated forums, etc.
4	Monitoring the impact of solar pumping in agriculture	Update of the NAMA solar pumping and prepare a financial request for the transformation of the solar pumping market	The NAMA Solar pumping was updated and a concept note was produced in 2019.
		Design of a Tele-monitoring system adapted to different solar pumping systems	A first remote monitoring solution compatible with the various solar pumping technologies has been developed at the national level.
		Development of a remote monitoring IT tool	A remote monitoring tool “SOLARPUMPMONITOR” is available.

Source: Table established on the basis of “*Bilan à mi-parcours du projet GEF-PSIA*” and “*Bulletin Officiel d’Avril 2020*”

3.2.3. Effectiveness of Partnerships

The partnership developed in the framework of the project between:

- AMEE (Moroccan Agency for Energy Efficiency) and institutional stakeholders, especially with Departments of Energy, Agriculture and Finance led to the establishment of 19 solar pumping standards and tax exemptions for solar pumps.
- AMEE and ONCA (National Office of the Agricultural Council) made it possible to train 61 agricultural advisers (13 women and 48 men) on solar pumping and carry out awareness activities targeting farmers and agricultural cooperatives.
- AMEE, AMISOLE (Moroccan Association for Solar and Wind Industries), GCAM (Crédit Agricole Group of Morocco) and Tamwil El Fellah has led to the design and implementation of the “TaqaPro label - solar pumping” and the training of executives and technicians from DRA (Regional Directorate of Agriculture) and technicians from micro-enterprises “Resovert”, and the development of technical specifications and technical monitoring of solar pumping projects.
- The set-up of 3 "Resovert" regional networks has made it possible to raise awareness among micro-enterprises “Resovert” and to support 60 micro-enterprises and to disseminate quality standards.

3.2.4. Key Factors Influencing the Project Implementation and its Effectiveness

The project implementation and its outputs and outcomes have been positively influenced by factors such as the motivation of the project team, the strong commitment of the implementing partners, and the availability of internal and external expertise, whereas it has been negatively affected by some other factors: the late start of project activities, the non-operationalization of the subsidy component of PNPS (National Program for Solar Pumping) and the health context linked to the COVID-19 pandemic.

The motivation of the project team has been crucial for the completion of most of the project’s activities scheduled in the annual work plans. The strong commitment of the institutional and professional implementing partners and the development of forms of synergy between them are also cited by key informants interviewed as the main comparative advantage of the project. The availability of internal expertise within AMEE and external expertise also positively impacted the project implementation.

Three major factors have negatively impacted the project effectiveness. First of all, the delay in launching the project. It was officially launched on October 1, 2017, i.e. more than a year delay, and it was not operational in 2018. Second, the non-operationalization of the subsidy component of PNPS (National Program for Solar Pumping) made it difficult to carry out the 10 pilot projects. Third, the Coronavirus pandemic has impacted the project implementation. To cope with this contextual change, the project management team had to postpone activities requiring field visits and monitoring, delay the launch of consultations, studies, etc.

3.3. Project Efficiency

3.3.1. Resources Usage

The management of the project required the recruitment of a large team of 53 people: 13 women (about 25%) and 40 men (nearly 75%).

The table below shows that Product 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed) represents 29% of the total amount of cumulative expenditure (2017,

2018 and 2019), against 25% and 5% respectively for Product 2 (A sustainable implementation framework and standards for solar pumping and “fertirrigation” practices are developed) and Product 3 (Financial support mechanisms and incentives are identified, designed and suggested to the Ministry of Economy and Finance for adoption). The share of Product 4 (The capacities of the project’s beneficiaries are strengthened) was higher (36%).

Table 9: Disbursement by product

CDRs signed	2017		2018		2019		Total	
	Expenses	%	Expenses	%	Expenses	%	Expenses	%
Product 1	63,108.82	61	93,646.94	21	185,839.11	29	342,594.87	29
Product 2	30,146.48	29	135,965.84	30	128,751.39	20	294,863.71	25
Product 3	-	0	-	0	60,325.59	9	60,325.59	5
Product 4	5,737.28	6	167,928.69	38	249,365.16	39	423,031.13	36
Project management	4,479.85	4	49,949.53	11	16,260.94	3	70,690.32	5
Total	103,472.43	100	447,491.00	100	640,542.19	100	1,191,505.62	100

Source: Table established on the basis of CDR 2017 to 2019

The share of the project management expenses in the total amount of the project expenses is relatively low: 4% in 2017, 11% in 2018 and 3% in 2019. In this regard, if we refer to the standard of "best practices" of GEF projects, i.e. a management fee rate of less than 10%, we can notice that the Project GEF-Solar Pumping is below the standard, except in 2018. For instance, in 2019, for 100 dollars spent, 3 dollars went into “project management fees” and 97% to the project’s interventions in the field.

3.3.2. Efficiency Index

The results of the project’s interventions carried out at the end of the project in 2018 and 2019 show a physical achievement rate of 30% and 60%, respectively; and a financial achievement rate of 20% and 44%, respectively. The efficiency index (physical achievement rate / financial achievement rate) of the project is therefore 1.5 and 2018 and 1.36 in 2019.

Table 10: Efficiency Index

Year	2017	2018	2019
Physical achievement rate (%)	-	30	60
Financial achievement rate (%)	4	20	44
Efficiency index	-	1.5	1.36

Source: Table established on the basis of annual

3.3.3. Key Factors impacting the Project Efficiency

Four main factors have positively or negatively affected the project efficiency:

- The delay in the implementation of the subsidy component of PNPS-National Program for Solar Pumping (negative aspect).
- The delay in the implementation of the project’s budget and its induced effect: the postponement of some planned activities (negative aspect).
- The hosting of the project by AMEE (Moroccan Agency for Energy Efficiency) allowed the project to save on office rental costs and on technical expertise (positive aspect).
- The strong involvement of institutional partners in the project design and implementation, activity planning and monitoring (positive aspect).

3.4. Project Impacts

3.4.1. Immediate Impacts of Beneficiaries

The project's interventions have contributed to building the capacities of institutional and professional stakeholders involved in the solar pumping sector (Department of Energy and Environment, Department of Agriculture, Department of Water, farmers, agricultural cooperatives, solar pump installers, agricultural technicians and advisers, finance professionals, etc.) through information, awareness and training.

The project's interventions have also improved the transparency and efficiency of the solar pumping market through the improvement of the quality of solar pumps installed (particularly thanks to the development of equipment standardization procedures, training and labeling of technical operators, the development of technical guides and technical standards, the development of a Tele-monitoring system adapted to solar pumping systems, the labeling of "Resovert" micro-enterprises, etc.), the availability of reliable and relevant information on the evolution and the characteristics of the solar pumping market (key actors, products and services, strengths, constraints, opportunities, current modes of financing...) and the strengthening of the financing capacities of the solar pumping sector due to the establishment of 19 solar pumping standards and tax exemptions for solar pumping.

3.4.2. Possible Longer-Term Impacts on Beneficiaries

Among the possible longer-term impacts on beneficiaries, we can mention:

- The fact that many stakeholders, specially farmers, executives and technicians from DRA (Regional Directorate of Agriculture), agricultural technicians / advisers from ONCA (National Office of the Agricultural Council) and technicians from micro-enterprises "Resovert" have acquired knowledge and skills in solar pumping. Know-how and skills, they will likely put at the service of the solar pumping industry.
- The implementation of an "experimentation / demonstration / replication" approach through the 10 planned solar pumping pilot projects. If effective, they will be replicated and, therefore, will contribute to increase the irrigated plots equipped with solar power and national energy production.

3.5. Project Sustainability

3.5.1. Key factors likely to Influence the Project Sustainability

Two main hypotheses suggest that the results achieved by the project will last. In fact, the question of the sustainability of solar pumps installed does not arise because of their lifespan, more than 20 years, if well maintained. Also, project ownership had already been perceived in the Project Document as a prerequisite for the sustainability of its achievements.

3.5.2. Risks for Sustainability

The main risks for sustainability identified in the Project Document are financial, environmental, organizational and institutional risks (see table below). The only additional risk is the recent health risk resulting from the Coronavirus pandemic. If the pandemic persists and / or gets worse, it could cause the project activities to stop.

Table 11: Risks identified in the Project Document and Occurrence or not of these Risks

N°	Description of risks	Category of risk	Severity of consequences	Probability	Risk situation at the date of the mid-review
1	Delay in the implementation of PNPS (National Program for Solar Pumping)	Organizational	High	High	Controlled
2	Climate change risks	Environmental	High	Average	In progress. But anticipatory management measures are integrated into the implementation of the project.
3	Environmental risks	Environmental	High	Average	In progress. But anticipatory management measures are integrated into the implementation of the project.
4	Institutional risks	Institutional	High	Average	In progress. But anticipatory management measures are integrated into the implementation of the project.
5	Financial risks	Financial	Average	Average	In progress. But anticipatory management measures are integrated into the implementation of the project.

Source: Table established on the basis of the Project Document and annual reports

3.6. Project Implementation and Adaptative Management

3.6.1. Management and Activity Planning

Organizational and institutional arrangements to ensure good governance and effective implementation of the project's interventions were established from the start of the project. A validation workshop of the Project Document was organized and an official launch ceremony was organized on October 1, 2017 with the participation of the members of the Project Steering Committee, as well as with the participation of all the stakeholders. Moreover, the project's human and financial resources are managed in accordance with UNDP procedures. Finally, key stakeholders are represented in the Project Steering Committee. Remote interviews with key implementing partners show that the Project Steering Committee works well (the statutory meetings were held within the allotted time).

The project's interventions are planned and scheduled annually and all the institutional and technical implementing partners are involved in the development of annual work plans. The planning tools used are: Project Document and log-frame, internal planning meetings, and planning meetings with implementing partners.

3.6.2. Co-financing

The project is financed by the Government of Morocco (41,837,000 USD), local private banks (28,966,000 USD), GEF (2,639,726 USD), and UNDP (100,000 USD).

Table 12: Co-financing

Source of funding	Amount (USD) Year 1	Amount (USD) Year 2	Amount (USD) Year 3	Amount (USD) Year 4	Amount (USD) Total
FEM (Grant)	468,500	718,500	863,025	589,701	2,639,726
ADEREE (Grant)	1,804,000	1,804,000	1,804,000	1,804,000	7,216,000
ADEREE (In-kind)	100,000	100,000	100,000	100,000	400,000
MAPM (Grant)	7,732,000	7,732,000	7,732,000	7,732,000	30,928,000
MAPM (In-kind)	60,000	60,000	40,000	40,000	200,000
MEME (Grant)	773,250	773,250	773,250	773,250	3,093,000
PNUD (Grant)	25,000	25,000	25,000	25,000	100,000
GCAM & other banks (Grant)	7,216,500	7,216,500	7,216,500	7,216,500	28,866,000
GCAM & other banks (In-kind)	30,000	30 000	20,000	20,000	100,000
TOTAL	18,209,250	18,459,250	18,573,775	18 300 451	73,542,726

Source: Project Document, p. 57

3.6.3. Monitoring and Evaluation Systems

The project has adopted a results-based monitoring and evaluation strategy using various tools such as quarterly, semi-annual and annual monitoring carried out by project staff and Project Steering Committee, and external monitoring assessments conducted by project implementing partners or by UNDP. Monitoring reports are used to collect the data necessary to fill in the project log-frame. Monitoring and evaluation tools are developed in a participatory and inclusive manner. Also, both individual missions and joint missions to monitor the project activities, as well as site visits by partners, the Project Management Unit and UNDP are carried out.

3.6.4. Data Communication

Remote interviews with key informants reveal that products / deliverables, especially annual reports, were produced by the project management team and submitted to UNDP on time. Once approved by UNDP, they are then submitted to the implementing partners for comments. Annual reports provide information on the project achievements, project management and governance, risk management, financial achievement rates, and recommendations.

3.6.5. Communication

The project has developed a variety of internal and external communication tools and activities: regular staff meetings and regular meetings with the implementing partners. At the same time, the project has developed external communication tools to boost its visibility: participation in exhibitions and forums dedicated to renewable energies and Energy Efficiency; facilitation of a panel on the evolution of Energy Efficiency in Africa and in the world; participation in the International Agricultural Show in Morocco, participation in the Elexpo Show and the Solaire Expo; the design of a graphic charter; the design, creation and production of a video capsule on solar pumping; etc.

4. CONCLUSIONS, LESSONS LEARNT, GOOD / BAD PRACTICES, AND RECOMMENDATIONS

4.1. Conclusions

Evaluation criteria	Conclusions
The project relevance	<p>Rating: very satisfactory</p> <p>The project relevance is good, for several reasons. First of all, the project design process was participatory and inclusive involving the solar pumping sector's stakeholders. The latter are also closely involved in the project implementation, as well as in the planning and monitoring in the project's activities.</p> <p>Second, the project approach is relevant because its objectives, expected results, activities, stakeholders and beneficiaries were defined or chosen taking into account the results of an in-depth study of the context of solar pumping, but also because the project has a partnership approach that involves the solar pumping sector's public and private stakeholders.</p> <p>Third, there is a strong correlation between the project's interventions and the main challenges facing all the stakeholders: the challenge of transforming the solar pumping market from a wider use of diesel and butane to a wider use of solar energy, the challenge of quality control and information / awareness of the solar pumping sector's stakeholders, the challenge of accessing to financial markets and credits, and the challenge of capacity building of stakeholders involved in the solar pumping sector.</p> <p>Fourth, the project is consistent with both Morocco's sustainable development priorities and Morocco's energy development priorities, UNDP programmatic tools (Strategic Plan 2018-2021 and Country Program Document 2017-2021), the United Nations Development Assistance Framework) 2017-2021, and the Sustainable Development Goals.</p> <p>In addition, the project is gender sensitive. Of course, only one log-frame indicator out of 19 indicators (around 5%) explicitly refer to women and 4 indicators out of 19 indicators (21%) are disaggregated by sex; however, the project has made efforts to integrate gender issues into the project implementation through: training and capacity building of women farmers; awareness of the general public, including women; strong involvement of women from AMEE in awareness and communication activities on solar pumping, energy efficiency and sustainable energies (+ 33%); good representativeness of women in project staff (30%); involvement of women in the Project Monitoring Committee (30%); involvement of women in training and capacity building activities (10 to 15%); involvement of women in local awareness workshops (10%); and good representativeness of women in dedicated salons (over 40%).</p> <p>Finally, all the project log-frame indicators are relevant, and the end-of-project targets are "SMART" (Specific, Measurable, Attainable, Relevant, Time-bound). Unfortunately, mid-term targets were not designed.</p>
Progress made towards achieving expected results	<p>Rating: satisfactory</p> <p>The project achievements are satisfactory. While the objective of installing 10 pilot solar pumps has not yet been reached, another key expected result of Product 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed), i.e. "The design and operationalization of a MRV system", has been achieved. Furthermore, 3 expected results out of 5 expected results (60%) of Product 2 (A sustainable implementation framework and standards for solar pumping and "fertirrigation" practices have been developed) have already been achieved, against 67% and 75% respectively for Product 3 (Financial support and</p>

	<p>incentive mechanisms are identified, designed and suggested to the Ministry of Economy and Finance for adoption) and Product 4 (Capacities of the project beneficiaries in terms of development, implementation and management of solar pumping and “fertirrigation” systems are strengthened).</p> <p>Most of the project’s activities carried out in 2018, 2019 and 2020 have been successful, contributing to improve the effectiveness of the solar pumping market, favor a better access to financial products and tax incentives, and improve the quality of the supply of solar pumping products and services.</p> <p>The project implementation and its outputs and outcomes have been positively influenced by factors such as the motivation of project team, the strong commitment of the implementing partners, and the availability of internal and external expertise, whereas it has been negatively affected by some other factors: the late start of project activities, the non-operationalization of the subsidy component of PNPS (National Program for Solar Pumping) and the COVID-19 pandemic.</p>
The project efficiency	<p>Rating: very satisfactory</p> <p>The project’s Output 1 (Solar pumping units, including a set of configurations, are designed, evaluated and installed) represents 29% of the total amount of cumulative expenditure (2017, 2018 and 2019), against 25% and 5% respectively for Output 2 (A sustainable implementation framework and standards for solar pumping and “fertirrigation” practices are developed) and Output 3 (Financial support mechanisms and incentives are identified, designed and suggested to the Ministry of Economy and Finance for adoption). The share of Output 4 (Capacities of beneficiaries are strengthened) was higher (36%).</p> <p>The share of the project management expenses in the total amount of the project expenses is relatively low: 4% in 2017, 11% in 2018 and 3% in 2019. In this regard, if we refer to the standard of "best practices" of GEF projects, i.e. a management fee rate of less than 10%, we can notice that the project is below the standard, except in 2018. For instance, in 2019, for 100 dollars spent, 3 dollars went into “project management fees” and 97% to the project’s interventions in the field.</p> <p>The physical achievement rate in 2018 and 2019 is 30% and 60%, respectively; and the financial achievement rate is 20% and 44%, respectively. The efficiency index (physical achievement rate / financial achievement rate) of the project is therefore 1.5 and 2018 and 1.36 in 2019.</p> <p>At least two factors negatively impacted the project efficiency: the delay in the implementation of the subsidy component of PNPS ((National Program for Solar Pumping) and the delay in the implementation of the project’s budget and its induced effect: the postponement of some planned activities. On the other hand, the hosting of the project by AMEE (this allowed the project to save on office rental costs and on technical expertise) and the strong involvement of the institutional partners in the project design and implementation, activity planning and monitoring have positively impacted the project efficiency.</p>
The project impacts	<p>Rating: satisfactory</p> <p>Among the immediate positive impacts of the project’s interventions on beneficiaries, we can mention the following:</p> <ol style="list-style-type: none"> 0. Technical capacities building of institutional and professional stakeholders involved in the solar pumping sector (Department of Energy and Environment, Department of Agriculture, Department of Water, farmers, agricultural cooperatives, solar pump installers, agricultural technicians and advisers, finance professionals, etc.) through

	<p>information, awareness and training.</p> <ol style="list-style-type: none"> 1. A better transparency and efficiency of the solar pumping market through the improvement of the quality of solar pumps installed, the availability of reliable and relevant information on the evolution and the characteristics of the solar pumping market. 2. Improvements in their financing capacities due to the establishment of 19 solar pumping standards and tax exemptions for solar pumping. <p>There are at least two possible longer-term impacts of the project's interventions on beneficiaries:</p> <ul style="list-style-type: none"> - The fact that beneficiaries, specially farmers, executives and technicians from DRA (Regional Directorate of Agriculture), agricultural technicians / advisers from ONCA (National Office of the Agricultural Council) and technicians from micro-enterprises "Resovert" have acquired knowledge and skills in solar pumping, know-how and skills, they will likely put at the service of the solar pumping industry. - The implementation of an "experimentation / demonstration / replication" approach through the 10 solar pumping pilot projects. If effective, they will be replicated and, therefore, will contribute to increase the irrigated plots equipped with solar power and national energy production.
The project sustainability	<p>Rating: satisfactory</p> <p>Two main hypotheses suggest that the results achieved by the project will last. The question of the sustainability of solar pumps installed does not arise because of their lifespan, more than 20 years, if well maintained. Also, project ownership had already been perceived in the Project Document as a prerequisite for the sustainability of its achievements.</p> <p>The main risks for sustainability identified in the Project Document are financial, environmental, organizational and institutional risks. The risk situation at the date of the mid-term review is that all these risks are in progress. But anticipatory management measures are integrated into the project implementation.</p> <p>To these risks, we must add the recent health risk resulting from the COVID-19 pandemic. If the pandemic persists and / or gets worse, it could cause the project activities to stop.</p>
The project implementation and adaptative management	<p>Rating: very satisfactory</p> <p>Organizational and institutional arrangements to ensure good governance and effective implementation of the project's interventions were established from the start of the project. A validation workshop of the Project Document was organized and an official launch ceremony was organized on October 1, 2017 with the participation of the members of the Project Steering Committee and all the stakeholders. The project's human and financial resources are managed in accordance with UNDP procedures.</p> <p>The project interventions are planned and scheduled annually and all the institutional and technical implementing partners are involved in the development of annual work plans. The project has various planning tools: the Project Document and log-frame, internal planning meetings, and planning meetings with implementing partners, etc. It has also adopted a results-based monitoring and evaluation strategy using various tools such as quarterly, semi-annual and annual monitoring carried out by project staff and the Project Steering Committee, and external monitoring assessments conducted by the project implementing partners or by UNDP.</p> <p>Remote interviews with key informants revealed that deliverables, especially annual reports, were produced by the project management team and submitted to UNDP on time. The project annual reports, for instance, provide information on the project achievements, project management and governance, risk management, financial achievement rates, and</p>

	<p>recommendations.</p> <p>Finally, internal and external communication tools and activities have been developed: regular staff meetings and regular meetings with the implementing partners. At the same time, the project has developed external communication tools to boost its visibility: participation in exhibitions and forums dedicated to renewable energies and energy efficiency; facilitation of a panel on the evolution of energy efficiency in Africa and in the world; participation in the International Agricultural Show in Morocco, participation in the Elexpo Show and the Solaire Expo; the design of a graphic charter; the design, creation and production of a video capsule on solar pumping; etc.</p>
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4.2. Lessons Learnt

The main lessons learned from the design and implementation of the project include the following:

1. Efforts to put in place a framework conducive to the development the solar pumping sector and the creation of favorable conditions for its success are in vain if at the same time everything is not done to set up suitable financing mechanisms and to articulate these mechanisms with accompanying measures in terms of capacity building, quality benchmarks, technical assistance, etc.
2. We cannot understand the results of the project without taking into account the dynamic partnership developed, on the one hand, between institutional implementing partners (Department of Energy and Environment, Department of Agriculture, and Department of Water) and, on the other hand, between the latter and professional implementing partners, as well as the strong commitment of the Project Management Unit, the strong involvement of all stakeholders in the project design and implementation, and the availability of both internal expertise within AMEE (Moroccan Agency for Energy Efficiency) and external expertise.

4.3. Good / Bad Practices

The following good / bad practices in the project design and implementation were identified:

1. The participatory and inclusive approach based on the real and strong involvement of all institutional and professional stakeholders in the project design and the implementation and on activity planning and monitoring allows a better ownership of the project and its achievements (good practice).
2. Insufficient consideration of the gender dimension in project development (bad practice).
3. Taking the gender dimension into account in the project implementation through sensitization, training and capacity building of women farmers, capacity building of agricultural advisers, etc. (good practice).
4. Compliance with international “best practice” management standards, i.e. management fee rates below 10% (good practice).

4.4. Recommendations

No	Recommendation	Type of recommendation	Addressed to:
Project strategy			
1	For the rest of the project, continue to promote the participatory and inclusive approach.	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Government Steering Committee Implementing Partners Project Management Unit
2	For the rest of the project, continue to place special emphasis on activities targeting women: capacity building for women farmers; awareness of women farmers;	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Government Steering Committee Implementing Partners Project Management Unit

	involvement of women from AMEE in awareness and communication activities on solar pumping; involvement of women in the Project Monitoring Committee; involvement of women in training and capacity building activities and local awareness workshops.		
3	For a similar project, take more into account the gender dimension in its design by defining from the start some gender sensitive indicators and end-of project targets.	a. Priority: high b. Resources: not applicable c. Timeframe: long-term	Donors (Government, GEF, UNDP, GCAM, Tamwil EF Fellah) Institutional partners
Progress made towards achieving expected results			
4	For the rest of the project, pay particular attention to key activities that have not yet been implemented, especially pilot projects	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Government UNDP Morocco Steering Committee Project Management Unit
5	Because the COVID-19 pandemic has impacted the project implementation and outcomes (postponement of activities requiring field visits / monitoring, delay in the launch of consultations and studies, etc.) and because the project started with more than one year delay, think about extending of the duration of the project without additional costs.	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Donors (Government, GEF, UNDP, banks) UNDP Morocco Steering Committee Project Management Unit
Efficiency			
6	For the rest of the project, given that it is difficult to support solar pumping projects without subsidies, operationalize the subsidy component of PNPS (<i>Programme National de Pompage Solaire</i>).	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Donors (Government, GEF, UNDP, banks)
Impact			
7	For the rest of the project, continue to focus on activities with a strong impact on beneficiaries: capacity building of institutional and professional implementing partners, promotion of the quality of solar pumps installed, and technical support and structuring of micro-enterprises "Resovert".	a. Priority: high b. Resources: not applicable c. Timeframe: short-term	Government UNDP Morocco Steering Committee Project Management Unit
Sustainability			
8	For the rest of the project, maintain the dynamic partnership / consultation / synergy between implementing partners to make the project achievements more sustainable.	a. Priority: average b. Resources: not applicable c. Timeframe: short-term	Government UNDP Morocco Steering Committee Project Management Unit