



## **TERMINAL EVALUATION**

of the UNDP-supported GEF-financed Full-Size Project

# **Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan**

GEF Project ID: 5536, UNDP Project ID (PIMS): 4947

### **Final version**

GEF 5 Focal Area:	Multi-focal (CCM-1, CCM-2, LD-1)
Executing agency:	State Committee for Water Management of Turkmenistan (former Ministry of Water Economy)
Implementing agency:	UNDP CO Turkmenistan

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## Abbreviations and acronyms

APR	Annual Project Review
AWP	Annual Work Plan
CDR	Combined Delivery Reports
CEO	Chief Executive Officer
CO	UNDP Country Office
CTA	Chief Technical Advisor
CP	UNDP Country Programme
CPAP	UNDP Country Programme Action Plan
EOP	End of Project
FSP	Full-Size Project
GEF	Global Environment Facility
GHG	Greenhouse Gas
IWRM	Integrated Water Resource Management
mil	million
MSP	Mid-Size Project
MTE	Mid-Term Evaluation (equivalent to MTR)
MTR	Midterm Review (equivalent to MTE)
MWE	Ministry of Water Economy (transformed into the State Committee for Water Management - SCWM)
NGO	Non-Government Organization
PB	Project Board
PDF	Project Development Facility
PIMS	Project Information Management System (UNDP GEF)
PIR	Project Implementation Review
PIU	Project Implementation Unit
ProDoc	Project Document
RTA	UNDP Regional Technical Advisor
SCWM	State Committee for Water Management of Turkmenistan (former MWE)
SIWMD	State Institute of Water Management Design
SLM	Sustainable Land Management
SMART	Specific, Measurable, Attributable, Relevant, Time- bound/Timely/Trackable/ Targeted
TE	Terminal Evaluation
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

## **1. EXECUTIVE SUMMARY**

### **I. Brief Description of the Project**

The six-year UNDP/GEF project was designed with the objective as per ProDoc to “provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan”.

The aim of the project was – in line with top country priorities - to reduce water losses and thus water demand in agriculture and water supply industries by introduction of more efficient technologies and practices, including sustainable land management (SLM) and integrated water resources management (IWRM) planning, and thus to reduce GHG emissions primarily by increasing energy efficiency, and also by offsetting fossil fuels utilization with renewable energy.

The project addressed simultaneously climate change mitigation (energy efficiency, renewable energy) and climate change adaptation (land degradation).

The project was structured into four components that included:

- Demonstration projects (Component 1 and 2),
- Capacity building (Component 3), and
- Policy/regulatory framework for integrated water resource management (IWRM) (Component 4).

Demonstration projects included:

1. Low-water irrigation and sustainable land management including land leveling at the newly created 145 ha Green Polygon agriculture demonstration site at Geokdepe;
2. Audits of electricity and diesel driven water pumps and pump replacement for more efficient ones;
3. Installation of PV driven water pumping and purification in off-grid areas;
4. Replacement of unlined open canal supplying water to the municipality of Kaahka and elimination of water pumping by inefficient pumps from wells with a gravity-driven water supply by new piping from the river;
5. Installation of production lines for domestic production of canal lining materials and lining of water canals.

The project planned also for a significant replication of demonstration projects by the end of the project to be financed with state financing (replication factor in terms of energy and GHG emission savings was expected to be 36 – which is not considered to be a realistic assumption, see discussion below).



**Table 1: Project Information Table**

Project Details		Project Milestones	
Project Title	Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan	PIF Council Approval Date:	November 7, 2013
UNDP Project ID (PIMS #):	4947	CEO Endorsement Date (FSP) / Approval date (MSP):	May 26, 2015
GEF Project ID:	5536	ProDoc Signature Date:	July 17, 2015
UNDP Atlas Business Unit, Award ID, Project ID:	TKM1000080840; 00080840; 00090400	Date Project Manager hired:	July 2015
Country/Countries:	Turkmenistan	Inception Workshop Date:	November 18-19, 2015
Region:	Central Asia	Mid-Term Review Completion Date:	October 30, 2018
Focal Area:	Multi-focal area	Terminal Evaluation Completion date:	March 7, 2022
GEF Operational Programme or Strategic Priorities/Objectives:	<p>GEF 5 Focal Area Objectives:</p> <p>CCM-1: Technology Transfer</p> <p>Promote the demonstration, deployment, and transfer of innovative low-carbon technologies</p> <p>CCM-2: Energy Efficiency</p> <p>Promote market transformation for energy efficiency in industry and the building sector</p> <p>LD-1: Agriculture and Rangeland Systems: Maintain or improve flow of agro-ecosystem services sustaining the livelihoods of local communities</p>	Planned Operational Closure Date:	<p>July 16, 2021</p> <p>Extended to:</p> <p>April 16, 2022</p>
Trust Fund:	GEF		

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Implementing Partner (GEF Executing Agency)	State Committee for Water Management of Turkmenistan (SCWM), former Ministry of Water Economy of Turkmenistan (MWE)
NGOs/CBOs involvement:	-
Private sector involvement:	-
Geospatial coordinates of project sites:	145 ha agriculture pilot site Green Polygon in Geokdepe - 38°07'40.5N 58°03'14.7E Kaahka gravity driven water pipeline - 37°11'22.7N 59°33'07.3E Pumping stations - 38°00'39.5N 58°20'20.8E, 38°52'52.5N 63°45'05.0E, 37°32'01.8N 62°00'45.3E, 39°09'59.9N 56°20'36.9E, 42°20'23.0N 59°01'38.4E PV powered water pumping and purification facilities - 38°45'39.1N 58°43'09.8E, 38°44'55.4N 58°51'05.7E, 39°47'41.6N 58°06'18.4E Canal lining (HDPE geomembrane) production at Bezmein factory of SCWM, 38°02'11N 58°11'46E

Financial Information		
PDF/PPG	at approval (US\$M)	at PDF/PPG completion (US\$M)
GEF PDF/PPG grants for project preparation	0.15 (0.164250 incl. fee)	0.15
Co-financing for project preparation	0	0
Project	at CEO Endorsement (US\$M)	at TE (US\$M)
[1] UNDP contribution:	0.1	0.1
[2] Government:	72	72
[3] Other multi-/bilaterals:	0	0
[4] Private Sector:	0	0
[5] NGOs:	0	0
[6] Total co-financing	72.1	72.1

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[1 + 2 + 3 + 4 + 5]:		
[7] Total GEF funding:	6.185	6.185
[8] Total Project Funding [6 + 7]	78.285	78.285

## II. Summary of Findings and Conclusions

### i. Findings

The project strategy was to develop enabling framework for efficient and sustainable water supply and irrigation based on hands-on experience gained from implementation of demonstration projects, with the aim to scale-up investment through the replication of demonstration projects.

The project strategy was clear and appropriate, and it fully matched with governmental priorities. However, it included unrealistically high replications expected to materialize already during project implementation period, which translated into unrealistically high energy and GHG emission savings targets. The project design relied on governmental funding for large-scale replication of demonstration projects already during the implementation period without any additional support from the project. This would be a rather risky strategy in most cases, but in this specific case in Turkmenistan, it actually proved to be an acceptable approach, and numerous replication projects have been already funded and implemented by the government (actual co-financing invested totals 71 mil USD – 98% of target, of which 49 mil USD have been newly mobilized).

The project results framework, and specifically some indicators, baselines and targets were poorly designed, and project indicators were not SMART. Unclear and/or confusing specification of indicators and targets to some extent influenced transparency of reporting as per the logframe. Additional analysis of specification of indicators and targets and adequate monitoring methodology were developed in order to interpret and apply project indicators and targets, and to report project achievements fairly enough.

The project planned that significant investment through the replication of demonstration projects would materialize already during the six-year project implementation period, i.e. before all project deliverables could have been available. The planned replication factor in terms of energy and GHG emission savings was expected to be 36, and the replication factor for efficient irrigation and sustainable land management in terms of land area was expected to be 60. In other words: most of expected water, energy savings and GHG emission reductions were planned to be achieved by the large-scale replication already by the end of the project. The expected replication rate is extremely high, and it is hardly realistic to expect that this scale of replication of demonstration projects could have materialized by the end of the project and fully benefit from all project deliverables. Key project deliverables designed to facilitate replication (especially regulations) were planned to be delivered by the end of project, and thus this left effectively no time for replications. Most of replication projects that were implemented, were based on experience from demonstration projects and on capacity building.

Life-time energy savings from demonstration projects and replications reached 976,409 GJ, which is 29% of the combined target. Demonstration projects generated 146,773 GJ of energy savings, and replication projects 829,636 GJ of savings.

Life-time GHG emission savings from both demonstration projects and replications reached 206,975 tCO<sub>2</sub>, i.e. 46% of the combined target. The target was mistakenly higher by 80,000 tCO<sub>2</sub>. Thus, the actual achievement rate should be 56%.

Replication projects were expected to be financed and implemented by the government, independently from and without any additional specific support from the project. There was no specific strategy designed for the support of replications within the project implementation period except for relying on the confirmed co-financing from the government.

Although the project strategy was clear and appropriate, the project results framework/logFrame was the weakest part of the project design. Although the project results framework was revised according to recommendations of both, the Inception Report and MTR, the clarity of several indicators and baselines remained insufficient. Even after the last revision as per MTR recommendations, there are multiple indicators that are not SMART, there is often a disproportion in a definition of indicators, their baselines and targets, including for example their expression in various units (absolute vs. specific values), miscalculation of baseline value in some cases, etc. Another uncertainty arose from rather general assumptions used for baseline (and target) calculations of water, energy and GHG emission savings, vis-à-vis a need to use more complex calculations and specific assumptions especially for calculation of achievements from irrigated crop land/Green Polygon (various mix of crops, variable size of land cultivated during the year, various meteorological and hydrological conditions).

Thus, there is some level of uncertainty when comparing achieved water, energy and GHG savings to expected targets and baselines as per logFrame. This applies primarily for project objective and Component 1 indicators.

Project objective indicators included combined targets of water, energy and GHG savings for both, demonstration projects as well as their replication within the project implementation period. However, there is a different level of control of the project team over implementation of demonstration (direct) versus replication (indirect) projects, as well as different level of quality of calculated water and energy savings and GHG emission reductions due to different level of uncertainty of assumptions used for savings calculation.

Project results framework includes indicators for project objective and outcomes structured into four project components. The logframe matrix does not include indicators for project outcomes.

The project was not designed to address specifically gender equality and women’s empowerment. The project is considered to be gender neutral, and to have no direct impact, positive nor negative, on gender equality and women’s empowerment.

Social and Environmental Safeguards and risk management were adequately analyzed and addressed (for minor comments see Chapter 4.1.7).

Knowledge management was an integral part of the project design and implementation and it focused primarily on governmental and regional decision makers and experts, and to some extent also on farmers. Trainings and workshops were partially impacted by COVID-19 related restrictions, and were substituted with on-line sessions when necessary. There is an opportunity to utilize the knowledge and experience developed by this project in other follow-up outreach activities implemented by other projects.

The project properly identified all main relevant partners and stakeholders and effectively collaborated with them.

As of November 25, 2021, in total 6.069 mil USD have been spent, i.e. 98% of the GEF budget of 6.185 mil USD.

## **ii. Conclusions and terminal evaluation rating**

Despite some delays in early years of project implementation, caused partially perhaps also by a vacant post of a Project Manager for 6 months after resignation of the first Project Manager, the project has delivered practically all expected results. With an exception of two targets that have not been fully met because they were set unrealistically high, and one target was not met due to delayed implementation in 2021, but it is expected to be reached after project termination.

All five planned demonstration projects (Components 1 and 2) have been implemented. The last demonstration project, installation of two lines for production of domestic canal lining materials was installed, tested and transferred to the SCWM in 2021, however, it was not put into a full operation by the Bezmein factory yet. Thus new canal lining based on these domestically produced lining materials has not materialized yet.

Expected results of Component 3 - Capacity building, and in the Component 4 - Policy/regulatory framework for integrated water resource management (IWRM) have been delivered with some deviations, but they effectively met relevant targets. The number of regulations developed (Component 4) highly exceeded the target.

The project did reach and exceeded targeted water savings. Note that the baseline and target of the project objective indicator 3 are not directly comparable and use different units. However, based on analysis of original calculation of this target, the expected water savings were planned to reach 40%, and the actual achievement is 56%).

The project did not fully deliver all expected energy savings and related GHG emission reductions. This is primarily because the actual replication by the end of the project (although significant), was lower than expected and planned for in the ProDoc (expected rate of replication was unrealistic high – see above). This applies similarly also to replication of land area reclaimed from salinization (part of Indicator 4). The GHG emission saving target was miscalculated and should have been lower by 80,000 tCO<sub>2</sub>.

Due to delayed implementation of the installation of two production lines for domestic production of canal lining materials, no canals have been lined with these products yet (the target was 400 km, see part of the Indicator 17). However, the production line has been installed and it is expected that full three-shift operation will start early in 2022. Thus, one can assume with high probability that also the target of 400 km length of lined water canals will be met, although with a delay of few years.

Other project targets have been met or exceeded.

Efficient low-water irrigation and elimination of salinization also significantly increase crop yields. This effect that means also increased income of farmers, was not reflected in the logFrame indicators.

There are good prospects for long-term sustaining project results and continuous investment of the government in efficient water supply and irrigation technologies and implementing newly

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developed practices in IWRM and SLM. The best argument is actual funding already invested in efficient water supply and irrigation technologies by the government, and the new draft State Program on the Development of Water-Saving Irrigation Technologies for 2021-2030 that includes not only commitment but also budget allocations for actual investment.

During the project implementation period, and especially since 2018, the state policy allowed for a strong growth of private farmers, including small ones, who were provided 99-year lease of agriculture land for crop cultivation. Private farmers demonstrate high interest in efficient irrigation subject to affordable financing.

In conclusion, the project did de facto deliver all expected targets. Thus, the overall project outcome rating is S – Satisfactory. Formally, two targets were not met because they were based on unrealistically high assumptions on replication rate by the end of project, and one target was not met due to delays, but the demonstration project has been implemented and the achievements will materialize after project termination. Other targets have been met or exceeded.

**Table 2: Terminal Evaluation Rating**

Monitoring and Evaluation (M&E)	Rating
M&E design at entry	MU – Moderately Unsatisfactory
M&E Plan Implementation	S – Satisfactory
Overall Quality of M&E	S – Satisfactory
UNDP Implementation/Oversight and Implementing Partner Execution	
Quality of UNDP Implementation/Oversight	S – Satisfactory
Quality of Implementing Partner Execution	S – Satisfactory
Overall quality of Implementation/Execution	S – Satisfactory
Assessment of Outcomes	
Relevance	HS – Highly Satisfactory
Effectiveness	S – Satisfactory
Efficiency	S – Satisfactory
Overall Project Outcome Rating	S – Satisfactory
Sustainability	
Financial sustainability	L – Likely
Socio-political/economic sustainability	L – Likely
Institutional framework and governance sustainability	L – Likely
Environmental sustainability	L – Likely
Overall Likelihood of Sustainability	L – Likely

**Table 3: Terminal Evaluation Rating Scales**

Ratings for Outcomes, Effectiveness, Efficiency, M&E, Implementation/Oversight, Execution, Relevance	Sustainability ratings:
6 = Highly Satisfactory (HS): exceeds expectations and/or no shortcomings 5 = Satisfactory (S): meets expectations and/or no or minor shortcomings 4 = Moderately Satisfactory (MS): more or less meets expectations and/or some shortcomings 3 = Moderately Unsatisfactory (MU): somewhat below expectations and/or significant shortcomings 2 = Unsatisfactory (U): substantially below expectations and/or major shortcomings 1 = Highly Unsatisfactory (HU): severe shortcomings Unable to Assess (U/A): available information does not allow an assessment	4 = Likely (L): negligible risks to sustainability 3 = Moderately Likely (ML): moderate risks to sustainability 2 = Moderately Unlikely (MU): significant risks to sustainability 1 = Unlikely (U): severe risks to sustainability Unable to Assess (U/A): Unable to assess the expected incidence and magnitude of risks to sustainability

**iii. Key Lessons Learned**

Lessons learned

1. Calculation of achievements of low-water irrigation and SLM is a complex process that requires specific methodology (in case of crop yields not only annual values, but also specific time-bound data collection of rainfall, temperature, wind, humidity, evaporation, land moisture, etc.) Such robust and site-specific methodology, including weather normalization and assumptions, needs to be developed already during the project design phase for calculation of baselines and targets, or at the earliest stage of project implementation at the latest. And the same methodology should be used for assessment of actual achievements. In case the methodology would be revised during project implementation, the baseline needs to be adjusted accordingly.
2. Combining direct (demonstration) and indirect (replication) project results in a single indicator does not allow to distinguish the project performance from activities implemented independently by other parties and has to be avoided. Separate indicators for direct and indirect project activities need to be used.
3. Good quality project results framework with SMART indicators and realistic baselines and targets is a key for adequate monitoring and reporting of project achievements. Good quality project results matrix is difficult to design. Theory of Change helps to properly identify project objectives, outcomes, and outputs, and their indicators, and needs to be included in the project design. Even significant revision of the project



results framework at the beginning of the project may be necessary if its quality is not sufficient.

4. High co-financing for replication already within the project implementation period tends to include also some co-financing allocated already before the project start. In such case baseline and project additionality needs to be properly analyzed and clearly distinguished. Project achievements based on co-financing should not include results achieved by activities planned for and with financing confirmed before the project start, but only results of project specific activities additional to baseline.
5. The project strongly benefitted from several highly qualified international experts with practical experience in relevant fields. The selection of proper experts and their timely involvement are essential for a successful know-how transfer, especially in projects with a strong focus on application of best international practices.

#### iv. Recommendations

Recommendations are summarized in Table 4.

**Table 4: Recommendations Table**

Rec #	TE Recommendation	Entity Responsible	Time frame
A	Category 1: Immediate for PIU until End-of-Project		
A.1	Focus on timely development of Lessons Learned Report well before the end-of-project.	PIU	End-of-Project
A.2	As part of Lessons Learned to be developed, structure the information also in a brief, easy to read summary information on benefits and costs of each demonstrated technology (including water/energy savings, increased crop yields, payback, etc.)	PIU	EOP
A.3	Publish information based on project achievements and Lessons Learned Report also in a format accessible for farmers, i.e. brief practical guide/information for farmers on efficient water irrigation, on a permanent web site that will be available after project termination. Consider targeted information dissemination in partnership with other on-going projects (SCRL), if possible.	PIU	EOP
A.4	Follow-up with the Bezmein factory of the SCWM on actual start of the full-scale production of HDPE geomembrane, its actual annual production, and utilization of the geomembrane in terms of km of canals lined.	PIU, UNDP	Up to one year after EOP

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B.	Category 2: Follow-up for UNDP CO (and Government of Turkmenistan)		
B.1	Good quality project results framework is critical for successful project. Include planned activities with confirmed co-financing into project baseline, not into targets, ensure adequacy of assumptions used, and coherent and SMART specification indicators. In future projects during the project development phase implement specific quality assurance of project results framework based on Theory of Change.	UNDP/ Country Office (CO)	Not limited
B.2	Indicators with baselines and targets for direct project interventions and their achievements should be defined and reported separately from indirect project activities (such as replications during the project period).	UNDP/CO	Not limited
B.3	Document full methodology and assumptions used for specific calculation of project baselines, targets and achievements (including monitoring and verification). Use the same/compatible methodology for baseline, target and achievement calculations.	UNDP/CO	Not limited
B.4	Avoid double counting of achievements from GEF and other donors financed projects in reporting (not limited to GHG emission reduction).	UNDP/CO	Not limited
B.5	Report latest achievements as of June of actual year in appropriate column in annual PIRs.	UNDP/CO	Not limited
B.6	Use Critical Path Method <sup>1</sup> for design and timely implementation of projects.	UNDP/CO	Not limited
B.7	Consider development of a financial support scheme with preferential financing and technical assistance in partnership with suitable donors for small private farmers planning to invest in efficient water irrigation, drainage, and SLM.	UNDP/Government of Turkmenistan	Not limited
B.8	Integrate gender aspects into future project design and implementation in accordance with updated GEF requirements.	UNDP/CO	Not limited
B.9	Follow up with the Bezmein Factory of Construction Materials and SCWM to ensure launch of the full scale lining geomembrane production and actual implementation of canal lining.	UNDP CO	Until full operation and canal lining.

<sup>1</sup> A Critical Path Method (CPM) identifies critical path of activities that, if delayed, would delay the entire project. CPM is a project management technique used to create a project schedule, to estimate the total duration of a project by identifying the longest stretch of dependent activities, and to manage timely implementation of a project. For more information on CPM see for example: [https://en.wikipedia.org/wiki/Critical\\_path\\_method](https://en.wikipedia.org/wiki/Critical_path_method).

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C.	Category 3: For UNDP/GEF		
C.1	When considering project proposals, focus especially on an appropriate design of project result frameworks and appropriate SMART specification of indicators, baselines and targets, including assumptions. This is an obvious requirement. However, in practice the project result framework is often the weakest part of a project design/Project Document.	GEF/UNDP CO	Not limited
C.2	Consider recommendation/requirement to use a Critical Path Method in project design and implementation of GEF-financed projects.	GEF/UNDP CO	Not limited

## **2. INTRODUCTION**

### **2.1 Evaluation Purpose**

This terminal evaluation was performed at the request of UNDP CO Turkmenistan (the GEF Agency) as a standard mandatory requirement for all UNDP-supported GEF-financed projects.

Terminal Evaluation provides a basis for learning and accountability for managers and stakeholders and for providing recommendations and lessons learned which can be applied when designing future relevant UNDP projects.

The objective of the terminal evaluation is to assess:

- achievement of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming;
- promotion of accountability and transparency and assesses the extent of project accomplishments;
- broader project impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals;
- and recommendations for follow-up activities.

The updated 2020 UNDP/GEF “Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects” specifies four complementary evaluation purposes of GEF-financed projects:

- To promote accountability and transparency;
- To synthesize lessons that can help to improve the selection, design and implementation of future UNDP-supported GEF-financed activities; and to improve the sustainability of benefits and aid in overall enhancement of UNDP programming;
- To assess and document project results, and the contribution of these results towards achieving GEF strategic objectives aimed at global environmental benefits;
- To gauge the extent of project convergence with other priorities within the UNDP country programme, including poverty alleviation; strengthening resilience to the impacts of climate change, reducing disaster risk and vulnerability, as well as cross-cutting issues such gender equality, empowering women<sup>2</sup> and supporting human rights.

### **2.2 Scope of the Evaluation**

This terminal evaluation evaluated UNDP/GEF project “Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan” between October 2021 and January 2022. The draft Terminal Evaluation Report was submitted to the UNDP CO Turkmenistan on December 15, 2021.

The terminal evaluation assessed performance of all project components against expectations set out in the project’s Logical Framework/Results Framework according to the criteria outlined

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in the 2020 UNDP/GEF “Guidance for Conducting Terminal Evaluations of UNDP-supported GEF-financed Projects”.

All key project stakeholders as well as a selection of other project partners and stakeholders and beneficiaries were selected for interviews.

Governmental project stakeholders are located in Ashgabat, the capital of Turkmenistan, some other stakeholders are located in several regions. Project sites are also located in several regions is located at Geokdepe. Exact location and coordinates of project sites are shown in Chapter 3.10.

### **2.3 Evaluation Methodology**

The methodology used for the project terminal evaluation is based on the 2020 revision of the UNDP/GEF “Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects”, and it combines:

- mixed methods approach – a combination of qualitative and quantitative evaluation methods and instruments;
- desk review of all relevant project documents, reports and deliverables prior to evaluation interviews;
- semi-structured interviews with key stakeholders, and
- data review, analysis and triangulation.

Due to COVID-19 related travel restrictions the terminal evaluation was organized remotely without any international travel, and interviews were held on-line (with few exceptions). The national consultant performed several field visits to project demonstration sites and interviewed some of project stakeholders and beneficiaries face to face on site, or by local phone, in case internet connection was not accessible.

The terminal evaluation followed participatory and consultative approach ensuring close engagement with the Project Team, government counterparts, Implementing Partners, the UNDP Country Office, the Chief Technical Advisor (CTA), the Regional Technical Advisor (RTA), direct beneficiaries and other stakeholders.

### **2.4 Data Collection and Analysis**

Data collection method combined desk review, on-line interviews and field visits of demonstration sites.

Collected data were subject to triangulation with information obtained from other sources, such as documents, interviews with local stakeholders, and field visits at project demonstration sites.

In order to integrate gender considerations into data analysis and evaluation, data collection method sought for information disaggregated by sex where relevant and available.

In addition to collection of project specific data, relevant information available from open sources was collected and analyzed.

Specification of data that were collected was based on evaluation questions and analysis needed for triangulation of information obtained.

## **2.5 Ethics**

The terminal evaluation was conducted in accordance with the principles outlined in the United Nations Evaluation Group (UNEG) “Ethical Guidelines for Evaluations”. Both evaluators, the international and the national consultants, signed the UNEG Code of Conduct for Evaluators prior to the actual start of the evaluation.

## **2.6 Limitations**

This terminal evaluation was performed when international travel to Turkmenistan faced restrictions due to COVID-19 pandemic. Thus the terminal evaluation was performed remotely, and interviews with project stakeholders were organized online as a video conference. Multiple online interviews were switched to voice over internet only due to poor internet connection. Local travel was possible to some extent, and the local TE consultant was thus able to visit several demonstration project sites and to hold interviews with stakeholders without access to internet. Although face-to-face interview always provide more in-depth information, including non-verbal body-language, evaluators were able to collect all necessary information for a fair evaluation.

In Turkmenistan, draft governmental policies and programs are not in general publicly available before they are officially approved. Thus, the information collected on the content of the draft State Program on the Development of Water-Saving Irrigation Technologies for 2021-2030 was limited and evaluators were not able to collect any specific information on planned budget for this program, and thus to estimate the scale of planned post-project replications.

Project results framework was poorly designed, the specification of indicators, baselines and targets do not necessarily correspond with each other. The methodology for calculation of project achievements, and especially of energy savings and GHG reductions from irrigated land, had to be developed in more detail and additional specific assumptions had to be used. Thus the methodology differs from that used in the baseline and target calculation. Hence, also comparing the achievements with targets needs to take into account this uncertainty due to different calculation methodologies and assumptions used.

## **2.7 Structure of the TE Report**

The structure of the TE Report follows the requirements specified in the TE TOR and in the 2020 UNDP/GEF “Guidance for Conducting Terminal Evaluations of UNDP-supported GEF-financed Projects”. For the specific structure used in this TE Report, see the Table of Content on page i.

### 3. PROJECT DESCRIPTION

The project has three main pillars:

- Demonstration of energy and water efficient water supply and irrigation technologies and SLM practices;
- Dissemination of experience gained, including development of specific IWRM plans and SLM practices based on experience from the agriculture demonstration site Green Polygon; and
- Development of policies and country-wide regulations/by-laws (including program and action plan with budget) for large scale replication/scaling-up of efficient irrigation and water supply technologies.

The project design was structured into four components. Components 1 and 2 were designed to deliver full-scale demonstration projects in efficient irrigation and water supply, including:

Component 1:

- Efficient water supply and irrigation in agriculture and sustainable land management;
- Efficient water pumps;
- PV driven water pumping and purification.

Component 2:

- Efficient water supply to municipality – replacement of unlined canal with water pipeline;
- Domestic production of canal lining materials.

Component 3 includes dissemination of experience gained from demonstration projects and development and implementation of advanced Integrated Water Resource Management (IWRM) Plans and Sustainable Land Management (SLM) practices.

Component 4 covers development of policy and regulatory framework for large-scale replication, including national program and action plan with budget on efficient water irrigation and supply, standards on water pumps performance and maintenance, and regulatory framework for water consumption measurement and gradual transition to adoption of water consumption tariffs.

Expected project results per outputs of project components are summarized in the following overview.

Note that the wording of project components and outputs in this overview are rephrased to clearly describe the content of each component and output, i.e. the wording is not copied from the ProDoc. Exact wording of project objective and outcomes and their baselines and targets is quoted in Table 17: Project Results and Achievements as per LogFrame Targets in Chapter 4.3.1 Progress Towards Objective and Expected Outcomes.

**Component 1: Demonstration projects in efficient water irrigation and SLM in agriculture, water pumping, and off-grid renewable energy for water pumping and purification**

Output 1.1 Efficient water irrigation and Sustainable Land Management in agriculture demonstration plot

Geokdepe Green Polygon - demonstration of efficient water supply and irrigation technologies and sustainable land management in a 170 ha agricultural plot, including planning and soil monitoring

Output 1.2 Efficient water pumps

Audits of 100 aged electrical and diesel water pumps, and advanced servicing and replacement of 10 inefficient water pumps with more efficient ones.

Output 1.3 Renewable energy driven water pumping and purification in a remote pasture area

5 kW photovoltaics installations combined with efficient pump and purification of water for local community of shepherds

**Component 2: Demonstration of efficient long-distance water supply for municipality and production of effective canal lining materials**

Output 2.1 Efficient water supply for Kaakha municipality

Replacement of 20 km unlined canal supplying water to the city from the river with a water pipeline with MWE co-financing, and due to elimination of estimated 50% water losses, removal of electric pumping from 41 wells. Small Hydro Power installation at the end of a pipeline (400 m elevation slope) to be financed by the MWE.

Output 2.2 Domestic production of effective lining materials for reduction of water losses in interdistrict canals

Identification of suitable lining products (plastic sheets, concrete slabs, ..) and specification, design and installation of production technology in one of the factories operated by the MWE.

Both Components 1 and 2 include also ex-post monitoring of results achieved.

**Component 3: Regional/local IWRM planning and capacity building, lessons learned**

Output 3.1 Development of Technology Action Plans<sup>2</sup>

Technical proposals on system design, including specification of effective supply and drainage canals, irrigation, and other on-farm water management practices such as irrigation scheduling, analysis of benefits of water and energy conservation, and land reclamation, financial justifications and proposed budgets.

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<sup>22</sup> Technology Action Plans specify efficient technologies for IWRM and SLM. The project integrated TAPs into IWRM and SLM methodologies.



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#### Output 3.2 Training in efficient water management and SLM

Experience gained in Components 1 and 2 delivered to specific target groups, including system designers, water management staff, farmers, and students.

#### Output 3.3 Lesson learned and project evaluation

Lessons learned developed in audience-specific formats for different target groups, including decision makers, teachers etc. Includes also GHG inventory from demonstration projects, and MTR and TE.

### **Component 4: National policy and regulatory framework established for integrated water resource management**

#### Output 4.1 Standards and regulations for pump performance and maintenance adopted and enforced

Standards for pump performance, including mandatory performance requirements, pump maintenance, regular pump audits, including specification of audit requirements, timing, correct pump sizing adopted and enforced. Technical guidance manuals developed.

#### Output 4.2 Policy framework for measuring water consumption, monitoring energy consumption in the water sector, and making the transition to end-use tariffs developed and adopted

Fully operational systems of measurement of water consumption and energy consumption in the water sector across Turkmenistan, adopted regulations with a defined timetable for staged implementation of tariffs.

#### Output 4.3 Policy and state budget framework for widespread deployment of efficiency improvements to irrigation and water infrastructure adopted and implemented

Support to the MWE in developing a policy framework under the Water Codex to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide, and adoption of regulations, state programs, and budget allocations.

#### Output 4.4. Administrative reform for implementation of integrated water resource management and sustainable land management adopted and implemented

Support to MWE in developing sub-legislative acts (by-laws) under the Water Codex and Land Codex for overall administrative reform in support of integrated water management and sustainable land management.

### 3.1 Project Start and Duration

#### Project cycle milestones

PIF submission date:	August 13, 2013
PPG approved:	September 12, 2013
PIF Council approval date/Project Concept approved:	November 7, 2013
Project approved for implementation <sup>3</sup> :	May 25, 2015
Project Document signed:	July 17, 2015
Planned project duration:	6 years (72 months)
Original operational closing date:	July 16, 2021
Actual operational closing date:	April 16, 2022
Actual project duration:	6 years and 9 months (81 months)
Draft Terminal Evaluation Report was submitted on:	December 15, 2021
Final comments on the draft report were provided to evaluators on:	February 2, 2022
The final Terminal Evaluation Report was submitted on:	March 6, 2022

### 3.2 Project Development Context

Turkmenistan, located in the Central Asia, has a total area of 491,000 km<sup>2</sup> and a population of 6 million people (in 2020, 5.6 mil in 2015), of which 58% live in rural areas. Turkmenistan has extremely hot and dry climate, between 1991 and 2020 it received only 154 mm precipitation annually<sup>4</sup> (ranges from 80 mm in the North up to 380 mm in the mountains in the South). 80% of the total area of the country is covered by the Karakum Desert.

Agriculture accounts for 19% of the GDP, and 48% of the labor force. Agriculture land accounts for 80% of total land area, however it consists mostly of semiarid desert grassland for free-ranging livestock. Arable land needs to be fully irrigated and it accounts for 5% of agriculture land only.

The Amu-Darya river is a major source of water in Turkmenistan. The amount of intake water is subject to negotiations with other countries of the region of Central Asia. Water is distributed

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<sup>3</sup> Source: GEF data at <https://www.thegef.org/project/energy-efficiency-and-renewable-energy-sustainable-water-management-turkmenistan>.

<sup>4</sup> Source: The World Bank Climate Change Knowledge Portal, <https://climateknowledgeportal.worldbank.org/country/Turkmenistan/climate-data-historical>

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throughout Turkmenistan via networks of canals, extending over 42,500 km, as well as a collector-drainage network over 35,000 km. There is limited amount of available water for irrigation, in a number of districts in Turkmenistan, there is an acute shortage of drinking water as well. The irrigation infrastructure in Turkmenistan is mostly aged, it was constructed up to 60 years ago. The Ministry of Water Economy estimated that 50% of irrigation water is lost, mostly in unlined open water canals. Water and energy within national consumption limits are supplied free of charge, overuse is subject to charges. However, end-use water consumption and electricity is not generally metered.

**Chyba! Nenalezen zdroj odkazů.** illustrates water resources in Turkmenistan and in the entral Asian context. It shows how important source of water Amu-Darya river is for Turkmenistan.

Figure 1: Water Resources in Turkmenistan and in Aral Sea Basin



Source: CAWater-info, Portal of Knowledge for Water and Environmental Issues in Central Asia, [http://www.cawater-info.net/aral/index\\_e.htm#](http://www.cawater-info.net/aral/index_e.htm#), November 29, 2021

There are about 3,500 water pumps run by electricity in Turkmenistan with a total installed capacity of 250 MW. Water management is the second largest power-consuming sector in Turkmenistan, accounting for about 25% of total power consumption. In off-grid areas, there

are additional 1180 pumps run by diesel fuel with estimated fuel consumption of 15 mil liters annually. Energy used in water supply industry accounts for 6.9 MtCO<sub>2</sub> annually, which is 27% of energy related GHG emissions, and 11% of total GHG emissions in the country.

Land degradation, and mainly soil salinization has been a serious problem for several last decades. Only about 4% of irrigated land, i.e. arable land, is not salinized.

Sufficient supply of both, water for irrigation and of drinking water, and land desalinization are of a high priority for the Government of Turkmenistan.

Remedying salinization has two strategies: avoidance of waterlogging and surface evaporation, and leaching away deposited salts, which requires sufficient water supply and sufficient drainage of excess water.

The centerpiece of Turkmenistan’s long-term strategy with regard to drainage is the construction of the Altyn Asyr Lake (Golden Age Lake), a huge reservoir of drainage water that will be recycled for irrigation after partial desalination treatment. The lake will receive drainage waters from around the country, eventually holding about 130 cubic kilometers of water. The construction begun in 2000. In 2008, a 385-km drainage outlet canal was completed, and waters began to accumulate in the lake. Total projected costs are estimated at US \$4.5 to 6 billion.

Source: Project Document, and the World Bank Data Indicators,  
<https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=TM>.

### **3.3 Problems that the Project Sought to Address**

Scarce water resources and inefficient water supply result in limited energy and carbon intensive supply of drinking water and especially of water for irrigation in agriculture, which represents one the main socio-economic sectors in Turkmenistan, as well as in land degradation through soil salinization.

Further development of water-consuming economic activities, especially agriculture production and meeting demand for drinking water, is possible only via increasing efficiency, improving water resource management, recycling wastewater, using unconventional water sources, and introduction of new irrigation technologies in combination with adequate water pricing.

The project objective addresses GEF-5 focal area objectives CCM-1 Technology Transfer, CCM-2 Energy Efficiency, LD-1 Agriculture and Rangeland Systems, and is fully in line with Turkmenistan priorities as specified in “Fundamental Directions of Economic, Political, and Cultural Development of Turkmenistan in the Period up to 2020” and “National Program for the Social Development of Rural Areas” including significant budget allocations.

Integrated water resources management and improvement of the legal and regulatory framework regarding water in Turkmenistan were both specifically noted as targets in the 2010-2015 Country Programme Action Plan (CPAP) jointly adopted by UNDP and the Government of Turkmenistan. The UN Development Assistance Framework (UNDAF) jointly signed by the

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UN and the Government also prominently cites the need for joint activity on integrated water management and mitigation of land degradation.

The project addresses five Sustainable Development Goals, including SDG 6 Clean Water and Sanitation (Targets 6.4, 6.5), SDG 7 Affordable and Clean Energy (Targets 7.1, 7.2 and 7.3), SDG 9 Industry, Innovation and Infrastructure (Target 9.4), SDG 13 Climate Action (Target 13.2, 13.3), SDG 15 Life on Land (Target 15.3).

### **3.4 Immediate and Development Objectives of the Project**

The project development objective is to provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan.

Two environmental objectives were specified to:

- Reduce GHG emissions associated with water management, and to
- Prevent and remediate salinization of lands

The project was designed to address specifically water savings/efficient water management, energy efficiency and renewable energy, reduction of land degradation (salinization), and indirectly also increased agricultural productivity<sup>5</sup>.

The Project addressed simultaneously climate change mitigation (energy savings, renewable energy and GHG emission reductions), and climate change adaptation (land degradation - sustainable land management).

### **3.5 Project’s Theory of Change**

The Project Document does not describe application of theory of change.

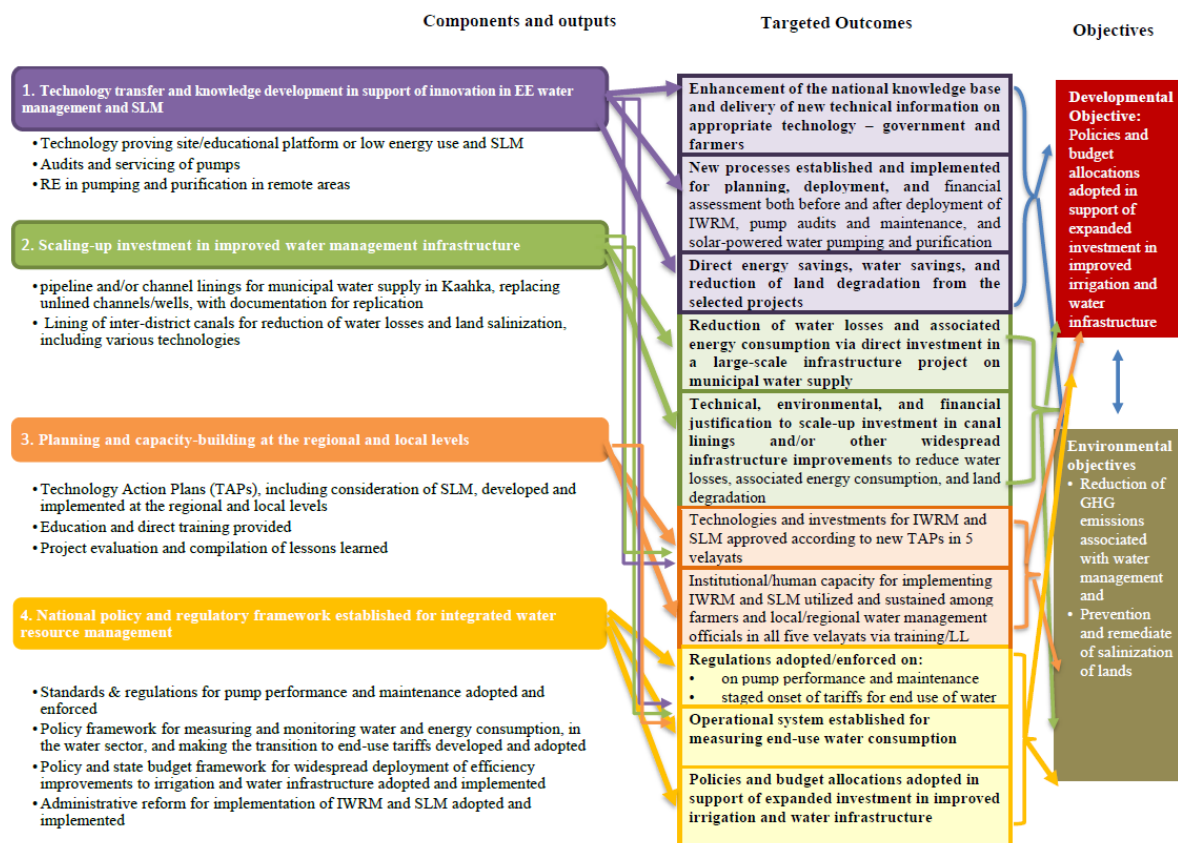
Development of a theory of change for the project would require complete revision and new formulation of project logframe, and especially of project outcomes. Note that project outcomes have been specified but not linked directly to project outputs. At this phase of project implementation (terminal evaluation), the project results matrix and new specification of project outcomes cannot be changed. Thus, development of a theory of change for the project at this project phase would have no practical impact.

The MTR reconstructed results chain as shown in the Figure 2.

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<sup>5</sup> Increased agricultural productivity is an effect of improved water management and efficient irrigation.

**Figure 2: Reconstructed Results Chain as of the MTR**



### 3.6 Expected Results

Expected results include delivery of:

- Demonstration projects in:
  - Energy and water efficient water supply and irrigation in agriculture and sustainable land management;
  - Efficient water pumping;
  - PV driven water pumping and purification;
  - Energy and water efficient water supply to municipality – replacement of unlined canal with water pipeline and elimination of water pumping from wells with inefficient pumps;
  - Domestic production of canal lining materials.
- Dissemination of experience gained from demonstration projects and development and implementation of advanced Integrated Water Resource Management (IWRM) Plans and Sustainable Land Management practices.
- Development of policy and regulatory framework for large-scale replication, including national program and action plan with budget on efficient water irrigation and supply,

national standards on water pumps performance and maintenance, and regulatory framework for water consumption measurement and gradual transition to adoption of water consumption tariffs.

The ultimate, primary goal of the project is to increase efficiency of water supply and irrigation, and to reduce degraded (salinized) land for potential agriculture utilization in a sustainable and energy efficient way. It should be noted that the goal to maximize water efficiency and water savings is not necessarily in all cases fully compatible with maximization of energy savings and GHG emission reductions (especially the most water efficient irrigation - drip irrigation, requires higher pressure and thus more energy).

Project results framework specifies expected results for project objective and for each of four project components.

Expected results as specified in the Project Document were subject to review at both, the inception phase and at the mid-term evaluation, and subsequently the project results framework has been updated. Table 5: Summary of Expected Results summarizes original expected project results as per Project Document as well as final expected results as per revised project results framework after the MTE.

More detailed analysis of project logframe/project results framework is discussed in Chapter 4.1.1 Project Results Framework (logFrame) Analysis.

Expected results on a project objective level were defined for:

- Energy savings;
- GHG emission reductions;
- Water savings;
- Reduced salinization of land;
- Implementation of national and regional Integrated Water Resources Management Plans; and
- Number of people benefitting from improved water management system.

Note that expected project results (and project targets) combine energy, water and GHG savings for both, demonstration projects directly supported and implemented by the project, as well as expected replication during the project implementation period without any additional direct project support.

**Table 5: Summary of Expected Results**

<b>Expected Results</b>	<b>Target Value (as per ProDoc)</b>	<b>Target Value (updated as per final revision after MTE)</b>
<i>Project Objective: Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan</i>		
Energy savings	3.4 million GJ	3.4 million GJ/year
GHG emission reductions	448,000 tGHG	448,000 t. “The baseline is estimated in yearly values; however, the project reports in direct reductions of GHG emissions.”
Reduction of water consumption per hectare of irrigated land	40-50%	48,000 m <sup>3</sup> /ha/year reduction of normalized water consumption
Land protected/reclaimed from salinization	21,400 hectares	145 ha of arable land by direct project interventions 20,000 ha by replication
IWRM	National and 5 sub-national IWRM plans adopted and implemented	6 (with at least 1 national and others - sub-national)
State and private investment in new and efficient integrated water management	-	No target specified in the ProDoc. Target added and wording of an indicator revised.
<i>Revised indicator:</i> Resources and co-funding mobilized by the Project from state and other sources on water and energy efficiency, as well as land reclamation techniques (US\$)	-	US\$ 72.1M
Number of people directly benefitting from new and improved water management systems	35,000	Added “and indirectly”
<i>Component 1: Technology transfer and knowledge development in support of innovation in EE water management and SLM</i>		
Reduction of water use	40-50%	At the project demonstration sites
Normalized energy consumption (per type of soil and agriculture crop)	30%	At the project demonstration sites
Water pumps audited	100 audits, of which 25 diesel pumps	



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Energy and emission savings from improved maintenance and replacement of water pumps	20% energy savings 436,750 tGHG emission reduction	Emission reduction target deleted
Land protected/reclaimed from salinization in demonstration projects	300 hectares	
Number of communities served by renewable energy driven water supply in remote locations	20 communities 6 RE installations (total installed capacity 30 kW, 100 tGHG direct emission savings)	1,100 people directly benefiting from measures on renewable-energy water supply in remote locations
<i>Component 2: Scaling-up investment in improved water management infrastructure</i>		
Reduction of water losses and avoided energy consumption from Kaakhka municipal water supply demonstration project	<5% water losses 42 wells decommissioned 240 tGHG emission reductions 486 MWh (“direct energy savings per year“)	5% Wells decommissioning and GHG emission reduction targets deleted. Up to 486 MWh
Replication of Kaakha demo project	90 wells decommissioned	At least 1 similar project under implementation (target of 90 wells decommissioned deleted)
Volume and cost of production of canal lining materials	Three types of canal lining and pipes tested Initiation of mass production of new materials 20% cost reduction of two new products	Indicator changed to: Number of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes (#) and kilometers of canals newly lined. Target: 2 production lines established
Length of canals newly lined	400 km 50% water losses reduction of newly lined canals	Water loss reduction target deleted
	50% expansion of domestic production and installation of two lining materials	Target deleted
<i>Component 3: Planning and capacity-building at the regional and local levels, plus evaluation and compilation of lessons learned</i>		
Formal adoption of sustainable land management (SLM) plans for regions	5 IWRM Plans approved (one in each velayat) that include consideration of SLM	Number of IWRM developed and submitted for approval: for 3 velayats

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		Recommendations for other 2 velayats
Number of participants and new content of training seminars	100 specialists and 300 farmers trained Expanded training delivered annually in all five velayats on integrated water management	
<i>Component 4: National policy and regulatory framework established for integrated water resource management</i>		
Regulations, other sub-legislative acts, and/or state programs adopted and/or enforced on pumps, tariffs, and IWRM	Adopted in 7 areas: water metering and tariffs; monitoring of energy consumption; water pump audits, maintenance and replacement; deployment of low-water irrigation; implementation of expanded drainage and measurement of drainage; administrative reform for implementation of integrated water resource management.	At least 3 acts related to pump audits, crop-specific irrigation norms, and water/energy saving practices (incl. irrigation infrastructure) to lead to GHG emission reduction.
Identified technologies for efficient irrigation and water management infrastructure diffused widely with state investment	20% increase in state investment	Deleted and replaced with:
<i>Revised indicator:</i> There is a formal commitment of the government to allocate resources for demonstrated by the project technologies (e.g. inclusion in state-funded programmes and budgets) (Yes/No)	-	Yes
Number and geographic extent of water end-use measurement devices newly installed and regularly checked	- National program for measurement of water end-use adopted and made operational	Deleted and replaced with:
<i>Revised indicator:</i> Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No)	-	Yes

### 3.7 Total Resources

**Table 6: Summary of Total Resources**

<b>Total Resources</b>	<b>78,285,000 USD</b>
Of which:	
GEF Trust Fund	6,185,000 USD
UNDP (TRACK)	100,000 USD
Government (cash)	72,000,000 USD

### 3.8 Main Stakeholders

The Project Document specified the following main project stakeholders:

- Ministry of Water Economy of Turkmenistan (transformed into the State Committee for Water Management of Turkmenistan), National Implementing Partner, member of the Project Board, partner in project implementation
- Ministry of Agriculture of Turkmenistan (transformed into the Ministry of Agriculture and Environmental Protection of Turkmenistan), member of the Project Board
- Ministry of Nature Protection of Turkmenistan (merged with the Ministry of Agriculture), member of the Project Board
- Ministry of Economy and Development of Turkmenistan (renamed to the Ministry of Finance and Development of Turkmenistan), member of the Project Board
- Ministry of Energy and Industry of Turkmenistan (renamed to the Ministry of Energy of Turkmenistan), member of the Project Board
- Ministry of Foreign Affairs of Turkmenistan, member of the Project Board

All main project stakeholders - ministries were planned to participate in the Project Board

### 3.9 Key partners

UNDP serves as a GEF Agency and project Executing Partner.

Ministry of Water Economy (transformed to the State Committee for Water Management) serves as a Project Implementing Partner and GEF Operational Focal Point.

### **3.10 Context of Other Ongoing and Previous Evaluations**

The Project was subject to the Mid-Term Review. The Mid-Term Review was performed between July and October 2018, i.e. three years after the project start, in the middle of planned six-year project.

Location and coordinates of project demonstration sites:

1. Geokdepe Green Polygon – 145 ha research site located in “Shorgala” farmers association of Geokdepe district of the Ahal region - 38°07'40.5N 58°03'14.7E
2. Hivaabad-Kaahka water gravity conduit, with a length of 14.8 km, located in the Kaahka district of the Ahal region - 37°11'22.7N 59°33'07.3E
3. Five pumping stations in each region of Turkmenistan:
  - 3.1. Pumping station (No. 3 bis) in the city of Ashgabat along the bypass highway (Gurtly) - 38°00'39.5N 58°20'20.8E
  - 3.2. Pumping station in “Yenish 2” f/a in the Sayat district of Lebap region - 38°52'52.5N 63°45'05.0E
  - 3.3. Pumping station in “Chashdepe” f/a in the Murgap district of Mary region - 37°32'01.8N 62°00'45.3E
  - 3.4. Pumping station in “Sumbar” f/a in the Magtymguly district of Balkan region at 1030th km of the Karakum River - 39°09'59.9N 56°20'36.9E
  - 3.5. Pumping station in “Hakykat” f/a in the Koneurgench district of Dashoguz region - 42°20'23.0N 59°01'38.4E
4. Installed solar power supply systems for pumping and desalination of water in the villages of Yel, Byashkak and Bori of Ahal region:
  - 4.1. “Yel” Village, located in Ak Bugday district of Ahal region - 38°45'39.1N 58°43'09.8E
  - 4.2. “Byashkak” Village, located in Ak Bugday district of Ahal region - 38°44'55.4N 58°51'05.7E
  - 4.3. “Bori” Village, located in Geokdepe district of Ahal region - 39°47'41.6N 58°06'18.4E
5. Bezmein Factory of Construction Materials of SCWM, Ashgabat, Bezmein district - 38°02'11N 58°11'46E

**Figure 3: Yel Village, demonstration site of PV driven water pumping and purification**



Source: mapy.cz,

<https://mapy.cz/zakladni?x=58.7197143&y=38.7608297&z=17&l=0&base=ophoto>

**Figure 4: Satellite photo of a demonstration Green Polygon at Geokdepe before and during project implementation**



Source: Mapy.cz, and maps.google.com

## 4. FINDINGS

### 4.1 Project Design and Formulation

The design of the project is very complex, and it addresses both, climate change mitigation as well as land degradation focal areas. The project addresses key priorities of the country: sustainable land use in agriculture and rational use of water, as well as GHG emission reductions, energy efficiency and renewable energy.

The six-year, 6.185 mil USD project is focused on sufficient and sustainable water supply, specifically on water supply and irrigation in agriculture that is far the largest consumer of water for irrigation in Turkmenistan, as well as on supply of drinking water.

The rationale for the project and the project strategy and design are clearly and logically formulated – with one exception. It is not clear from the project design how the massive replication expected to materialize with governmental investment already during the project implementation period, i.e. before the project end, could benefit from all project deliverables.

Massive replication already during project implementation period could not by definition benefit from all planned project deliverables and expected experience to be gained by the end of the project. However, achievements of replication during the project implementation period (in terms of water, energy and GHG savings, and land reclamation from salinization) have been expected to be the same as for post-project replications.

The project was structured into four components that were designed to:

**Component 1:** introduce *new technologies in irrigated agriculture and pumping* for energy efficiency, water conservation, and sustainable land management (SLM), i.e. demonstration projects at Geokdepe Green Polygon on efficient water supply and irrigation in agriculture and SLM, energy efficient water pumps, and renewable energy powered water pumping and purification in off-grid locations.

**Component 2:** scale-up investment in *new and expanded efficient water-management (i.e. water-supply) infrastructure*, i.e. replacement of open canal with water pipeline for supply of municipal water, and production of materials for water canal lining.

**Component 3:** deliver *local and region-specific planning and educational outreach for IWRM and SLM* among farmers and water-sector designers and managers

**Component 4:** develop and support implementation of *policy reform for IWRM*.

The project combines demonstration of new technologies in sustainable arable land management, efficient water irrigation, energy efficient water pumping, renewable energy driven pumps in off-grid areas (Component 1), and efficient water supply (drinking water pipeline), and introduction of domestic production of lining materials (and lining of open canals) (Component 2) with large scale replication of demonstration projects. The replication has been planned to be supported by development and dissemination of Technology Action Plans and advanced IWRM plans, educational and trainings curricula, experience and lessons learned

from implemented new techniques and technologies (Component 3), and by development of policy and regulatory framework for IWRM dissemination and large-scale state investment in efficient water and land management (Component 4).

The project was designed to create an effective framework for continuous replication and investment in efficient water supply and irrigation infrastructure after project termination (post-project, or consequential investment). However, the project design expected that large-scale replication will materialize also already during the project implementation period, i.e. before all project deliverables will be completed, including policy and regulatory framework for large-scale replication. There was no specific replication strategy designed in the project document for projects to be replicated within the project implementation period, except for committed state-financing.

The planned scale of replication envisaged to materialize already during the project implementation period is truly high; the planned replication factor in terms of energy and GHG emission savings was expected to be 36 within the planned six-year project period. The replication factor differs by specific technologies and individual demonstration projects. The highest replication factor of 60 was planned for efficient irrigation and sustainable land management (in terms of land area). Results of expected replications within the project implementation period (i.e. water, energy and GHG savings and land reclamation from salinization) have been designed to be reported jointly with results of demonstration projects.

The project budgeted in total 3.3 mil USD for investment in equipment of demonstration projects, i.e. 53% of total GEF project costs. The financing of replication projects was planned to heavily depend on direct state investment (confirmed governmental co-financing was 72 mil USD).

The Project Document did not include any financial support mechanism for replication. The financial support mechanism was considered during the project development phase, but it was eventually excluded since the primary investor was expected to be state agencies with funding from the state budget.

The designed timing and funding of the project was sufficient for its complex scope. The project strategy was appropriately designed for reaching expected project results, as well as for enabling post-project replication. Massive replication planned already for the project implementation period depended exclusively on state financing but was not supported by any other explicit strategy.

#### **4.1.1 Project Results Framework (logFrame) Analysis**

The Project Results Framework was not clearly structured and specified in the Project Document. It was subject to revisions and update of wording following recommendations of both, the Inception Report as well as the Mid-Term Review. However, the revisions adopted have not sufficiently improved the logFrame, and in some cases even introduced additional confusion in definitions. For example, it is not clear – without additional analysis of ProDoc, Inception Report and MTR – what does the final revised target value (“48,000”) of indicator 3 (“Reduction of normalized water consumption m<sup>3</sup>/ha/year” refer to. Actually, the target value of

48,000 m<sup>3</sup>/ha annually is not a target of water reduction, as the name of this indicator would suggest, but it is actually annual water consumption per hectare.

The Chief Technical Advisor, who was hired after the MTR, recommended additional revision of the logFrame, and not implementing some of the logFrame revisions recommended by the MTR. However, these recommendations (after the logFrame has been revised according to the MTR recommendations) could not have been implemented according to GEF procedures.

The Project Results Framework is structured into four components, and for each component outcomes and outputs are specified. However, there is no explicit hierarchical link between project outcomes and outputs that would indicate which outputs relate to which outcome.

Indicators have been defined for project objective and project outcomes. There are no specific indicators for project outcomes. Outcomes serve in principle only as more specific description of project components.

There are multiple indicators in the Project Results Framework that are not SMART.

- Definition of indicators, and specification of baselines and targets are not clear and consistent with each other, they are wrongly specified, unclear, or irrelevant in some cases.
  - Baseline value of energy and GHG emission savings does not correspond with a target value.
  - Indicators, baselines and targets often refer to and are expressed in different units (specific vs. absolute, annual vs. life-time values, etc.).
  - Project objective indicators of water, energy and GHG emission savings are expressed in specific units of savings per hectare. That would indicate that they were designed to cover only improvement in irrigation. Baselines of these indicators are expressed in absolute annual values of water consumption in agriculture, GHG emissions including non-agriculture water management. Energy savings and GHG emission reduction targets are expressed in lifetime savings/reductions. Water savings were originally expressed in % and revised to specific annual value per hectare.
- Project indicators are not structured per project outcomes and outputs. Six out of a total of 20 indicators are specified for the project objective, and other 14 project indicators are structured per four project components.
- The LogFrame in the ProDoc did not include any mid-term target, only end-of-project targets were specified. The Inception Report defined annual targets for each indicator.
- One project objective indicator had no target nor baseline specified in the ProDoc (was added after MTR recommendation).

*Example:*

The first project objective indicator reads:

*Extent of change in energy efficiency (UNDP Integrated Results and Resources Framework indicator 1.5.2) – specifically, consumption of electricity and fossil fuels and associated emissions of CO<sub>2</sub> from water management per hectare of irrigated land.*



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This refers to specific energy consumption and CO<sub>2</sub> emissions per hectare of irrigated land. Thus, results of efficient water supply of drinking water and of PV powered water supply would not be included.

Project objective indicator refers to an extent of change in energy efficiency, which would be measured in %, and in the same time to *energy consumption and associated CO<sub>2</sub> emissions per hectare of irrigated land*.

Its baseline is defined as:

*9 million GJ/year and approximately 6.9 MtCO<sub>2</sub>/year from water management, including non-agricultural uses.*

Baseline refers to absolute annual volumes, i.e. not to specific values per hectare, but to a total. According to own calculations, baseline values seem to be disproportionately low compared to targets, should they really mean total annual values from water management, including non-agricultural use.

End-of project target is specified as:

*Direct energy savings of 3.4 million GJ and reduction of GHG emissions by 448,000 tonnes, not including indirect post-project reductions.*

A thorough analysis of Annex 6 of the Project Document, Analysis of Reductions in GHG Emissions, and of the Table A.6.1 Summary of Projected GHG Emissions Reductions from Planned Activities, enabled to reconstruct what exactly the target of 448,000 tons of GHG emission reductions and savings of 3.4 million GJ refer to.

Energy savings of 3.4 mil GJ and emission reductions of 448,000 tCO<sub>2</sub> as per ProDoc are total lifetime GHG emission reductions from all but one type of demonstration and replication projects that were planned to materialize during the project implementation period. Energy and GHG emission savings from planned canal lining projects are not included.

ProDoc calculated also additional energy savings and GHG emission reductions from projects to be replicated after the project implementation period. These indirect post-project, or consequential savings and emission reductions are not correctly included in the LogFrame targets.

There is a significant difference in quality/accuracy of estimating GHG emission reductions and energy savings between demonstration projects and replication projects implemented during the project implementation period without any direct support from the project.

While demonstration projects are directly financed from the GEF project budget and are subject to specific monitoring by the project team, information on replication projects financed by third parties (government) without any specific direct support from the project is limited and thus estimation of their results has to be based on wider range of assumptions and their accuracy is thus limited.

This suggests that savings from demonstration projects should have been reported separately from savings from replication projects. The project followed the terminology used in the project

document and refers to both, savings from demonstration projects and savings from replications, as “direct” savings.

The project objective indicator should not have been expressed in specific emission reductions per hectare of irrigated land, since first, the target is expressed in absolute values over a lifetime of technology used; and second, GHG reductions include also emission reductions from projects that are not related to irrigated land (such as supply of drinking water, and PV driven water pumping and purification).

There are six indicators for project objectives defined in the ProDoc. Out of these six indicators, for one indicator specification of baseline and target was omitted in the ProDoc, two indicators and their baselines and targets were not properly defined (see the example above), one indicator has partially irrelevant wording of a baseline and to some extent of a target as well, but the “proper” target can be extracted. Only two out of six project objective indicators, including their baselines and targets, are properly defined and are SMART.

Some related targets as defined in the ProDoc do not correspond to each other. For example, indicator “Number of communities served by renewable energy water supply in remote locations” has two targets: 6 RE installations and 20 remote communities. It is not clear how one small RE installation could serve more than one remote community. This target has been revised after the MTR and the new wording reads: “1,100 people directly benefiting from measures on renewable-energy water supply in remote locations “.

In total, the ProDoc specified 20 indicators and 21 targets (some of indicators include multiple targets). They were structured separately for project objective and for each of four project components. However, project indicators are not explicitly aligned to specific project outcomes nor outputs. As per logic of the project, indicators can be aligned to specific outputs.

Despite the inconsistency and unclear specification of some logFrame indicators, baselines and targets, the project team did its best to fairly interpret the targets and reported project achievements against these targets. Some of the logFrame targets were subject to revision and clarification of wording after the Inception Report and after the MTR. Additional suggestions of the CTA to revise and clarify some of the indicators, baselines and targets, as well as suggestions not to implement some revisions recommended by the MTR, could not have been formally adopted.

The matrix for measuring achievements of project objective (to provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan) includes indicators for energy and water savings, GHG emission reduction, area of land reclaimed from salinization, number of regulatory documents adopted, resources mobilized for replication, and number of people benefiting from the project, and address also broader socio-economic benefits. Indicators were not sex-disaggregated. Improved efficiency in water irrigation has also impact on increase of agriculture productivity, and thus also on income of farmers. This was not included among ProDoc indicators. However, the project has monitored and reported increase in crop yield from the demonstration project at the Geokdepe Green Polygon.

#### 4.1.2 Assumptions and Risks

The ProDoc specified six risks in four categories (Political and Financial, Institutional and Economic, Technical and Environmental).

Identified risks include:

1. Political will regarding national policies and state budget investment - Government commits funds to water conservation and energy conservation at a level insufficient to achieve significant scaled-up effects.
2. Cooperation of farmers and other stakeholders - Farmers and other stakeholders resist change, complicating efforts of project to introduce new technology, practices, and norms for low-water irrigation.
3. Local technical or environmental conditions affecting demonstration projects - Demonstration projects need to be significantly changed because of unforeseen local technical or environmental conditions.
4. Replication and availability of materials and products - Replication of demonstration project technology and practices lags because of insufficient availability of materials and products.
5. Reduction in end-use water consumption and increased pump performance does not automatically lead to energy savings and avoided emissions.
6. Climate change risks - Climate change – specifically, increased average temperatures and reduced precipitation – exacerbates problems of water scarcity and land degradation, muting the benefits of the project.

For each risk its probability and impact have been evaluated, and countermeasures specified, as well as responsible party.

Relevant project risks and mitigation countermeasures were properly specified, as well as their probability and impact were adequately rated - with one exception, see below. All ratings of risk probability and impact have been rated between 1 to 3 on a 5-point scale (least to most). Risks with highest rated probability and impact of 3 included risks #1 and 5.

The project planned for a large-scale replication to be funded by the government already during the project implementation period. The large-scale replication with a replication factor of 36 means that most of expected project objective results depend on governmental investment in replications. Thus, the evaluators would suggest rating of the impact of risk #1 that includes insufficient governmental commitment to fund replication projects to be higher than the average rating of 3 as per ProDoc. The level of governmental spending is out of direct control of the project. Countermeasures specified in the ProDoc for this risk included ad hoc adaptive management. This included “targeted analysis for specific technologies; changes in focus to address matters of highest priority to Government, while still being consistent with project

objectives; and intensified communication and outreach”. There was no detailed alternative strategy outlined in the ProDoc how to reach project objectives in case the planned governmental funding would not materialize.

Otherwise, assumptions and risks are well-articulated and logical, and they account also for external factors (lack of materials – Risk 3, and climate change – Risk 5).

Assumptions are properly defined in the project results framework for project objective and for each of four project components.

Due to lack of evidence, it is not possible to evaluate if assumptions and risks were used for specification of project outputs and activities, or vice versa.

#### **4.1.3 Lessons from Other Relevant Projects**

It is evident from the project design that best international experience has been applied when developing the project document. UNDP also directly benefitted from experience and lessons learned gained during implementation of an earlier project focused on strengthening efficient water management practices (UNDP/Adaptation Fund: Addressing Climate Change Risks to Farming Systems in Turkmenistan). This includes specifically three lessons learned from this project: legislation development is a multi-year process, and dependent upon national timetables and processes; water management approaches have to be carefully adapted to the local context; and international best practice is important for agricultural systems and well worth to get due consideration at the project design stage.

UNDP has a long history of implementing projects with the Government of Turkmenistan, and relevant experience gained and lessons learned have been utilized during the project design, such as aligning project idea with top governmental priorities.

#### **4.1.4 Planned Stakeholder Participation**

The project planned to involve all main relevant stakeholders. Due to a strong role of the state in this sector in Turkmenistan, most of the stakeholders include governmental ministries and their agencies.

All project stakeholders identified in the Project Document and their assumed role in the Project are summarized in Table 7.

**Table 7: Stakeholders Involvement Plan**

<b>Stakeholder</b>	<b>Planned role and key responsibilities</b>
Ministry of Water Economy <sup>6</sup>	National Implementing Partner. Member and Chair of the Project Board. Overall project oversight and coordination with national initiatives. Jointly with UNDP project team leads design and execution of all project components.
Ministry of Agriculture	Member of the Project Board. Participates in design and delivery of all project activities at the farm level, including training for farmers, and in development of national, regional, and local action plans on sustainable land management. Coordinates activities with local farmers' associations.
Ministry of Economy and Development	Member of the Project Board. Participates in design and delivery of all project activities. Support especially in infrastructure projects and in scaling up of investment.
Ministry of Energy and Industry	Member of the Project Board. Jointly with UNDP leads monitoring and assessment of energy savings. Participates in development of pump specifications. With UNDP identifies and supports opportunities for scaling up energy-saving technologies.
Ministry of Communal Services	Member of the Project Board. Jointly with MWE and UNDP oversees design and implementation of municipal water supply projects (Kaakhka demonstration and replication).
Ministry of Nature Protection	Member of the Project Board. Support of design and assessment of all project activities with regard to climate change mitigation and sustainable land management. Participation in drafting and review of regulations and policies. Support in development of regional action plans for both water management and sustainable land management.
Ministry of Education	Potential member of the Project Board. Approval of new curricula on water management and sustainable land management.
State Concern “Turkmengaz”	Planned to be invited to membership in the Project Board. Technical and logistical support in design and implementation of photovoltaic water supply demonstration project for desert pasture and replication.
State Institute of Water Management Design “Turkmensuwylmytaslama”	Planned to be invited to membership in Project Board. Co-design and implementation of demonstration projects on low-water irrigation, municipal water supply in Kaakhka, and canal linings.
Local farmers' associations in all five velayats	Training and feedback on design of action plans and demonstration projects related to agriculture, irrigation, drainage, and sustainable land management.
Turkmen Agricultural University	Participation in development and delivery of new curricula on low-water irrigation and drainage.
Dashoguz Agricultural Institute	Participation in a development and delivery of new curricula on low-water irrigation and drainage.

<sup>6</sup> The Ministry of Water Economy was transformed into the State Committee for Water Management of Turkmenistan (SCWM).

<b>Stakeholder</b>	<b>Planned role and key responsibilities</b>
Institute of Energy	Participation in a development and delivery of new curricula on low-water irrigation and drainage, and renewable energy systems.
Institute of Livestock Management	Participation in design, implementation, and evaluation of the demonstration project on solar-powered water supply for desert pasture.
Union of Industrialists and Entrepreneurs	To be invited to participate in the design, implementation, and especially dissemination of demonstration projects on low-water irrigation, municipal water supply, canal linings, modern pumps, and solar-energy installations for water supply and purification.
NGO “Tebigy Kuwwat”	Technical specification of the proposed demonstration project on solar-powered water supply for desert pasture.

Main project partners were consulted and involved in the project development phase to comment on the project draft and clarify their potential role in the project.

#### 4.1.5 Linkages between the Project and Other Interventions within the Sector

Since 2000, the Government of Turkmenistan has invested significant amount of funds to a construction of nation-wide drainage canals and a central reservoir of drainage waters, the Golden Age Lake. In 2008, the 385 km drainage canal from Dashoguz velayat has been completed and waters began to accumulate in the lake. Water from the lake is planned to be used for irrigation after partial desalinization. Total costs have been estimated at 4.5 to 6 billion USD.

Turkmenistan has been also investing heavily into the development of new Ashgabat, including new parks and newly planted trees within the capital, as well as in planting millions of trees around Ashgabat and countrywide. Efficient water irrigation, mostly locally produced drip irrigation, has been utilized for watering newly planted trees. Thus, although there has been already some domestic experience with efficient irrigation technologies developed, their application (and evaluation of performance, including savings) in agriculture was rather limited.

There remains a need to develop new administrative processes, detailed technical and financial justifications, and regulatory frameworks for efficient water supply and irrigation and SLM.

The project was designed to focus on integrated approach to energy and water efficiency in water supply and irrigation, as well as in SLM.

The National program Fundamental Directions of Economic, Political, and Cultural Development of Turkmenistan in the Period up to 2020 calls for MWE (SCWM) to implement major programs for sustainable land use in agriculture, as well as rational use of water.

National Program for the Social Development of Rural Areas addresses the improvement of fertility of cultivated land and modernization of equipment and technology for agricultural irrigation.

SCWM was operating three own factories for production of construction materials and pipes.

The co-financing letter of the MWE states that the Government of Turkmenistan planned to invest more than \$403 million to upgrading and maintaining the efficiency of water management and large-scale irrigation systems in Turkmenistan for the period 2015-2020, of which \$72 million were planned specifically to cover investment and other support for replication of technical and practical solutions developed by the project, at the intersection of water management, energy efficiency, and SLM.

Other baseline activities included:

UNDP/Adaptation Fund: Addressing Climate Change Risks to Farming Systems in Turkmenistan (2.9 mil USD, 2012-2016) focuses on strengthening water management practices at the community level and developing integrated water management policies at the national level.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ): Transboundary Water Management in Central Asia, training for water management staff in all five Central Asian countries on river basin planning and management. It also facilitates dialogue among officials in the countries, as well as exchange of best practices.

EU, UNECE/OECD: European Union Water Initiative in Eastern Europe, the Caucasus and Central Asia (EUWI EECCA) – national policy dialogs on IWRM, Turkmenistan joined in 2011.

UNEP/GEF: Global Technology Needs Assessment includes a detailed market and barrier analysis for prioritized climate change mitigation technologies in the water sector.

U.S. Agency for International Development (USAID) runs various initiatives in Turkmenistan pertaining to water management, especially with regard to training and technology transfer.

The Project Document outlined briefly linkages and coordination with complementary interventions.

#### **4.1.6 Gender Responsiveness of Project Design**

The project design did not include any specific gender analysis, but it briefly addressed gender equality and women’s empowerment in the Social and Environmental Screening Template.

According to Food and Agriculture Organization (FAO), women in Turkmenistan, especially in rural areas, manage households and raise children, and perform economic functions as well. The main areas of employment for rural women are farmer associations, farms and the informal sector. In 2014, agriculture employed 735 000 people, of which 53.5% were women. Women accounted for 64 percent of home farm workers and almost 71 percent of household workers. Widespread home farming and leasing of agricultural land result in the use of women and children as unpaid labor<sup>7</sup>.

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<sup>7</sup> Source: Food and Agriculture Organization of the United Nations, [https://www.fao.org/gender-landrights-database/country-profiles/countries-list/general-introduction/en/?country\\_iso3=TKM](https://www.fao.org/gender-landrights-database/country-profiles/countries-list/general-introduction/en/?country_iso3=TKM), November 25, 2021

Women thus represent a significant, and in some aspects also larger group of project beneficiaries than men.

The Social and Environmental Screening (SES) Template described likelihood to improve gender equality and women’s empowerment: “thousands of women” will directly benefit from the project as agricultural workers and municipal water supply consumers, increased crop yields will lead to increase of income of women and men in agriculture, food needs will be more easily met.

SES Template also specified that the project will actively seek to engage women in all of its efforts regarding stakeholder engagement and educational outreach. Share of women in the trainings and educational outreach was not systematically monitored and reported, with some exceptions.

#### 4.1.7 Social and Environmental Safeguards

Social and Environmental Screening (SES) Template of the ProDoc indicated that the project is relevant to biodiversity conservation and natural resources management and climate change mitigation and adaptation, and not relevant to other SES requirements, including gender equality and women’s empowerment. However, the project is directly relevant also to pollution prevention and resource efficiency, although the SES Template does not suggest that.

Four potential social and environmental risks have been identified, including:

Risk 1.8: Significant extraction, diversion or containment of surface or ground water,

Risk 1.11: Project results in secondary or consequential development activities which could adverse social and environmental effects,

Risk 2.2: Project outcomes sensitive or vulnerable to climate change impacts, and

Risk 3.3: Large-scale infrastructure development

The risk 3.3 was not further elaborated, since the project was designed to “improvements of existing infrastructure” and not to development of new infrastructure. In one case newly developed water supply pipeline is to be constructed to replace water supply through an existing open canal. And the environmental improvements have been expected to be “strongly positive”. New infrastructure development includes also new irrigation technologies. But the environmental benefits are also expected to be positive in this case, thus Risk 3.3 did not have to be elaborated. All relevant risks were thus properly identified and elaborated.

Adequate management measures were developed for two risks, first risk combined risk 1.8 and 1.11, and for the risk 2.2, including their impact and probability assessment (I=3, P=3, and I=4, P=2).

The project was designed to improve efficiency of water supply and irrigation. Thus, assessment of the risk 1.8 seems to be redundant, since the project does not lead to new, additional water extraction, but to more efficient distribution and use of water. The amount of extracted water to cover the same needs is thus expected to decrease. Similarly, this applies also to the risk 2.2. - impact of climate change will be reduced compared to baseline scenario.



Thus, the most relevant is risk 1.11, especially in case of municipal water supply, since improved water supply in terms of quantity and uninterrupted availability might lead to increased demand as well as to extension of municipal water supply network. However, it was not expected that the intake of water would increase, but that the maximum amount of available water as in the baseline could potentially serve also new customers and thus improve their quality of life.

Specification of risks and their impact and probability rating were perhaps slightly overestimated. However, this brings the social and environmental screening on more safe side.

#### 4.1.8 Replication Approach

The project was designed to develop effective framework for country-wide replication of experience gained from implementation of demonstration projects and to scale-up investment in efficient water supply and irrigation and SLM. The planned replication consisted of two phases: replication during the project implementation period, and post-project replication that would fully benefit from all project deliverables, including new regulatory framework etc.

The replication factor planned for the project implementation period was 36 in terms of lifetime energy and GHG emission savings (savings from replicated projects compared to demonstration projects).

The highest replication factor of 60 was planned for the Output 1.1 - efficient water irrigation and Sustainable Land Management in agriculture, the most important output in terms of energy and GHG emission savings. This output was planned to account for 80% of total lifetime project energy and GHG emission savings.

Expected post-project replication factor is 2 (in terms of lifetime energy and GHG emission savings). According to GEF methodology, post-project period includes 10 years after project termination.

The expected replication during the project implementation period is unusually high.

Before the end of the project implementation period, by definition, not all project deliverables could have been in place, including the policy and regulatory framework for IWRM expected to foster scaling up investment in efficient water supply and irrigation and SLM. The project replication factor of 36 (during the project implementation period) is 18-times higher than the expected post-project replication factor of 2. Only the post-project replication and scaling-up of investment in efficient water supply and irrigation and Sustainable Land Management could fully benefit from newly developed project deliverables, namely the new policy and regulatory framework for IWRM. In addition to that, post-project replication would have about three times longer period for implementation of project replications (10 years vs. 3 years of remaining project implementation period after implementation of demonstration projects, demonstration project were planned for year 2 and 3 of a six-year project).

Replication strategy (for post-project replication) has been logically structured and designed. Actually, the whole project has been developed to support replication (implementation of demonstration projects, dissemination of experience gained from implemented demonstration

projects, and development of new regulatory framework and program for scaling-up state investment).

The Project Document does not specify any strategy for replication within project implementation period.

The project design relies on state investment into replication of efficient water supply and irrigation and SLM projects. The state is the only owner of inter-district and main water infrastructure. Investment in efficient water irrigation and SLM at privately cultivated land is supposed to be supported by the project deliverables, namely water and energy efficiency standards and regulations.

The project has been designed to provide technical, knowledge, and normative support for long-term project sustainability and replication. The PIF included also a financial support mechanism (revolving fund, and financial incentives) for investment in efficient water irrigation and renewable powered water supply. Potential financial support scheme for private farmers was considered, however it was excluded from the ProDoc design, since “water remains essentially free of charge for agricultural end-users, and investors could not recoup the investment costs”. Thus, governmental financing of demonstration project replications and scaling-up was considered as a priority, and the project aimed to support the Government in state budget allocations for efficient water supply and irrigation, including SLM.

## **4.2 Project Implementation**

### **4.2.1 Adaptive Management**

The project was implemented in accordance with the project strategy which was described in the Project Document and did not require any significant revisions or updates.

The project did implement several changes on activity and output levels as per recommendations of the Inception Report (revision of the logFrame), and especially at mid-term according to recommendations of the MTR.

Both, the Inception Report and MTR recommended, and the project implemented revision of the logFrame, including revised wording of the project objective targets. Changes in project objective targets require additional approval of the GEF Secretariat. However, revised project objective targets included formal revisions/clarification of the wording of targets, it did not include changes in the substance of these targets, and the approval of the GEF Secretariat was not requested.

The project implemented most of MTR recommendations. Due to delays at mid-term, most of MTR recommendations were focused on accelerating project delivery as well as on ensuring good quality of project results, including for example strengthened staffing and hiring international CTA. MTR also recommended to extend the project for 18 months. No revision of project strategy was recommended.

One of major MTR recommendations suggested not to install two production lines and start producing canal lining materials within project implementation period, but instead to develop technical and economic specifications for the production lines only. Based on the subsequent advice by the CTA hired after MTR, and also driven by the request of the SCWM, the project did not develop only technical specification of canal lining production line, but also stuck to the original target of installation of these production lines.

The CTA revised the logFrame and recommended some further changes in order to improve the clarity, and also identified some errors in calculating emission reduction target in the ProDoc. However, these post-MTR changes could not have been incorporated anymore, because the recommended changes in the logFrame were approved by the Project Board already.

The project implemented sufficient adaptive management. However, in some cases the adopted changes (logFrame revisions) were not sufficiently elaborated and did not lead to fully SMART indicators.

#### 4.2.2 Actual Stakeholder Participation and Partnership Arrangements

The project cooperated with main project stakeholders as identified in the ProDoc as well as with a number of other relevant stakeholders. Project stakeholders included:

- State Committee of Water Economy of Turkmenistan (former Ministry of Water Economy);
- Ministry of Finance and Economy of Turkmenistan;
- Institute “Turkmensuvlymtaslama” of SCWM;
- Ministry of Education of Turkmenistan;
- State Energy Institute in Mary;
- State Agricultural University in Ashgabat;
- State Agriculture Institute in Dashoguz;
- National Institute of Agriculture;
- Institute of Chemistry;
- Geokdepe, Kaahka, Akbugday district (etrap) administrations;
- State Enterprise Turkmenenergo of the Ministry of Energy of Turkmenistan;
- Union of Entrepreneurs and Industrialists of Turkmenistan;
- Ministry of Agriculture and Nature Protection of Turkmenistan, member of the Project Board;
- Ministry of Economy and Development, member of the Project Board;
- Ministry of Energy of Turkmenistan, member of the Project Board;
- Ministry of Foreign Affairs of Turkmenistan;
- and others.

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#### 4.2.3 Project Finance and Co-Finance

The GEF budget of 6.185 mil USD as of the Project Document is shown in Table 8.

**Table 8: Project Budget as per Project Document [USD]**

	1	2	3	4	5	6	Total	% of Total
Component 1	159 390	1 372 590	239 290	158 490	119 290	136 790	2 185 840	35%
Component 2	131 860	1 248 860	1 052 360	101 260	96 860	77 560	2 708 760	44%
Component 3	63 195	92 995	132 695	72 995	58 995	87 495	508 370	8%
Component 4	60 695	85 795	92 295	82 295	82 295	89 095	492 470	8%
Project Management	52 260	47 460	47 460	47 460	47 460	47 460	289 560	5%
<b>Total GEF</b>	<b>467 400</b>	<b>2 847 700</b>	<b>1 564 100</b>	<b>462 500</b>	<b>404 900</b>	<b>438 400</b>	<b>6 185 000</b>	100%
% of Total	8%	46%	25%	7%	7%	7%	100%	

Actual project expenditures as per Combined Delivery Reports as of November 25, 2021 are shown in Table 9.

**Table 9: Annual Project Expenditures (CDR) [USD] as of November 25, 2021**

	2015	2016	2017	2018	2019	2020	25.11.2021	Total
Component 1	57 961,04	427 144,20	720 132,02	657 211,41	264 303,15	110 251,46	36 597,14	2 273 600,42
Component 2	58 518,04	91 748,69	719 302,13	788 370,21	686 835,80	116 615,44	237 644,84	2 699 035,15
Component 3	50 804,55	43 223,38	188 900,42	112 179,43	52 528,97	37 703,69	16 979,52	502 319,96
Component 4	2 757,98	10 477,13	117 081,35	94 294,53	47 411,68	44 269,84	14 701,09	330 993,60
Project Mngmnt	26 199,36	78 463,24	140 807,39	36 230,35	36 540,11	20 074,13	19 977,04	358 291,62
of which GEF	26 199,36	49 555,97	101 860,06	36 200,54	20 483,11	14 074,13	11 977,04	260 350,21
of which UNDP	0	28 907,27	38 947,33	29,81	16 057,00	6 000,00	8 000,00	97 941,41
Other GEF	0	- 1 066,28	5 133,13	- 2 974,26	728,40	728,39	607,00	3 156,38
<b>Total GEF</b>	<b>196 240,97</b>	<b>621 083,09</b>	<b>1 852 409,11</b>	<b>1 685 281,86</b>	<b>1 072 291,11</b>	<b>323 642,95</b>	<b>318 506,63</b>	<b>6 069 455,72</b>
Total GEF+UNDP	196 240,97	649 990,36	1 891 356,44	1 685 311,67	1 088 348,11	329 642,95	326 506,63	6 167 397,13
% of GEF budget	3%	10%	30%	27%	17%	5%	5%	98%

**Table 10: Total Project Expenditures (CDR) [USD] as of November 25, 2021**

	Total	% of GEF total	% of GEF budget
Component 1	2 273 600,42	37%	104%
Component 2	2 699 035,15	44%	100%
Component 3	502 319,96	8%	99%
Component 4	330 993,60	5%	67%
Project Mngmnt	358 291,62		
of which GEF	260 350,21	4%	90%
of which UNDP	97 941,41		
Other GEF	3 156,38		
<b>Total GEF</b>	<b>6 069 455,72</b>	<b>100%</b>	<b>98%</b>

Table 10 shows total project expenditures per project component, percentage of GEF total expenditures, and a percentage of each component expenditure per the total GEF budget of 6.185 mil USD.

Annual project expenditures illustrate the delay the project faced in early years of project implementation period. As of November 25, 2021, after project extension, the GEF project expenditures represent 6.069 mil USD, i.e. 98% of the total GEF budget of 6.185 mil USD have been spent.

There were no budget revisions nor changes in fund allocations among project components. Very good correlation between actual expenditures and budgets per components (especially for Components 1 through 3) illustrate that adequate financial controls were established.

Reported GEF project management expenditures represent 4% of the GEF budget.

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Note that project management costs are excluding of project team staff costs that have been assigned to budgets of individual components in the ProDoc (except for 20% of costs of the Project Manager that are assigned to the project management budget line), and project MTR and TE costs are included in Output 3.3 budget line. Non-inclusion of project evaluation costs into project management budget line is not a common practice, and it reduces transparency of the budget.

UNDP budgeted contribution of 0.1 mil USD has been used for financing of project management costs. As of November 25, 2021, total of 97,941 USD, i.e. 97.9% of the UNDP budget has been spent.

The project budgeted 3.3 mil USD for demonstration projects (equipment), of which 1.275 mil USD in component 1 and 2.025 mil USD in component 2.

Actual costs of expenditures for demonstration projects were 3.569 mil USD, of which equipment 2.3 mil USD.

The project was not subject to financial audits. The project has been implemented by UNDP as a Country Office full support to NIM and as such it is exempt from the HACT/NIM audits.

#### 4.2.4 Co-Financing



**Table 11: Co-Financing as of November 25, 2021**

Co-financing (Type/Source)	UNDP Financing (mill US\$)		Government (mill US\$)		Private (mill US\$)		Total (mill US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	0.1	0.098					0.1	0.098
Loans/Concessions								
In-kind support								
Other			72	64.935		6.293	72	71.228
<b>Total</b>	<b>0.1</b>	<b>0.098</b>	<b>72</b>	<b>64.935</b>		<b>6.293</b>	<b>72.1</b>	<b>71.326</b>

**Table 12: Confirmed Sources of Co-Financing at TE as of November 25, 2021**

Sources of Co-Financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount (US\$)
GEF Agency	UNDP	Grant	Investment mobilized	97,941
Recipient Country Gov't	SCWM	Public Investment	Investment mobilized	64,934,870
Private Sector/ Beneficiaries	Farmers	Equity Investment	Investment mobilized	6,293,405
Total Co-Financing				71,326,216

Note: Actual co-financing provided as of November 25, 2021

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The ProDoc planned co-financing in the form of the (cash) governmental investment in replication projects in the amount of 72 mil USD. Actual documented co-financing combines cash investment from the Government in the amount of 64.9 mil USD and 6.3 mil USD from private investors in replication projects. Total actual co-financing (except for UNDP) is 71.2 mil USD, i.e. 99% of the planned co-financing.

#### 4.2.5 Monitoring and Evaluation

The Project Document described in sufficient detail required monitoring and evaluation procedures at the project start, quarterly and annual monitoring reporting requirements, periodic monitoring through site visits, mid-term and terminal evaluation, as well as learning and knowledge sharing, and communication and visibility requirements.

Project’s monitoring and evaluation plan specified responsible party, time frame and budget for each M&E activity, including technical evaluation of demonstration projects and Project Board meetings. Project Board meetings were held once or twice a year.

The M&E budget planned sufficient funds for performing all necessary monitoring and evaluation activities. Total M&E budget was 253,200 USD. Project evaluation costs have been budgeted as part of the Output 3.3, i.e. only part of the M&E budget is included in the Project Management budget line.

The Project Results Framework/logFrame that is subject to periodic M&E activities does not have well-defined SMART indicators, including baselines, and targets as discussed in Chapter 4.1.1.

The M&E plan did not address specifically the role of the GEF Operational Focal Point.

Methodology on data calculations for achievements reporting and target evaluation were developed during the course of project implementation. The methodology used in the Project Document for calculation of water, energy, and GHG emissions savings targets was not sufficiently specific. After the methodology has been developed, specific achievements were regularly reported against targets. In several cases baselines had to be revised based on the revised and updated methodology, and/or mistakes in baseline calculation corrected.

Project Implementation Reviews were prepared regularly. Reporting period of the PIR covers the period between the middle of the previous calendar year till the middle of current year. However, development progress was typically reported as of June 30 of the previous year (Level at June 30), and up-to-date progress for current year was reported as a “Cumulative progress since project start”.

Latest PIRs include extensive description of activities performed in the “Level at June 30” column. It would be appropriate to report in this column actual achievement against the target, and to provide details and evidence in the next column of “Cumulative progress” only, or in a separate section/file. Extensive detailed reporting was implemented in response to the MTR recommendation.

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Monitoring of project results were developed with support of the project staff and presented regularly to main project stakeholders at Project Board meetings.

Monitoring of project results was primarily based on technical analysis, monitoring methodology developed and on calculations. Monitoring thus required primarily technical expertise, rather than inclusive and participatory monitoring systems.

Monitoring was primarily used for reporting. Adaptation of technical project performance was not needed. Several project activities (namely regulations) were adjusted according to actual needs and demand of the government.

Monitoring included training of staff including students in data collection at the Geokdepe Green Polygon. However, there is no financing guaranteed for post-project data collection and monitoring.

Gender aspects and specific impacts on various social groups were not assessed in the project monitoring.

Environmental and social risks identified in the SES were considered during project monitoring to the extent feasible for the project implementation (such as extension of water supply in Kaakha municipality to additional communities).

The project document did not specify Theory of Change, and thus it was not refined during implementation period.

PIR self-evaluation rating was consistent with both MTR and TE rating, both MTR and TE include also some additional findings not covered by the PIRs.

Based on the MTR recommendations, the project has implemented adaptive management and adjusted several activities accordingly. See discussion in Chapter 4.2.1 Adaptive Management. The project was not advised and did not need to change the project strategy.

The Project Board was regularly informed on project progress. Project Board was not actively involved in monitoring activities.

**Table 13: Rating of Monitoring and Evaluation**

Monitoring & Evaluation (M&E)	Rating
M&E design at entry	MU – Moderately Unsatisfactory
M&E Plan Implementation	S – Satisfactory
Overall Quality of M&E	S – Satisfactory

**Table 14: Monitoring and Evaluation Rating Scale**

Rating	Description:

6 = Highly Satisfactory (HS)	There were no shortcomings; quality of M&E design/implementation exceeded expectations
5 = Satisfactory (S)	There were minor shortcomings; quality of M&E design/implementation met expectations
4 = Moderately Satisfactory (MS)	There were moderate shortcomings; quality of M&E design/implementation more or less met expectations
3 = Moderately Unsatisfactory (MU)	There were significant shortcomings; quality of M&E design/implementation was somewhat lower than expected
2 = Unsatisfactory (U)	There were major shortcomings; quality of M&E design/implementation was substantially lower than expected
1 = Highly Unsatisfactory (HU)	There were severe shortcomings in M&E design/implementation
Unable to Assess (U/A)	The available information does not allow an assessment of the quality of M&E design/implementation.

#### 4.2.6 UNDP Implementation and Execution of Implementing Partner

UNDP Country Office in Turkmenistan provided full support to the project implementation under the National Implementation Modality, its regular support and oversight was critical for project implementation.

The project development phase lasted 2+ years. The Project Identification Form (PIF) was signed on August 13, 2013, the Project Document on July 17, 2015.

Actual project implementation started immediately after ProDoc signature. A Project Manager was recruited in July 2015, two project specialists in November 2015.

Project inception phase lasted for five months (August – December 2015) after ProDoc signature. Final Inception Report was issued in March 2016 after the first meeting of the Project Board held on February 26, 2016.

Mid-Term Review was performed in July – October 2018, three years after ProDoc signature, i.e. in the middle of planned six-years project implementation period.

There were three Project Managers serving under this project. The first PM served between July 2015 and August 2016 when he left for another position. After seven months, second Project Manager was hired in March 2017. In the meantime, UNDP Programme Specialist for Environment and Energy took over responsibilities of the PM. The second PM served in his position until November 2020 when he resigned for another career at UNDP. After three months a third PM was hired in February 2021.

The first Chief Technical Advisor was hired in August 2016, and his contract was terminated after five months in December 2016. Next CTA was hired as per recommendation of the MTR

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in March 2019, i.e. after 2+ years and he served in this position for two and half years until September 2020.

The project faced some delays in launching demonstration projects, and later also due to external factors (COVID-19 related restrictions), and thus it was extended as per MTR recommendations for 9 months until April 16, 2022.

There was zero delay in actual start of project implementation and recruitment of the Project Manager. This could serve as an example of good practice for other UNDP/GEF projects.

The quality and timeliness of UNDP support, candor and realism in annual reporting, responsiveness to most implementation problems and quality of risk management was fully adequate. The project would have probably benefitted from an earlier appointment of the second Chief Technical Advisor whose experience and drive significantly supported project implementation.

The project was implemented on a daily basis by the project team lead by the Project Manager appointed by UNDP, which implemented also regular oversight. The role of SCWM as a national executing partner whose representative served also as a national project coordinator and chair of the Project Board was focused more on strategic issues, and on project deliverables directly involving agenda of SCWM. As with all other institutions it depends on personality of the person representing the institution. SCWM role was actively executed especially after Mr. Baygeldi Bayjanov was appointed to his position of National Project Coordinator as a Director of Water Use Department of State Committee of Water Economy of Turkmenistan.

**Table 15: Assessment of Project Implementation/Oversight and Execution**

UNDP Implementation/Oversight & Implementing Partner Execution	Rating
Quality of UNDP Implementation/Oversight	S - Satisfactory
Quality of Implementing Partner Execution	S - Satisfactory
Overall quality of Implementation/Oversight and Execution	S - Satisfactory

**Table 16: Implementation/Oversight and Execution Ratings Scale**

Rating	Description:
6 = Highly Satisfactory (HS)	There were no short comings; quality of implementation/execution exceeded expectations
5 = Satisfactory (S)	There were minor shortcomings; quality of implementation/execution met expectations
4 = Moderately Satisfactory (MS)	There were moderate shortcomings; quality of implementation/execution more or less met expectations

3 = Moderately Unsatisfactory (MU)	There were significant shortcomings; quality of implementation/execution was somewhat lower than expected
2 = Unsatisfactory (U)	There were major shortcomings; quality of implementation/execution was substantially lower than expected
1 = Highly Unsatisfactory (HU)	There were severe shortcomings in quality of implementation/execution
Unable to Assess (U/A)	The available information does not allow an assessment of the quality of M&E design/implementation

**4.2.7 Risk Management**

The Inception Report revised risk log matrix as described in the ProDoc and increased probability of the Risk 4: “Replication of demonstration project technology and practices lags because of insufficient availability of materials and products” from 1 to 2, as well as description of risks and assumptions in the LogFrame have been updated.

The project identified one additional COVID-19 related risk (P=4, I=4) that might delay project implementation and requested no-cost extension. Except for this, no additional risks were identified. It should be noted, however, that MTR recommended no-cost extension already in 2018, before the COVID-19 pandemic broke out in early 2019.

As described earlier, project objectives have been designed to heavily depend on governmental investment in project replications already during the project implementation period, with the replication factor of 36 in terms of energy and GHG emission savings. Although the level of governmental spending is out of direct control of the project, there was no detailed alternative strategy outlined in the ProDoc nor during project implementation how to reach project objectives in case the planned governmental funding would not fully materialize.

Risk associated with potential underperformance in one of the demonstration project (production of canal lining materials) was not formally addressed, and rather the target has been revised according to the MTR recommendation, i.e. instead of installation of production lines, it included only development of technical specifications for canal lining materials (water proofed geomembrane and forms for concrete slabs). However, at the end the production line has been installed as originally planned.

No other significant risk has been identified that would have been omitted in project design nor in its implementation.

The Project Board was informed of the only new risk identified (potential delay due to the COVID-19 pandemic).

Social and environmental risks and measures remained unchanged during the project implementation period.

Gender equality and women’s empowerment was not addressed in the project design nor during project implementation.

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The Social and Environmental Screening Table prepared at the project development phase (2015) does not include question 6.

Measures identified in the SESAP, i.e. Environmental and Social Impact Assessment for the Kaakha municipality water supply project, have been implemented and training to communities has been delivered, as well as hydrological studies.

There has been no project’s grievance redress mechanism (GRM) utilized.

### **4.3 Project Results and Impact**

Although the project has defined targeted outcomes, indicators with baselines and targets were specified for four project components, not for project outcomes. Thus, the project achievements are evaluated against project objective and components targets as specified in a Project Results Framework, final revision after the MTR.

Note that targets and thus also achievements include combined results of both, direct project interventions (including demonstration projects), as well as results of replication funded by the government during the project implementation period.

#### **4.3.1 Progress Towards Objective and Expected Outcomes**

Project objective and outcome level results and rating are summarized in Table 17: Project Results and Achievements as per LogFrame Targets below.



**Table 17: Project Results and Achievements as per LogFrame Targets**

Indicator (units)	Baseline	Targets End of Project	Achievement	Rating	Justification
<b>Project Objective</b> Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan					
1. Reduction of yearly energy consumption per ha of irrigated land (J/ha/year)	9 million GJ/year	3.4 million GJ/year of direct energy savings <sup>8</sup>	976,409 GJ <sup>9</sup> life-time energy savings from demos and replication	<b>U</b>	Target achieved at 29%, of which: 146,773 GJ (15%) from demonstration projects and 829,636 GJ (85%) from replicated projects. Share in energy savings from demonstration projects: Efficient pumps: 61%, Kaahka gravity driven water pipeline: 34%, Green Polygon: 4%, PV: 1%. Estimated 96,506 GJ savings from post-project canal lining were excluded, although it was reported in PIR (total of 1,072,915 GJ life-time savings). <i>Note that the rating is against the target that includes unrealistically high replications.</i>
2. Reduction of GHG emissions (tonnes)	6,900,000 per year	448,000. The baseline is estimated in yearly values; however, the project reports in direct reductions of GHG emissions.	206,975 tCO <sub>2</sub> life-time CO <sub>2</sub> emission savings from demos and replication (PIR 223,542 tCO <sub>2</sub> ) 50%	<b>U</b>	Target achieved at 46%. (The target was overestimated by 80,000 tCO <sub>2</sub> , achievement to the revised target would be 56%.) Estimated emission reductions of 16,575 tCO <sub>2</sub> from post-project canal lining were excluded, although it was reported in PIR (total of 223,542 tCO <sub>2</sub> life-time emission reductions). <i>Note that the rating is against the target that includes unrealistically high replications.</i>
3. (Reduction) of normalised water consumption (m <sup>3</sup> /ha/year)	120,000	48,000. An estimation of the exact area of land under interventions needs to be finalized in 2016.	654,370 m <sup>3</sup> /y of water saved in the Green Polygon in 2020, or 7,204	<b>HS</b>	Enumerated baseline and target do not correspond with a realistic annual (reduction) of water consumption per hectare. The target savings are an equivalent of 40%, which was

<sup>8</sup> As per target calculation reconstructed by the evaluators from the ProDoc, the target refers to life-time energy savings from both, demonstration projects as well as from projects replicated during the project implementation period, not to an annual value.

<sup>9</sup> Life-time energy savings from both, demonstration projects as well as from projects replicated during the project implementation period.

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			m3/ha.y, it represents 56% water savings.		derived from the original target of 40-50% water reduction in low-water irrigation demonstration project as per ProDoc. Water savings reached 56%, the target has been exceeded. Water savings in 2018 were 40% and 38% in 2019 – including additional water used for leaching away deposited salt.
4. Area of land protected and/or reclaimed from salinization (# ha)	To be defined in the first year during agro-chemical investigation of the pilot polygon	145 ha of arable land directly improved as a result of project interventions and condition of up to 20,000 ha of land is improved by the end of the project period via indirect impact such as replication activities and from improved irrigation and prevention of water losses	Area of 145 ha, i.e. all arable area at the Green Polygon improved and protected from secondary salinization, additional 289 ha of neighboring land improved due to better operation and maintenance of water collectors (decreased level of groundwater).	<b>HS</b>	This indicator includes two targets:  The target for the Green Polygon has been reached, plus additional land has been improved.

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			State Water Project Design Institute developed design for construction of 463 km and refurbishment of 54 km of drainage-collectors that would lead to the land reclamation on the territory of 18,406 hectares of irrigated land.	<b>MS</b>	Replication has not materialized yet, but design has been developed for targeted area of land.
5. Regulatory documents directly related to efficient water use or energy consumption/ savings leading to GHG reductions are adopted at national and sub-national level and implementation started (#)	A detailed analysis of potential regulations, norms, and standards related to activities within the project is to be carried out. The list of potential regulations is to be consulted with the main partners for prioritisation.	6 (with at least 1 national and others - sub-national).	17 national regulations developed or final draft under development, of which three regulations adopted, and five drafts submitted.	<b>HS</b>	Target has been significantly exceeded. Adopted regulations: 1. Rules for the technical operation of irrigation systems - adopted 2. Rules for the technical operation of collector-drainage systems – draft submitted 3. Rules for technical operation of reclamation pumping stations – draft developed 4. Regulations on carrying out preventive maintenance of irrigation and drainage systems and hydraulic structures – draft developed 5. Methodological recommendations for the development of water use plans for farms - draft 6. Methodological recommendations for the development of water use plans for etraps and irrigation system basins – draft under development 7. Methodical recommendations for the organization of water accounting in irrigation systems – draft under development 8. Regulation (Charter) on Regional Water Management Organizations – draft under development

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				<p>9. Building Code 2.06.04-2020 “Reclamation systems and structures” – draft submitted</p> <p>10. Building Code 551-2020 “Instructions for the design and construction of anti-filtration lining from polyethylene (polymer) film for water reservoirs” – draft submitted</p> <p>11. Methodology for compiling water balances – draft under development</p> <p>12. Regulation on water protection zones and coastal water protection belts of water bodies - draft under development</p> <p>13. Updated version of the Annex to the Building Code of Turkmenistan "Melioration systems and structures" - "Operation of irrigation and drainage systems" - draft under development</p> <p>14. Development of a normative document "Irrigation norms of the main agricultural crops (except for orchards and vineyards) cultivated in Turkmenistan in relation to the soil-reclamation and climatic conditions of the country." – draft under development</p> <p>15. Development of a normative document "Irrigation norms of gardens and vineyards, in relation to soil-reclamation and climatic conditions of Turkmenistan." – draft under development</p> <p>16. Development of "Recommendations for the design of drip irrigation systems for agricultural crops in vineyards, orchards and forest plantations." - adopted</p> <p>17. "Recommendations for the design and operation of sprinkler irrigation systems for agricultural crops for the soil and climatic conditions of Turkmenistan." - adopted</p>
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6. Resources and co-funding mobilized by the Project from state and other sources on water and energy efficiency, as well as land reclamation techniques (US\$)	0	US\$ 72.1 M	48.9 mil USD newly mobilized.  Additional 22.2 mil USD co-funded but mobilized before the project start.  Total co-funding 71.1 mil USD	<b>S</b>	The target has been set to the amount of expected co-financing of 72.1 mil USD, including UNDP co-financing, however, it refers to “newly mobilized funding by the project”, and not to the whole “co-financing”. Part of the co-financing from the government reported in the PIR has been committed already before the project start. The target of (newly) mobilized funding has been achieved at 68% of the target, overall co-financing target has been met. (0.2 mil USD provided as direct co-financing for the project implementation is not considered as funding mobilized by the project as reported in the PIR nor achievement of this indicator, as well as 0,1 mil USD co-financing from UNDP.)
7. Number of people directly (and indirectly) benefiting from measures on better water management, efficient water use, energy saving and land degradation in Turkmenistan	0	35,000	36,000 people directly benefitting	<b>HS</b>	35 000 inhabitants of Kaahka municipality benefit from water supply pipeline. 1 200 people benefit from PV driven water pumping and purification in desert settlements. 10 farmers and their families benefit from the improved irrigation, land reclamation, and crop yield increase at the Green Polygon demonstration site. The target has been achieved.
<b>Project Component 1: Technology transfer and knowledge development in support of innovation in EE water management and SLM</b>					
8. Reduction of water used for specific soil types (m3/ha/year)	For medium and heavy loam soils norms are 6700 m3/ha for cotton; 4500 m3/ha for winter wheat; and 29000 m3/ha for rice	40% (at the project demonstration sites)	47%	<b>HS</b>	47% is a weighted average of: 40% in 2018 (from 14,559 to 8,793 m3/ha) 50% in 2019 (from 14,672 to 7,396 m3/ha) 56% in 2020 (from 12,813 to 5,609 m3/ha)

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9. Normalised energy consumption reduced (compared with average values for similar soil types)	0	30% (at the project demonstration sites)	60% weighted average at Green Polygon	<b>HS</b>	Savings of electricity for pumping reached 48% - 72% between 2018 and 2020 at the whole Green Polygon (including plots with traditional furrow irrigation).
10. Number of pump audits completed by project: total and (diesel pumps) (#)	0	100 total (25 diesel)	121 pump audits developed, of which 77 electric pumps, and 44 diesel pumps.	<b>HS</b>	The target has been achieved and exceeded in 2017.
11. Energy saving achieved by replacement and/or fixing of old pumps (%)	0	20%	18.2% - weighted average savings, of which 14.8% savings of electric pumps and 42.4% savings of diesel pumps.	<b>S</b>	The target of energy savings by pump replacement was achieved at 91%.
12. Area of land protected or reclaimed from salinization as a result of demonstration projects (# ha)	0	300	Total of 434 ha, of which: 145 ha – total arable land of the Green Polygon reclaimed from salinization, plus additional area of 289 ha due to improved drainage water collectors and decreased level of underground water	<b>HS</b>	Target achieved.

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13. Number of people directly benefiting from measures on renewable-energy water supply in remote locations	0	1100	1200	<b>HS</b>	Over 1200 people benefit from installation of PV driven water pumping and purification in remote areas.
<b>Project Component 2 - Scaling-up investment in improved water management infrastructure</b>					
14. Reduction in water loss between withdrawal and entrance point of the Kaakhka town Water Treatment facility (%).	50%	5%	3%	<b>HS</b>	The target has been achieved.
15. Direct energy savings due to decommissioning of up to 41 wells (MWh/year)	0	Up to 486 MWh of direct energy savings per year	435 MWh/year	<b>S</b>	The target has been achieved by 90%.
16. Number of similar projects initiated in other similar (or mountainous areas) districts of Akhal and Balkan velayats of Turkmenistan (#).	0	At least 1 similar project under implementation	Additional 49 km of pressure water pipelines installed, no gravity pipeline.	<b>S</b>	Replications included 49 km of new pipelines replacing open canals were installed with water pumps. No gravity-driven pipelines were installed.

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<p>17. Number of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes (#) and kilometres of canals newly lined</p>	<p>0</p>	<p>2 production lines established and  up to 400 kilometers of canals newly lined</p>	<p>2 production lines installed (production of polyethylene geomembrane, and hexagonal concrete slabs)  308 m of canal lining from a test production</p>	<p><b>HS</b>  <b>U</b></p>	<p>Installation of two production lines for lining production from domestic raw materials has been installed has been postponed, MTR actually recommended just to develop technical specification for the production lines. Technical specification were developed and production lines procured, installed, and production of 1000 m<sup>2</sup> of HDPE geomembrane was tested, that could be used for lining of 308 m of canal. As of November 2021 contract for purchase of domestic raw material for geomembrane (polyethylene) was under negotiation, and the production was expected to start in early 2022. Thus no canals could have been lined so far with these products (except for a test production for 308 m of canals).</p>
<p><b>Project Component 3 - Planning and capacity-building at the regional and local levels, plus evaluation and compilation of lessons learned</b></p>					
<p>18. Number of regional Integrated Water Distribution Plans developed and formally submitted for approval (#)</p>	<p>0</p>	<p>At least 3 velayat TAPs developed and submitted for approval, recommendations are developed for other 2 velayats (Lebap and Balkan)</p>	<p>Methodologies for IWRM planning developed.</p>	<p><b>S</b></p>	<p>Methodologies have been developed, including methodologies for design of on-farm water use plans (including small-scale farmers), and methodology for design/revision of regional water distribution plans/methodology for re-estimation of the inter-farm irrigation systems efficiency. Integrated water distribution plans have been developed in cooperation with a parallel UNDP/GEF SCRL project. Instead on developing three regional IWRM plans or TAPS, the project focused on newly emerged priority – methodology for on-farm water use plan, (including small farms), and revision of methodology for regional IWRM plans. However, this refocus of these activities could not have been translated in a new revision of the target anymore.</p>



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19. Number of participants and new content of training seminars	Training delivered by MWE to an estimated 78 specialists and 36 farmers annually	Expanded training delivered annually in all five velayats on integrated water management, to a total of 100 specialists and 300 farmers by the end of the project	380 specialists from ministries and state agencies trained. 100 water and agriculture experts and farmers trained (on-line). Geokdepe Green Polygon study visits of students organized.	<b>HS</b>	Four trainings were developed on: 1. Development of water-saving irrigation systems for agricultural crops, orchards and vineyards and development of on-farm water use plans” 2. Improvement of water accounting and rational use of water resources in irrigation systems 3. Technical operation of pumping stations and water use planning on inter-farm irrigation systems (on-line) 4. Seminar on improving the efficiency of water resources use in irrigation systems.
<b>Project Component 4 - National policy and regulatory framework established for integrated water resource management</b>					
20. Number of regulations, norms, and/or standards developed and adopted in support of the new Water Code (#)	0	At least 3 acts related to pump audits, crop-specific irrigation norms, and water/energy saving practices (incl. irrigation infrastructure) to lead to GHG emission reduction.	17 national regulations developed or final draft under development, of which three regulations adopted, and five drafts submitted.	<b>HS</b>	See indicator 5.
21. There is a formal commitment of the government to allocate resources for demonstrated by the project technologies (e.g. inclusion in state-funded programmes and	No	Yes	New State Program on the Development of Water-Saving Irrigation Technologies for 2021-2030 under development by the Government with inputs from the project.	<b>HS</b>	The draft of the new National Program on the Development of Water-Saving Irrigation Technologies for 2021-2030 is confidential and was not disclosed for evaluators. However, it is without doubts that the program with associated funding will be approved and implemented. The project estimates budget allocations of about 11 mil USD for implementation of planned measures in efficient water supply and irrigation. Yes, there is a strong commitment of the government to continue funding of efficient water supply and irrigation technologies. However, the

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budgets) (Yes/No).			State Program for the Development of Agriculture 2019-2025 under implementation.		exact details of the proposed program and budget are not yet public.
22. Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No).	No	Yes	Water measurement /monitoring program has been developed and used for the Geokdepe Green Polygon.	<b>HS</b>	The original target of adoption of a national program for water end-use metering/measurement has been revised to demonstration site due to lack of interest from the government to implement water metering in a short/medium term. The revised target has been achieved.

**Indicator Assessment Key**

Green = Targets Achieved <b>HS, S</b>	Yellow = Target not achieved, some shortcoming <b>MS, MU</b>	Red = Target not achieved, important shortcoming <b>U, HU</b>
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Rating used:

HS – Highly Satisfactory, S – Satisfactory, MS – Moderately Satisfactory, MU - Moderately Unsatisfactory, U – Unsatisfactory, HU - Highly Unsatisfactory

#### 4.3.2 Relevance

##### *National policies:*

The project and its objective are highly relevant to the top priorities of Turkmenistan as defined both, before the project start and even more with priorities specified during the project implementation period in governmental policies and programs, including the “Fundamental Directions of Economic, Political, and Cultural Development of Turkmenistan in the Period up to 2020”, “National Program for the Social Development of Rural Areas”, and the “State Program on the Development of Water-Saving Irrigation Technologies for 2021-2030”.

The timing of the project was very appropriate. The Government of Turkmenistan has already recognized the need to invest into improvement of efficient water supply and irrigation, and it had already invested significantly into drainage water collectors and the central water reservoir, The Golden Lake, that is planned to provide water for irrigation.

The project did not include explicit gender aspects and it was not formulated to address any national/local gender strategies.

##### *UNDP and GEF strategic priorities:*

The project is also fully in line with both, UNDP and GEF strategic priorities, and all relevant strategies, including UNDP Strategic Plan, CPD, UNDAF, UN Sustainable Development Cooperation Framework (UNSDFC), SDGs, as well as with GEF strategic programming.

Integrated water resources management and improvement of the legal and regulatory framework regarding water in Turkmenistan were both specifically noted as targets in the 2010-2015 Country Programme Action Plan (CPAP) jointly adopted by UNDP and the Government of Turkmenistan. The UN Development Assistance Framework (UNDAF) jointly signed by the UN and the Government also prominently cites the need for joint activity on integrated water management and mitigation of land degradation.

The project addresses five Sustainable Development Goals, including SDG 6 Clean Water and Sanitation (Targets 6.4, 6.5), SDG 7 Affordable and Clean Energy (Targets 7.1, 7.2 and 7.3), SDG 9 Industry, Innovation and Infrastructure (Target 9.4), SDG 13 Climate Action (Target 13.2, 13.3), SDG 15 Life on Land (Target 15.3).

The project did not use, and the project document did not include Theory of Change. The MTR reconstructed results chain that illustrates logic and connection between project components, targeted outcomes, and project objectives.

##### *Stakeholder engagement:*

The project was implemented in close cooperation with the SCWM and other state institutions. The project formulation reflected governmental strategic priorities, as well as specific needs and relevant interests of governmental stakeholders that were reflected also during project implementation and specific project activities adjusted accordingly (see specific regulations developed).

*Relevance and complementarity with other initiatives:*

The project has been designed to complement earlier interventions in this sector in Turkmenistan. Relevant lessons learned gained from previous projects implemented in Turkmenistan, and especially those implemented by UNDP, were taken into account in the project design.

#### **4.3.3 Effectiveness**

The project design as well as implementation with its focus on water savings, sustainable land management, energy savings and GHG reductions, including technology demonstration and replication, and strengthening regulatory framework, effectively contributed to country program outcomes and outputs, the SDGs, the UNDP Strategic Plan, GEF strategic priorities, and national development priorities.

The project has not reached fully all expected results primarily due to lower than planned replication. However, it should be noted that the scale of expected replication already during project implementation period was highly overestimated in the project design. Project replicated within the project implementation period could not have fully benefitted from all project deliverables, especially from the improved regulatory framework.

Project implementation did not face any significant socio-economic, political, cultural or environmental constraining risk, except for the impact of the COVID-19 pandemic that further increased the delay of some deliverables.

There has been no alternative strategy identified that would deliver project’s objective more effectively. For more details regarding strengthening some of project outputs (expanded training/information dissemination, targeting also newly emerged small private farmers) see Chapter 5.4 Recommendations.

Gender responsive and human rights-based approach was not incorporated into the project design nor to its implementation. The project is considered to be neutral in terms of gender equality, empowerment of women, and human rights.

#### **4.3.4 Efficiency**

Project expenditures in all four project components have been spent in accordance with planned budget. As of November 25, 2021, expenditures per component 1 - 3 have been 99% - 104% of component budgets as designed in the project document, and 67% in component 4).

Financial and human resources have been used reasonably efficiently and as planned in the project document.

Expected project objective results of energy and GHG savings were not fully met due to lower than expected replication by the end of project. However, the expected replication was unrealistically high as discussed above, and the project has no direct control of government investment. Actual project implementation was extended by 9 months from originally planned

6 years project, project duration extension of such a complex project by 12.5% is not uncommon.

It is speculative to estimate costs for integrating gender equality and human rights into the project, without specification how exactly they would be integrated. However, these costs are expected to be negligible compared to the total GEF financing of 6.185 mil USD.

Project resources were designed to be used and were used also for demonstration of PV driven water pumping and purification in isolated desert settlements of herd breeders, who belong to the most vulnerable groups in the country.

Despite immediate start of actual project implementation after signature of the project document, the project witnessed delayed implementation of demonstration projects compared to the planned time schedule even before the outbreak of the COVID-19 pandemic. Also the MTR in 2018 recommended to accelerate the work. In this period, there was a 6 months period when the project did not have a project manager in place. However, delayed demonstration projects have been implemented well before the planned project end, except for one – installation of two production lines for local production of canal lining materials from domestic resources. The COVID-19 pandemic caused further delay in technology procurement for this particular demonstration project. Although the project extension is not substantial compared to the planned duration of the project, the delay was for sure caused not only by external factors, and it could have been avoided by a better focus on timely delivery of project results. However, Critical Path Method is not generally used in management of UNDP/GEF projects.

A typical UNDP/GEF project management structure has been designed in the ProDoc and it was also utilized during the project implementation period. This management structure is considered to be fully appropriate for effective project implementation.

Standard UNDP/GEF monitoring and evaluation systems have been used during project implementation. However, its effectiveness and transparency suffered from poorly defined indicators, baselines and targets in the project results framework, although some revisions have been implemented both after an Inception Report and after the MTR.

#### 4.3.5 Overall Project Outcome

**Table 18: Assessment of Outcomes**

Assessment of Outcomes	Rating
Relevance	HS
Effectiveness	S <sup>10</sup>
Efficiency	S
Overall Project Outcome Rating	S

<sup>10</sup> Taking into account that expected replication by the end of the project and related energy savings and GHG emission reduction targets were unrealistically high.

**Table 19: Outcome Ratings Scale - Relevance, Effectiveness, Efficiency**

Rating	Description:
6 = Highly Satisfactory (HS)	Level of outcomes achieved clearly exceeds expectations and/or there were no shortcomings
5 = Satisfactory (S)	Level of outcomes achieved was as expected and/or there were no or minor shortcomings
4 = Moderately Satisfactory (MS)	Level of outcomes achieved more or less as expected and/or there were moderate shortcomings
3 = Moderately Unsatisfactory (MU)	Level of outcomes achieved somewhat lower than expected and/or there were significant shortcomings
2 = Unsatisfactory (U)	Level of outcomes achieved substantially lower than expected and/or there were major shortcomings
1 = Highly Unsatisfactory (HU)	Only a negligible level of outcomes achieved and/or there were severe shortcomings
Unable to Assess (U/A)	The available information does not allow an assessment of the level of outcome achievements

#### 4.3.6 Sustainability

##### 4.3.6.1 Financial sustainability

The government of Turkmenistan was expected to be the only source of funding for project replication. This funding in replication projects has materialized already during the project implementation period, although at a somewhat lower scale than originally expected (see the discussion on overestimated target above). In addition to the planned governmental funding, private investors also invested already in replication of efficient water irrigation. The government (SCWM) is preparing the State Program on the Development of Water-Saving Irrigation Technologies until 2030 that will include also allocations from the state budget for investment in replication projects. Although the Program has not been yet officially approved and the draft with planned allocation of funds is not publicly known, there are no doubts that the Program will be adopted, and adequate funds allocated. In addition to direct governmental investment, there is a rapidly growing share of private farmers who have also already invested to some efficient water irrigation projects and their interest and willingness to invest is expected to grow. Thus, there is a high likelihood that financial resources will be available after project termination.

Most of funding for investment in replication projects comes from the state budget. There are also preferential bank credits available for farmers that are specifically targeted for procurement of modern irrigation water saving technologies. These credits are typically accessible for larger farms which have larger collateral assets.

#### ***4.3.6.2 Socio-Political Sustainability***

There have been no socio-political risks identified that would undermine the longevity of project results. Efficient water supply and irrigation and SLM is expected to remain on top of governmental priorities, with strong country ownership as well.

The project team plans to develop lessons learned by the end of the project. Lessons learned have not been developed on a continual basis.

Key project stakeholders and decision makers are well aware of benefits of efficient water supply and irrigation. Awareness among newly emerged farmers and especially small farmers is expected to be much lower.

The project did not address directly gender issues and thus there are no gender results neither.

#### ***4.3.6.3 Institutional Framework and Governance Sustainability***

The newly developed regulatory framework is expected to strengthen replication of project results.

Mechanism for technical knowledge transfer and dissemination, as well as for institutional strengthening has been established (training of experts, curricula for students). However, the need for information and knowledge dissemination and for capacity strengthening is a long-term multi-source process. Thus, one cannot expect that with some mechanisms in place the country-wide need for capacity and institutional strengthening and information and knowledge dissemination could be fully saturated.

The project was not able to choose champions to work with, but it worked with individuals who officially were assigned to represent relevant stakeholders/state institutions.

There is a general consensus to continue replication of efficient water supply and irrigation projects after project termination.

Project results have been already incorporated into the state planning, see the draft State Program on the Development of Water-Saving Irrigation Technologies until 2030, as well as in development of IWRM plans, both on regional as well as on-farm levels.

Institutional strengthening did not address gender equality and human rights.

#### ***4.3.6.4 Environmental Sustainability***

There have been no environmental factors identified that could undermine future flow of project benefits, including environmental ones. This applies despite the fact that climate change, including higher temperatures and lower water availability impose significant risk to agriculture in Turkmenistan. The project and its results will, because of its nature, always decrease this negative impact of climate change.

There have been no probable factors identified that would pose a threat to a long-term sustainability and replication of project outcomes. The scope of replication might vary

depending on various factors (including for example future state income from oil and gas exports), but it is not expected that replication itself would be affected. Insufficient maintenance of demonstration projects might potentially undermine long-term results of demonstration projects, but not the overall replication.

**4.3.6.5 Overall Likelihood of Sustainability**

**Table 20: Likelihood of Sustainability**

Sustainability	Rating
Financial sustainability	L
Socio-political sustainability	L
Institutional framework and governance sustainability	L
Environmental sustainability	L
Overall likelihood of sustainability	L

**Table 21: Sustainability Ratings Scale**

Rating	Description:
4 = Likely (L)	There are little or no risks to sustainability
3 = Moderately Likely (ML)	There are moderate risks to sustainability
2 = Moderately Unlikely (MU)	There are significant risks to sustainability
1 = Unlikely (U)	There are severe risks to sustainability
Unable to Assess (U/A)	Unable to assess the expected incidence and magnitude of risks to sustainability

**4.3.7 Country Ownership**

This project has a strong explicit country ownership as demonstrated by state (and also private) funding of replication projects that has materialized already during project implementation period, and further funding is planned to continue after project termination; incorporation of project outcomes into the regulatory framework and planning (see the draft State Program on the Development of Water-Saving Irrigation Technologies until 2030, methodologies for regional and on-farm IWRM plans, and other regulations).



Another example of a strong country ownership is the installation of two production lines for domestic production of canal lining materials. This demonstration project has been delayed and the MTR recommended instead of procurement and installation of the technology just to develop technical specification of two production lines canal lining products. However, the SCWM has requested to procure and install the technology in its factory as originally planned. One could assume that the motivation was to receive the grant financing from the project. But whatever the motivation was, the factory is finalizing the contract for purchase of raw materials for production of canal lining materials, employees have been hired, and it clearly shows that the company that is owned by the SCWM does plan to produce canal lining materials, and thus also that the SCWM does plan to utilize it and invest in canal lining installations.

#### **4.3.8 Gender Equality and Women’s Empowerment**

The project did not address gender equality nor women’s empowerment neither in the project design/document, nor in its implementation. The project objective targeted the population of Turkmenistan, regardless of sex. The project was designed to “support and enhance social conditions and economic livelihood of the population of Turkmenistan”. One of the main project results, although it was not included among the project results framework indicators, is increase of crop yields after implementation of efficient water irrigation. Families of farmers, and thus also women, are direct beneficiaries since higher crop yields mean also higher income.

The project is considered to be gender neutral, and to have no direct impact, positive nor negative, on gender equality and women’s empowerment.

#### **4.3.9 Cross-Cutting Issues**

The project was designed to address:

- GEF Strategic Objective and Program: CCM-1, CCM-2, LD-1, with GEF Expected Outcomes:
  - CCM Outcome 1.1: Technologies successfully demonstrated, deployed, and transferred
  - CCM Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced
  - LD Outcome 1.2: Improved agricultural management
- UNDP Country Programme Document for Turkmenistan (2010-2015) and Country Programme Action Plan (2010-2015) Outcome 3.2 Environmentally sustainable use of natural resources contributes to effectiveness of economic processes and increased quality of life, and its indicators:
  - Output 3.2.1 –National authorities better plan, manage, and monitor the environment sector
    - Indicator 2. Number of laws revised to align national legislation with international standards

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Indicator 3. Number of sectoral plans/strategies revised to integrate respective environmental priorities and concerns, and incorporate strategic adaptation measures

Indicator 5. Number of municipalities apply improved waste disposal and better water/sanitation management

Output 3.2.2 –Local communities contribute to and benefit from sustainable use of natural resources

Indicator 3. Number of laws and policies revised and aligned internationally for better water governance

Indicator 4. Number of pilot areas practice integrated water resource management

Output 3.2.3 –Government introduces carbon reduction and energy saving technologies.

Indicator 1. Comprehensive policy framework is in place regulating long-term measures for sustainable use of energy resources and promotion of alternatives/renewables

Indicator 5. Number of pilot projects are in place promoting alternative and renewable sources of energy

The project addressed directly also priorities 1 (reduce GHG emissions) and 2 (national legislative framework responsive to climate change) of the following UNDP Country Programme Document for Turkmenistan (2016-2020), and six out of 17 UN Sustainable Development Goals, including SDG 2 (sustainable agriculture), SDG 6 (sustainable water management), SDG 7 (sustainable energy), SDG 9 (resilient infrastructure), SDG 13 (climate action), and SDG 15 (reverse land degradation).

The project directly addressed climate change mitigation and adaptation, and land degradation, as well as capacity development, knowledge management, and indirectly poverty alleviation.

Project outcomes resulted in:

- water savings;
- increased crop yields and subsequently also in increased income of farmers due to efficient water irrigation;
- land reclamation from salinization;
- GHG emission reductions;
- improved regulatory frameworks for water resources allocation and distribution (IWRM); and
- improved livelihood of vulnerable groups (herders in remote desert areas) due to PV driven water pumping and purification.

The project did not address directly gender equality, women’s empowerment and human rights.

#### 4.3.10 GEF Additionality

The project covers four out of six GEF additionalities as described in the Table 22, namely:

- Specific Environmental Additionality (CO2 reductions)
- Legal/Regulatory Additionality (regulatory reform regarding integrated water management and planning)
- Institutional Additionality/Governance additionality (institutions have been strengthened to be able to support achievement of environmental impact)
- Socio-Economic Additionality (efficient water supply/irrigation increases water availability for domestic use/crop yields and income of farmers)

**Table 22: Six Areas of GEF’s Additionality**

GEF’s Additionality	Description
Specific Environmental Additionality	The GEF provides a wide range of value-added interventions/services to achieve the Global Environmental Benefits (e.g. CO <sub>2</sub> reduction, Reduction/avoidance of emission of POPs).
Legal/Regulatory Additionality	The GEF helps stakeholders transformational change to environment sustainable legal /regulatory forms.
Institutional Additionality/Governance additionality	The GEF provides support to the existing institution to transform into efficient/sustainable environment manner.
Financial Additionality	The GEF provides an incremental cost which is associated with transforming a project with national/local benefits into one with global environmental benefits.
Socio-Economic Additionality	The GEF helps society improve their livelihood and social benefits thorough GEF activities.
Innovation Additionality	The GEF provides efficient/sustainable technology and knowledge to overcome the existing social norm/barrier/practice for making a bankable project.

#### 4.3.11 Catalytic/Replication Effect

The project has a *scaling up* catalytic effect in development of methodologies for IWRM planning and efficient water irrigation regulations that have been adopted and legally required on a national level.

Project’s catalytic effect includes also large-scale *replication* of *demonstration* projects implemented by the UNDP/GEF project, i.e. actual additional investment in follow-up investment projects (efficient water supply and irrigation, SLM, and efficient pumps) achieved already during the project implementation period.

Catalytic effect includes also knowledge transfer and capacity building (trainings).

**Table 23: Assessment of Catalytic Role**

Scaling up	Approaches developed through the project are taken up on a regional / national scale, becoming widely accepted, and perhaps legally required
Replication	Activities, demonstrations, and/or techniques are repeated within or outside the project, nationally or internationally
Demonstration	Steps have been taken to catalyze the public good, for instance through the development of demonstration sites, successful information dissemination and training
Production of public good	The lowest level of catalytic result, including for instance development of new technologies and approaches. No significant actions were taken to build on this achievement, so the catalytic effect is left to ‘market forces’

**4.3.12 Progress to Impact**

The progress to impact includes:

- Environmental stress reduction – reduced water intake, GHG emission reductions – see achievements;
- Environmental status change – land reclaimed from salinization;
- Contribution to changes in policy – new/updated regulatory framework established, institutional strengthening and capacity building; and
- Contribution to changes in socio-economic status – increase of farmers’ income due to increased crop yields, better quality and reliability of/access to water supply.

## **5. MAIN FINDINGS, CONCLUSIONS, LESSONS LEARNED AND RECOMMENDATIONS**

### **5.1 Main Findings**

The UNDP/GEF project was designed with an objective to “provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan”.

The key project goal – in line with top country priorities - was to reduce water losses and thus water demand in agriculture and water supply industries by introduction of more efficient technologies and practices, including sustainable land management (SLM) and integrated water resources management (IWRM) planning.

The project focused also on energy efficiency, renewable energy and GHG emission reductions. The project addressed simultaneously climate change mitigation and climate change adaptation, including land degradation.

The project was structured into four components that included:

- Demonstration projects (Component 1 and 2),
- Capacity building (Component 3), and
- Policy/regulatory framework for integrated water resource management (IWRM) (Component 4).

Demonstration projects included:

1. Low-water irrigation and sustainable land management including land leveling at the newly created Green Polygon demonstration site at Geokdepe;
2. Audits of electricity and diesel driven water pumps and pump replacement for more efficient ones;
3. Installation of PV driven water pumping and purification in off-grid areas;
4. Replacement of unlined open canal supplying water to the municipality of Kaahka and elimination of water pumping from wells with a gravity-driven water supply by new piping from the river;
5. Installation of production lines for domestic production of canal lining materials and lining of water canals.

The project strategy was to develop enabling framework for efficient and sustainable water supply and irrigation based on hands-on experience gained from implementation of demonstration projects, and to large-scale post-project investment in and replication of demonstration projects.

However, the project also planned that significant investment in replication of demonstration projects would materialize already during the six-year project implementation period, i.e. before all project deliverables could have been available. The planned replication factor in terms of energy and GHG emission savings was expected to be 36, and the replication factor for efficient irrigation and sustainable land management in terms of land area was expected to be

60. In other words: most of expected water, energy savings and GHG emission reductions were planned to be achieved by the large-scale replication already by the end of the project. The expected replication rate is extremely high, and it is hardly realistic to expect that this scale of replication could materialize as a replication of demonstration projects within few years. These replicated projects have been expected to be financed and implemented by the government, independently from and without any additional specific support from the project.

The project strategy was clear, appropriate and logically defined. However, there was no specific strategy designed for the support of the state funded replications within the project implementation period except for relying on the confirmed co-financing from the government.

The weakest part of the project design was the project results framework/logFrame. Although it was updated according to an Inception Report and MTR clarity of several indicators and baselines remained insufficient.

There are multiple indicators that are not SMART, there is often a disproportion in a definition of indicators, their baselines and targets, including for example their expression in various units (absolute vs. specific values), miscalculation of baseline value in some cases, etc. Another uncertainty arose from rather general assumptions used for baseline (and target) calculations of water, energy and GHG emission savings, vis-à-vis a need to use more complex calculations and specific assumptions especially for calculation of achievements from irrigated crop land/Green Polygon (various mix of crops, variable size of land cultivated during the year, various meteorological and hydrological conditions).

Thus, there is some level of uncertainty when comparing achieved water, energy and GHG savings to expected targets and baselines as per logFrame. This applies primarily for project objective and Component 1 indicators.

Project objective indicators included combined targets of water, energy and GHG savings for both, demonstration projects as well as their replication within the project implementation period. However, there is a different level of control of the project team over implementation of demonstration (direct) versus replication (indirect) projects, as well as different level of quality of calculated water and energy savings and GHG emission reductions due to different level of uncertainty of assumptions used for savings calculation.

Project results framework includes indicators for project objective and outcomes structured into four project components. The logframe matrix does not include indicators for project outcomes.

## **5.2 Conclusions**

Despite some delays in early years of project implementation, caused partially perhaps also by a vacant post of a Project Manager for 6 months after resignation of the first Project Manager, the project has delivered practically all expected results. With an exception of two targets that have not been fully met because they were set unrealistically high, and one target was not met due to delayed implementation in 2021, but it is expected to be reached after project termination (for details see below).

All five planned demonstration projects (Components 1 and 2) have been implemented. The last demonstration project, installation of two lines for production of domestic canal lining materials, has been implemented only in 2021. Although the production line has been installed, tested and transferred to the SCWM already, it was not put into a full operation yet by the Bezmein factory, (as of November 2021 contract for purchase of raw material has been negotiated, full operation is expected to start by early 2022), and thus new canal lining based on these domestically produced lining materials has not been implemented yet.

Expected results of Component 3 - Capacity building, and in the Component 4 - Policy/regulatory framework for integrated water resource management (IWRM) have been delivered with some deviations. The number of regulations developed (Component 4) highly exceeded the target.

The project did reach and exceeded targeted water savings. Note that the baseline and target of the project objective indicator 3 are not directly comparable and use different units. However, based on analysis of original calculation of this target, the expected water savings were planned to reach 40%, and the actual achievement is 56%).

The project did not fully deliver all expected energy savings and related GHG emission reductions. This is primarily because the actual replication by the end of the project (although significant), was lower than expected and planned for in the ProDoc (expected rate of replication was unrealistic high – see above). This applies similarly also to replication of land area reclaimed from salinization (part of Indicator 4). The GHG emission saving target was miscalculated and should have been lower by 80,000 tCO<sub>2</sub>.

Due to delayed implementation of the installation of two production lines for domestic production of canal lining materials, no canals have been lined with these products yet (the target was 400 km, see part of the Indicator 17). However, the production line has been installed and it is expected that full three-shift operation will start early in 2022. Thus, one can assume with high probability that also the target of 400 km length of lined water canals will be met, although with a delay of few years.

Other project targets have been met or exceeded.

Efficient low-water irrigation and elimination of salinization also significantly increase crop yields. This effect that means also increased income of farmers, was not reflected in the logFrame indicators.

There are good prospects for long-term sustaining project results and continuous investment of the government in efficient water supply and irrigation technologies and implementing newly developed practices in IWRM and SLM. The best argument is actual funding already invested in efficient water supply and irrigation technologies by the government, and the new draft State Program on the Development of Water-Saving Irrigation Technologies for 2021-2030 that includes not only commitment but also budget allocations for actual investment (although the actual proposed budget was not disclosed for evaluators).

During the project implementation period, and especially since 2018, the state policy allowed for a strong growth of private farmers, including small ones, who were provided 99-year lease of agriculture land for crop cultivation. Private farmers demonstrate high interest in efficient irrigation subject to affordable financing.

In conclusion, the project did de facto delivered all expected targets. Thus, the overall project outcome rating is S – Satisfactory. Formally, two targets were not met because they were based on unrealistically high assumptions on replication rate, and one target was not met due to delays, but the demonstration project has been implemented and the achievements will materialize after project termination. Some targets have been exceeded.

### **5.3 Lessons Learned**

1. Calculation of achievements of low-water irrigation and SLM is a complex process that requires specific methodology (in case of crop yields not only annual values, but also specific time-bound data collection of rainfall, temperature, wind, humidity, evaporation, land moisture, etc.) Such robust and site-specific methodology, including weather normalization and assumptions, needs to be developed already during the project design phase for calculation of baselines and targets, or at the earliest stage of project implementation at the latest. And the same methodology should be used for assessment of actual achievements. In case the methodology would be revised during project implementation, the baseline needs to be adjusted accordingly.
2. Combining direct (demonstration) and indirect (replication) project results in a single indicator does not allow to distinguish the project performance from activities implemented independently by other parties and has to be avoided. Separate indicators for direct and indirect project activities need to be used.
3. Good quality project results framework with SMART indicators and realistic baselines and targets is a key for adequate monitoring and reporting of project achievements. Good quality project results matrix is difficult to design. Theory of Change helps to properly identify project objectives, outcomes, and outputs, and their indicators, and needs to be included in the project design. Even significant revision of the project results framework at the beginning of the project may be necessary if its quality is not sufficient.
4. High co-financing for replication already within the project implementation period tends to include also some co-financing allocated already before the project start. In such case baseline and project additionality needs to be properly analyzed and clearly distinguished. Project achievements based on co-financing should not include results achieved by activities planned for and with financing confirmed before the project start, but only results of project specific activities additional to baseline.
5. The project strongly benefitted from several highly qualified international experts with practical experience in relevant fields. The selection of proper experts and their timely involvement are essential for a successful know-how transfer, especially in projects with a strong focus on application of best international practices.



## 5.4 Recommendations

**Table 24: Recommendations**

Rec #	TE Recommendation	Entity Responsible	Time frame
A	Category 1: Immediate for PIU until End-of-Project		
A.1	Focus on timely development of Lessons Learned Report well before the end-of-project.	PIU	End-of-Project
A.2	As part of Lessons Learned to be developed, structure the information also in a brief, easy to read summary information on benefits and costs of each demonstrated technology (including water/energy savings, increased crop yields, payback, etc.)	PIU	EOP
A.3	Publish information based on project achievements and Lessons Learned Report also in a format accessible for farmers, i.e. brief practical guide/information for farmers on efficient water irrigation, on a permanent web site that will be available after project termination. Consider targeted information dissemination in partnership with other on-going projects (SCRL), if possible.	PIU	EOP
A.4	Follow-up with the Bezmein factory of the SCWM on actual start of the full-scale production of HDPE geomembrane, its actual annual production, and utilization of the geomembrane in terms of km of canals lined.	PIU, UNDP	Up to one year after EOP
B.	Category 2: Follow-up for UNDP CO (and Government of Turkmenistan)		
B.1	Good quality project results framework is critical for successful project. Include planned activities with confirmed co-financing into project baseline, not into targets, ensure adequacy of assumptions used, and coherent and SMART specification indicators. In future projects during the project development phase implement specific quality assurance of project results framework based on Theory of Change.	UNDP/ Country Office (CO)	Not limited
B.2	Indicators with baselines and targets for direct project interventions and their achievements should be defined and reported separately from indirect project activities (such as replications during the project period).	UNDP/CO	Not limited
B.3	Document full methodology and assumptions used for specific calculation of project baselines, targets and achievements (including monitoring and verification). Use the same/compatible methodology for baseline, target and achievement calculations.	UNDP/CO	Not limited

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B.4	Avoid double counting of achievements from GEF and other donors financed projects in reporting (not limited to GHG emission reduction).	UNDP/CO	Not limited
B.5	Report latest achievements as of June of actual year in appropriate column in annual PIRs.	UNDP/CO	Not limited
B.6	Use Critical Path Method <sup>11</sup> for design and timely implementation of projects.	UNDP/CO	Not limited
B.7	Consider development of a financial support scheme with preferential financing and technical assistance in partnership with suitable donors for small private farmers planning to invest in efficient water irrigation, drainage, and SLM.	UNDP/Government of Turkmenistan	Not limited
B.8	Integrate gender aspects into future project design and implementation in accordance with updated GEF requirements.	UNDP/CO	Not limited
B.9	Follow up with the Bezmein Factory of Construction Materials and with SCWM to ensure launch of the full scale lining geomembrane production and to monitor actual implementation of canal lining.	UNDP CO	Until full operation and canal lining
C.	Category 3: For UNDP/GEF		
C.1	When considering project proposals, focus especially on an appropriate design of project result frameworks and appropriate SMART specification of indicators, baselines and targets, including assumptions. This is an obvious requirement. However, in practice the project result framework is often the weakest part of a project design/Project Document.	GEF/UNDP CO	Not limited
C.2	Consider recommendation/requirement to use a Critical Path Method in project design and implementation of GEF-financed projects.	GEF/UNDP CO	Not limited

<sup>11</sup> A Critical Path Method (CPM) identifies critical path of activities that, if delayed, would delay the entire project. CPM is a project management technique used to create a project schedule, to estimate the total duration of a project by identifying the longest stretch of dependent activities, and to manage timely implementation of a project. For more information on CPM see for example: [https://en.wikipedia.org/wiki/Critical\\_path\\_method](https://en.wikipedia.org/wiki/Critical_path_method).

## 6. ANNEXES

### Annex 1: List of Persons Interviewed

Name	Position	Institution
Mr. Rovshen Nurmammedov	Assistant Resident Representative	UNDP CO Turkmenistan
Mr. Farhat Orunov	Resilience, Environment and Energy Programme Analyst	UNDP CO Turkmenistan
Mr. Bahtiyar Kurt	Regional Technical Support Specialist	UNDP Regional Hub Istanbul
Mr. Paata Janelidze	Chief Technical Advisor	International Consultant
Mr. Baygeldi Bayjanov	National Project Coordinator, Director, Water Use Department	State Committee for Water Management of Turkmenistan (SCWM)
Mr. Yanov Pashyyev	Head of Operations Department	State Committee for Water Management of Turkmenistan (SCWM)
Mr. Gundogdy Sahetov	Pump Specialist	State Committee for Water Management of Turkmenistan (SCWM)
Mr. Tirkesh Annagulyyev	Senior Specialist, Department of Financial monitoring of Agro-industrial complex	Ministry of Economy and Finance of Turkmenistan
Mr. Vepa Toylyyev	Head of the laboratory	Institute “Turkmensuwylmytaslama”
Mr. Orazberdi Atayev	Senior Specialist	Institute “Turkmensuwylmytaslama”
Mr. Orazov Yusup	Engineer	Institute “Turkmensuwylmytaslama”
Mr. Georgy Kurtovezov	Head of the Hydro technology laboratory	Institute “Turkmensuwylmytaslama”
Mr. Begench Reimov	Scholar	State Energy Institute
Mr. Shanazar Allakulyyev	Head of the department	State Energy Institute
Ms. Oguloraz Saparlyyeva	Instructor	State Energy Institute
Mr. Babageldi Kurbanov	Head of the department	Turkmen Agricultural Institute
Mr. Orazmuhammet Durdyev	Head of the department	Turkmen State Agricultural University
Mr. Dovlet Taganov	Lecturer	Oguz han Engineering and Technology University of Turkmenistan
Ms. Amangul Ovezberdiyeva	Project Manager	SCRL UNDP project in Turkmenistan
Ms. Gozel Atamuradova	Land Specialist	SCRL UNDP project in Turkmenistan

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Ms. Zuleyha Achilova	Specialist	US Aid Governance support program (GSP)
Ms. Irana Bagirova	Coordinator of CAREC projects in Turkmenistan	CAREC – Turkmenistan
Mr. Nazarguly Hojanepesov	Deputy Director	Bezmein factory for construction materials of SCWM
Mr. Tirkish Atayev	Archyn (head) of Shorgala Farmers Association	Ahal region administration
Mr. Chary Rejepov	Farmer entrepreneur	The Union of Industrialists and Entrepreneurs of Turkmenistan
Mr. Shohrat Niyazmuradov	EERE Project Manager	EERE UNDP project in Turkmenistan
Mr. Geldi Myradov	Former EERE Project Manager	EERE UNDP project in Turkmenistan
Mr. Mamed Shaharov	Former EERE Field Assistant	EERE UNDP project in Turkmenistan
Mr. Akmyrat Yazhanov	EERE Specialist on Agriculture	EERE UNDP project in Turkmenistan
Mr. Chariyarkuli Taganov	EERE Specialist on Capacity Building and Legislation	EERE UNDP project in Turkmenistan
Mr. Guwanch Hanmedov	EERE Specialist on Monitoring	EERE UNDP project in Turkmenistan
Mr. Umar Nurmamedov	Former EERE Filed Consultant on the introduction of energy efficient pumps, Lebap region	EERE UNDP project in Turkmenistan
Mr. Chary Annadurdyev	Former National Consultant on Kaka-Hiwabat gravity-driven water pipeline	EERE UNDP project in Turkmenistan
Mr. Muhammet Tanrykulyev	Hydraulic engineer	EERE UNDP project in Turkmenistan
Mr. Oraz Annamammedov	Archyn (head) of the Farmers Assosiation named after Takhirov	Kaka district administration

## **Annex 2: List of documents reviewed**

### **General documentation**

- UNDP Programme and Operations Policies and Procedures
- Project-Level Evaluation, Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects, UNDP, 2012
- GEF Monitoring and Evaluation Policy
- GEF Guidelines for Conducting Terminal Evaluations
- GEF focal area strategic program objectives
- UNDP Development Assistance Framework
- UNDP Country Program Document
- UNDP Country Program Action Plan

### **Project documentation**

- Project Identification Form
- Project Document
- Inception Report
- Midterm Review
- Annual Work Plans
- Annual Project Implementation Reports/Standard Progress Reports
- Project Implementation Review reports
- Project risk log
- Project tracking tool
- Combined Delivery Reports
- GEF Operational Quarterly Reports
- Project Board Meeting minutes
- Midterm Review
- Management response to MTE

### **Project deliverables**

### Annex 3: Project Results Framework – Logical Framework Matrix (LogFrame)

<p><b>This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:</b>                  Environmentally sustainable use of natural resources contributes to effectiveness of economic processes and increased quality of life</p>					
<p><b>Country Programme Outcome Indicators (from CPAP):</b>  <b>Output 3.2.1 – National authorities better plan, manage, and monitor the environment sector</b>                  Indicator 2. Number of laws revised to align national legislation with international standards                  Indicator 3. Number of sectoral plans/strategies revised to integrate respective environmental priorities and concerns, and incorporate strategic adaptation measures                  Indicator 5. Number of municipalities apply improved waste disposal and better water/sanitation management  <b>Output 3.2.2 – Local communities contribute to and benefit from sustainable use of natural resources</b>                  Indicator 3. Number of laws and policies revised and aligned internationally for better water governance                  Indicator 4. Number of pilot areas practice integrated water resource management  <b>Output 3.2.3 – Government introduces carbon reduction and energy saving technologies.</b>                  Indicator 1. Comprehensive policy framework is in place regulating long-term measures for sustainable use of energy resources and promotion of alternatives/renewables                  Indicator 5. Number of pilot projects are in place promoting alternative and renewable sources of energy</p>					
<p><b>Primary applicable Key Environment and Sustainable Development Key Result Area:</b> 1. Mainstreaming environment and energy</p>					
<p><b>Applicable GEF Strategic Objective and Program:</b> CCM-1, CCM-2, LD-1</p>					
<p><b>Applicable GEF Expected Outcomes:</b>                  CCM Outcome 1.1: Technologies successfully demonstrated, deployed, and transferred                  CCM Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced                  LD Outcome 1.2: Improved agricultural management</p>					
	<b>Indicator (units)</b>	<b>Baseline</b>	<b>Targets End of Project</b>	<b>Source of verification</b>	<b>Risks and Assumptions</b>
<p><b>Project Objective:</b>                  Provide for sufficient and environmentally sustainable water supply to support and enhance social</p>	<p>1. Reduction of yearly energy consumption per ha of irrigated land (J/ha/year)</p>	<p>9 million GJ/year</p>	<p>3.4 million GJ/year of direct energy savings</p>	<p>Pump audits and other evaluation of energy consumption in water sector                  Measurements of water consumption</p>	<p>Baseline data are based largely on national-level statistics and estimates, but not on metering. Metering data at the level of end users are largely absent for both energy and water.</p>

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<b>conditions and economic livelihood of the population of Turkmenistan</b>	2. Reduction of GHG emissions (tonnes)	6,900,000 per year	448,000. The baseline is estimated in yearly values; however, the project reports in direct reductions of GHG emissions.	Evaluation of demonstration projects and national statistics	Scaling up of project results depends directly on allocation of state budget investment in low-water irrigation, drainage, canal linings, and infrastructure improvements. One major goal of this project is to provide technical and financial justification for such budget allocations.
	3. Reduction of normalised water consumption (m <sup>3</sup> /ha/year)	120,000	48,000. An estimation of the exact area of land under interventions needs to be finalised in 2016.	Evaluation reports on demonstration projects	
	4. Area of land protected and/or reclaimed from salinisation (# ha)	To be defined in the first year during agro-chemical investigation of the pilot polygon	145 ha of arable land directly improved as a result of project interventions and condition of up to 20,000 ha of land is improved by the end of the project period via indirect impact such as replication activities and from improved irrigation and prevention of water losses	<i>Ditto</i>	
	5. Regulatory documents directly related to efficient water use or energy consumption/ savings leading to GHG reductions are adopted at national and sub-national	A detailed analysis of potential regulations, norms, and standards related to activities within the	6 (with at least 1 national and others - sub-national).	Project reports, official documents endorsed by the Government.	There are a number of activities, which potentially could lead to the development and endorsement of national-wide regulations, e.g. pump audit, crop-specific irrigation norms, etc.

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	level and implementation started (#)	project is to be carried out. The list of potential regulations is to be consulted with the main partners for prioritisation.			
	6. Resources and co-funding mobilised by the Project from state and other sources on water and energy efficiency, as well as land reclamation techniques (US\$)	0	US\$ 72.1 M	Financial reports of the Project, national statistics on state (budget) investments.	This is about 100% of the project budget. It’s an estimate. Further, leveraging will be estimated and considered instead. Reporting will be cumulative starting from 2016.
	7. Number of people directly (and indirectly) benefiting from measures on better water management, efficient water use, energy saving and land degradation in Turkmenistan - #(#)	0	35,000	Project reports, social surveys, M&E reports	
<b>Component 1: Technology transfer and knowledge development in support of innovation in EE water management</b>	8. Reduction of water used for specific soil types (m3/ha/year)	For medium and heavy loam soils norms are 6700 m3/ha for cotton; 4500 m3/ha for winter wheat; and	40% (at the project demonstration sites)	Project reports, research results, communication materials, M&E reports	



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<b>and SLM (cont'd).</b>		29000 m3/ha for rice			
	9. Normalised energy consumption reduced (compared with average values for similar soil types)	0	30% (at the project demonstration sites)	Project reports, research results, communication materials, M&E reports	
	10. Number of pump audits completed by project: total and (diesel pumps) - # (#)	0	100 total (25 diesel)	Project reports, communication materials, M&E reports	
	11. Energy saving achieved by replacement and/or fixing of old pumps (%)	0	20%	Project reports, research results, communication materials, M&E reports	
	12. Area of land protected or reclaimed from salinisation as a result of demonstration projects (# ha)	0	300	Evaluation of demonstration projects and national statistics	
	13. Number of people directly benefiting from measures on renewable-energy water supply in remote locations (#)	0	1100	Project reports, social surveys, communication materials, M&E reports	Total population of the village of Byori.

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<b>Project Component 2 - Scaling-up investment in improved water management infrastructure</b>	14. Reduction in water loss between withdrawal and entrance point of the Kaakhka town Water Treatment facility (%).	50%	5%	Project reports, data from direct measurement, communication materials, M&E reports	To be proved by direct measurement or water allocation through water dividing installations.
	15. Direct energy savings due to decommissioning of up to 41 wells (MWh/year)	0	Up to 486 MWh of direct energy savings per year		
	16. Number of similar projects initiated in other similar (or mountainous areas) districts of Akhal and Balkan velayats of Turkmenistan (#).	0	At least 1 similar project under implementation	Nat'l statistics, communication with government agencies	Actual funding of the replication project could be found later but an agreement on such project would be a requirement.
	17. Number of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes (#) and kilometres of canals newly lined	0	2 production lines established and up to 400 kilometers of canals newly lined	Project reports, communication materials, M&E reports	

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<b>Project Component 3 - Planning and capacity-building at the regional and local levels, plus evaluation and compilation of lessons learned</b>	18. Number of regional Integrated Water Distribution Plans developed and formally submitted for approval (#)	0	At least 3 velayat TAPs developed and submitted for approval, recommendations are developed for other 2 velayats (Lebap and Balkan)	National media, project reports, M&E reports, communications	
	19. Number of participants and new content of training seminars	Training delivered by MWE to an estimated 78 specialists and 36 farmers annually	Expanded training delivered annually in all five velayats on integrated water management, to a total of 100 specialists and 300 farmers by the end of the project		
<b>Project Component 4 - National policy and regulatory framework established for integrated water resource management</b>	20. Number of regulations, norms, and/or standards developed and adopted in support of the new Water Code (#)	0	At least 3 acts related to pump audits, crop-specific irrigation norms, and water/energy saving practices (incl. irrigation infrastructure) to lead to GHG emission reduction.	Training feedback forms processing results	Adoption of these standards could happen after the project will have ended; however, it is critical that the corresponding documents are formally accepted for approval.
	21. There is a formal commitment of the government to allocate resources for demonstrated by the project technologies (e.g. inclusion in state-funded programmes and budgets) (Yes/No).	No	Yes	Commitment letters, state budget lines, communications with key agencies	

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	22. Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No).	No	Yes	Commitment letters, state budget lines, communications with key agencies	
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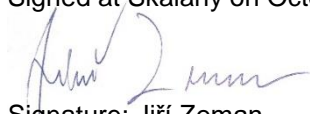

### Annex 4: UNEG Code of Conduct for Evaluators

Independence entails the ability to evaluate without undue influence or pressure by any party (including the hiring unit) and providing evaluators with free access to information on the evaluation subject. Independence provides legitimacy to and ensures an objective perspective on evaluations. An independent evaluation reduces the potential for conflicts of interest which might arise with self-reported ratings by those involved in the management of the project being evaluated. Independence is one of ten general principles for evaluations (together with internationally agreed principles, goals and targets: utility, credibility, impartiality, ethics, transparency, human rights and gender equality, national evaluation capacities, and professionalism).

**Evaluators/Consultants:**

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people’s right not to engage. Evaluators must respect people’s right to provide information in confidence and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders’ dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.
8. Must ensure that independence of judgement is maintained, and that evaluation findings and recommendations are independently presented.
9. Must confirm that they have not been involved in designing, executing or advising on the project being evaluated and did not carry out the project’s Mid-Term Review.

**Evaluation Consultant Agreement Form**  
 Agreement to abide by the Code of Conduct for Evaluation in the UN System:  
 Name of Evaluators: Jiří Zeman, Rovshen Ishangulyyev  
 Name of Consultancy Organization (where relevant): NA  
 I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at Skalary on October 19, 2021  Signature: Jiří Zeman	Signed at Ashgabat on October 19, 2021  Signature: Rovshen Ishangulyyev
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## Annex 5: Terminal Evaluation Criteria Matrix (Evaluation Question Matrix)

Evaluation Questions	Indicators	Sources	Data Collection Method
Evaluation Criteria: Relevance - How does the project relate to the main objectives of the GEF Focal area, and to the environment and development priorities at the local, regional and national level?			
<ul style="list-style-type: none"> <li>Does the project’s objective align with the priorities of the local government and local communities?</li> </ul>	<ul style="list-style-type: none"> <li>Level of coherence between project objective and stated priorities of local stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Local stakeholders</li> <li>Document review of local development strategies, environmental policies, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Local level field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Does the project’s objective fit within the national environment and development priorities?</li> </ul>	<ul style="list-style-type: none"> <li>Level of coherence between project objective and national policy priorities and strategies, as stated in official documents</li> </ul>	<ul style="list-style-type: none"> <li>National policy documents, such as National Biodiversity Strategy and Action Plan, National Capacity Self-Assessment, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>National level interviews</li> </ul>
<ul style="list-style-type: none"> <li>Did the project concept originate from local or national stakeholders, and/or were relevant stakeholders sufficiently involved in project development?</li> </ul>	<ul style="list-style-type: none"> <li>Level of involvement of local and national stakeholders in project origination and development (number of meetings held, project development processes incorporating stakeholder input, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Project staff</li> <li>Local and national stakeholders</li> <li>Project documents</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Does the project objective fit GEF strategic priorities?</li> </ul>	<ul style="list-style-type: none"> <li>Level of coherence between project objective and GEF strategic priorities (including alignment of relevant focal area indicators)</li> </ul>	<ul style="list-style-type: none"> <li>GEF strategic priority documents for period when project was approved</li> <li>Current GEF strategic priority documents</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Was the project linked with and in-line with UNDP priorities and strategies for the country?</li> </ul>	<ul style="list-style-type: none"> <li>Level of coherence between project objective and design with UNDAF, CPD</li> </ul>	<ul style="list-style-type: none"> <li>UNDP strategic priority documents</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> </ul>

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Evaluation Criteria: Efficiency - Was the project implemented efficiently, in line with international and national norms and standards?			
<ul style="list-style-type: none"> <li>Is the project cost-effective?</li> </ul>	<ul style="list-style-type: none"> <li>Quality and adequacy of financial management procedures (in line with UNDP, and national policies, legislation, and procedures)</li> <li>Financial delivery rate vs. expected rate</li> <li>Management costs as a percentage of total costs</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interviews with project staff</li> </ul>
<ul style="list-style-type: none"> <li>Is the project implementation approach efficient for delivering the planned project results?</li> </ul>	<ul style="list-style-type: none"> <li>Adequacy of implementation structure and mechanisms for coordination and communication</li> <li>Planned and actual level of human resources available</li> <li>Extent and quality of engagement with relevant partners / partnerships</li> <li>Quality and adequacy of project monitoring mechanisms (oversight bodies' input, quality and timeliness of reporting, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>National and local stakeholders</li> <li>Project staff</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interviews with project staff</li> <li>Interviews with national and local stakeholders</li> </ul>
<ul style="list-style-type: none"> <li>Is the project implementation delayed? If so, has that affected cost-effectiveness?</li> </ul>	<ul style="list-style-type: none"> <li>Project milestones in time</li> <li>Planned results affected by delays</li> <li>Required project adaptive management measures related to delays</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interviews with project staff</li> </ul>
<ul style="list-style-type: none"> <li>What is the contribution of cash and in-kind co-financing to project implementation?</li> </ul>	<ul style="list-style-type: none"> <li>Level of cash and in-kind co-financing relative to expected level</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interviews with project staff</li> </ul>
<ul style="list-style-type: none"> <li>To what extent is the project leveraging additional resources?</li> </ul>	<ul style="list-style-type: none"> <li>Amount of resources leveraged relative to project budget</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> </ul>	<ul style="list-style-type: none"> <li>Desk review</li> <li>Interviews with project staff</li> </ul>
Evaluation Criteria: Effectiveness - To what extent have the expected outcomes and objectives of the project been achieved?			

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<ul style="list-style-type: none"> <li>Are the project objectives likely to be met? To what extent are they likely to be met?</li> </ul>	<ul style="list-style-type: none"> <li>Level of progress toward project indicator targets relative to expected level at current point of implementation</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>What are the key factors contributing to project success or underachievement?</li> </ul>	<ul style="list-style-type: none"> <li>Level of documentation of and preparation for project risks, assumptions and impact drivers</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>What are the key risks and barriers that remain to achieve the project objective and generate environmental benefits?</li> </ul>	<ul style="list-style-type: none"> <li>Presence, assessment of, and preparation for expected risks, assumptions and impact drivers</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Are the key assumptions and impact drivers relevant to the achievement of environmental benefits likely to be met?</li> </ul>	<ul style="list-style-type: none"> <li>Actions undertaken to address key assumptions and target impact drivers</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<p>Evaluation Criteria: Results - Are there indications that the project has contributed to, or enabled progress toward reduced environmental stress and/or improved ecological status?</p>			
<ul style="list-style-type: none"> <li>Have the planned outputs been produced? Have they contributed to the project outcomes and objectives?</li> </ul>	<ul style="list-style-type: none"> <li>Level of project implementation progress relative to expected level at current stage of implementation</li> <li>Existence of logical linkages between project outputs and outcomes/impacts</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Are the anticipated outcomes likely to be achieved? Are the outcomes likely to contribute to the achievement of the project objective?</li> </ul>	<ul style="list-style-type: none"> <li>Existence of logical linkages between project outcomes and impacts</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Are impact level results likely to be achieved?</li> </ul>	<ul style="list-style-type: none"> <li>Environmental indicators</li> <li>Level of progress through the project’s Theory of Change</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>



Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

Evaluation Criteria: Sustainability - To what extent are there financial, institutional, socio-political, and/or environmental risks to sustaining long-term project results?			
<ul style="list-style-type: none"> <li>To what extent are project results likely to be dependent on continued financial support? What is the likelihood that any required financial resources will be available to sustain the project results once the GEF assistance ends?</li> </ul>	<ul style="list-style-type: none"> <li>Financial requirements for maintenance of project benefits</li> <li>Level of expected financial resources available to support maintenance of project benefits</li> <li>Potential for additional financial resources to support maintenance of project benefits</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Do relevant stakeholders have or are likely to achieve an adequate level of “ownership” of results, to have the interest in ensuring that project benefits are maintained?</li> </ul>	<ul style="list-style-type: none"> <li>Level of initiative and engagement of relevant stakeholders in project activities and results</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>Do relevant stakeholders have the necessary technical capacity to ensure that project benefits are maintained?</li> </ul>	<ul style="list-style-type: none"> <li>Level of technical capacity of relevant stakeholders relative to level required to sustain project benefits</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>To what extent are the project results dependent on socio-political factors?</li> </ul>	<ul style="list-style-type: none"> <li>Existence of socio-political risks to project benefits</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>
<ul style="list-style-type: none"> <li>To what extent are the project results dependent on issues relating to institutional frameworks and governance?</li> </ul>	<ul style="list-style-type: none"> <li>Existence of institutional and governance risks to project benefits</li> </ul>	<ul style="list-style-type: none"> <li>Project documents</li> <li>Project staff</li> <li>Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Field visit interviews</li> <li>Desk review</li> </ul>

Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

<ul style="list-style-type: none"> <li>• Are there any environmental risks that can undermine the future flow of project impacts?</li> </ul>	<ul style="list-style-type: none"> <li>• Existence of environmental risks to project benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents</li> <li>• Project staff</li> <li>• Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Field visit interviews</li> <li>• Desk review</li> </ul>
Gender equality and women’s empowerment - How did the project contribute to gender equality and women’s empowerment?			
<ul style="list-style-type: none"> <li>• How did the project contribute to gender equality and women’s empowerment?</li> </ul>	<ul style="list-style-type: none"> <li>• Level of progress of gender action plan and gender indicators in results framework</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents</li> <li>• Project staff</li> <li>• Project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Desk review, interviews, field visits</li> </ul>
Cross-cutting and UNDP Mainstreaming Issues			
<ul style="list-style-type: none"> <li>• How were effects on local populations considered in project design and implementation?</li> </ul>	<ul style="list-style-type: none"> <li>• Positive or negative effects of the project on local populations.</li> </ul>	<ul style="list-style-type: none"> <li>• Project document, progress reports, monitoring reports</li> </ul>	<ul style="list-style-type: none"> <li>• Desk review, interviews, field visits</li> </ul>

## Annex 6: Terminal Evaluation TOR

# International Consultant for the Terminal Evaluation (TE) of full-sized UNDP-GEF project

<b>Location:</b>	home-based with possible trip to Turkmenistan in case of ease of travel restrictions, TURKMENISTAN
<b>Application Deadline:</b>	20-Aug-21 ( <b>Midnight New York, USA</b> )
<b>Time left:</b>	-d --h -m
<b>Additional Category:</b>	Sustainable Development and Poverty Reduction
<b>Type of Contract:</b>	Individual Contract
<b>Assignment Type:</b>	International Consultant
<b>Languages Required:</b>	English
<b>Starting</b>	<b>Date:</b> 10-Oct-2021
(date when the selected candidate is expected to start)	
<b>Duration of Initial Contract:</b>	Two months period from the start date of the assignment
<b>Expected Duration of Assignment:</b>	26 working days

## **BACKGROUND**

### **1. Introduction**

In accordance with UNDP and GEF M&E policies and procedures, all full- and medium-sized UNDP-supported GEF-financed projects are required to undergo a Terminal Evaluation (TE) at the end of the project. This Terms of Reference (ToR) sets out the expectations for the TE of the *full-sized* project titled “Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan” (PIMS# 4947) implemented through the State Committee for Water Management of Turkmenistan (SCWM). The project started on 17 July 2015 and is in its sixth year of implementation. The TE process must follow the guidance outlined in the document ‘Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects’

([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf)).

### **2. Project Description**

The \$6.185 million UNDP - GEF “Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan” project started in July 2015 and is scheduled to finish in April 2022. The project is financed by the Global Environment Facility and implemented through the United Nations Development Programme.

Through technology transfer, investment and policy reform, this project seeks to promote an integrated approach to water management that is energy and water efficient, reduces root causes of land degradation, and enhances local livelihoods and public service delivery. Co-financing of \$72.1 million USD has been

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

committed from various sources. Through various interventions, the project aims to achieve some 3.4 million GJ of direct energy savings per year by the end of the project and some 448,000 tonnes of CO<sub>2</sub> per year by the end of project.

The objectives of this UNDP/GEF project are as follows:

- Development objective: Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan;
- Environmental objectives: Reduce GHG emissions associated with water management (448,000 tonnes of CO<sub>2</sub> per annum by the end of the project); Prevent and remediate salinization of lands.

The project’s activities are organized into four components:

- Component 1 introduces new technologies in irrigated agriculture and pumping for energy efficiency, water conservation, and sustainable land management (SLM);
- Component 2 scales-up investment in new and expanded efficient water-management infrastructure;
- Component 3 delivers local and region-specific planning and educational outreach for IWRM and SLM among farmers and water-sector designers and managers;
- Component 4 develops and supports implementation of policy reform for IWRM.

The first two components of the project constitute the technical foundation of the project. For agriculture and infrastructure, respectively, these components are identifying, verifying, and documenting the most promising ways to save water, increase energy efficiency, and reduce water-related root causes of land degradation in Turkmenistan. The components are generating technical and financial performance data and practical experience to be used to plan and provide necessary justification to scale-up public investment and technology deployment nationwide.

While the first two components define the technical opportunity and priorities for replication, the second two components are seeking to carry actual replication out on a national scale. The third component supports replication from the bottom up via development of action plans at the regional and district levels across the country, as well as educational outreach and capacity-building among farmers and local water-management personnel. The fourth component works from the top down, defining and implementing policies, programmes, and investment plans for IWRM and SLM at the national level.

### **3. TE Purpose**

The TE report will assess the achievement of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming. The TE report promotes accountability and transparency and assesses the extent of project accomplishments.

The final evaluation will focus on the delivery of the project’s results as initially planned (and as corrected after the mid-term evaluation). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project’s results.

## **DUTIES AND RESPONSIBILITIES**

### **4. TE Approach & Methodology**

The TE report must provide evidence-based information that is credible, reliable and useful.

The TE team will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Social and Environmental Screening Procedure/SESP) the Project Document, project reports including annual PIRs, project budget revisions, lessons learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based evaluation. The TE team will review the baseline and midterm GEF focal area Core Indicators/Tracking Tools submitted to the GEF at the CEO endorsement and midterm stages and the terminal Core Indicators/Tracking Tools that must be completed before the TE field mission or online interviews with relevant stakeholders and counterparts begin.

The TE team is expected to follow a participatory and consultative approach ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), Implementing Partners, the UNDP Country Office(s), the Chief Technical Advisor (CTA), the Regional Technical Advisor (RTA), direct beneficiaries and other stakeholders.

Engagement of stakeholders is vital to a successful TE. For this reason, in case if travel restrictions due to COVID-19 pandemic are eased, it is absolutely essential that shortly after the start of the assignment the international consultant travels to Turkmenistan for a period of 2 weeks (10 working days, not including weekends) to meet with all relevant stakeholders. Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to (State Committee for Water Management of Turkmenistan (SCWM), Ministry of Agriculture and Environmental Protection of Turkmenistan (MAEP), State Agricultural University, Municipality of Ahal region, Municipality of Kaahka district and Municipality of Geokdepe district); executing agencies, senior officials and task team/component leaders, key experts and consultants in the subject area, Project Board, project beneficiaries, academia, local government, etc. Additionally, the TE team is expected to conduct field missions to (Kaahka and Geokdepe project sites), including the following project sites (Kaahka water pipeline and Green Polygon) as the travel conditions due to COVID-10 permit.

The specific design and methodology for the TE should emerge from consultations between the TE team and the above-mentioned parties regarding what is appropriate and feasible for meeting the TE purpose and objectives and answering the evaluation questions, given limitations of budget, time and data. The TE team, however, must use gender-responsive methodologies and tools and ensure that gender equality and women’s empowerment, as well as other cross-cutting issues and SDGs are incorporated into the TE report.

The final methodological approach including interview schedule, field visits and data to be used in the evaluation must be clearly outlined in the TE Inception Report and be fully discussed and agreed between UNDP, stakeholders and the TE team.

The final TE report must describe the full TE approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the evaluation.

### **5. Detailed Scope of the TE**

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

The TE will assess project performance against expectations set out in the project’s Logical Framework/Results Framework (see ToR Annex A). The TE will assess results according to the criteria outlined in the Guidance for TEs of UNDP-supported GEF-financed Projects

[http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf)

The Findings section of the TE report will cover the topics listed below. A full outline of the TE report’s content is provided in ToR Annex C.

The asterisk “(\*)” indicates criteria for which a rating is required.

### Findings

#### i. Project Design/Formulation

- National priorities and country drivenness
- Project Strategy and objectives
- Gender equality and women’s empowerment
- Social and Environmental Safeguards
- Analysis of Results Framework: project logic and strategy, indicators
- Assumptions and Risks
- Lessons from other relevant projects (e.g. same focal area) incorporated into project design
- Planned stakeholder participation
- Linkages between project and other interventions within the sector
- Management arrangements

#### ii. Project Implementation

- Adaptive management (changes to the project design and project outputs during implementation)
- Actual stakeholder participation and partnership arrangements
- Project Finance and Co-finance
- Monitoring & Evaluation: design at entry (\*), implementation (\*), and overall assessment of M&E (\*)
- Implementing Agency (UNDP) (\*) and Executing Agency (\*), overall project oversight/implementation and execution (\*)
- Risk Management, including Social and Environmental Standards

#### iii. Project Results

- Assess the achievement of outcomes against indicators by reporting on the level of progress for each objective and outcome indicator at the time of the TE and noting final achievements
- Relevance (\*), Effectiveness (\*), Efficiency (\*) and overall project outcome (\*)
- Sustainability: financial (\*), socio-political (\*), institutional framework and governance (\*), environmental (\*), overall likelihood of sustainability (\*)
- Country ownership
- Gender equality and women’s empowerment
- Cross-cutting issues (improved governance, climate change mitigation and adaptation, capacity development, knowledge management, etc., as relevant)
- GEF Additionality
- Catalytic Role / Replication Effect
- Progress to impact

#### iv. Main Findings, Conclusions, Recommendations and Lessons Learned

- The TE team will include a summary of the main findings of the TE report. Findings should be presented as statements of fact that are based on analysis of the data.

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

- The section on conclusions will be written in light of the findings. Conclusions should be comprehensive and balanced statements that are well substantiated by evidence and logically connected to the TE findings. They should highlight the strengths, weaknesses and results of the project, respond to key evaluation questions and provide insights into the identification of and/or solutions to important problems or issues pertinent to project beneficiaries, UNDP and the GEF, including issues in relation to gender equality and women’s empowerment.
- Recommendations should provide concrete, practical, feasible and targeted recommendations directed to the intended users of the evaluation about what actions to take and decisions to make. The recommendations should be specifically supported by the evidence and linked to the findings and conclusions around key questions addressed by the evaluation.
- The TE report should also include lessons that can be taken from the evaluation, including best practices in addressing issues relating to relevance, performance and success that can provide knowledge gained from the particular circumstance (programmatic and evaluation methods used, partnerships, financial leveraging, etc.) that are applicable to other GEF and UNDP interventions. When possible, the TE team should include examples of good practices in project design and implementation.
- It is important for the conclusions, recommendations and lessons learned of the TE report to include results related to gender equality and empowerment of women.

The TE report will include an Evaluation Ratings Table, as shown in the ToR Annex F.

### 6. Expected Outputs and Deliverables

The TE Consultant shall prepare and submit:

- **TE Inception Report:** TE team clarifies objectives and methods of the TE no later than *2 weeks* before the TE mission or online interviews with relevant stakeholders. TE team submits the Inception Report to the Commissioning Unit and project management. Approximate due date: *(19/10/2021)*
- **Presentation:** TE team presents initial findings to project management and the Commissioning Unit at the end of the TE mission online interviews with relevant stakeholders and counterparts. Approximate due date: *(09/11/2021)*
- **Draft TE Report:** TE team submits full draft report with annexes *within 3 weeks* of the end of the TE mission or online interviews with relevant stakeholders. Approximate due date: *(01/12/2021)*
- **Final TE Report\* and Audit Trail:** TE team submits revised report, with Audit Trail detailing how all received comments have (and have not) been addressed in the final TE report, to the Commissioning Unit *within 1 week* of receiving UNDP comments on draft. Approximate due date: *(10/12/2021)*

\*The final TE report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

All final TE reports will be quality assessed by the UNDP Independent Evaluation Office (IEO). Details of the IEO’s quality assessment of decentralized evaluations can be found in Section 6 of the UNDP Evaluation Guidelines. <http://web.undp.org/evaluation/guideline/>

### 7. TE Arrangements

The principal responsibility for managing the TE resides with the Commissioning Unit. The Commissioning Unit for this project’s TE is the UNDP Country Office in Turkmenistan.

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

The Commissioning Unit will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country (if applicable) for the TE team. The Project Team will be responsible for liaising with the TE team to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

### **8. Duration of the Work**

The total duration of the TE will be approximately *26 working days* over a time period of *9 weeks* starting on 10/10/2021. The tentative TE timeframe is as follows:

- 20/08/2021: Application closes
- 05/10/2021: Selection of TE Team
- 10/10/2021: Preparation of the TE team (handover of project documents)
- 10/10/2021: 4 days: Document review and preparing TE Inception Report
- 19/10/2021: 1 day: Finalization and Validation of TE Inception Report- latest start of TE mission
- 28/10/2021: 10 days: TE mission or online consultations: stakeholder meetings, interviews, field visits or online interviews with relevant stakeholders and counterparts
- 09/11/2021: 1 day: Mission wrap-up meeting & presentation of initial findings- earliest end of TE mission
- 15/11/2021: 8 days: Preparation of draft TE report
- 01/12/2021: 1 day: Circulation of draft TE report for comments
- 10/12/2021: 1 day: Incorporation of comments on draft TE report into Audit Trail & finalization of TE report
- 15/12/2021: Preparation & Issue of Management Response
- 06/01/2022: Expected date of full TE completion

The expected date start date of contract is 10/10/2021.

### **9. Duty Station**

The TE assignment is expected to be home-based in case if current travel restrictions due to COVID-19 pandemic are not eased. However, in case if travel restrictions are eased it is absolutely essential that shortly after the start of the assignment the international consultant travels to Turkmenistan for a period of 2 weeks (10 working days, not including weekends) to meet with all relevant stakeholders and conducts field missions to Kaahka and Geokdepe project sites.

#### **Travel:**

- International travel might be required to Turkmenistan during the TE mission;
- The BSAFE course must be successfully completed prior to commencement of travel;
- Individual Consultants are responsible for ensuring they have vaccinations/inoculations when travelling to certain countries, as designated by the UN Medical Director.
- Consultants are required to comply with the UN security directives set forth under: <https://dss.un.org/dssweb/>
- All related travel expenses should be included to the **Letter of Confirmation of Interest and Availability**.

## **REQUIRED SKILLS AND EXPERIENCE**

### **10. TE Team Composition and Required Qualifications**



## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

A team of *two independent evaluators* will conduct the TE – *one team leader (with experience and exposure to projects and evaluations in other regions) and one local team expert*. The team leader will *be responsible for the overall design and writing of the TE report*. The team expert will *assess emerging trends with respect to regulatory frameworks, budget allocations, capacity building, work with the Project Team in developing the TE itinerary, etc.*

The evaluator(s) cannot have participated in the project preparation, formulation and/or implementation (including the writing of the project document), must not have conducted this project’s Mid-Term Review and should not have a conflict of interest with the project’s related activities.

The selection of evaluators will be aimed at maximizing the overall “team” qualities in the following areas:

### Corporate Competencies:

- Demonstrates integrity by modeling the UN’s values and ethical standards;
- Promotes the vision, mission, and strategic goals of UNDP;
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability;
- Treats all people fairly without favoritism;
- Fulfills all obligations to gender sensitivity and zero tolerance for sexual harassment.

### Functional Competencies:

- Competence in adaptive management;
- Knowledge of and work experience in the energy efficiency related water and agriculture projects, including those funded by the GEF;
- Excellent training, facilitation and communication skills;
- Results driven, ability to work under pressure and to meet required deadlines;
- Good understanding and experience in the field of GHG emissions calculation and monitoring.

### Education

- Advanced University degree, Masters or preferably a PhD, in Energy, Environment, Business Administration, Economics, Engineering or related field is required;

### Experience

- Extensive (at least 10-year) work experience and proven track record with policy advice and/or project development/implementation in climate change and or water efficiency (including at least some experience with climate change and/or water projects) in transition economies is required;
- Experience working with the GEF or GEF project evaluations within the past seven years including experience with SMART based indicators (Project evaluation/review experiences within United Nations system will be considered an asset) is required;
- Experience working with international technical assistance projects in the Eastern Europe countries or CIS region in the past seven years (experience in Turkmenistan will be an asset) is required;
- Excellent communication and presentation skills;
- Demonstrable analytical skills.
- Project evaluation/review experience within United Nations system will be considered an asset;
- Experience with implementing evaluations remotely will be considered an asset

### Language

- Fluency in written and spoken English is required, knowledge of Russian will be an asset.

## **11. Evaluator Ethics**

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

The TE team will be held to the highest ethical standards and is required to sign a code of conduct upon acceptance of the assignment. This evaluation will be conducted in accordance with the principles outlined in the UNEG ‘Ethical Guidelines for Evaluation’. The evaluator must safeguard the rights and confidentiality of information providers, interviewees and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The evaluator must also ensure security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process must also be solely used for the evaluation and not for other uses without the express authorization of UNDP and partners.

### 12. Payment Schedule

- 20% payment upon satisfactory delivery of the final TE Inception Report and approval by the Commissioning Unit
- 40% payment upon satisfactory delivery of the draft TE report to the Commissioning Unit
- 40% payment upon satisfactory delivery of the final TE report and approval by the Commissioning Unit and RTA (via signatures on the TE Report Clearance Form) and delivery of completed TE Audit Trail

Criteria for issuing the final payment of 40%

- The final TE report includes all requirements outlined in the TE TOR and is in accordance with the TE guidance.
- The final TE report is clearly written, logically organized, and is specific for this project (i.e. text has not been cut & pasted from other TE reports).
- The Audit Trail includes responses to and justification for each comment listed.

## APPLICATION PROCESS

### 13. Recommended Presentation of Proposal

Interested individual consultants must submit the following documents/information to demonstrate their qualifications:

All experts applying for this position are required to provide:

- Brief description of **approach to work/technical proposal** of why the individual considers him/herself as the most suitable for the assignment, and a proposed methodology on how they will approach and complete the assignment; (max 1 page);
- Financial Proposal with the references to (1) the daily rate for the assignment and within the timing scale indicated in the present TOR, and (2) any other expenses (including transportation costs, accommodation costs, the possibility of vaccination and etc.). Template of the **Letter of Confirmation of Interest and Availability** can be found at: <http://www.tm.undp.org/content/turkmenistan/en/home/procurement.html>. The UNDP will enter into an Individual Contract based on a lump sum amount. The financial proposal shall represent a detailed, justified and “all inclusive” amount. In order to assist UNDP in the comparison of financial proposals, the financial proposal shall include a breakdown of this lump sum amount, including: a daily fee for the tasks and an estimated duration as specified in this announcement, travel (to and

## Terminal Evaluation: “EE and RE for Sustainable Water Management in Turkmenistan”

from the missions), per diems, any other possible costs (including vaccinations, dwelling, communication etc.);

- Cover letter explaining why they are the most suitable candidate for the assignment;
- Resume /CV.

Note (Conflict of Interest): Any individual who participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) is ineligible to participate in this bidding.

### **15. Criteria for the Selection of Best Offer**

Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the financial proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP’s General Terms and Conditions will be awarded the contract.

When using this method, the award of the contract should be made to the individual consultant whose offer has been evaluated and determined as:

- Responsive/compliant and having received the highest score – out of 100 points.

Out of the maximum score, the score for technical criteria equals 70% - maximum 70 points, and for financial criteria 30%.

The technical evaluation will take into account the following as per the scoring provided:

- Educational background (Advanced University degree, Masters or preferably a PhD, in Energy, Environment, Business Administration, Economics, Engineering or related field) – 10 points max; (PhD related to Energy/Environment/Natural Resources/Water/Climate Change = 10 points, PhD related to other relevant topic = 8 points, Masters related to Energy/Environment = 6 points, Masters related to other relevant topic = 4 points, combined (2 or more) Masters related to relevant topics = 8);
- Extensive (at least 10-year) work experience and proven track record with policy advice and/or project development/implementation in climate change and or water efficiency (including at least some experience with climate change and/or water projects) in transition economies – 20 points max (more points if experience specifically includes experience related to both climate change and/or water efficiency projects; more than 20 years = 17 points, 15-20 years = 12 points, 14-10 years = 7 points, 6-9 years = 2 points.) The consultant shall score +3 points if they have specific work experience related to other projects dealing with the issues of both climate change and also specifically related to water efficiency. If the consultant has only specific experience related to one of these two areas then they shall score +1 point;
- Experience working with the GEF or GEF project evaluations within the past seven years including experience with SMART based indicators (Project evaluation/review experiences within United Nations system will be considered an asset) – 20 points max (excellent evidences of the required experience = 20 points (3 assignments or more); very good evidence (2 or more assignments) = 14 points satisfactory evidences (1 other relevant GEF evaluation experience) = 8 points; no evidence of ever having evaluated a GEF project = 0 points);
- Experience working with international technical assistance projects in the Eastern Europe countries or CIS region in the past seven years (experience in Turkmenistan will be an asset and persons who have worked in Turkmenistan before on technical assistance projects will score 10 points) – 20

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points max (strong experience (4 assignments or more or at least 1 prior assignment in Turkmenistan) = 20 points; very good experience (3 other assignments or more) = 14 points, good experience (2 assignments or more) = 8 points, satisfactory experience (1 assignment or more) – 6 points, no experience = 0);

- Methodology on how IC will approach and complete the assignment – 10 points max;
- Interview – 10 points max;
- Language skills (English required, knowledge of Russian will be an asset) – 10 points max (10 points for superior writing and oral skills in English + at least some knowledge of Russian; 7 points for superior writing and oral skills in English but no Russian, 4 points for average English and satisfactory writing skills, 1 point for poor English fluency and poor writing skills). Writing skills will be judged by the quality of the 1-page cover letter with the brief description of the approach to the work to be carried out to be sent with this application.

Maximum available technical (education, experience and competencies) score – 100 points.

Additional requirements for recommended contractor:

Recommended contractors aged 65 and older, and if the travel is required, shall undergo a full medical examination including x-ray, and obtain medical clearance from the UN-approved doctor prior to taking up their assignment. The medical examination is to be cleared by the UN physicians, and shall be paid by the consultant.

### 15. Annexes to TE ToR

- **ToR Annex A: Project Logical/Results Framework**
- **ToR Annex B: Project Information Package to be reviewed by TE team**
- **ToR Annex C: Content of the TE report**
- **ToR Annex D: Evaluation Criteria Matrix template**
- **ToR Annex E: UNEG Code of Conduct for Evaluators**
- **ToR Annex F: TE Rating Scales and TE Ratings Table**
- **ToR Annex G: TE Report Clearance Form**
- **ToR Annex H: TE Audit Trail template**

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### ***ToR ANNEX C: Contents of the TE Report***

1 Executive Summary (maximum 4 pages)

A concise Executive Summary (maximum 4 pages) should precede the Introduction section of the TE report and must include:

- a Project Information Table (ToR Table 1);
- a brief description of the project;
- a completed Evaluation Ratings Table (ToR Table 2) using the specified rating scales (ToR Table 3);
- a concise summary of findings and conclusions
- synthesis of the key lessons learned (bullet points; one-page maximum);
- a Recommendations Summary Table. (ToR Table 4).

ToR Table 1 Project Information Table

Project Details		Project Milestones	
Project Title		PIF Approval Date:	
UNDP Project ID (PIMS #):		CEO Endorsement Date (FSP) / Approval date (MSP):	
GEF Project ID:		ProDoc Signature Date:	
UNDP Atlas Business Unit, Award ID, Project ID:		Date Project Manager hired:	
Country/Countries:		Inception Workshop Date:	
Region:		Mid-Term Review Completion Date:	
Focal Area:		Terminal Evaluation Completion date:	
GEF Operational Programme or Strategic Priorities/Objectives:		Planned Operational Closure Date:	
Trust Fund:			
Implementing Partner (GEF Executing Agency)			
NGOs/CBOs involvement:			
Private sector involvement:			

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Geospatial coordinates of project sites:		
Financial Information		
PDF/PPG	at approval (US\$M)	at PDF/PPG completion (US\$M)
GEF PDF/PPG grants for project preparation		
Co-financing for project preparation		
Project	at CEO Endorsement (US\$M)	at TE (US\$M)
[1] UNDP contribution:		
[2] Government:		
[3] Other multi-/bilaterals:		
[4] Private Sector:		
[5] NGOs:		
[6] Total co-financing [1 + 2 + 3 + 4 + 5]:		
[7] Total GEF funding:		
[8] Total Project Funding [6 + 7]		

ToR Table 2: Evaluations Ratings Table for “*Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan*” project

Monitoring and Evaluation (M&E)	Rating
M&E design at entry	
M&E Plan Implementation	
Overall Quality of M&E	
Implementation and Execution	
Quality of UNDP Implementation/Oversight	

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Quality of Implementing Partner Execution	
Overall quality of Implementation/Execution	
Assessment of Outcomes	
Relevance	
Effectiveness	
Efficiency	
Overall Project Outcome Rating	
Sustainability	
Financial sustainability	
Socio-political/economic sustainability	
Institutional framework and governance sustainability	
Environmental sustainability	
Overall Likelihood of Sustainability	

ToR Table 3 TE Rating Scales

Ratings for Outcomes, Effectiveness, Efficiency, M&E, Implementation/Oversight, Execution, Relevance	Sustainability ratings:
<p>6 = Highly Satisfactory (HS): exceeds expectations and/or no shortcomings</p> <p>5 = Satisfactory (S): meets expectations and/or no or minor shortcomings</p> <p>4 = Moderately Satisfactory (MS): more or less meets expectations and/or some shortcomings</p> <p>3 = Moderately Unsatisfactory (MU): somewhat below expectations and/or significant shortcomings</p> <p>2 = Unsatisfactory (U): substantially below expectations and/or major shortcomings</p> <p>1 = Highly Unsatisfactory (HU): severe shortcomings</p> <p>Unable to Assess (U/A): available information does not allow an assessment</p>	<p>4 = Likely (L): negligible risks to sustainability</p> <p>3 = Moderately Likely (ML): moderate risks to sustainability</p> <p>2 = Moderately Unlikely (MU): significant risks to sustainability</p> <p>1 = Unlikely (U): severe risks to sustainability</p> <p>Unable to Assess (U/A): Unable to assess the expected incidence and magnitude of risks to sustainability</p>

ToR Table 4 Recommendations Table

Rec #	TE Recommendation	Entity Responsible	Time frame
A	Category 1:		
A.1	<i>Key recommendation:</i>		
A.2			

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A.3			
B.	Category 2:		
B.1	<i>Key recommendation:</i>		
B.2			
B.3			
C.	Category 3:		
C.1	<i>Key recommendation:</i>		
C.2			
C.3			
D.	Category 4:		
D.1	<i>Key recommendation:</i>		
D.2			
D.3			
E.	Category 5:		
E.1	<i>Key recommendation:</i>		
E.2			
E.3			

2. Introduction (2-3 pages maximum)

- A) Evaluation purpose
- B) Scope of the Evaluation
- C) Methodology
- D) Data Collection and Analysis
- E) Ethics
- F) Limitations

3. Project description (3-6 pages maximum)

- **Project start and duration**, including project cycle milestones.
- **Development context:** environmental, socio-economic, institutional, and policy factors relevant to the project objective and scope: Significant socio-economic and environmental changes since the beginning of project implementation and any other major external contributing factors.



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- **Problems that the project sought to address:** How the project objectives fit into the partner government’s strategies and priorities; GEF and UNDP priorities and programming; and how they are linked to relevant Sustainable Development Goals (SDG) targets/indicators
- **Immediate and development objectives** of the project
- **Description of the project’s Theory of Change** including description of the outputs, outcomes, intermediate states, and intended long-term environmental impacts of the project; the causal pathways for the long-term impacts; and, implicit and explicit assumptions. The project’s objective(s) should also be included within the theory of change. Where appropriate, after consultations with project stakeholders, the TE team may refine the theory of change. Where an explicit theory of change is not provided for the project, the TE team should develop one based on information provided in the project documentation and through consultations with stakeholders.
- Expected results
- **Total resources** that have been identified for the project, including approved grant financing from the GEF Trust Fund (GEF TF), Least Developed Countries Fund (LDCF) or Special Climate Change Fund (SCCF) and expected co-financing from other sources
- Summary of **main stakeholders** involved in implementation and their roles
- **Key partners involved in the project**, including UNDP, other joint implementing partners, executing agencies, country counterparts – including the GEF Operational Focal Point – and other key stakeholders
- How this evaluation fits within the **context of other ongoing and previous evaluations**, for example if a Mid-Term Review was also carried out for the project, or if another implementing partner has evaluated this or a closely linked project

The TE report should include geo-referenced maps and/or coordinates that demarcate the planned and actual area covered by the project. Also, where feasible, the TE report should include geo-referenced photos of the sites where GEF-supported interventions were undertaken.

### 4. Findings

#### 4.1 Project Design/Formulation

*4.1.1 Analysis of Results Framework: project logic and strategy, indicators*

*4.1.2 Assumptions and Risks*

*4.1.3 Lessons from other relevant projects (e.g. same focal area) incorporated into project design*

*4.1.4 Planned stakeholder participation*

*4.1.5 Linkages between project and other interventions within the sector*

*4.1.6 Gender responsiveness of project design*

*4.1.7 Social and Environmental Safeguards*

#### 4.2 Project Implementation

*4.2.1 Adaptive Management*

*4.2.2 Actual stakeholder participation and partnership arrangements*

*4.2.3 Project Finance and Co-finance*

ToR Table 5: Co-financing Table

Co-financing (type/source)	UNDP financing (US\$m)		Government (US\$m)		Partner Agency (US\$m)		Total (US\$m)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants								

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Loans/Concessions								
In-kind support								
Other								
Totals								

ToR Table 6. Confirmed Sources of Co-financing at TE stage

Sources of Co-Financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount (US\$)
Select one: • GEF Agency • Donor Agency • Recipient Country Gov't • Private Sector • Civil Society Organization • Beneficiaries • Other		Select one: • Grant • Loan • Equity Investment • Public Investment • Guarantee • In-Kind • Other	Select one: • Investment mobilized* • Recurrent expenditure**	
Total Co-Financing				

*Monitoring & Evaluation: design at entry (\*), implementation (\*), overall assessment of M&E (\*)*

Monitoring & Evaluation (M&E)	Rating
M&E design at entry	
M&E Plan Implementation	
Overall Quality of M&E	

ToR Table 7. Monitoring and Evaluation Rating Scale

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Rating	Description:
6 = Highly Satisfactory (HS) 5 = Satisfactory (S) 4 = Moderately Satisfactory (MS) 3 = Moderately Unsatisfactory (MU) 2 = Unsatisfactory (U) 1 = Highly Unsatisfactory (HU) Unable to Assess (U/A)	<p>There were no short comings; quality of M&amp;E design/implementation exceeded expectations</p> <p>There were minor shortcomings; quality of M&amp;E design/implementation met expectations</p> <p>There were moderate shortcomings; quality of M&amp;E design/implementation more or less met expectations</p> <p>There were significant shortcomings; quality of M&amp;E design/implementation was somewhat lower than expected</p> <p>There were major shortcomings; quality of M&amp;E design/implementation was substantially lower than expected</p> <p>There were severe shortcomings in M&amp;E design/implementation</p> <p>The available information does not allow an assessment of the quality of M&amp;E design/implementation.</p>

*UNDP implementation/oversight (\*), Implementing Partner execution (\*) and overall assessment of implementation/oversight and execution (\*)*

UNDP Implementation/Oversight & Implementing Partner Execution	Rating
Quality of UNDP Implementation/Oversight	
Quality of Implementing Partner Execution	
Overall quality of Implementation/Oversight and Execution	

ToR Table 8. **Implementation/Oversight and Execution Ratings Scale**

Rating	Description:
6 = Highly Satisfactory (HS) 5 = Satisfactory (S) 4 = Moderately Satisfactory (MS) 3 = Moderately Unsatisfactory (MU) 2 = Unsatisfactory (U) 1 = Highly Unsatisfactory (HU) Unable to Assess (U/A)	<p>There were no short comings; quality of implementation/execution exceeded expectations</p> <p>There were minor shortcomings; quality of implementation/execution met expectations</p> <p>There were moderate shortcomings; quality of implementation/execution more or less met expectations</p> <p>There were significant shortcomings; quality of implementation/execution was somewhat lower than expected</p>

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	<p>There were major shortcomings; quality of implementation/execution was substantially lower than expected</p> <p>There were severe shortcomings in quality of implementation/execution</p> <p>The available information does not allow an assessment of the quality of M&amp;E design/implementation.</p>
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### 4.2.4 Risk Management

## 4.3 Project Results and Impacts

### 4.3.1 Progress Towards Objective and Expected Outcomes

#### 4.3.2 Relevance (\*)

#### 4.3.3 Effectiveness (\*)

#### 4.3.4 Efficiency (\*)

#### 4.3.5 Overall Project Outcome (\*)

Assessment of Outcomes	Rating
Relevance	
Effectiveness	
Efficiency	
Overall Project Outcome Rating	

ToR Table 9. Outcome Ratings Scale - Relevance, Effectiveness, Efficiency

Rating	Description:
6 = Highly Satisfactory (HS)	Level of outcomes achieved clearly exceeds expectations and/or there were no shortcomings
5 = Satisfactory (S)	Level of outcomes achieved was as expected and/or there were no or minor shortcomings
4 = Moderately Satisfactory (MS)	Level of outcomes achieved more or less as expected and/or there were moderate shortcomings.
3 = Moderately Unsatisfactory (MU)	Level of outcomes achieved substantially lower than expected and/or there were major shortcomings.
2 = Unsatisfactory (U)	Only a negligible level of outcomes achieved and/or there were severe shortcomings
1 = Highly Unsatisfactory (HU)	The available information does not allow an assessment of the level of outcome achievements
Unable to Assess (U/A)	

### 4.3.6 Sustainability: financial(\*), socio-political(\*), institutional framework and governance(\*), environmental(\*), overall likelihood of sustainability(\*)

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Sustainability	Rating
Financial sustainability	
Socio-political sustainability	
Institutional framework and governance sustainability	
Environmental sustainability	
Overall likelihood of sustainability	

ToR Table 10. **Sustainability Ratings Scale**

Rating	Description:
6 = Highly Satisfactory (HS)	There are little or no risks to sustainability
5 = Satisfactory (S)	There are moderate risks to sustainability
4 = Moderately Satisfactory (MS)	There are significant risks to sustainability
3 = Moderately Unsatisfactory (MU)	There are severe risks to sustainability
2 = Unsatisfactory (U)	Unable to assess the expected incidence and magnitude of risks to sustainability
1 = Highly Unsatisfactory (HU)	
Unable to Assess (U/A)	

### 4.3.7 Country ownership

### 4.3.8 Gender equality and women’s empowerment

### 4.3.9 Cross-cutting Issues

### 4.3.10 GEF Additionality

ToR Table 11. **Six Areas of GEF’s Additionality**

GEF’s Additionality	Description
Specific Environmental Additionality	The GEF provides a wide range of value-added interventions/services to achieve the Global Environmental Benefits (e.g. CO <sub>2</sub> reduction, Reduction/avoidance of emission of POPs).
Legal/Regulatory Additionality	The GEF helps stakeholders transformational change to environment sustainable legal /regulatory forms.
Institutional Additionality/Governance additionality	The GEF provides support to the existing institution to transform into efficient/sustainable environment manner.

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Financial Additionality	The GEF provides an incremental cost which is associated with transforming a project with national/local benefits into one with global environmental benefits.
Socio-Economic Additionality	The GEF helps society improve their livelihood and social benefits thorough GEF activities.
Innovation Additionality	The GEF provides efficient/sustainable technology and knowledge to overcome the existing social norm/barrier/practice for making a bankable project.

### 4.3.11 Catalytic/Replication Effect

ToR Table 12. **Assessment of Catalytic Role**

Scaling up	Approaches developed through the project are taken up on a regional / national scale, becoming widely accepted, and perhaps legally required
Replication	Activities, demonstrations, and/or techniques are repeated within or outside the project, nationally or internationally
Demonstration	Steps have been taken to catalyze the public good, for instance through the development of demonstration sites, successful information dissemination and training
Production of public good	The lowest level of catalytic result, including for instance development of new technologies and approaches. <i>f</i> No significant actions were taken to build on this achievement, so the catalytic effect is left to ‘market forces’

### 4.3.12 Progress to Impact

### 4.3.13 Main Findings, Conclusions, Recommendations, Lessons Learned

- Main Findings
- Conclusions
- Recommendations
- Lessons Learned

### 4.3.14 Annexes

- Annex 1. Glossary of Terms

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## **Annex 7: Terminal Evaluation Audit Trail**

The Terminal Evaluation Audit Trail was developed and submitted to the UNDP CO Turkmenistan in a separate file.

## **Annex 8: GEF Tracking Tool**

The GEF Tracking Tools for climate change and land degradation with terminal results were reviewed and are provided in a separate files.

## **Annex 9: TE Report Content Review Checklist**

Content Review Checklist is annexed in a separate file.

## Annex 10: Terminal Evaluation Clearance Form

Evaluation Report for the Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan Project (PIMS# 4947) was Reviewed and Cleared by:

Commissioning Unit (M&E Focal Point)

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Regional Technical Advisor (Nature, Climate and Energy)

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_