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**Final report**

**Midterm Review**

**full-sized UNDP-GEF project**

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

MTR time frame: July- September 2018

date of MTR report October 30, 2018

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|  |  |
| --- | --- |
| **Project:** | Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan |
| **Region:** | Central Asia |
| **Country:** | Turkmenistan |
| **Project ID:**  **Focal Area:** | UNDP PIMS ID: 4927 GEF Project ID: 5536  Climate Change Mitigation; Land Degradation (GEF-5) |
| **Implementing Agency:** | United Nations Development Programme |
| **Executing Agency:** | Ministry of Agriculture and Water Economy |

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###### **Acronyms**

|  |  |
| --- | --- |
| AWP  APR  AF | Annual Work Plan  Annual Progress Report  Adaptation Fund |
| CDP | Capacity Development Programme |
| CDF | Capacity Development Framework |
| CDR  CEO  CCM | Combined Delivery Report  Chief Executive Officer  Climate change mitigation |
| CTA  CO  DISOs  DPMAs | Chief Technical Advisor  County Office  district water management agencies- irrigation system operators  district production management agencies |
| EE | Energy Efficiency |
| EU  EECCA  EUWI | European Union  Eastern Europe, the Caucasus and Central Asia  European Union Water Initiative |
| EERE | Energy Efficiency and Renewable Energy |
| FAO | Food and Agriculture Organization of the United Nations |
| FSP | Full-Sized Project |
| GEF | Global Environment Facility |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit |
| GHG | Greenhouse gases |
| GoT | Government of Turkmenistan |
| IRH | UNDP Istanbul Regional Hub |
| IR | Inception report |
| IWRM | Integrated Water Resource Management |
| LD | Land Degradation |
| LPAC  LL | Local Project Advisory Committee  Lessons Learnt |
| M&E | Monitoring and Evaluation |
| MAWE | Ministry of Agriculture and Water Economy |
| MoA  MoE  MTR  MoNP | Ministry of Agriculture (former)  Ministry of Energy  Midterm Review  Ministry of Nature Protection |
| MoWE | Ministry of Water Economy (former) |
| NAP  NAS | National Adaptation Plan  National Academy of Sciences |
| NIM | National Implementation Modality |
| NSCC | National Strategy on Climate change |
| NEPAAM | National Economic Programme of Action on Adaption and Mitigation to Climate Change |
| NGO | Non-Governmental Organisation |
| NLEDP | National Low Emission Development Plan |
| NPC  NPD  OECD | National Project Coordinator  National Policy Dialogue  Organization for Economic Cooperation and Development |
| OIU  O&M  PB | Operations Implementation Unit  Operation and Maintenance  Project Board |
| PM | Project Manager |
| PIR | Project Implementation Review |
| PIF | Project Identification form |
| PRF | Project Results Framework |
| PPG | Project Preparation Grant |
| ProDoc  QA/QC  QORs  RCU | Project Document  Quality Assurance and Quality Control  Quarterly Operational Reports  Regional Coordination Unit |
| RE  RRF | Renewable Energy  Results and Resources Framework |
| RTA | Regional Technical Advisor |
| SIWMD  SAU  SCNPLR | State Institute of Water Management Design  State Agriculture University  State Committee on Nature Protection and Land Resources |
| SLM  SNIP  SNT  SCRL | Sustainable Land Management  Building Codes (Строительные нормы и правила)  Construction norms of Turkmenistan (revised SNIPs)  Supporting Climate Resilient Livelihoods in Agricultural Communities in Drought-prone Areas of Turkmenistan |
| TAC  TNA  TAP | Technical Advisory Committee  Technology Needs Assessment  Technology Action Plan |
| TMT | Turkmenistan Manat |
| TBD  TRAC | To Be Defined  Target for Resource Assignments from the Core |
| ToR | Terms of Reference |
| UNDAF | UN five-year Development Assistance Framework |
| UNDP  UNEG | United Nations Development Programme  United Nations Evaluation Group |
| UNDP CO | United Nations Development Programme Country Office |
| UNFCCC  UNECE  USAID  USSR  WDP  WHO | UN Framework Convention on Climate Change  United Nations Economic Commission for Europe  United States Agency for International Development  Union of Soviet Socialist Republics  Water Development Program  World Health Organization |

Measurement Units

|  |  |
| --- | --- |
| GJ | gigajoule |
| g/l | gram per litre |
| ha | hectare |
| km | kilometre |
| kW | kilowatt |
| l/s | Litre/second |
| m3 | Cubic metre |
| Mt | Megaton |
| MWh | Megawat/hour |
| tCO2e | Tons of CO2 equivalent |
| US$ | United States dollar |

# **EXECUTIVE SUMMARY**

***Table 1 Project Information Table***

|  |  |
| --- | --- |
|  |  |
| **Project:** | Energy Efficiency and Renewable Energy (EERE) for Sustainable Water Management in Turkmenistan |
| **Project ID:** | UNDP PIMS ID: 4927; GEF Project ID: 5536 |
| **Executing Agency:** | Ministry of Agriculture and Water Economy (MAWE) |
| **Region:** | Central Asia |
| **Country:** | Turkmenistan |
| **Focal Area:** | Climate Change Mitigation; Land Degradation - GEF-5 |
| **Implementing Agency:** | United Nations Development Programme (UNDP) |
| **MTR time frame** | July- September 2018 |
| **MTR report date** | September 30, 2018 |
| **MTR Consultants** | Lilit V Melikyan (Team leader); Irina Atamuradova (National Consultant) |

#### **Project Description in brief**

Water management is a defining aspect of the economy and environment in the hot, arid conditions of Turkmenistan. Irrigated agriculture accounts for ninety (90) percent of total water consumption, supplied by aging, energy-intensive infrastructure. About fifty (50) percent of water is lost between withdrawal and ultimate delivery. Water management also plays a direct role as both a cause and a potential remedy for extensive and often severe problems of land degradation in Turkmenistan. 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. It consists of four components. While the first two components (for agriculture and infrastructure, respectively) were seen as defining the technical opportunity and priorities for replication, the second two components were seen as seeking to carry out the actual replication on a national scale. In particular:

* **1st component**coversidentification, verification and documenting of the most promising ways to save water, increase energy efficiency, and reduce water-related root causes of land degradation in Turkmenistan;
* **2nd component** supportsgenerating 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;
* **3rd component** aims at the 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; and
* **4th component,** working from the top down, aims at defining and implementing policies, programs, and investment plans for integrated water resources management (IWRM) and sustainable land management (SLM) at the national level.

***Project Progress Summary***

At midterm the EERE has made significant progress towards achieving its planned results, but the focus has been primarily on (a) drafting three regulations under the Water Code, and (b) three pilots, as described below:

* the **Green polygon in Geokdepe** is completed and trials are ongoing with the tentative promising results, potentially changing the existing norms on irrigation techniques permissible for salinized lands. Two (2) PhD students from two higher educational institutions carry out research at the site;
* the **Gravity based water pipeline in Kaahka** is completed with a number of innovative elements; water losses are almost eliminated in the part of and when using the system instead of the open canal which was in its place. However, the existing system of wells will need to be partially used during the three to four months per year with possible consequences for the planned energy saving and greenhouse gas (GHG) reductions; and
* the **energy audits of 121 pumps is completed** with the procurement of the replacement of five to ten old pumps ongoing at the time of the Midterm Review (MTR).

There has been little progress on the remaining two pilots: (a) solar power- based water supply and purification systems in Karakum, and (b) identification of new canal materials with subsequent support on starting local production. There has been little progress in the part of the institutionalization/policy frameworks except for the drafting of four legislative acts mentioned. Only 50 people have been trained so far. Table 2 summarizes the achievements along the planned outcomes and corresponding ratings.

*Table 2: Achievement ratings*

|  | Performance | Rating | **Achievement Description** |
| --- | --- | --- | --- |
| **Progress to results - Component 1** | **Outcome 1.** Enhancement of the national knowledge base and delivery of new technical information on appropriate technology – government and farmers | **S** | No indictor to capture the enhancement of knowledge base and delivery of technical information, but the achievements at Geokdepe and Kaahka as well as the pump audit program have strong potential to contribute to national knowledge base |
| **Outcome 2.** New processes established and implemented for planning, deployment, and financial assessment both before and after deployment of IWRM, pump audits and maintenance, and solar-powered water pumping and purification | **MS** | 121 pumps were audited instead of 100 planned. The methodology needs to be better documented with more systematic knowledge transfer; and  The target on the number of people benefiting from the solar powered water pumping and purification systems (500) was not achieved: the pilot has not started as yet |
| **Outcome 3.** Direct energy savings, water savings, and reduction of land degradation from the selected projects | **MS** | The midterm targets atGeokdepe for both water saving were not met given the completion less than a year ago. Meeting of the endline targets is possible but the plot size at 145 ha and not 170 (used for the calculations of targets) has to be noted, as it contains a risk factor. The midterm target for land reclamation was met - with 100 ha, surpassing the target of 50ha  The midterm target for energy saving was met as it is about “*suppliers identified for replacement”* |
| **Progress to results Component 2** | **Outcome 4**. Reduction of water losses and associated energy consumption via direct investment in a large-scale infrastructure project on municipal water supply | **MS** | For Kaahka:  (a) The midterm targets for reduction of water losses, and energy saving were met, given that the targets are defined as “*the extent of the completion of the construction of the pipeline”* (there are risks with meeting the endline target on energy saving); and  (b) The midterm target for replication “*Draft design completed, all stakeholders agree on details, funding also agreed*” was not met. |
| **Outcome 5**. Technical, environmental, and financial justification to scale-up investment in canal linings and/or other widespread infrastructure improvements to reduce water losses, associated energy consumption, and land degradation | **MU** | The pilot on canal lining had just begun at the time of the midterm review, and so the midterm target of “*Procurement started, contracts concluded*” is not met. The end-line target of “*Two production lines operational with 400km lined*” is too ambitious and unlikely to be met (arguably this was overly ambitious from the start). |
| **Progress to results -Component 3** | **Outcome 6**. Technologies and investments for IWRM and SLM approved according to new Technology Action Plans (TAPs) in five (5) *velayats* | **MU** | The midterm target of “*Methodology tested in one Velayat (of 3 selected earlier) as a pilot*” is not met, At the time of the review the methodology was being developed, but the plans for testing were not finalized |
| **Outcome 7**. Institutional/human capacity for implementing IWRM and SLM utilized and sustained among farmers and local/regional water management officials in all five velayats via training/sharing Lessons Learnt | **MS** | The bullet points below summarize the situation along three indicators (note the confusion in indicators between the Inception report and the Project Implementation Reports (PIRs)):   * Share of positive feedback from the trainees, was met (89.3 percent against 70 percent for midterm). This indicator is not tracked but it is in the Results and Resources Framework (RRF) from the Inception report; * Number of people trained – 50, is rather low. There is no target, since this indicator is not in the RRF from the Inception report; and * Share of the staff (percent) of partner agencies trained: this indicator is in the RRF from the Inception report but not in PIR and hence not tracked. The midterm target is 25 percent; and unclear whether this was achieved |
| **Progress to results Component 4**  **omponent 4** | **Outcome 8.** Regulations adopted/enforced on: (a) pump performance and maintenance; and (b) staged onset of tariffs for end use of water | **S** | Four (4) regulations are developed for the Water Code, but none as yet on pump performance and maintenance. The rating is “S” however, since no indicator exists in the RRF specifically on the latter. Also, no indicator exists in the RRF on the revision of tariffs. |
| **Outcome 9.** Operational system established for measuring end-use water consumption | **MU** | The midterm target of “*Water measurement equipment is made operational*”, of the indicator “*Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No)”* is not met |
| **Outcome 10.** Policies and budget allocations adopted in support of expanded investment in improved irrigation and water infrastructure | **MS** | No formal submission was made to MAWE as a contribution to the “*Water Development Program of Turkmenistan for 2018-2024” (WDP 2018-2024)*” being developed. However, several project experts serve as part of the Working Group developing it, so informally the project is contributing and will likely have contributed to the development of the program by the end of the project. |
| **Progress to results -Project objective** | **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 Objective: (a)** Reduce direct energy use and Greenhouse Gas emissions associated with water management; and **(b**) prevent and remediate salinization of lands | **MS** | ***Three (3) Midterm targets of the indicators listed below were met***.   1. ***Number of regulations***: the mid-term target of “Technical specifications defined as at least two (1 at national level) regulations to update, legal procedures started” of the indicator “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 (#)” has been met, but with the caveat that the regulations currently being developed cover only water use efficiency; 2. ***Number of people benefiting***; the midterm target of “10,000 direct and 100,000 indirect beneficiaries” of the indicator “Number of people directly (and indirectly) benefiting from measures on better water management, efficient water use, energy saving and land degradation in Turkmenistan” has been met (even with Kaahka alone); and 3. ***Land reclamation:*** the midterm target of land reclamation was met with 100 ha, surpassing the target of 50ha.   The target forco-financing was almost met (US$35.3 million actual, $42.0 million planned)  ***The following three (3) midterm targets were not met***:   * ***Direct GHG reduction:*** the target “*150,000 tCO2 reduction*”; * ***Energy saving***: the target of “*Energy consumption calculation is introduced on regular basis in each pilot project under implementation*”; and * ***Water saving***: the target of “*85,000 m3/ha/year of normalized water consumptio*n” |
| **Implementation & Management** | **Project Implementation & Adaptive Management** | **MS** | All aspects of project management (work planning and reporting, visibility, stakeholder engagement at sufficient scale, etc.) need improvement. The implementation of some of the components (the pilots in Kaahka and Geokdepe in particular) is leading to efficient and effective project implementation and adaptive management, but the implementation of some components requires remedial action (the remaining pilots and Components 3 and 4 in particular), with, *inter alia*, the support of an international/regional/national consultants and an international Chief Technical Adviser (CTA), with the latter advising also on project management issues |
| **Sustainability** | **Likelihood of Sustainability** | **ML** | There are moderate risks to sustainability, but the expectation is that at least some outcomes (in particular the Outcome 1 in the part of Geokdepe pilot; the pilot in Kaahka under Outcome 2) will be sustained given the progress towards results at the Midterm Review. |

#### **Summary conclusions in brief**

The project has made an impressive progress on the three large pilots, but the performance was uneven overall. In part, the latter is related to the project design being overly ambitious, in particular in relation to the pilot on canal lining as well as Component 4, with three policy frameworks targeted to be developed (on administrative reform, reforms of water measurement and pricing in irrigation, as well as budgeting planning), especially compared to the current level of staffing of the project.

While the results at the Green Polygon in Geokdepe are impressive and particularly important for the agricultural production on salinized lands, similar to those in Geokdepe (potentially leading to the change of certain norms), the applicability of these results to other areas (and also in relation to developing Technology Action Plans, planned under Output 3.1) needs to be addressed more robustly. One potential way is to combine the experimental testing with using modeling tools, like the Food and Agriculture Organization’s (FAO) *Aqua Crop*.

There is no firm data on water saving as yet across all the pilots, but the tentative results from Geokdepe and Kaahka are promising and there are no concerns in terms of meeting the endline targets. As for the energy saving and GHG reduction, while similarly, there are no firm data at midterm, there are some concerns related to endline targets for direct reduction given that: (a) the size of the plot in Geokdepe is smaller, with 145 hectares instead of 170 (here the replication, as planned, does not raise doubts); and (b) the pumps of the wells’ based water supply will be operating during three to four months a year in Kaahka (here there are also concerns about indirect reduction, given that there are no assurances as yet that the planned replication will materialize). As for the audit program, the amounts of direct reduction might be affected by replacing a smaller number of pumps than planned; here the replacement of the pumps by the Government is already happening, so meeting the indirect reduction targets looks possible.

The Government co-financing at midterm, while impressive at US$35.3, still falls short of the planned at midterm US$42.0 million.[[1]](#footnote-1) The endline target of US$72.0 million would be likely if the replication of gravity base canal materializes; otherwise there are significant risks.

The project is somewhat skewed towards water efficiency with less focus on climate change mitigation and even less so – on land degradation. In the remaining period it is recommended that this balance is restored with: (a) more involvement of the Ministry of Energy (MoE), including training of its experts; (b) development of legislative acts related to the pumps’ performance (as was planned in the Project Document); as well as (c) more comprehensive tracking of Land Degradation (LD) indicators at the pilot sites.

Overall, the list of the stakeholders with whom the project actively engages, is somewhat narrow (significantly narrower than envisioned in the ProDoc) and this needs to be remedied. On a related matter, the project needs to conduct more workshop type events to discuss approaches to certain issues before finalizing with wider circle of experts. The project could do better in utilizing synergies both with other UNDP projects as well as the projects funded/implemented by other agencies.

*Table 3: List of recommendations*

| Type | No | Recommendation |
| --- | --- | --- |
| ***Corrective actions for the design, implementation, monitoring and evaluation of the project*** | 1 | **Accelerate the work on the remaining two pilots:**   * 1. **For the solar powered water supply and purification system (Output 1.3*):*** (a) hire a national or international consultant (to be decided by the project manager in consultation with the to-be -hired international CTA) for quality assurance; and (b) engage the specialists from the Institute of Solar Energy in the installation of the planned two systems. If conditions permit, construct the third planned system (with the donated pump) in cooperation with the Institute, of a combined wind-solar type. Upon completion, within a year, document technical design and economic performance assessments and disseminate according to the Communications and Knowledge Sharing Plan to-be-developed (as in *Recommendation 9.2*), including to the ministries, as a possible basis for state investment. One year after the completion conduct a mini survey among residents at the pilot sites to capture socioeconomic and gender outcomes   2. **For canal lining (Output 2.2)**, hire an international technical consultant to guide the market research and identification of the suitable materials. Allocate sufficient time for rigorous testing in various locations (of potentially several types of materials). It is recommended that the endline target is revised to “*technical and economic specifications for the production of lining materials (2) are prepared*” and not “*2 production lines operational and 400 km lined”*. Estimate GHG emission effect from the testing of lined canals categorising the GHG emission effect as a direct GHG emission reduction. |
| 2 | **Accelerate the work on Components 3 and 4*.*** For the Outputs 3.1; 4.1. 4.2; 4.3 and 4.4 (1) hire a national or international consultant(s) [to be decided by the project manager in consultation with the to-be -hired international CTA] to guide the implementation and (2) conduct of national workshops inviting various experts and agencies to share ideas and approaches before finalizing the methodologies For **Output 3.1 on TAPs**, assess the suitability of using FAO’s Aqua Crop model and if justified, conduct training for the national experts involved in this activity;   * 1. For **Outputs 3.2 and 3.3**. (a) Develop the envisioned Capacity Development Plan (CDP) and implement it. In the part of revision of the curricula at the higher educational institutions, establish cooperation with the Ministry of Education. (b) Develop not one (in the end) but more knowledge (lessons learnt) documents, covering at a minimum each pilot;   2. For **Output 4.1 on regulations**,select 1-2 building codes (SNIPs)aiming at improving standards and specifications of water pumps, as well as regular energy audits of water stations and support their revision and subsequent adoption (ideally with the support of an international consultant). Consider also the revision of the existing “*Regulation of technical operation of the electric facilities of consumers*”. Estimate GHG emission effect of applying the already developed and the to-be-developed/revised regulatory acts;   3. For **Output 4.2 on the “*Program for water measurement***”,the selection of the demonstrated sites needs to be accelerated together with technical designs and installation of the measurement equipment. It is recommended to amend the end line target with words “***Programme for water measurement and Payment”,*** to be clear that it will contain a tariff methodology for irrigation.”   4. For **Output 4.3 on “*Policy framework under the Water Code to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide*”,** accelerate the formal submission of the recommendations on the “*Required budget allocations*” to the Government [the recommended expert would guide the development of: procedures for technical assessment; criteria for financial justification; and targets for investment and deployment]   5. For **Output 4.4. on the recommendations for administrative reform in IWRM/SLM**, it is recommended that instead of the intended *Policy framework* the project aims at two regulations (on: redefining agency roles; and planning targets to emphasize integration, optimization, and sustainability of IWRM) |
| 3 | **Ensure that the “mitigation” aspects of the project are addressed adequately, on par with the adaptation goals.** Involvethe MoE and respective research and higher educational institutions more, e.g. (in addition to the regulations suggested under the Component 4.1):   1. ***Ensure systematic on-site practical training for local specialists in conducting step-by-step energy audits for water pumps*** using simplified calculations (for instance, Excel-sheets); 2. ***Undertake technical assessments (upon the completion of all the energy audit results) of the modernized pumps to facilitate replication*** (through MAWE or private investments) and disseminate according to the Communications and Knowledge Sharing plan to be-developed (as in Recommendation 9.2); and 3. ***Facilitate the students from the Energy Institute in Mary benefiting from learning at the Geokdepe*** ***Polygon*** |
| 4 | **For the already completed Pilots in Geokdepe and Kaahka ensure regular and rigorous monitoring and documenting results and lessons*.*** In particular:   * 1. For **Geokdepe (Output 1.1):**compile and disseminate results as a written report, and as material for training seminars for water district officials, system designers, and farmers according to the to-be-developed Communications and Knowledge Sharing Plan (as in Recommendation 9.2)   2. For **Kaahka (Output 2.1):**(a)Ensure that the usage of pumps and the corresponding reduction in GHG emissions is closely monitored. (b) generate more accurate flow data, (c) after one year conduct a mini survey among Kaahka residents to capture socioeconomic and gender outcomes; and (d) work closely with MAWE to help identify a replication project and, possibly, support design works. |
| 5 | **Ensure adequate measures are in place to record and achieve the planned GHG reductions by**   1. firmly placing the responsibility for monitoring and reporting within the TOR of one of the project team; and*.* 2. Ensuring that (a) as a matter of priority the baseline GHG emissions for the pilots are calculated (with a note for energy audits that representativeness of the sample of audited pumps needs to be ensured); (b) upon the completion of the pilots as well as achievement of the targeted replication, the actual GHG reductions are estimated; and (c) GHG reduction from the adoption of regulations (as in *Recommendation No.2.3*) and canal lining (as in *Recommendation No.1.2*) are estimated. |
| 6 | **Ensure adequate staffing*.*** Hire   1. aCTA to provide strategic management and direction to the Project Manager to help strengthen and improve the overall project management. It is very important that the international CTA spends significant time in country in order to make a significant contribution to the overall improvement of the project; and 2. an additional staff to work on Components 3.1, 4.3 and 4.4; as well as 3. engaging a communications intern, supporting only the EERE. |
| 7 | **Enlarge the scope of the stakeholders the project works with and directly consults with.** The Stakeholder Engagement Plan from the ProDoc should serve as a guide. There are benefits to be reaped from the closer engagement with the Ministry of Energy, Institute of Solar Energy, Institute of Desert. The project should also engage with larger circles of individual experts from diverse institutions and independent ones. |
| 8 | **Improve Planning, monitoring and reporting practices*.*** In particular:  ***8.1)*** ***Reporting***   1. Improve the RRF by: removing repeating indicators and overlaps; choosing the indicators for training; incorporating indicators to capture, institutional reform (see *Table 20*); 2. Improve the quality of PIRs in terms of level of detail, reporting of risks and recording of lessons learned; 3. Ensure monitoring of the indicators currently in the LD and CCM tracking tools; including by conducting a household survey in Kaahka, and Karakum in a year time after the completion of the pilots, collecting information not only on household incomes, but also on: *“percent of residents reporting increased availability of water for drinking”* and *“percent of women beneficiaries reporting less time spending on collection of water*”; 4. monitor more LD indicator, e.g. *Habitat Protected, Vegetable Cover;* and 5. monitor water quality in Kaahka   ***8.2)*** ***Planning:*** *u*se (a) multiyear planning tools (b) better risk management strategies; and (c) RRF as a management tool.  ***8.3)*** ***Monitoring***: (a) ensure that monitoring is more participatory; and (b) develop a visit plan by GEF Regional Technical Adviser (RTA) |
| 9 | **Improve**   1. **Internal communication** by ensuring that (a) the Project Board (PB) receives reporting against results framework and (b) there is better communication with GEF Istanbul Regional Center. As part of the later point, ensure that there are missions at least once a year to visit the project by the RTA. 2. **External Communication**: Develop and implement a comprehensive Communications and Knowledge sharing Plan, that will specify and cater for diverse audiences and communication/distribution channels, working closely with UNDP Senior Communications Advisors in New York. Implement the activities through the project, but also ensure that the Government agencies have quality materials to distribute through their own networks and channels. |
| 10 | **Rationalize Budget allocations by using breakdown by fiscal years and along the priorities identified in the MTR** |
| 11 | **Develop close synergies with UNDP SCRL (Supporting Climate Resilient Livelihoods in Agricultural Communities in Drought-prone Areas of Turkmenistan) project (with regular meetings) as well as other agencies active in related fields in Turkmenistan.** The latter applies to, in particular, theGIZ funded projects in Turkmenistan on water basin and pasture management; USAID funded activities related to water management. Plus, given that Embassy of Israel has recently committed to support the State Agricultural University (SAU) with five (5) experts specializing in low water irrigation (based on the interview of the MTR team; no further detail is available), potential links with EERE should be explored. |
| 12 | **Extend the project for 18 months** given the delays and the sheer ambition of the current project design if there are available budget resources for no-cost extension. The conditions for the extension should be that all of these recommendations are implemented in full and no extension shall be implemented unless it can be shown that all recommendations have been fully implemented. In addition, UNDP Turkmenistan CO should present a clear justification and detailed plan regarding the extension |
| ***Actions to follow up or reinforce benefits from the project*** | 13 | **Assess the feasibility and merits of combining the “*experimental*” approach of EERE and the modelling tools** (e.g. FAO AquaCrop). Assess the feasibility and merits of:   1. using the ***results from the*** ***Green Polygon in Geokdepe, for testing whether Aqua Crop provides adequate forecast***, ***so that to use it*** ***for predictions in other soil and climatic circumstances.*** Possibly join the UNDP SCRL-planned testing (for fruit trees) of the model at the Polygon of the Agricultural Institute in Dashoguz; and 2. Using the above to ***inform the development of TAPs under Output 3.1*** |
| **Proposals for future directions underlining main objectives** | 14 | **Explore the opportunities for closer engagement of UNDP in the development of the Water Development Program (WDP 2018-2024**) through greater dialogue and participation in the relevant working groups (or at a minimum should present recommendations formally)**:** this could potentially help boost the level of national ownership over the four (4) planned policy frameworks (yet to be developed). |
| 15 | Engage with MAWE more closely and at high levels to ensure strong buy-in as a crucial element for mainstreaming (policy frameworks and regulations and the Government complying with the committed financial. Consider requesting that the MAWE nominates a Deputy Minister for the NPC (National Project Coordinator) |

# **Introduction**

## **Purpose of the MTR and Objectives**

The Midterm review (MTR) of the United Nations Development Programme (UNDP) - Global Environmental Facility (GEF) full-sized project titled *“Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan”* is called to (see ***Annex 1****: TOR*):

1. Document and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results;
2. Review the project’s strategy, its risks to sustainability; and
3. Propose adaptive management to better increase the chances of the project being successful, including, potentially proposed revisions and amendments to the project Results and Resources Framework (RRF).

The MTR is looking to determine if the project’s building blocks (technical, financial, management, legal) are being put in place and then, if together these catalysts are sufficient to reach a critical mass to make the project successful. The MTR is then providing recommendations to the Project Management and the UNDP Country Office (CO) to strengthen the project implementation over the second half of the project lifetime.

## **Scope, Methodology and Limitations**

The ***scope of the MTR*** covers the following evaluation criteria: relevance of the project, coherence and relevance of the project strategy, the adequacy of the RRF, the extent of progress towards planned outcomes, adequacy of management arrangements and quality of adaptive management, as well as the likelihood and risks to sustainability. The scope of the MTR is described in ***Table 5*.**

***The MTR*** ***was designed and executed in accordance with the United Nations Evaluation Group (UNEG) Ethical Guidelines for Evaluator*s** (see the Evaluation Consultant Code of Conduct Agreement forms signed by the evaluation consultants in ***Annex 10****: UNEG Code of Conduct for Evaluators/Midterm Review Consultants)*. In particular, the evaluators ensured the anonymity and confidentiality of individuals interviewed (often asking the UNDP/EERE staff members not to participate in the interviews and aggregating the responses in the current report) and strived to ensure that the results are presented in a manner that clearly respects stakeholders’ dignity and self-worth. The principal responsibility for managing this MTR resided with the Commissioning Unit, i.e. UNDP Turkmenistan Country Office (CO). The Project Team provided all relevant documents, set up stakeholder interviews, and arranged the field visits during the field mission that took place from 23rd of July until 3rd of August, 2018 (see ***Annex 2***: *Agenda for the visit*).

***The overall approach and methodology*** ***of the MTR sought to provide evidence-based information that is credible, reliable and useful***, following the UNDP Guidance for Conducting MTRs of UNDP-supported, GEF-financed Projects.[[2]](#footnote-2) The MTR follows a collaborative and participatory approach in close engagement with the Project Team, government counterparts, UNDP CO, UNDP-GEF Regional office representatives, and other key stakeholders. The ***methods of data collection and analysis*** included:

* 1. ***An*** ***evaluation matrix******of indicative questions***, prepared ahead of the mission to Turkmenistan (see ***Annex 8:*** *Evaluation Matrix*), spelling out the indicators, sources of information and methodology of analysis**.** It was used as quality assurance tool for the MTR team;
  2. ***Triangulation*** was used as the main methodology, bringing together information gathered through (see *Table 4*): ***document review*** (see the full list in *Annex 4: List of Documents reviewed);* ***in- depth interviews*** *(see* ***Annex 9****: Example Interview Guide used for data collection)* and ***field validation*** *(field visits to Kaahka and Geokdepe);*

*Table 4*: *Sources of information for triangulation of findings*

|  |  |
| --- | --- |
| *Source* | *Typology* |
| **Document review** | * ***UNDP and project documents, including:*** Project Identification form (PIF), UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document (ProDoc), Annual Project Reviews (PIRs), project budget revisions and Combined Delivery Reports (CDRs), thematic reports by project consultants and their TORs; reports on site visit monitoring by the project, agendas for training events, and Climate change mitigation (CCM) and Land Degradation (LD) tracking tools; * ***National strategic and legal documents***, including e.g. National Adaptation Plan (NAP); National Strategy on Climate Change Strategy (NSCC), and National Low Emission Development Plan (NLEDP); and * ***third party reports***, e.g. reports by other international development agencies (e.g. GIZ, WB). |
| **Interviews with stakeholders**. | * + ***Government of Turkmenistan (GoT):*** Ministry of Agriculture and Water Economy (MAWE), State Committee on Nature Protection and Land Resources (SCNPL) and the Ministry of Energy (MoE);   + ***Mejlis of Turkmenistan:*** heads and members of several Committees;   + ***Academia***: State Agriculture University (SAU), National Academy of Sciences (NAS), the State Institute for Water Management Design (SIWMD), Institute of Solar Energy and Institute of Desert;   + ***Municipalities*** of Kaahka and Geokdepe districts;   + ***UNDP***: UNDP-GEF Regional office representatives; CO staff; EERE project manager, staff, key experts and consultants; and the staff of the “*Supporting Climate Resilient Livelihoods in Agricultural Communities in Drought-prone Areas of Turkmenistan”* (SCRL) project;   + ***Current and potential beneficiary household representatives.*** Due to the schedule and its time constraints, as well as due to the type of review being conducted, no individual household interviews could have been accommodated. In order to compensate for this, the MTR and project team ensured (through facilitation) that the interviews include representative of current and potential beneficiaries during the field visits |
| **Field validation** | field missions were conducted to Kaahka and Geokdepe project sites. |

* 1. ***Progress Towards Outcomes Analysis with ratings.*** The targets for logframe indicators for midterm (from the Results and Resources Framework (RRF) of the Inception Report (IR)) were compared with progress made towards these (from the PIR (2018)), examining also the factors behind these, using the *Progress Towards Results Matrix* (see *Annex 7. Progress towards results Matrix and MTR Rating*)*.* The progress was colour coded in a “*traffic light system*”, assigning a rating on progress for each outcome, accompanied with brief descriptions of the associated achievements in an *MTR Ratings & Achievement Summary Table* (see *Table 2*) in the Executive Summary (ES), as well as in the relevant Sections of the ***Chapter 4*** on Findings.No rating on Project Strategy and no overall project rating was required by the TOR/GEF guidance (see ***Annex 10*** *MTR Rating guidance and scales)*. The review also assessed the likelihood of attainment of the end -of-the project targets where possible. In addition, the MTR involved the review of CCM and LD Tracking Tools: (a) the version submitted to the GEF at CEO endorsement at the start of the project and (b) the version prepared for the midterm stages*.* And finally, the review was also informed by evidence of progress towards outputs*,* using the *Table on Intended Outputs by Components* from the Project Document (ProDoc) and the IR;
  2. ***Contribution analysis*** when attribution of the observed outcomes to EERE was not possible;[[3]](#footnote-3) and
  3. ***Assessing*** ***potential for*** ***sustainability.*** The review covered the likelihood of- and hence, the risks to- programmatic, technical, human resources’, institutional and financial aspects of sustainability. References were made to the indicators from the Capacity Development Framework (CDF), along with the baseline and midterm assessments of the indicators.

*Table 5: The scope of the MTR*

| Evaluation criteria | | Description of the task |
| --- | --- | --- |
| **Project Strategy** | **Project design** | * Relevance of the problem addressed by the project (including the project concept being in line with country priorities) and adequacy of identification of the underlying assumptions * Relevance of the project strategy (including being informed by lessons from earlier projects; and adequacy of how the project addresses country priorities * Relevance of country ownership * Adequacy of decision-making processes (inclusiveness of various perspectives) * Adequacy of the coverage of gender issues |
| **Results Framework/**  **Logframe** | * Adequacy of the project’s logframe indicators and targets (being SMART); * Extent of clarity and feasibility of the project’s objectives and outcomes within its time frame * Extent of the progress so far leading to catalytic beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc.) that should be included in the project RRF and monitored on an annual basis. * Coverage of the broader development and gender aspects of the project as part of monitoring |
| **Progress towards Results** | | * Progress towards outcomes analysis, including comparison of the indicators from the GEF Tracking Tools at the Baseline and MTR * Remaining barriers to achieving the project objective in the remainder of the project. * Ways in which the project can further expand benefits. |
| **Project Implementation and Adaptive Management** | **Management Arrangements** | * Effectiveness of project management in the ProDoc and the changes to it; clarity of the responsibilities and reporting lines; and transparency and timeliness of the decision-making. * Quality of execution of the Executing Agency/Implementing Partner(s) and of support provided by UNDP |
| **Work Planning** | * Causes of delays in project start-up and implementation and whether they have been resolved. * Work-planning processes being results-based; use of RRF/ logframe as a management tool. |
| **Finance**  **and co-finance:** | * Quality of financial management of the project, with specific reference to the cost-effectiveness of interventions. * Appropriateness and relevance of budget revisions; appropriateness of financial controls * Use of co-financing strategically; and Project Team meeting with all co-financing partners regularly to align financing priorities and annual work plans |
| **Project**  **M&E Systems** | * Adequacy of monitoring tools (providing the necessary information; involving key partners; being aligned or mainstreamed with national systems; using existing information; being efficient and cost-effective) * Adequacy of the financial management of the project’s monitoring and evaluation budget. |
| **Stakeholder Engagement** | * Havingdeveloped and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders * The local and national government stakeholders supporting the objectives of the project, playing active role in project decision-making * Extent to which the stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives |
| **Reporting** | * Extent of the adaptive management changes having been reported by the project management and shared with the Project Board. * Adequacy of the Project Team and partners fulfilling GEF reporting requirements * Extent of the lessons derived from the adaptive management process being documented, shared with key partners and internalized by partners. |
| **Communications** | * Adequacy of the internal project communication with stakeholders (regularity, coverage and effectiveness; existence of feedback mechanisms; contribution to the awareness of project outcomes and activities and investment in the sustainability of project results) * Adequacy of the *external project communication* (effectiveness of means to express the project progress and intended impact to the public and the project implementing appropriate outreach and public awareness campaigns\_ |
| **Sustainability** |  | * Relevance of the risks identified in the ProDoc, PIRs and the ATLAS Risk Management Module (most important ones and appropriateness of risk ratings) * Needs to ensure the sustainability of the project |
| **Risks to sustainability** | * likelihood of financial and economic resources not being available once the GEF assistance ends * likelihood of social or political risks that may jeopardize sustainability of project outcomes, including low level of stakeholder ownership * Likelihood of risks being posed by the legal frameworks, policies, governance structures and processes * environmental risks that may jeopardize sustenance of project outcomes |
| **Conclusions** | | * Summary of the project’s progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits. |
| **Recommendations** | | * Up to 15 recommendations: on actions that (a) are corrective (b) to follow up or reinforce initial benefits and (c) inform future directions |

The MTR was carried out over July to September 2018 - a holiday period, and as a result, some of the stakeholders (e.g. donor agency representatives) were not present in the country. Skype calls were initiated later during the stage of writing/finalizing the report. Plus, many of those who were involved at the start of the project were no longer involved (the first project manager (PM), the first RTA and the CTA, as well as the Resident Representative of UNDO CO): with most of them the MTR team managed to conduct interviews or correspond in writing. The MTR team assumes that the information obtained was representative.

## **Report Structure and Content**

The MTR report is prepared in accordance with the outline specified in the UNDP-GEF guideline:

* Chapter 1 presents the Executive Summary;
* Chapter 2. the Introduction, describes the objectives of the MTR, the approach taken and the rationale;
* Chapter 3 describes the objective of the project, the expected results and the development context;
* Chapter 4 presents the findings of the review, covering the relevance of project Strategy; assessment of the extent of the Progress Towards Results; quality of Project Implementation and Adaptive Management; and likelihood of and risks to Sustainability; and
* Chapter 5 includes a summary of the Conclusions and Recommendations.

# **Project Description and Context**

## **Development Context**

***Water Resources.***Turkmenistan is a predominantly arid country with over 75 percent of its territory of 488,100 square kilometers characterized by desert, and only 3 percent of land arable.*[[4]](#footnote-4)* The country is inherently water scarce, with continental and very dry climate, low levels of precipitation (on average 191 mm of per year), and moisture (35 percent on average) and the meteorological drought as a semi-permanent condition. Water runoff formation is fully dependent on natural flow from glaciers, with the estimated 30 percent of which lost during the past century, as a result of global warming. In recent decades, available water resources in Turkmenistan (around 27 billion m3; less in dry years) have been fully utilized.*[[5]](#footnote-5)* Irrigated agriculture accounts for about 90 percent of total water consumption, or about 24 billion m3 per year, but water consumption for industrial and household use is also a high priority. The drainage network also provides water for watering desert pastures. Fresh groundwater is scarce and unevenly distributed.*[[6]](#footnote-6)* As a result of climate change the flow of the Amu-Darya is expected to be reduced by 10 to 15 percent by 2050 and the flow of the smaller rivers of Turkmenistan – the Murghab, Tejen, and Atrek – by 5-8 percent by 2030.[[7]](#footnote-7) Water availability and supply are likely to suffer also due to trans-boundary competition.*[[8]](#footnote-8)* Moving billions of cubic meters of water over thousands of kilometers requires vast inputs of energy. Water management accounts for about 25 percent of total power consumption in the country.[[9]](#footnote-9)

Most canals in the country are unlined, including those that serve farms, but also those that serve the municipal water supply systems across the country. Approximately 50 percent of water is lost due to infiltration.

The rapid expansion of livestock husbandry in Turkmenistan implies an increasing need for potable water for animals, as well as for human needs in the desert pastures. In many areas of need, both water and electricity are unavailable.

***Administrative framework of water management in Turkmenistan.*** Management of water resources of Turkmenistan is implemented in three administrative tiers. The Ministry of Agriculture and Water Economy (MAWE) oversees water management across the country, owning essentially all water management infrastructure from canals to pumps, from the source all the way to end users, overseeing 119 affiliated organizations and enterprises, and defining allocations of water to regions, districts, and end-users. The State Committee on Nature Protection and Land Resources (SCNPLR) is responsible for implementing state policy in protection and rational use of natural resources. At the second tier of the hierarchy, both the MAWE and the SCNPLR have five regional agencies, one in each *velayat*. Within MAWE, each regional agency in turn oversees *a third* level of water management, consisting of local district water management agencies- irrigation system operators (DISOs),[[10]](#footnote-10) operating within the boundaries of administrative districts (*etraps*). developing water use plans, schedules and allotments for water delivery (in accordance with irrigation norms) formalized in contracts with end-users. The management of water use at the farm level is carried out by farmers, with assistance from district irrigation system managers. There are no internally-governed Water Users Associations (WUA) in Turkmenistan.[[11]](#footnote-11) The state budget is the source for all investment funds for infrastructure.

***Agriculture.*** Agricultural land accounts for more than 80 percent of Turkmenistan’s territory and is highly dependent on irrigation.[[12]](#footnote-12) Agriculture represents 19 percent of the country’s GDP, but employing close to 48 percent of total labor force (the share of rural population is 58 percent). Aridity and reliance on agriculture as a source of both income and food, renders the country vulnerable to climate change impacts.

***Greenhouse gas (GHG) emissions***. Approximately 6.9 MtCO2/year,[[13]](#footnote-13) or 27 percent (and growing) of all energy-related CO2 emissions and 11 percent of all GHG emissions (in CO2 equivalent)[[14]](#footnote-14) come from energy use in water management.[[15]](#footnote-15) Most of the country’s non-energy GHG emissions are methane, a third of which is from agriculture.

***Land degradation:*** Serious land degradation problems -soil salinization, in particular- have emerged in Turkmenistan as a result of agricultural and water management practices,[[16]](#footnote-16) with nearly 70 percent of irrigated lands at least moderately salinized, and 11 percent severely salinized, causing declines in crop yields by some 25 per cent.[[17]](#footnote-17) Salinization is also prevalent around open unlined canals and drainage collection bodies. Deficient drainage infrastructure has been the most important barrier to desalinization of lands.[[18]](#footnote-18) Drainage water is measured at the level of entire farmer associations (and not end users), and according to hierarchies of collector-drainage systems. Solutions to salinization lie in: (1) avoidance of waterlogging and surface evaporation; and (2) applying large quantities of water to fields outside the growing season (leaching away deposited salts). These two do not address, however, the drainage waters with dissolved mineral content: these are discharged, aiming not to allow it entering groundwater basins.[[19]](#footnote-19) The planned Altyn Asyr Lake (Golden Age Lake) is seen by the Government of Turkmenistan (GoT) as the main solution, but with a recognition that integrated measures are needed to reduce water losses and increase efficiency throughout the water management network, both for supply and drainage, and not just at its end point***.***

## **Problems that the Project sought to address**

The challenges of efficient water management and sustainable land use in Turkmenistan are fundamentally defined by the country’s extreme climatic and geographic conditions, the sheer scale and limitations of its vast but outdated infrastructure; and institutional barriers. According to the ProDoc, further development of water-consuming economic activity, including expansion of irrigated lands and fulfilment of municipal supply needs, is possible only via:

* ***increasing efficiency of water use by:*** reducing water losses and consumption, thereby reducing pumping volumes and pumping energy consumption throughout the system;
* ***increasing efficiency of use of energy*** ***by:*** reducing energy consumption by increasing the efficiency of pumps and other energy-using infrastructure and replacing pumps and other infrastructure with more efficient or renewable technology; and curtailing associated GHG emissions from the water management sector;
* ***improving water resource management;***
* ***recycling wastewater and using unconventional water sources*;** and
* ***introducing new irrigation technology****.*

All these areas are declared as high priority by the GoT, and specifically by the MAWE. The ***points below summarize the barriers – as well as the ways to address- as identified in the ProDoc:***

* ***Free-of-charge (up to a limit) water and energy largely eliminate consumer*** ***incentive for conservation.*** Direct incentives for farmers lie only with the need to reduce salinization;
* While energy conservation and climate change mitigation in water management recently gained importance in Turkmenistan, the ***required levels of*** a***ccounting for energy use in planning and implementation of water management, awareness and capacity among the technical specialists and decision-makers, as well as clear standards and procedures*** ***are lacking***;
* ***Measurement of energy and water consumption among end users is essentially absent***, with the data on water losses in transit available only at a highly generalized level. The ProDoc identifies the need in more availability and better quality of data, to inform technical, investment, and policy decisions on improving efficiency;
* ***The lack of a fully integrated system of water management*** pointing to theneed in policy and organizational reform to lead to full realization of the technical potential for optimal water use for organizational integration, regular informational feedback, and alignment of incentives to support universally rational water use. The adoption of adequate regulations under Land Code and a Water Code for effective implementation was one of the needed aspects of the reforms, identified in the ProDoc;
* ***Challenges related to technology transfer***, requiring an exposure to the new technology and an understanding of how best to apply it within local constraints, implying an associated need in concerted training, research, testing, and evaluation across the country;
* While MAWE has established some manufacturing of equipment for efficient irrigation and canal linings, the ***limitations of production facilities for materials and technology for efficient water infrastructure are evident***, pointing to the ***need in transition to new products and production lines;***
* ***The lack of a clearly identifiable stakeholder -directly affected by environmental degradation, motivated and empowered to remedy it,*** with costs widely passed on to others, is a challenge requiring technical solutions, education, policy mandates, and enforcement; and
* There are ***gaps in decision process for state investment in efficiency improvements***, with agriculture being still hugely capital and labor intensive, with low productivity and the GoT concerned with rising water deficits, the unequal water distribution over the hydrographic network,[[20]](#footnote-20) and resulting disagreements about management solutions. These point to the need for more clarity in legal framework and integration, as well for clear mechanisms for assessment of the needed investment to account for new objectives and more complex technologies.

## **Project Description and Strategy**

### **Project Strategy *and Objectives***

The project, implemented by UNDP and with a GEF project grant of US$6.185 million, on “***Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan***” (EERE) started in July 2015 and is scheduled to finish in July 2021. 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. The ***objectives of this UNDP/GEF EERE 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; and
* **Environmental objectives:** reduction of GHG emissions associated with water management; and Prevention and remediate of salinization of lands

This project is expected to contribute to achieving of the following Country Programme Outcome of UNDP Turkmenistan as defined in Country Programme Action Plan (CPAP): ***Environmentally sustainable use of natural resources contributes to effectiveness of economic processes and increased quality of life.*** The project is expected to contribute to the following outputs of this Outcome: *National authorities better plan, manage, and monitor the environment sector (3.2.1); local communities contribute to and benefit from sustainable use of natural resources (3.2.2);* and the *Government introduces carbon reduction and energy saving technologies. (3.2.3)*

***“Mainstreaming environment and energy”*** is the primary applicable GEF *Key Environment and Sustainable Development Result Area* for this project*.* The applicable GEF Strategic Objectives: Climate Change Mitigation (CCM) 1 and 2, and Land Degradation (LD)-1. The applicable GEF Expected Outcomes are as follows: ***CCM Outcome 1.1:*** *Technologies successfully demonstrated, deployed, and transferred*; ***CCM Outcome 2.1***: *Appropriate policy, legal and regulatory frameworks adopted and enforced*; and ***LD Outcome 1.2***: *Improved agricultural management*

### **Project Description**

The project’s ***activities*** falling under four components are described below. The ***corresponding expected Outcomes and Outputs*** are described in ***Table 6*.**

***Component 1:*** *Introduction of new technologies in irrigated agriculture and pumping for energy efficiency, water conservation, and Sustainable Land Management (SLM).* This Component includes three out of five planned pilot demonstrational projects within EERE, with the following activities:

* ***Installation and testing of various water saving irrigation technologies at the assigned by the MAWE to the SIWMD*** ***a 145ha research site.*** Research activities aim at producing “a *model for norms for different crops based on a crop-water response model adapted to Turkmen conditions of relatively high-water table and salinity”*;
* ***Conducting a Pump Audit Program and assessment of the energy and work efficiency of 100 pumps used in water distribution system of the water sector of the country with following replacement of 10 most ineffective pumps***; and
* ***Implementing a solar energy project****,* which includes installation of solar panels to generate energy for pumping of water to a remote pasture in the Karakum desert. According to the ProDoc, the vision for EERE was to integrate several local end uses for local shepherds: pumping from wells and sardobs (underground rainwater storage bodies), purification, and provision of electricity for up to a few small service buildings. It was expected that mineralized water, unsuitable for use without purification, will be made available as a source and that the total expected electric capacity of the installation will not exceed 5 kW.

*Component 2: Scaling up of investment in new and expanded efficient water-management infrastructure.* This Component includes two large-scale pilots:

* ***Kaahka pilot project, replacing the existing water supply system of Kaahka town (41 wells with pumps) with a gravity-based system*** ***(with a 14.8 km long pipeline) with the decommissioning of the pumps of the existing system***; and
* ***Reconstruction of existing two plants under MAWE for pilot production of alternative canal lining products***. MAWE operates three factories that produce materials such as concrete pipes and plates for canal lining. With the rationale, that modernization of products and production lines could lead to a dramatic increase in installation of canal linings and pipes nationwide, significantly reducing water losses, salinization, and other problems throughout the system, the ProDoc has committed to identifying the potential new materials, testing and assisting these three (3) companies (in Dashoguz, Mary and Ahal provinces), before deciding on and upgrading two (2), based on the analysis of current production of canal lining products with subsequent upgrade.

***Component 3:*** *Delivery of local and region-specific planning and educational outreach for Integrated Water Resources Management (IWRM) and SLM among farmers and water-sector designers and managers.* This Component includes two lines of activities:

***Development of Technology Action Plans (TAPs) in all five velayats.*** The MAWE and its affiliates develop and carry out inter-district and district-level plans for delivery of water, as well as maintenance and updating of infrastructure. For their part, the MAWE, the SCNPLR, and a number of other agencies develop land inventories and local area land-use plans across the entire country. With the rationale that these plans are not well integrated with each other and do not reflect the advanced technology and practices, ***the project conceived the TAPs*** as both technical and policy justifications for state investment in each chosen district; [[21]](#footnote-21) and

***Capacity building of the national stakeholders*** ***with training, awareness raising and alike***. According to the ProDoc, MAWE and SIWMD conduct local seminars for farmers on efficient use and management of water resources (with, on average, 78 specialists and 36 farmers receiving training on water management annually). Various international initiatives also provide regular training of the stakeholders by national and international experts. The ProDoc envisioned two types of activities to complement these: *(a)* *Compiling and delivering all of the results of the demonstrations and technical work of Components 1 and 2 in seminars and in-the-field training to water management staff and farmers in all five velayats*; and *(b)* *new educational outreach to students of agriculture and water management.*

***Component 4:*** *Developing and support to implementation of policy reform for IWRM****.*** This Component *aims at addressing the identified policy level barriers with four Outputs, through the development of:*

* ***Standards and regulations for pump performance and maintenance.*** According to the ProDoc, to facilitate and “*lock in*” the widespread replication of the project’s audits and demonstrations of pumps in Output 1.2, the project aimed to develop (a) performance standards, as well as specifications for regular audit and maintenance of existing pumps, with full instructions on the timing and content of data collection, steps for visual inspection and repair, and documentation requirements; and (b) specifications for operating schedules and for the selection of new pumps where needed;
* ***Policy framework for measuring and monitoring energy and water use in the water sector.*** Accounting for water is most difficult on the on-farm irrigation network due to the large number of distribution points and water consumption. Here, due to various reasons (premature wear and tear, damage, etc.), water-regulating structures often fail and often do not ensure the continuity of water measurement. The objective was to develop a “*Policy framework for measuring and monitoring energy and water use in the water sector*”, with the ultimate intention of supporting the MAWE in the development of “*justification, regulations, and procedural details for staged implementation of tariffs for end use of water*”;
* ***Policy and state budget framework*** ***for widespread deployment of efficiency improvements to irrigation and water infrastructure.*** The idea (as in the ProDoc) was that the project will assist the MAWE and other ministries in developing a policy framework under the Water Code to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide, which will define numerous elements (drawing heavily from the experience gained from the technical field-testing, planning processes, and financial justifications generated via the first three components of the project), including (a) procedures for technical assessment; (b) criteria for financial justification; and (c) targets for investment and deployment; and
* ***Proposals (including draft regulations) for administrative reform of IWRM implementation and SLM.*** The idea from the ProDoc was that the project will assist the MAWE and other ministries ***in developing sub-legislative acts*** ***under the Water and the Land Codes for overall administrative reform in support of IWRM and SLM.*** The goal wasto focus largely on redefining agency roles and planning targets to emphasize integration, optimization, and sustainability of water resource management, and not just water delivery and agricultural output. Integration was viewed as involving not only the matching of downstream efficiency improvement with upstream investment and management in the water system, but also improved coordination among various ministries.

## **Project Implementation Arrangements**

*Table 6: Expected Outputs and Outcomes*

|  |  |  |
| --- | --- | --- |
|  | **Targeted Outputs** | **Expected Outcomes** |
| *Component 1* | * *Output 1.1*: Technology proving site and educational platform for low-water irrigation and SLM in agricultural croplands developed and implemented * *Output 1.2:* Audits and servicing of pumps of various sizes in both inter-district water networks and on farms in all velayats of Turkmenistan * *Output 1.3:* Renewable-energy applications of water pumping and purification in remote pasture areas | 1. Enhancement of the national knowledge base and delivery of new technical information on appropriate technology for irrigation, pumps, and solar-powered water pumping and purification to water management agency staff and farmers. 2. New processes established and implemented for planning, deployment, and financial assessment both before and after deployment of integrated water resource management, pump audits and maintenance, and solar-powered water pumping and purification; and 3. Direct energy savings, water savings, and reduction of land degradation from the selected projects |
| *Component 2* | * *Output 2.1:* Installation of pipeline and/or channel linings for municipal water supply in Kaahka, replacing unlined channels and wells, with documentation of results **and** presentation of recommendations and cost analysis for replication * *Output 2.2:* Lining of inter-district canals for reduction of water losses and land salinization, using various technologies | 1. Reduction of water losses and associated energy consumption via direct investment in a large-scale infrastructure project on municipal water supply; and 2. Technical, environmental, and financial justification to scale-up investment in canal linings and/or other widespread infrastructure improvements to reduce water losses, associated energy consumption, and land degradation |
| *Component 3* | * *Output 3.1:* Technology Action Plans, including consideration of SLM, developed and implemented at regional and local levels * *Output 3.2:* Education and direct training provided to water-management system designers, local water management staff and farmers in all regions of Turkmenistan on pump maintenance, irrigation, and other aspects of efficient water management and SLM * Output 3.3: Project evaluation and compilation of lessons learned | 1. Technologies and investments for IWRM and SLM approved according to new Technology Action Plans (TAPs) in all five velayats; and 2. Institutional/human capacity for implementing IWRM and SLM utilized and sustained among farmers and local/regional water management officials in all five velayats via training on best practices as well as compilation and delivery of lessons learned. |
| *Component 4* | * *Output 4.1:* Standards and regulations for pump performance and maintenance adopted and enforced * *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 * *Output 4.3:* Policy and state budget framework for widespread deployment of efficiency improvements to irrigation and water infrastructure adopted and implemented * *Output 4.4.* Administrative reform for implementation of IWRM and SLM | 1. Regulations on pump performance and maintenance adopted and enforced 2. Operational system established for measuring end-use water consumption 3. Regulations adopted for the staged onset of tariffs for end use of water 4. Policies and budget allocations adopted in support of expanded investment in improved irrigation and water infrastructure |

The project is carried out under a national implementation modality (NIM). According to the Project IR, the overall governance of the project was to be carried out by the Project Board (PB), the meetings of which were to be held at least once a year (with a recommendation to shift to a twice a year format (in June and January), to coincide with key reporting requirements (PIR and APR)). The IR specified the list of agencies to be represented (see Table 27), stipulating that the PB may invite other agencies to join as members. The National Project Coordinator (NPC) was to serve as Chair of the PB, with assistance from the UNDP CO in organizing and running of all the meetings and other exchanges of information (see Figure 1). The *main stakeholders* are as follows: the MAWE, the MOE, the SIWMD, the State Committee on Nature Protection and Land Resources (SCNPLR), the MoE, the SAU, the Municipalities of Kaahka and Geokdepe districts of the Ahal region; the PB members, senior experts and consultants in the subject area, etc (see *Table 14*).

UNDP joins MAWE to manage the project and provide quality assurance, in accordance with plans approved by the PB:

* It was understood that most of the UNDP’s work for the project was to be based in its CO in Ashgabat, under the supervision of the Programme Specialist for Environment and Energy and other senior programme staff, including the UNDP Resident Representative and Deputy Resident Representative as warranted. The UNDP Regional Technical Advisor (RTA), based in the UNDP Regional Service Centre in Istanbul, was to provide technical support, assistance with coordination, and overall project monitoring to ensure consistency with expectations from UNDP and GEF; and
* In the ProDoc, the former Ministry of Water Economy of Turkmenistan (MWE) has been identified as the national implementing partner, with the responsibility to oversee all aspects of project implementation. During the re-structuring of the Government in early 2016, the MWE merged with the former Ministry of Agriculture (MoA) to become a new ministry, the MAWE. *The MAWE is the national implementing partner*, *with successive Heads of Departments on International Cooperation appointed as NPCs*. In addition, technical supervision of the project is undertaken by the senior officials from the key scientific and design institute within the structure of the MAWE, the SIWMD.

*Figure 1 Management structure of the proposed UNDP/GEF project*

**Field Assistant**

**International part-time Chief Technical Advisor (CTA)**

**PROJECT BOARD**

**Project Manager**

**Project Specialist**

Water management engineering

**Project Specialist**

Agriculture and land degradation

**Project support through UNDP CO PIU**

**National implementing partner-** MAWE

***Other national partners:*** State Committee on Nature Protection and Land Resources, Ministry of Energy, Water Design Institute, Agriculture University; Ahal region municipality and Mejlis

***Executing entity-*** UNDP

**Project management and assurance**

UNDP Country Office and

UNDP Regional Technical Advisor

**National and international consultants**

## **Project timing and milestones**

The planned start date of the project was August 1, 2015, with the planned end date of July 31, 2021. There were no delays in the actual start of the project. After the ProDoc was approved by the MAWE and the UNDP CO in July 2015, UNDP CO recruited a Project Manager (PM) in late July; two (2) project specialists were recruited in November 2015; and a Chief Technical Adviser (CTA) was selected in August 2016). The project inception phase, lasted five months (August 2015 – December 2015) and an internal Inception meeting (a kick-off meeting) was organized in Istanbul at IRH on 10-11 September, 2015. An external Inception workshop convened with the project partners on November 18-19, 2015. The first PB meeting took place in Ashgabat on February 23, 2016, and the Inception Report was issued in March 2016.

Meanwhile the first hired PM resigned in September 2016 with the current (second) PM hired in March 2017: thus, for almost seven (7) months the project was without a PM, with the Programme Specialist for Environment and Energy from the UNDP CO covering for this position. In addition, the contract with the CTA was terminated in December 2016 (having worked from August 2016, i.e. around six (6) months), the project does not have a CTA since then.

# **FINDINGS**

## **Relevance and coherence of Project design**

### **Relevance of the concept of the project**

Broadly, the project addresses country priorities, as declared or signalled in some of the main policy documents. In particular:

* Efficient irrigation, other water conservation efforts, and SLM are declared as priorities in several state programs, including the “***Fundamental Directions of Economic, Political, and Cultural Development of Turkmenistan in the Period up to 2020***” and the “***National Program for the Social Development of Rural Areas*”***;*
* ***The Water Code*** ***of Turkmenistan,*** adopted in 2017, highlights the need to move to water basin-based management and prioritize water use efficiency;
* The current ***National Strategy on Climate change (NSCC),*** adopted in 2012***,*** sets forth, *inter alia*, the following principles: addressing climate change challenges should contribute to the country’s economy and sustainable development; innovative technologies and their transfer should be promoted as the basis for advances in climate change mitigation and adaptation, with the two coordinated; and combating climate change should involve collective effort of the entire Turkmen society. NSCC (2012) was being revised at the time of the MTR jointly by the UNDP and the GIZ: UNDP SCRL (Supporting Climate Resilient Livelihoods in Agricultural Communities in Drought-prone Areas of Turkmenistan) project supports it in the part of CCM and the GIZ- in the part of CCA;
* ***While there is no law as yet on energy efficiency (EE), there is a “State Program on Energy Conservation for 2018-2024”*** (02/2018)[NB: it was not made available to the MTR team]. The need to save energy has been increasingly made more prominent in various Government papers and speeches of the President; and
* ***Turkmenistan is one of the countries to have*** ***Technology Needs Assessment (TNA)*** in accordance with the UN Framework Convention on Climate Change (UNFCCC), to include detailed market and barrier analysis for prioritized CCM technologies in the water sector. UNEP/GEF support is planned for that, and while this work has not started in full as yet, once it does, there will be conceptual linkages to EERE.

#### EERE benefitted from several earlier projects and builds on them.This applies,in particular, to:

* ***UNDP/GEF project on “Capacity building and on-the-ground investments for SLM” (2007- 2010),*** which was followed with the ***UNDP/Adaptation Fund (AF) Project on “Addressing Climate change Risks to Farming Systems in Turkmenistan***” *(2011-2017).* The latter did not target neither energy management associated with water management, nor large-scale infrastructure, but the innovations related to adaptation were considered in designing the measures under the EERE; and
* **European Union (EU) Water Initiative in Eastern Europe, the Caucasus and Central Asia** (EUWI EECCA), implemented by the Organization for Economic Co-operation and Development (OECD) and the United Nations Economic Commission for Europe (UNECE). This project contributed to the implementation of the EUWI National Policy Dialogues (NPD) on IWRM and water supply and sanitation in ten EECCA countries, including Turkmenistan.[[22]](#footnote-22) During Phase I (2008-2012), in Turkmenistan, EUWI EECCA assisted the MWE and others in the analysis of national legislation on water, sharing best practices from the ECA region on IWRM, on transboundary water accidents and on water as it relates to health issues.

The vision of the project highlights addressing the intertwined problems of water management/conservation, energy consumption/efficiency, sustainable land management/land degradation (salinization), and agricultural productivity, through a set of integrated activities, with a goal toward achieving multiple benefits in different areas, applied and technically proven first at specific sites in the Ahal velayat, then replicated across the country through region-specific planning and outreach, as well as supporting policies and investment at the national level. Thus, improved water management is seen as leading not only to greater water availability, but also to significant energy savings, avoided GHG emissions, and reduced water and soil salinization. Similarly, the application of new renewable-energy solutions in water management is seen as leading not only to avoided GHG emissions, but also to greater water availability in remote populated areas.

The innovation (as seen in the ProDoc) was through testing, demonstration, and replication of new technologies and practices in four major areas (irrigation (including “smart” systems), municipal water supply pipeline infrastructure in Kaahka, interdistrict canal linings, and drainage) in an integrated manner: “..*vertical integration of end-use irrigation needs with upstream planning and management, as well as with drainage; individual investment projects integrated with strategic approaches for scale-up, and local planning integrated with national policy and investment; and integration of various environmental and social goals – water availability, water conservation, reduction of land degradation, agricultural productivity, and energy efficiency – with each other, and with the broader goals of sustainable national economic development and protection of the global environment*…”.[[23]](#footnote-23)

The nexus of interconnected challenges of water and energy is well acknowledged globally. Its manifestations for agriculture are well documented. According to the UN Water (2014) report:[[24]](#footnote-24)

* Energy subsidies allowing farmers to pump aquifers at unsustainable rates of extraction have led to the depletion of groundwater reserves;
* Applying energy efficiency measures along the agrifood chain can bring direct savings, through technological and behavioral changes, or indirect savings, through co-benefits derived from the adoption of agro-ecological farming practices; and
* Knowledge-based precision irrigation can provide flexible, reliable and efficient water application, which can be complemented by deficit irrigation and wastewater reuse

Addressing this nexus with the addition of SLM is valid and important for Turkmenistan (as is evident from the description of the project context in *Section 3.1*). Further integration of the IWRM and planning is also valid in theory, but with a reservation that in this the project might be somewhat ahead of the reforms in Turkmenistan, with the price of water heavily subsidized, no private land ownership as yet, and participatory water management not yet effectively in place. All of the above are essential for the success of effective IWRM, ***Therefore, one particular concern is the scale overall ambition of the project*** (discussed later in the Section 4.1.2 in more detail), ***especially in relation to its Component 4***, which targets, *inter alia* ***development of 3 policy frameworks,*** as discussed in Section 3.3.2.

### **Relevance and coherence of the project strategy**

While the first two components (for agriculture and infrastructure, respectively) of the EERE were seen as defining the technical opportunities and priorities for replication, the second two components were seen as seeking to carry out the actual replication on a national scale. In prticular (see Figure 2):

* ***1st component***supportstheidentification, verification and documenting of the most promising *ways* to save water, increase energy efficiency, and reduce water-related root causes of land degradation in Turkmenistan;
* ***2nd component*** supportsgenerating technical and financial performance data and practical experiences to be used to plan and provide necessary justification to scale-up public investment and technology deployment nationwide;
* ***3rd component***supports the replication from the bottom up, via the 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; and
* ***4th component,*** working from the top down, supports defining and implementing policies, programs, and investment plans for IWRM and SLM at the national level.

Figure 2 describes the Projects results chain which captures this vision. Overall,the project design is sound. Apart from it being overly ambitious. as discussed, there are, however, a few other areas of concern:

* ***Applicability of the results from Geokdepe in other areas*.** The question of replicability across the regions of Turkmenistan is not well discussed, while the country has areas where the soil and climatic features differ from those of Geokdepe.[[25]](#footnote-25) In particular, the applicability of the findings from Geokdepe to be used to develop the TAPs is not well elaborated in the ProDoc. Based on the correspondence with the EERE Research Coordinator, this has to involve modeling, but at this stage no more details are known. Plus, this has to be a well- tested model, rather than a new one to be developed with local resource. FAO’s Aqua Crop is the crop growth model that assesses the effect of the environment and management on crop production, by simulating yield response of herbaceous crops to water, and is particularly well suited to conditions in which water is a key limiting factor in crop production.[[26]](#footnote-26) Another UNDP Turkmenistan project, SCRL relies heavily on the use of this model. There could have been a link to use the results of the experimental trials to determine water use and water use efficiency of the crops to calibrate the Aqua Crop model and assess its performance (see *Recommendation No 13)*. In this regard, there seems to have been a need for much broader based consultation process at the stage of writing the ProDoc, going beyond the MAWE and the SIWMD (see further discussion under the Section 4.2.1);
* ***The project – as implemented (and already in the IR)- is somewhat skewed towards water efficiency with less focus on climate change mitigation and even less so on land degradation***. In the remaining period it is recommended that this balance is restored with more involvement of the MoE, including with the training of its staff and experts; the development of legislative acts related to the pumps’ performance as was intended in the ProDoc (see *Recommendation No 3*), as well as more comprehensive tracking of LD indicators. (see *Recommendation No 7.1);*
* ***There could have been more detailed assessments of the potential water flow in Kaahka at the stage of formulating the ProDoc.*** The fact that there will be essentially no water from the pipeline during the summer months became clear only after the project approval and the start***;*** and
* ***Relevant gender issues were not addressed as part of the project design and monitoring indicators*** *(*see *Recommendation No 7.1)*

Figure 2: Reconstructed Results Chain

**Components and outputs**

**Targeted Outcomes**

**Objectives**

|  |
| --- |
| **Enhancement of the national knowledge base and delivery of new technical information on appropriate technology – government and farmers** |
| **New processes established and implemented for planning, deployment, and** financial assessment both before and after deployment of IWRM, pump audits and maintenance, and solar-powered water pumping and purification |
| **Direct energy savings, water savings, and reduction of land degradation from the selected projects** |
| **Reduction of water losses and associated energy consumption via direct investment in a large-scale infrastructure project on municipal water supply** |
| **Technical, environmental, and financial justification to scale-up investment in canal linings and/or other widespread infrastructure improvements** to reduce water losses, associated energy consumption, and land degradation |
| Technologies and investments for IWRM and SLM approved according to new TAPs in 5 velayats |
| Institutional/human capacity for implementing IWRM and SLM utilized and sustained among farmers and local/regional water management officials in all five velayats via training/LL |
| **Regulations adopted/enforced on:**   * on pump performance and maintenance * staged onset of tariffs for end use of water |
| **Operational system established for measuring end-use water consumption** |
| **Policies and budget allocations adopted in support of expanded investment in improved irrigation and water infrastructure** |

**Developmental Objective:**

Policies and budget allocations adopted in support of expanded investment in improved irrigation and water infrastructure

**Environmental objectives**

* Reduction of GHG emissions associated with water management and
* Prevention and remediate of salinization of lands

Another concern with the project design is that it is too ambitious compared to the planned timeframe and resources. This will be discussed in the relevant sections, in particular related to the endline targets for Component 2. In this regard the project could have benefitted from the review of the lessons learnt from other projects, in relation to the level of ambition vis-à-vis realistic expectations.

### **Adequacy of the Results Framework**

Overall the outputs and outcomes are well formulated, except perhaps Output 4.4, where the idea is somewhat vague and not formulatedprecisely **(**seeSection 4.2.1., Output 4.4). There are multiple issues with the results framework of this project:

***Table 7: Issues with the RRF from the Inception report***

|  |  |
| --- | --- |
|  | *Issues* |
| *a* | ***There are two (2) of the same indicators cited twice*** (No 4 and 12 from the revised RRF from the Inception report, on reclaimed land from salinization) with different targets |
| *b* | ***Two (2) of the indicators are overlapping***: (no 5 and 21), both capturing the number of regulations, with one of them being a subset of the other |
| *c* | ***“Suppliers identified, contracts for pump delivery concluded” is cited as a midterm target both for the “number of audits” (indicator no 10) and “energy saving achieved as a result of replacement/repairs” (Indicator no 11), which is quite obviously an omission***. The midterm target for Indicator 10 should be related to the number of audits conducted. |
| *d* | ***Indicators are at quite drastically different levels of ambition for various results***. For example for the midterm the result for Indicator 12 (“*Area of land protected or reclaimed from salinization as a result of demonstration projects* (# ha)”), the midterm target is at 50 ha, which was not too complicated for mid-term, while for the indicator 16 “*Number of similar projects initiated in other similar (or mountainous areas) districts of Ahal and Balkan velayats of Turkmenistan (#)”,* the midterm target stipulates 1 such project already identified, design completed and funding agreed, which is overly ambitious |

*Source: RRF from the IR, IR and the ProDoc*

* The Project Results Framework (PRF) from the ProDoc was revised into ***Results and Resources Framework (RRF)*** ***at the Inception phase, but the revised version has many flaws*** (see *Table 7*). In particular there is an issue of clear separation of indicators capturing the project objectives and the Outcomes of separate components;
* ***It appears that the PIR was not updated in the light of the revised RRF from the IR,*** leading to inconsistency between the two, with different outcomes, summarized in *Table 8*.
* ***There are cases when both the PIR and the RRF from the Inception report deviate from the PRF of the ProDoc, in some cases not capturing the intended result*** (see *Table 9*).

There is a case when both the PRF/PIR and RRF do not have an indicator to capture the Outcome 1 on “*Enhancement of the national knowledge base and delivery of new technical information on appropriate technology for irrigation, pumps, and solar-powered water pumping and purification to water management agency staff and farmers*”. In addition, some of the indicators from the CDF could have been included in the RRF to capture the mainstreaming of the areas targeted but the project. Plus, the progress, at least in Kaahka and Karakum, could in the future catalyze beneficial development effects in terms of women’s empowerment (see *Recommendation 8.1c)*

As could be seen from the above, the RRF needs revision and consistency with the PIR ensured (see *Recommendation No. 8* and *Table 19*).

*Table 8: Outcome of inconsistencies between the RRF from the Inception Report and PIR*

| **Outcome of inconsistencies** | **Issues** |
| --- | --- |
| *With regards to two (2) indicators, the changes in the Inception report are problematic from the point of view of GEF policies and practices:* namely | 1. In part of the baseline and target levels for energy saving:  * The overall baseline level of 9 million GJ/year and target of 3.4 million GJ/year from the ProDoc PRF (ProDoc page 39) was changed to 4.50 GJ/year and 2.25 GJ/year respectively in the RRF in the Inception report (p36); * In the Inception report, while the RRF features 4.50 GJ/year and 2.25 GJ/year respectively for the baseline and target, textual part of the Inception report (p31) still features 3.4 or the target with no mention about the change that appears in the same document in the RRF (see above) * The PIRs feature 9 and 3.4 million GJ/year for baseline and target (i.e. as in the ProDoc)  1. Co-financing figures are different from the title page (US$72.0 million) and the Inception report from the RRF (US$6.5 million), but then the PIR rightly features US$72.0 million |
| *In some other instances the fact that PIR was not updated, meant that it continues to use different – including problematic -indicators/baselines* | ***It continues to use problematic indicators/baselines.*** For example:   * there is a case when instead of using the 2 indicators from the Inception report [No 19 “Percent of key stakeholders/institutions with relevant mandates involved trained jointly by the MWE/Project (percent)” with the endline target of 100 percent and No 20 “*share of positive feedback from training participants* (percent)” with an endline target of 90 percent], PIR continues to use non-SMART one from the ProDoc (namely “Number of participants and new content of training seminars”, with a baseline of “ Training delivered by MWE to an estimated 78 specialists and 36 farmers annually” and an end lien target of “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 period” which the project reports against annually]. Indicator No 19 from the RRF from the Inception report is also problematic; and. * PIR features a description for a baseline for the indicator No 8 “Reduction of water used for specific soil types (m3/ha/year)”, while it should be 0 (given that this is about reduction) as in the RRF from the Inception report. [At the same time, in the RRF from the Inception report Indicator No 9 “Normalized energy consumption reduced (compared with average values for similar soil types”) has a “TBD” for the baseline, while it should be 0, as in the PIR] |
| ***For Indicator 17.*** “*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****”, the endline target from the PIR and ProDoc is different from that of Inception report.*** In the PIR and ProDoc it is “2 production lines established and up to 400 kilometers of canals newly lined”, while the part on “400 kilometers of canals newly lined” is not in the Inception report. In other words, at the time of the MTR, the project was still aiming to achieve the latter at the project close. |

*Source: RRF from the IR, IR and the ProDoc*

*Table 9 Outcome of inconsistencies between the RRF from the IR/PIR and the ProDoc PRF*

| Type | Outcome/Example |
| --- | --- |
| *Deviation in indicators* | * The Indictor on “*Regulations, other sub-legislative acts, and/or state programmes adopted and/or enforced on pumps, tariffs, and IWRM*” from the ProDoc was replaced by “Number *of regulations, norms, and/or standards developed and adopted in support of the new Water Code” (No 20 from the PIR and No 21 from the RRF of the Inception report*”) * The Indicator “*Programme for water measurement is developed and made operational at focus demonstrational sites*” (No 20 in the PIR and No 21 from the RRF of the Inception report” does not feature the proposed Indicator from the ProDoc “*Transition to a paid basis for irrigation water, including measurement of water consumption*”, while the corresponding Output is specifically about that (*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)’* * The Output 4.4- “*Administrative reform for implementation of IWRM and SLM*”, is not captured by any indicator in the PIR and RRF from the IR, while there is a proposed indicator from the ProDoc – albeit a too wide one “*Regulations, other sub-legislative acts, and/or state programmes adopted and/or enforced on pumps, tariffs, and IWRM”* |
| *Inconsistencies in the formulation of project objectives* | The PRF from the ProDoc and the RRFs of Inception report specify “*Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan*”, while in the text of both the ProDoc and Inception report), the above is formulated as Development objective and there is also an Environmental objective: (a) Reduce GHG emissions associated with water management and (b) Prevent and remediate salinization of lands |

*Source: RRF from the IR, IR and the ProDoc*

## **Progress towards results**

### **Progress towards Outcomes Analysis**

#### **Component 1. Technology transfer and knowledge development in support of innovation in energy efficient water management and SLM**

1. ***Output 1.1. Technology proving site/educational platform or low energy use and SLM***

At the time of the MTR, the experiments on 145 ha of land provided by the MAWE were ongoing. Water distribution system at the site consists of a network of pipes feeding the irrigation demonstrations. Irrigation types (each featuring a distinct water feeding system) include: drip irrigation (20 ha), a linear and centre pivot irrigation (35 ha), a number of sprinkler systems (5 ha) and improved furrow irrigation systems (85 ha). The site is the first major demonstration of water-efficiency in agriculture in the Ahal velayat, which has the largest number of residents in the country and is the most affected in terms of salinized land area. The site expands the scope of previous efforts by testing various types of irrigation technology at one site. It allows identifying the best irrigation techniques for selected types of crops which are water and energy efficient, but goes beyond that, in that:

* it offers an opportunity for full integration of supply, delivery, and end use of water, involving not just irrigation but also on-site pumps and distributional infrastructure such as channel linings or piping in place of open canals;
* it involves not only physical equipment, but also planning techniques and soil monitoring so that water is delivered only where and when it is needed. Informational feedback from “smart” systems allows for reduced pumping when irrigation needs are low, thus lowering consumption of both water and electricity; and
* The entire process of planning, budgeting, and interagency administration for technology implementation is being documented. Financial performance, water consumption, energy consumption, and other technical parameters are monitored (to be continued throughout at least another growing season). Increased crop yields are documented and compared with analogous sites with traditional irrigation schemes. Based on collected evidence cost-benefit analysis of demonstrated technologies is planned to be performed.

As a result of conducting research on the experimental research site, the team is planning:

* to obtain water consumption norms for cotton, winter wheat, alfalfa, sugar beet, vegetable and other crops during sprinkling and drip irrigation in grey soils with medium and heavy mechanical composition, with the occurrence of groundwater, with mineralization of about 10-11 g / l, at a depth of 2.0 - 2.5 meters. The depth and mineralization of groundwater, the soil and climatic conditions of the experimental plot correspond to the soil and climatic conditions of: (a) the South-western zone (the Serdar and Bereket districts of the Balkan velayat); and (b) the Prikopetdag and Murgabo-Tedzhensky zones (all etraps of the Ahal velayat and most of the etraps of the Mary velayat). So, the findings from the site would be applicable also for these areas; and
* to propose recommendations on changes in the Building Regulations (SNIP) in the sections on “*Drip irrigation* and *Sprinkler irrigation systems”,* in the part of the design of newly constructed and reconstructed land reclamation systems' and structures. After consultations with the MAWE and the Ministry of Construction, the team plans to prepare an improved version of this SNIP.

The site is open to education and study visits and is conveniently located (close to Ashgabat and to major institutes of research and learning, including the SIWMD. Two PhD students (one from the SAU and one from the Dashoguz Agricultural Institute) conduct their studies there on the following research themes: "*Development of optimal irrigation regime for cotton and vegetable crops with drip irrigation*", and “*Development of the optimal irrigation regime for fodder crops with sprinkling systems*". The SAU is planning to organize annual practical training there for selected students. The site could be utilized also by the higher education institutions under the MoE, especially the Mary Energy Institute, as was envisioned in the ProDoc (see *Recommendation No 3*).

At the time of the MTR:

* ***the midterm targets of water saving at 20 percent (in m3/ha/year), and energy saving at 15 percent, cannot be confirmed as yet, as there is less than a year since the experiments started.*** The project team expects more than 20 percent from theintroduction of water-saving irrigation technologies and the improvement of water supply systems. For example, drip irrigation in comparison with the traditional methods, leads to more than 70-80 percent reduction in the amount of mechanized work, according to the experts of the project; and
* ***The midterm target for land reclamation of 50 ha was exceeded with 100 ha.[[27]](#footnote-27)***

In the part of the first two targets, the tentative results will be finalized only in the autumn of 2019, after one full agricultural season.

As for the ***end-of the project targets***:

* ***Meeting the end-line target of 30 percent of energy saving is possible, but the size of the plot being smaller than initially envisioned is a risk factor*** (145 hectares instead of 170 taken as the basis for calculations of the targets)***.*** Note that,there is also a target on energy saving from the ProDoc (not part of the RRF): 5.4 MWh electricity and 0.34 GJ of diesel per hectare on the pilot project (of 170 hectares), plus 10,234 hectares via replication;
* ***Meeting the end-line target of 40 percent*** ***saving for water is possible if other, even more efficient irrigation techniques are tested;*** and
* ***The end of project targets for the reduction of GHG emissio***ns (NB: not part of the RRF from the IR) are: 809,000 tCO2 in total; 270,000 tCO2 direct; and 539,000 tCO2 indirect bottom-up from spillover replication. These are being monitored and are possible to achieve, but it has to be noted that meeting the target for direct emissions will be affected by the size of the plot being smaller. As for the indirect targets, the fact that the GoT is including new irrigation technologies in the “*Water Development Program of Turkmenistan for 2018-202*4” (WDP2018-2024) currently being developed is promising. ***Note that the baseline GHG reduction calculations are not as yet available*** (s*ee Recommendation No 5a)*

Better capturing of the positive impact of reductions in land degradation is recommended. Monitoring was envisioned in the ProDoc. Currtnly only two indicators are captured (*Improved/increased water availability - land area*; and *Productivity of crops*), but the LD Tracking Tool contains other applicable indicators which could be monitored (see *Recommendation No 8.1d)*.

In line with the ProDoc, in the remaining period, the EERE team and national partners should compile and disseminate results as a written report, and as material for training seminars for water district officials, system designers, and farmers (*Recommendation No 4.1),*

It is also recommended to use Geokdepe results to test the suitability of AquaCrop model for the salinized land conditions of Turkmenistan (for further discussion see the Section 4.3 under “Synergies” and also *Recommendation No 12)*

1. ***Output 1.2: Audits and servicing of pumps***

According to the ProDoc there are 2360 electric and 1179 diesel pumps owned by the MAWE and its regional and local affiliates. The project prepared a comprehensive list of all the pumps with the information on: location, brands, type of energy consumed, operating regime (flow rate and head) and schedule (peaks and lows), years of operation, etc. This list (a first of its kind inventory in the country) served as a basis for selecting pumps to be audited, but the most-used pump brands, consuming the most energy in the system of water pumping (for instance, SNPE 500/10, SNP 500/10 - axial pump PG 50 with electric and diesel drive) were identified for audits. Other brands, which are less popular, but still significant in the total energy consumption, remained out of the sampling set. The project has supported the audits of 121 pumps including 43 diesel pumps, instead of 100 planned ones, across the whole range of sizes and output levels within the water management system and covering 35 administrative sub-regions (etraps).

Hence, regarding the midterm and endline targets:

* ***The midterm target is “Suppliers identified, contracts for pump delivery concluded”: this was expected to be completed during the time that the MTR was being drafted;*** and
* ***The endline target on the number of audits is already exceeded with 121 audited, but the sampling selection was not representative of the entire set of pumps operating in the country***

The audits were conducted by two local water engineers and the staff of the Grundfos (UK)[[28]](#footnote-28) representative office in Turkmenistan, with Grundfos supporting the local team with a special equipment and guidance in measurements and other technical issues. The Final Report prepared by the Grundfos is based on the collected information and contains resulting tables, representing outputs of a special software developed by the Grundfos using its methodology. The Report describes also the findings of site inspections, assessments of pump efficiency and energy consumption, operating schedule, overall operating condition, and recommendations for repair or replacement. The local engineers have not been systematically trained in conducting step-by-step energy audits (only around 10-15 of them, involved in maintaining selected water pumps at various locations, have taken part in collecting information with the Grundfos’s measuring equipment). According to the representative of the Grundfos, this is due to its methodology being protected by intellectual property rights. The interviews by the MTR team indicated, however, that many of the formulas are open and could be shared and the overall idea explained. The officials from the MoE expressed a high level of interest in receiving training in energy audits at water stations (see *Recommendation 3*).

The ProDoc requires replacing “*most inefficient audited pumps* *of various sizes”*, while almost all audited pumps have the same capacity and size. Upon the analysis of energy audit results, the project has selected 5 most inefficient pumps of the same capacity and size including 4 electric pumps and 1 diesel pump for replacement with new modernized electric ones. The target was 10, and the reason for lowering the number to 5, was based on the finding that these inefficient pumps are in a state that require complete replacement and not just some parts with corresponding cost implications. At the time of the MTR the procurement was ongoing, and this number (5) might be increased upon studying price quotations from bidders.

***For the indicator “Energy saving achieved by replacement and/or fixing of old pumps (percent)”***

* ***The midterm target of “Suppliers identified, contracts for pump delivery concluded” will be met either before the MTR is finalized or shortly thereafter;***

***As for the endline targets:***

* ***Meeting the target of 20 percent energy saving will depend on the number of pumps actually replaced and their capacity;*** and
* ***Meeting the total GHG emission reduction target (direct and spillover) of 475,200 tCO2 for electric and tCO2 26400 for diesel*** (NB: these are not part of the indicators from the results frameworks), ***is likely,*** since the target assumes replication of *(a)* 243 electric and 486 diesel during the project and (b)94 electric and 188 diesel after the project***,*** and the ***GoT is already replacing pumps with own resources.*** Within the last 2-3 years (2016-2017) about 600 pumps were already installed/replaced in the locations with very obsolete and broken units. The remaining 200 pumps are planned to be installed in the autumn of August 2018 as the requests are received by the MAWE’s regional water departments[[29]](#footnote-29)***.***

***Note that the baseline GHG reduction calculations were not available at the time when the MTR was being drafted.*** This needs to be accomplished as a matter of priority ***(***s*ee Recommendation No 5a).* This needs to be based on the sample audited, and so the sample should be representative. To ensure that, consider auditing 5-10 additional representative water pumps of brands different from ones initially audited (see *Recommendation No 5a*).

Upon the completion of all the energy audit results, technical assessments of the modernized pumps should

be completed to facilitate replication (through MAWE or private investments): this could be connected to Component 4, Output 4.3 (see *Recommendation No 3*) and would then be part of the planned (in the ProDoc) publication presenting the results of the energy audits to be disseminated according to the to-be-revised Communication and Knowledge Sharing Plan (see *Recommendation No 9.2*).

Monitoring of energy saving and the GHG emission reduction data should be arranged during at least a year, after the new modernized pumps are installed instead of outdated ones. Upon the analysis of the monitoring data, the actual energy savings should be assessed (see *Recommendation No.5b*).

1. ***Output 1.3: Renewable energy (RE) in pumping and purification in remote areas***

At the time of the MTR the project was about to launch (with a delay) the procurement of the two solar powererd pumping and purificaion systems for the villages of Yel and Bashkak in Karakum, each with approximately five (5) households (50-60 inhbitants); this was a change from the originally envisioaged location, decided based on the argumanetaion that the origianlly planned location – Bori- had already received UNDP support via pther projects. The Grundfos (see the previous point (b)) has committed to donate one (1) pump for a third location (solar panels, pumps, water purification AQ Pure and water distribution automated teller machine (ATM) -AQTap): Bori is considered as a potential location. Given the above:

* ***the midterm target of 500 people already benefittting from the installed system is not achived, but likely to be achived before 2019***

***As for the endline targets:***

* The ***endline target of “1100 people benefittting” is likely to be met***, since (a) the project will intall not one (1), as in the RRF, but three (3) systems (with the Grundfos donating a pump); and replication in three (3) other areas is likely, given that the technology seems to be gaining popularity in the country (with the contractor already designing similar schemes elsewhere), leading to reaching the endline target of “*six (6) systems in place*”; and
* ***Meeting the*** *e****ndline targets*** *(not in RRF, but from the ProDoc)* ***of GHG reduction at 872 tCO2 (436 (direct) and 436 (indirect bottom-up from spillover replication) might be affected in the part of direct reductions:*** the assumption of 10 MWh per solar installation, and meeting the target will depend on on the capacities of the procured anddonated pumps. ***Note that the baseline GHG emmissions were not calculated at the time of the MTR (****see Recommendation No 5a****)***

The project has hired a local consultant to draft the design documents for the solar powererd pumping and purificaion systems. Apparetnly, the Institute of Solar Energy was contacted at the stage of drafting the ProDoc, but not (or only briefly) subsequently, while according to the ProDoc “*The Solar Energy Institute, the NGO “Tebigy Kuwwat,” and local authorities in Byori and the Darvazin district (Bori Village) [were] to join UNDP in designing and managing the project”.* The representatives of the Solar Energy Institute indicated that the latter has own designs of combined solar-wind systems, which the experts of this Institute consider preferable in Turkmenistan (in sutiable locations)[[30]](#footnote-30). While, given the delays, it is recommended that the planned procurement of the two (2) systems (the villages of Yel and Bashkak) is seen through as in the current plans, engang the specialists of the Institute of Solar Energy in the installation and/or subsequent training (see the para below) is recommended. It must be ensured that, in line with the ProDoc***,*** the design, physical installation, and operation of the demonstration project is supplemented by hands-on training of local residents on the use and maintenance of the new technology (see *Recommendation No 1.1*). If the timing and local conditions permit it might be advisable to build one of the systems (out of the three (3)) in cooperation with the Institue, possibly of a combined wind-solar type, if the conditions of the location justify that (see *Recommendation No 1.1),*

***Table 10 Ratings for Progress to Outcome Analysis – Component 1***

| **MTR Rating** | **Rating** | **Achievement Description** |
| --- | --- | --- |
| **Outcome 1.** Enhancement of the national knowledge base and delivery of new technical information on appropriate technology – government and farmers | **S** | No indictor to capture enhancement of knowledge base and delivery of technical information, but the achievements at Geokdepe and the pump audit program are important from the point of the potential to contributing to national knowledge base. |
| **Outcome 2.** New processes established and implemented for planning, deployment, and financial assessment both before and after deployment of IWRM, pump audits and maintenance, and solar-powered water pumping and purification | **MS** | The number of pump audits exceeded the target (129 pumps were audited instead of 100 planned). The methodology needs to be better documented with more systematic knowledge transfer  **T**he target on the number of people benefiting from the solar powered water pumping and purification systems (500) was not achieved: the pilot has not started as yet |
| **Outcome 3.** Direct energy savings, water savings, and reduction of land degradation from the selected projects | **MS** | Water and energy saving targets at Geokdepe were not met given that it was completed less than a year ago (meeting the end of the project targets is possible but noting that the plot is 145 hectares and not 170 (used for the calculations of targets)). Here the midterm target for reclamation was met.  **T**he midterm target for energy saving was met as it is about suppliers identified for replacement. |

The technical design and economic performance assessments need to be documented and disseminated through a designed (in the to-be-updated Communications and Knowledge sharing Plan (see Section 4.3)). Among other recipients, this should be presented to interested ministries (including the MAWE, and the MoE) as a possible basis for expanded state investment and installation (see *Recommendations No 1.1 and No.9.2).* And finally, the project must carry out a small-scale survey in a year’s time after the completion of the pilot, to assess the change in incomes (as suggested in the LD tracking tool) as well as suggested gender indicators (see *Recommendation 8.1.b* and *8.1.c).*

***Table 10*** summarizes the ratings for the three outcomes of this Component with justifications.

***Component 2. Scaling-up investment in improved water management infrastructure***

1. ***Output 2.1. pipeline and/or channel linings for municipal water supply in Kaahka, replacing unlined channels/wells, with documentation for replication***

Constructing the *Gravity Flow Water System* *of Kaahka Town* was assessed as more justified compared to the lining options.[[31]](#footnote-31) The construction of the system (including 14.8km long pipeline) was prioritized by the national stakeholders (along with the Geokdepe site) compared to the other pilots (canal lining and the RE system). The national partners had initially asked UNDP to complete the canal in 2016, but as noted in the IR, it was realized that this is a sophisticated pilot, requiring a solid preparation stage. The system was completed in April 2018 (after around a year of construction). Several innovations were implemented, including an innovative engineering solution for the dampers. The residents had water from the canal in April 2018, which is also of better quality (currently not being monitored (see *Recommendation No 8.1* and *Table 19* )). However, since the end of May 2018 there was no water in the canal: there was no water at the time of the MTR. The concern that there might not be water in the canal for several (hottest) months of a given year, was present already at the design stage. The project experts had even thought to make boreholes at the source and in the lower stream of the open channel to test the available amount and the quality of underground water to enable to use the water pumped out from these boreholes to fill the gravity flow water system of to compensate the water deficit during the summer months, but then this idea was dropped. The UNDP CO had invited an expert to assess “*the capacity of the proposed piped water flow from the Layinsuw River to supply Kaahka town, exclusive of the pumped groundwater supply”[[32]](#footnote-32)* The motivating premise of the replacement of the channel flow with piped flow, was that the additional yield generated, can be used to replace flow currently pumped from boreholes. The consultant’s estimates for four usage/demand conditions indicate ***maximum energy savings at 99kW,*** except when the legislatively controlled demand of 135 l/s for the year 2022 is assumed: in this case, 22 kW of energy saving is predicted. ***These are less than the end of the project target of 486 MWh/year.*[[33]](#footnote-33)** At the same time, some of the pumps are larger than it was assumed, based on the information provided to the MTR team.

To summarize:

* For the indicator ***“Reduction in water loss between withdrawal and entrance point of the Kaahka town Water Treatment facility (percent)”:*** 
  + ***The midterm target*** *“****Implementation of Kaahka project is at the level of 30 percent completed***” ***is met;*** and
  + ***The endline target of 5 percent is likely to be met.*** The EERE experts’ team expects over 90 percent water saving
* For the indicator ***“Number of similar projects initiated in other similar (or mountainous areas) districts of Ahal and Balkan velayats of Turkmenistan (#)”.***
  + ***The midterm target for*** ***replication, i.e. “Draft design completed, all stakeholders agree on details, funding also agreed” is not*** ***met***; and
  + ***The endline target of “One (1) similar project under implementation” is under question,*** given that the MTR team was not given assurances of it being planned.

As for ***other endline targets on energy saving and GHG reduction:***

* ***There are concerns in relation to achieving the endline target of direct energy saving of 486 MWh/year, given the discussion above***; and.
* ***Meeting the*** *e****ndline targets*** *(not in the RRF, but from ProDoc)**of* ***GHG reduction of 22,500 tCO2*** (total, including 11,250 tCO2 (direct) and 11,250 tCO2 (indirect bottom-up from spillover replication) ***is under question.*** This concern is based onthe (a) potentially less energy saving due to some pumps operating in the summer months – for direct emissions and (b) the risks associated with the GoT not giving assurances that the end line target of one (1) spillover project will be implemented – in the part of indirect emissions (see *Recommendation No 4*). ***Note that the baseline GHG emmissions were not calculated at the time of the MTR (****see Recommendation No 5,1****)***

In addition to close monitoring of the use of the pumps, to reduce uncertainty in yield and associated energy saving estimates, in the remaining time frame(in line with the recommendations provided by the consultant hydrologist), the project should (see *Recommendation No 4*).

* ***generate more accurate flow data by validation of data at the Border Station and reduction in measurement error at the Water Institute weir measurement sites***. Measurements of flow in the natural gravel channel would allow (a) estimation of the total flow arriving into the territory of Turkmenistan; and (b)monitoring this flow into the future, in order to assess any variation; and
* ***clarify the prioritisation of stakeholders, to reduce uncertainty in the potential flow available as piped flow to Kaahka***.

Based on the interveiews conducted for the MTR, the water from the pipiline is used/will be used both for

drinking and irrigation purposes. The Project also needs to ***carry out a survey among the residents of Kaahka,*** to (a) assess the benefits accruing to them as a result of more availability of water for drinking and irrigation purposes, e.g. income (as envisioned in the LD tracking tool); as well as (b) to assess the achievement of the results along the suggested gender indicators (See *Recommendation 8.1c)*. Also, the improvement in the water quality should be monitored (see *Recommendation 8.1.e*). This can be combined with one other recommendation already made above, i.e. with clarifying the prioritization of stakeholders (see *Recommendation 4* and *Recommendation 13).* All of the above will allow to undertake a cost benefit analysis at the end of the project.

Currently, the design document for similar canals do not cover using pressure absorbers (dumpers). Based on the experience of design and construction of the water system in Kaahka, it would be possible- and it is planned by the project team- to prepare a standard design scheme for gravity based water pipelines in foothill and mountainous areas, including (1) standards for pressure absorbers (dampers) and (2) calculations for laying pipes (mainly polymer ones) in rocky soils.

1. ***Output 2.2. Lining of inter-district canals for reduction of water losses and land salinization, including various technologies***

The ProDoc has committed to (a) identifying the potential new materials, testing and assisting three (3) companies to start production (with two (2) operational at the end of the project), as well as (b) lining 400km of canals. A number of key interviewees for this MTR expressed the same view that this is overly ambitious and that. while the project can help the two (2) factories with studies and assessments, the rest, i.e. starting the new production, should be left to the MAWE. The same applies to the target for 400km lined -over and above the tested lining (see *Recommendation 1b and 8.1*). At the time of the MTR, the project had hired a local consultant to conduct a market research to identify suitable materials: he started in June 2018; by the end of 2018 the project plans to identify concrete activities related to modern canal lining to add them to the AWP 2019

Thus, ***in relation to Indicator 17****,* “*Number of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes (#)”:*

* ***the project has not met the midterm target*** ***of “procurement started contracts signed”;***
* ***the endline targets of*** *(a) two (2) companies with running operating lines*; *and (b) 400km lined* [NB: point (b) is missing from the RRF of the Inception Report, but in PIR], ***are overly ambitious***; and
* ***no separate target is identified in the ProDoc for GHG reduction related to this line of activity***. The targeted figure of 448 million tCO2 does not include any estimate from this activity

*Table 11 Ratings for Progress to Outcome Analysis – Component 2*

|  |  |  |
| --- | --- | --- |
| **MTR Rating** | Rating | **Achievement Description** |
| **Outcome 4**. Reduction of water losses and associated energy consumption via direct investment in a large-scale infrastructure project on municipal water supply | **MS** | The midterm targets for the reduction of water losses, and for the energy saving were met given that these are about the *“extent of the completion of the construction of the pipeline* [there are risks with the potential of meeting the end-of the project target on energy saving]  The midterm target for replication - “*Draft design completed, all stakeholders agree on details, funding also agreed*” - is not met. |
| **Outcome 5**. Technical, environmental, and financial justification to scale-up investment in canal linings and/or other widespread infrastructure improvements to reduce water losses, associated energy consumption, and land degradation | **MU** | The pilot on canal lining has just begun and so the midterm target of “*Procurement started, contracts concluded*” is not met. This will be met in 2019 only [the end-line target of 2 production lines operational with 400km lined” is too ambitious] |

“

This pilot is significantly delayed. ***It is*** ***advised to hire an*** ***international technical consultan***t (with an in- depth knowledge of the available materials worldwide, including the countries with similar climate)) ***as a matter of priority to lead the process of identifying the suitable materials, working in tandem with the local consultant.*** Plus, this pilot needs a considerable phase for testing – of different products, in different climatic/topographic areas of the country, for at least a year (see *Recommendation 1b*),

*Table 11* summarizes the ratings for this Component.

***Component 3. Planning and capacity-building at the regional and local levels***

1. ***Output 3.1. Technology Action Plans (TAPs), including consideration of SLM, developed and implemented at the regional and local levels***

The TAPs, according to the ProDocare intended to serve as both technical and policy justifications for state investment in each chosen district, covering: (a) both supply and drainage canals, irrigation, and other on-farm water management practices such as irrigation scheduling; (b) technical proposals on system design, as well as analysis of benefits in terms of water conservation, energy conservation, and land reclamation; (c) financial justifications and proposed budgets; and (d) broader land-use sustainability indices and measures added to area plans.

There is a local consultant tasked with developing the methodology for the TAPs (NB: the consultant is also the research coordinator of Geokdepe site and one of the consultants for Kaahka, see discussion in Section 4.3 under “Staffing”).[[34]](#footnote-34) There are however, no deliverables as yet. According to the interviews and communication with the mentioned expert, the methodology will be based on the (a) experience gained from the Green Polygon at Geokdepe and other project components and (b) the analysis of the soil, melioration and economic conditions of each region, to inform the feasibility studies for the introduction of resource-saving technologies for the cultivation of crops in irrigated agriculture. It is envisioned that recommendations will be developed on the reorganization of irrigation systems and improving their technical levels, and introducing water-saving irrigation technologies (leading to restoring soil fertility in saline lands and increasing the productivity of irrigated land).[[35]](#footnote-35)The above implies a need for using modelling techniques, and the local consultant agrees with this conclusion.[[36]](#footnote-36) [This is in- line with the argument made in Section 4.1.2]. Here, linkages with SCRL project as well training of the EERE consultant team in AquaCrop model could be beneficial (see *Recommendations No 2,1 and No 12*). As for the targets:

* ***The midterm target of having one (1) TAP tested in one (1) velayat is not met;*** and[[37]](#footnote-37)
* ***The end-of-project target is to have five (5) such TAPs, one or more in each velayat.*** At this stage the likelihood of achieving this target is unclear.

***The project would benefit from engaging an international consultant for this Output*,** as envisioned by the ProDoc) “..*t*o *provide overall coordination and technical assistance in development of the SLM recommendations, based on comprehensive research on water and soil conditions; human factors leading to degradation; and best practices and opportunities for increasing sustainability, especially involving water management*” (see *Recommendation No 2*). It is also recommended that the UNDP and the MAWE conduct a national workshop inviting various experts and agencies to share ideas and approaches before finalizing the methodology (*see Recommendation No.2),*

1. ***Output 3.2. Education and direct training provided*** ***to water-management system designers, local water management staff and farmers in all regions of Turkmenistan on pump maintenance, irrigation, and other aspects of efficient water management and SLM***

During the Inception phase a capacity assessment of project stakeholders at various governance levels was conducted, culminated in designing of a Capacity Development Framework (CDF), which was used for the baseline stakeholder capacity assessment. Based on this a *Capacity Development Programme (CDP)* was supposed to be developed to start already in 2016: ***such CDP was not developed*** ***at the time when the MTR*** (see *Recommendation No 2.2*).

***Assessing whether the midterm targets were met or not is complicated due to the confusion with the indicators,*** discussed in the Section 4.1.3 and also in Table 4 (see *Recommendation No. 8.1* and Table 19). The points below bring together the evidence along several indicators from various documents.

* Against the ProDoc task of ***Compiling and delivering all of the results of the demonstrations and technical work of Components 1 and 2 in seminars and in-the-field training to water management staff and farmers in all five velayats annually after the first project year*** (in conjunction with already-planned training efforts of MAWE and international agencies, where possible), ***at midterm*** ***only***
* ***limited number of people (50) have been trained.*** According to the PM, the pilot projects have yet to produce firm results, to allow documenting and using in training. This argument is convincing, but it is important to have the agreed-upon CDP ready, including the topics of the training[[38]](#footnote-38) and target audiences. Note, also that the updated for midterm CDF does not feature changes along the predominant majority of indicators. The indicator that was changed - with reduced scores – is the “*Availability of adequate funding for energy efficiency, irrigation water use, GHG emission reduction -related interventions (both state funding and innovative resource mobilization schemes)*”; and
* ***The share of positive feedback from the trainees, was met*** (89.3 percent against 70 percent target for midterm), but this indicator currently is not tracked (the result was calculated by the project team based from feedback forms upon the request from the MTR team), being in the RRF from the IR, but not in the PIR.
* Against the ProDoc task of “***New educational outreach to students of agriculture and water management****”,* wherebyit was planned that the project will work with the Ministry of Education and with key institutions of higher education, including the Turkmen SAU, the Dashoguz Agricultural Institute, and the Institute of Energy in Mary, to enhance, newly develop, and implement materials and instruction modules on relevant subjects (including low-water irrigation and IWRM), ***at the midterm:***
  + - * ***The project collaborates with the SAU and the Dashoguz Agricultural Institute:*** as mentioned earlier, there are 2 PhD students at Geokdepe Green polygon (one from each institution). *The collaboration with the SAU is likely to result in the changes in the curricula, based on MTR interviews, but* ***the project has not as yet established collaboration with the Ministry of Education*** to address this more systematically (see *Recommendation No.2.2*.); and
      * ***The project does not, as, yet cooperate with the Institute of Energy in Mary,*** despite the fact that it was envisioned in the ProDoc (see *Recommendation No.3*),

***Based on this the related Outcome is ranked as MS.*** *Table 12* sums up the rating for the 2 Outcomes associated with this Component

*Table 12 Ratings for Progress to Outcome Analysis – Component 3*

|  |  |  |
| --- | --- | --- |
| **MTR Rating** | **Rating** | **Achievement Description** |
| **Outcome 6**. Technologies and investments for IWRM and SLM approved according to new TAPs in 5 velayats | **MU** | The midterm target of “*Methodology tested in one Velayat (of 3 selected earlier) as a pilot*” is not met |
| **Outcome 7**. Institutional/human capacity for implementing IWRM and SLM utilized and sustained among farmers and local/regional water management officials in all five velayats via training/LL | **MS** | Due to confusion in indicators (between the Inception report and the PIRs), the bullet points below summarize the situation along 3 indicators   * percent of positive feedback from the trainees, was met (89.3 percent against 70 percent for midterm). This indicator currently is not tracked (it is in the RRF from the IR) * Number of people trained – 50. There is no midterm target, since it is not in the RRF of the Inception Report * percent of the staff of partner agencies trained: this indicator is in the RRF from the Inception report but not in PIR and hence not tracked. The midterm target is 25percent |

1. ***Output 3.3. Compilation of lessons learned***

The project has started alredy to deliver results, which could serve as a basis for developng lessons learned reports and factsheets. Curretnly there are only brief notes in the PIRs. According to the ProDoc, in its final year, the project is supposed to develop a lessons-learned document for dissemination. It is advised that there is more than one such report (on specific topics): all the pilots and other major activities of the project should, as is planned, result in publications. This was highlighted in the preceding subsections. Producing the same publications at various levels of complexity should be considered, in case these will be of interest to both sector experts and the farmers. (see *Recommendation 2.2*).

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

1. ***Output 4.1. Standards and regulations for*** ***pump performance and maintenance adopted and enforced***

It was planned that this activity will result in the ***creation and implementation of mandatory performance regulations, agency enforcement assignments***and ***official technical guidance manuals related to pump performance and maintenance.[[39]](#footnote-39)*** Based on the analysis of the gaps in the regulaitons, the project identified four (4) regulations to be developed, but all of these relate to the Water Code, including: *(a) operational regulations for pump stations; (b) regulation for scheduled preventive maintenance and repair of water systems and facilities; (c) technical regulations of irrigation infrastructure;* and *(d) technical regulations of drainage infrastructure.* [In addition, the analysis recommended to revise two national normative acts (building codes for the water sector): the SNT 2.06.04 (*Melioration system and facilities*); and the SNIP 2.06.03-85 (*Hydro land reclaiming system operation*)]*.*

***The indicator for this activity is*** **“*Number of regulations, norms, and/or standards developed and adopted in support of the new Water Code (#*)”:**

* ***The midterm target of one (1) regulation adopted is met*** *(“technical regulations of irrigation infrastructure”).* ***Plus, 3 regulations are ready in the draft form;***
* ***The endline target*** “*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*” ***will be met only if the project tackes also one or two SNIPs (from the ones mentioned above) related to new standards and specifications for water pumps*** (as in the ProDoc), ideally involving international expertise in the review of available building codes, and developing the criteria for the selection and the revision of selected building codes (see *Recommendation 2,3).* As suggested by the MoE during the MTR mission, the existing “*Regulation of technical operation of the electric facilities of consumers*” available for the water sector could also be revised in the part related to energy conservation (see *Recommendation 2,3).*

This indicator (the same in the PIR and the RRF of the IR) differs from the one in the ProDoc as described in *Table 9* and is limiting: itcoversonly part of the goal from the ProDoc as described above for this Output.

*:*

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

The ProDoc envisioned this activity leading to:

* The development of regulations or internal norms for the MAWE for monitoring water and energy consumption and compliance with applicable energy-related norms in the water sector;
* Adopted regulations with a defined timetable for staged implementation of tariffs; and
* Fully operational systems of measurement of water consumption and energy consumption in the water sector across Turkmenistan by the end of the project period.

There is a recognition in the ProDoc that the obectives listed above are very amibtious.[[40]](#footnote-40) At the time of the MTR, ***there was a*** ***consultant tasked with developing the methodology for better measurement of water and energy consumption in irrigation*** (NB: the same consultant tasked with developing the TAPs, who is also the Research Coordinator for the Geokdepe Polygon).Based on the correspondence and interview with the consultant, ***at the time of the MTR:***

1. ***Related to measurement of water use in irrigation, several options (and combinations of those) were being considered - with the number of sites not having been decided:*** (1) standard spillway water meter devices (thin-walled weirs or others); (2) calibrated channels with the use of a water gauge; (3) divers; and (4) standard water regulating structures. It was planned that the final selection of demonstration sites will depend on the analysis of various factors (e.g. hydraulic, economic and other conditions);
2. ***In the part of measurement of the use of energy,*** it was planned to carry out these activities at the sites where the measurement devices will be installed (combined with the information gathered through Output 1.1. on Geokdepe (various irrigation systems), and Output 1.2 on the audits of pumps); and
3. ***As for tariffs,*** ***it is*** ***planned to elaborate and recommend for the adoption tariffs for the maintenance of on-farm canals and collectors related to the amount (share) of the volume of water used by the water users.*** It is envisioned that the proposed regulation will (a)exempt water users from the costs of maintaining the collector-drainage network, when using drip irrigation and sprinkling; and (b) stipulate that in the case of using the water over the limit, in addition to paying for excess water used, there will be a payment also for the maintenance of canals and collectors. ***All of the above are at the level of ideas still, and no deliverable was produced as yet***. Note that the RRF does not feature the proposed Indicator from the ProDoc “*Transition to a paid basis for irrigation water, including measurement of water consumption*”, while the *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)”,* is very definitive about introducing tariffs.It is suggested to amend the endline target to become “***Programme for water measurement and Payment”,*** to be clear that it will contain a tariff methodology for irrigation.”

For the indicator **“*Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No)”*** (*No 20 in the PIR and No 21 from the RRF of the Inception report):*

* ***The midterm target - “Water measurement equipment is made operational***” - ***is not met,*** since even the demonstration sites were not identified at the time of the MTR; and
* ***The*** ***endline target is on having such a Program in place: meeting this target at the project close is possible but ambitious***

This is a very ambitious activity and needs a special attention and push to catch up with the planned timeframe: by the time of the MTR list of demo projects should have been completed and agreed with the national partners; the technical designs of pilot projects should have been developed (including on water measurement equipment and measurement methodologies) and water measurement equipment was made operational. It is suggested, in particular (see *Recommendation No 2.4.*):

* to organize a workshop to discuss the options, including for the overall approaches; and
* to hire an international consultant to (as in ProDoc) lead the analysis of (a) water supply and scarcity in specific areas, (b) the economic condition of end users, and (c) MAWE’s current and projected costs of managing its infrastructure, with new systems for measurement of water consumption (see *Recommendation No 2)*

1. ***Output 4.3, Policy and state budget framework for widespread deployment of efficiency improvements to irrigation and water infrastructure adopted and implemented***

***The intended*** ***policy framework (under the Water Code) was*** ***to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide***, ***defining numerous elements,*** including (a) the procedures for technical assessment; (b) the criteria for financial justification; and (c) the targets for investment and deployment. It was expected that:

* ***regulations, state programmes, and budget allocations will be adopted;***
* ***voluntary incentives*** ***will be established*** ***for farmers to deploy low-water irrigation and other technologies and practices for water efficiency and sustainable land use*** (possibly linked to tariffs; and/or state purchases of harvested crops; and/or subsidies for purchases of equipment, etc.); and
* ***the framework itself will be an important vehicle for replicating the results achieved*** under the first first three components of the EERE.

For the indicator ***“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)”***

* ***the midterm target***  **“*Required budget allocations submitted to the Government and accepted for consideration*”, *was not met, but with a caveat that the project contributes to the process informally***. The interviews for the MTR revealed that the SIWMD is helping the MAWE in developing the “*Water Development Program of Turkmenistan for 2018-2024*” (WDP2018-2024), that envisages rational use of water resources, improving land reclamation techniques and other issues of improving the national water sector in the long term. This work benefits and is informed by the EERE experience at Kaahka and Geokdepe– in relation to the construction of water-saving irrigation systems, as well as the budgeting of activities, as it is necessary to prepare an assessment budget for calculating the appropriations of the state budget (with the delayed pilot in canal lining being the missing part). [NB: The senior consultant for EERE leading many of the activites is also part of the Workign Group developing this Program]. The project should indeed submiit its contributions formally (see *Recommendation No 2.5*); and
* ***the endline target of “having the formal commitment in place”, looks somehwhat ambitious,*** but with a caveat that the commitment may be partial, applying to only parts of recommendations, something that the indicatr does not capture.

***This activity will benefit from hiring*** ***a consultant (international/regional***) who would post-2019 guide the development of the intended “*policy framework under the Water Code to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide*”, to define numerous elements, including: procedures for technical assessment; criteria for financial justification; and targets for investment and deployment (see *Recommendation No 2)*. The project would also benefit from the exposure to the views of larger spectrum of local experts, so it should also conduct workshops to discuss the draft proposals before finalizing (see *Recommendation No.2*).

1. ***Output 4.4. Administrative reform for implementation of IWRM and SLM adopted and implemented***

The expectation from the ProDoc was thatthis output will result in ***the adoption of official regulations redefining agency roles and planning targets*** ***to emphasize integration, optimization, and sustainability of IWRM or other policy documents, supported by annual plans and budgets of respective ministries.*** Overall the envisioned result as a *policy framework* is vague and not well formulated (with rather wide spectrum of issues mentioned). It is recommended that it is narrowed down, to, two (2) or three (3) concrete tasks, e.g. on regulations on “*redefining agency roles”* and *“planning targets’ setting” (see Recommendation No. 2.6*). Formally the work on this Output had not started at the time of the MTR: measures to make a progress are needed as a matter or priority. However, the work of the project on the development of by-laws of the Water Code contribute to this Output. It is planned that in the next two (2) years, the project will develop recommendations: this will benefit from the services of an international consultant and conducting workshop(s) to discuss options with a larger spectrum of local experts (see *Recommendation No. 2.6*). There is no indicator in the RRF to capture this activity (see *Recommendation 8.1* and *Table 20*)

*Table 13*sums the ratings for the three Outcomes associated with this Component with justificatins***.***

***Table 13 Ratings for Progress to Outcome Analysis – Component 4***

| **MTR Rating** | **Rating** | **Achievement Description** |
| --- | --- | --- |
| **Outcome 8.** Regulations adopted/enforced on: (a) pump performance and maintenance; and (b) staged onset of tariffs for end use of water | **S** | 4 regulations developed for the Water Code, but none as yet on pump performance and maintenance: the latter is in the plans for the next phase but no indicator exists in RRF specifically on regulations related to pump performance and maintenance  No indicator exists in the RRF related to revision of tariffs. Planned activities might lead to it, but no concrete output is planned at the time of the MTR |
| **Outcome 9.** Operational system established for measuring end-use water consumption | **MU** | The midterm target of “*Water measurement equipment is made operational*”, of the indicator “*Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No)”* is not met. |
| **Outcome 10.** Policies and budget allocations adopted in support of expanded investment in improved irrigation and water infrastructure | **MS** | While the midterm target “Required budget, allocations submitted to the Government and accepted for consideration”: it is not met formally, informally EERE contributes to the development of the NWP2018-2014 |

### **Progress towards Objectives**

Meeting of the project targets is captured with a set of seven (7) indicators in the RRF. The discussion below is organized along these indicators, divided along two (2) lines: environmental and development objectives. ***Table 14*** summarizes the ratings with justifications.

#### **Environmental objective**

As per the CCM Tracking Tool, the project should achieve the endline targets of: (a) Lifetime energy saved – 3.4GJ; (b) Lifetime direct GHG emissions avoided – 448,889 ton CO2eq.; and (c) Lifetime indirect GHG emission avoided – 886,085 ton CO2eq. The ProDoc describes the key assumptions used for the calculation of the targets for the Pilot projects.[[41]](#footnote-41) The project developed draft methodologies to estimate more precise baseline direct and indirect energy consumption and GHG emission, as well as corresponding energy savings and GHG reduction for the above pilots, but the baselines for each pilot were not estimated at the time of the MTR (as was mentioned in the preceding Sections), for the main reason, as explained to the MTR team - that a sufficient set of data had not been provided by the project team to the consultant charged with the estimation of GHG emissions. Due to delays in implementation of the pilots, two of them have been finalized just a few months prior to the MTR mission, and the third was to be completed by replacing inefficient pumps soon after the MTR, while the remaining two pilots were at the stage of pre-design, as was described in the preceding Sections. As a result, monitoring data are not collected and mid-term calculations of the annual energy savings and GHG emission reductions are not provided by the time of MTR. Therefore, the MTR team was unable to check GHG estimations and discuss the findings on absolute energy savings and corresponding direct GHG emission reduction targets.

To summarize, *t****he following three (3) midterm targets are not met:***

1. ***“Energy consumption calculation is introduced on regular basis in each pilot project under implementation”*** for the indicator “*Reduction of yearly energy consumption per ha of irrigated land (J/ha/year)”.* At the time of the MTR, calculations were introduced but not in all the pilots, since not all pilots have started at the time of the MTR;
2. ***(a)*** the ***midterm target of 150,000 tCO2 (direct emissions from the pilots,*** for the indicator “***Reduction of GHG emission***”); and ***(b)*** the ***midterm target of 85,000 m3/ha/year*** (from the baseline of 120,000 m3/ha/year) for the indicator of “***reduction of normalised water consumption***”. The reason for not meeting these targets is that even for the pilots that were completed, it has been less than a year after their completion.

***The midterm target of land reclamation was met with 100 ha, surpassing the target of 50ha.***

As for ***the likelihood of achieving the endline targets of (a) direct GHG reduction at 448000 million tCO2) and (b) energy saving (3.4 million GJ/year); and (c) normalized water consumption of 48,000 m3/ha/year*** - it varies and dependent on the performance and risks for each pilot along the lines of these indicators, described in respective subsections of Section 4.2.1 under Components 1 and 2.

#### **Development objective**

The ***mid-term target of “Technical specifications defined for at least 2 (1 at national level) regulations to update, legal procedures started****”* of the indicator “*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 (#)”* ***has been met***, but with the caveat that the regulations currently being developed cover only water use efficiency. At the time of the MTR:

* the project had disbursed 49 percent of the total required co-financing, at US$35.3million: ***while the target of US$42.0 million is not met, the gap is not large*** (NB: this assessment is using not the indicator from the RRF from the IR; [[42]](#footnote-42) but the figures form the ProDoc (Section 4 Work plan and budget); and
* The ***midterm target of 10,000 direct and 100,000 indirect beneficiaries*** of the indicator “*Number of people directly (and indirectly) benefiting from measures on better water management, efficient water use, energy saving and land degradation in Turkmenistan****” has been met (***evenwith Kaahka alone).

***Table 14 Ratings for Progress to Outcome Analysis – Objective***

|  |  |  |
| --- | --- | --- |
| **MTR Rating** | **Rating** | **Achievement Description** |
| ***Development objective (DO):*** Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan | **MS** | The midterm targets of the 2 out of 3 indicators (Number of regulations and number of people benefiting) are met. The target of co-financing was not met, but close  . |
| ***Environmental objectives (EO):* (a)** Reduce direct energy use and GHG emissions associated with water management; and (b) prevent and remediate salinization of lands | 3 out of 4 midterm targets (in GHG reduction and water and energy saving) have not been met, given that less than a year lapsed since start of the pilots. The midterm target for land reclamation was met. |

**Cross-cutting- gender.** In addition to recommended capturing of potential and anticipated changes in the income of farmers in Kaahka and Karakum through surveys, as discussed earlier, it is recommended that the project tracks “*more water available for the residents in Kaahka (and water quality) and Karakum pilot areas*” and hence” *less time residents/women spend for the collection and storing of water”* (see *Recommendation No 8.1c*)

### **Remaining Barriers to Achieving the Project Objective**

Regulatory barriers are covered elsewhere (e.g. under Sustainability). This Section lists the barriers which could and should be targeted by UNDP and EERE

***The strength of the ownership by the MAWE to co-lead the reforms together with UNDP is essential***. The role of the MAWE is crucial in successfully implementing the 3rd and 4th Components of the project, which include reforming/introducing several policies and processes, namely:

* The Policy framework for measuring and monitoring water and energy consumption;
* The Policy and state budget framework for widespread deployment of efficiency improvements to irrigation and water infrastructure adopted and implemented;
* The Policy framework on redefining agency roles and targets’ setting for IWRM and SLM; and
* The Policy framework/regulations on reforming tariffs for end use of water, etc.

Little progress has been made along the Outputs under the 3rd and 4th Components and measures to mitigate this need to be taken as a matter of priority. The role of the MAWE is also crucial in ensuring that its commitments are honoured in terms of allocating the resources for the agreed upon replications. Therefore, the strength of the ownership by the MAWE to co-lead the reforms together with UNDP is essential. The project and the UNDP CO could do more in highlighting the importance of this factors as well as elevating the visibility by roundtables/workshops and alike with participants from larger circles. As an important item under this agenda, the EERE could participate formally in the Working Groups (or at a minimum should present recommendations formally) to feed into the WDP2018-2024 being developed.

***EE/GHG mitigation and LD deserve more attention at the level of: regulations, training, and monitoring.*** The fact that there is no as yet Law on Energy Efficiency, is not conducive to the success of the Project. the MTR team was informed that a draft exists and is under review. Ideally, the EERE should support the Government in adopting relevant laws (e.g. on the EE) and a Program, or at a minimum, contribute [NB: there is a National Program on EE, but it was not made available to UNDP by the GoT].

## **Project Implementation and Adaptive Management**

### **Adequacy of Project Management Arrangements**

Project management arrangements, described in Section 3.4 are overall adequate. There are several areas of improvement, discussed in the Sections below.

***Project Board***. Meetings of the PB were usually held twice a year.[[43]](#footnote-43) There could have been broader representation in the PB, as envisioned in the ProDoc, including representatives from the Ministry of Economy and Development; and the Ministry of Industry (*see Recommendation No 7).*

***MAWE***: While the MAWE chairs the Board and provides the necessary overall support, the ownership over the entire spectrum of the project could have been more evident. At the time of the MTR, the latest CDR was not signed by the NPC; the underlying reason being the overemphasis by the MAWE on infrastructure activities as opposed to consulting support. And secondly, there could be more recognition by the MAWE and the SIWMD that, while they are the primary partners for the project, there is a need to engage more actively with others, including the MoE and related institutions, and the NAS (see *Recommendation No 7).* Arguably, the project would benefit from the NPC at the level of Deputy Minister, as was envisionedin the Inception Report *(see Recommendation 15)*

***UNDP:*** The UNDP CO is responsible for (i) reviewing of project progress; (ii) human resources; (iii) finance; (iv) procurement; (v) asset management; (vi) cash management; (vii) general administration; (viii) information systems**.** The role of UNDP was crucial in (a) providing the overall guidance; and (b) stepping in more directly when almost at the same time several people let the project (Project manager, RTA and CTA). The PM maintained regular contact with the UNDP CO regarding the work plan and its implementation, with the Program Specialist for the Energy and Environment in particular, but also the Deputy Resident Representative and the Resident Representative, as well as, since 2017, the Program Coordinator for the Energy and Environment Portfolio (a position created after the restructuring of the CO). And finally, the UNDP CO gathers once in two (2) weeks all the managers of UNDP projects for meetings at the UNDP CO premises to report on project status and highlight any issues in project implementation. The UNDP CO could have been more involved in its role of quality assurance however, in particular in relation to (a) recognizing the staffing and experience needs of the project;[[44]](#footnote-44) and (b) guidance related to project reporting. UNDP Regional Technical Advisor (RTA) for 2017 (the second in turn), could have been more involved in providing technical support: here it must be noted that the person was on a part time consultancy contract and was not based in the UNDP Regional Service Centre in Istanbul – a mode of engagement, which arguably was one of the constrains that impacted the extent of involvement); recently a new RTA was assigned for the project.

***Decision making:*** The project relies too heavily on the expertise from its main partners (the SIWMD in particular). There should have been – and should be in the remaining time frame- more exposure to other experts in various fields, listening to and considering other approaches and ideas. At a minimum there should be more workshop/roundtable type events (*see Recommendations no 2 and No 7).*

***Staffing and consultants.*** For such a large and ambitious project, the project is understaffed. Given the sheer volume of work that needs to be accomplished in the remaining time, it is recommended that the project team is amended with one (1) more staff. The project also needs more guidance, especially in relation to international expertise in the areas tackled. So far international expertise was sought only for the Kaahka pipeline and the GHG emission reduction calculations). One international consultant could be hired for the sub components 4.2; 4.3 and 4.4. (but these could be also a national consultant(s), to be decided by the PM and the CTA to-be-hired) and another one for the Component 2 (canal lining). In addition, hiring a CTA is recommended as a matter of priority. And finally, the work planning seems to be affected by the fact that a single consultant is engaged in many tasks, in addition to being heavily involved in the development of the WDP2018-2024: while a highly reputable individual, this has implied delays in the implementation of the activities under Component 3 and 4. Hiring a CTA and the suggested additional consultants, as suggested would potentially help address this issue (see *Recommendation No 6*).

***Work planning***. While the project has performed very well in ensuring the delivery of the two (2) very large-scale pilots -Goekdepe and Kaahka - and the pump audits in short time frame (catching up on time lost in the beginning), the work on the other two (2) pilots, as well as on most of the activities under Component 4, could have started in parallel. While it seems that the postponement of the two (2) pilots was a conscious decision taken jointly by the UNDP CO, and the MAWE, [[45]](#footnote-45) at least the preparatory stages of the remaining activities could have been completed by the midterm (research on the suitable canal lining materials, for example; and the designs of the solar powered water supply systems in Karakum). Indeed, staff shortages had played a role, but there could have been better work planning also. While the AWPs were prepared by the PM (with inputs from the UNDP CO, and approved by the PB) with annual procurement plans prepared and approved by the UNDP CO, the project would benefit from ***mapping out the remaining activities timewise for the whole remaining duration of the project ensuring the interlinkage***s (***see*** *Recommendation No .28).* The work-planning could be improved also in terms of strengthening the focus on results and timeline. The Project’s RRF is not as yet fully used as a management tool for planning, partly due to its quality issues (see Section 4.1.3.). ***Once the RRF is improved and aligned with the PIR, it must be ensured that this new RRF is used as a management tool*** (*see Recommendation 8).* Given that the project has experienced delays, in part related to the period of approximately seven (7) months when it was without a manager, ***it would be advisable to extend the project for 18 months*** (given also the sheer ambition of the current project design*),* if there are available budget resources for no-cost extension (s*ee**Recommendation No 12.)*

#### **Project-level reporting systems.**

#### Both the APRs and the annual PIRs (three (3) available to-date covering the period of July to June, and submitted by the PM to the UNDP CO, UNDP Regional Coordination Unit, and UNDP HQ for review and official comments, prior to final submission to the GEF) feature reporting against the PIR indicators. As mentioned the Section 4.1.3. the IR apparently was not acted upon at the Istanbul Regional Center- to update the PIR - and the inconsistencies affected both the APRs and PIRs. [The IR was not also used much by the project staff as well, otherwise the inconsistencies would have been spotted earlier]. The quality of these reports could be substantially better: this is partly connected with the quality of the indicators, but the actual writing could be improved in terms of the level of detail and accuracy (the latter also applies to the Tracking Tools). In addition, the lessons, derived from the adaptive management process have been documented only to a limited extent, reducing the chances of their internalization by various partners. And finally, the response to the comments in the PIRs, could have been more proactive and comprehensive.

Importantly, the PIRs were not shared with the PB. The MTR team encourages the Project team to include reporting against the RRF indicators at Objective and Outcome levels to reporting to the PB, which will help its members to take more ownership and focus more on the results and impacts of the project, rather than accomplished and planned activities. (see *Recommendation No 9.1*)

### **Finance and Co-Finance**

#### **Financial management**

The total revised budget of the project in the ProDoc is US$ 78.285 million, of which US$6.185 million (8 percent) is grant-aided by the GEF[[46]](#footnote-46) and US$72.0 million co-financed by the GoT (91.9 percent). The total project budget and workplan[[47]](#footnote-47) includes US$6.285 million, of which the GEF resources account for US$6.185million and UNDP TRAC contributed US$100K (see T*able 21*.). The project budget presented in the ProDoc is broken down by six (6) calendar years with the most important share of disbursements for the second calendar year (see *Table 22*). The approach to budget planning was revised in the IR by breaking down the budget by seven (7) fiscal years and making the budget allocations more rational in the first, second and third fiscal years (see Table 23**).** This approach seems more adequate, given the fairly typical project cycle with reporting by fiscal years and a lower allocation in the first 12-18 months, while the project was getting up- to speed, establishing the necessary infrastructure, contracting staff and consultants etc., following years of higher disbursements and investments. However, probably for the same reason as in the case of the Indicators (the IR not acted upon), the project continues referring to the budget as in the ProDoc, when planning and reviewing annual budgets. Therefore, further analysis made by the MTR team is based on the budget included in the ProDoc. However, the MTR team encourages the PM/UNDP CO to replace the initial project budget in Atlas with the revised one from the IR (see *Recommendation No 10*)

The total project expenditures over the project implementation period up to the midterm - August 2015-June 2018- are US$3,856,284.77 or 61 percent of total project budget, of which the GEF resources account for US$3,774,430.17 (or 61 percent of total approved GEF financing) and UNDP TRAC resources for US$81,854.60 (or 82 percent of total approved UNDP financing).

Each year a new annual budget was prepared for the following year and submitted for approval to the PB in the form of the AWPs. These annual budgets as shown in AWPs are summarized in T*able 24.* Significant discrepancies are observed comparing the annual budgets and disbursements. Actual annual disbursements *(Table 25*) are lower by approximately 20 percent, 44 percent, and 20 percent for the fiscal years 2015, 2016 and 2017 respectively. The lowest delivery rate is in 2016 (56 percent) when the project worked without a PM for seven (7) months. Another important point needs to be highlighted (marked as red in the Table): - low delivery rates under (a) Outcome 2 (48 percent, connected to the delay of the pilot on canal lining) and (b) Outcome 4 (34 percent, connected to the fact that the project had not commenced at midterm on the Outputs 4.2, 4.3. and 4.4). As discussed earlier, this is one of the key concerns of the MTR team: the work on these should start the soonest possible, as discussed in Section 4.2 (see the *Recommendation No 2*).

The project has complied with the permitted threshold of 10 percent budget re-allocations between the Components. The project is not subject to any external financial audits, since it follows the NIM implementation modality. During the MTR interviews, the UNDP CO Management and Finance officers confirmed that the project was being implemented in accordance with UNDP accounting requirements. The Project Implementation Unit (PIU) including the Finance/Procurement assistants have tracked the status of project payments and timely follow-up on outstanding payments

#### **Co-financing**

According to the ProDoc, the GoT was to provide a total co-financing contribution of US$72.0 million by the MAWE (cash), which specifically covers investment and other support for the replication of technical and practical solutions developed by the project.Other planned co-financing was expected only from the UNDP in the amount of US$100.0K. The total actual disbursement of the GoT co-financing as of July 2018 was US$35,339,779 (see *Table 15* below). At the time of the MTR, the project had already disbursed 49 percent of the total required co-financing, but had not, however, reach the level of US$ 42.0 million planned or midterm. [[48]](#footnote-48) A significant part (97 percent) of the GoT co-financing is provided for the deployment of the technologies recommended by the project under Outcome 1, and a small part for the support of technology diffusion under Outcome 2. There are opportunities for:

* the deployment of practices and technologies that are expected as part of the large-scale use of energy and water saving irrigation technologies, including (a) the replication of gravity-based canals (one (1) such replication was committed by the GoT at the project preparation stage, but there was no evidence of confirmed commitment at midpoint);[[49]](#footnote-49) and (b) modernization of the production of new canal lining materials in the remaining time of the project period; as well as
* the promotion of the enhanced application by the MAWE of new practices, in accordance with the revised sub-legal acts on efficient water use and regulations promoting energy conservation.

*Table 15: Actual governmental co-financing by outcomes, 09/2015 - 06/2018, in US$*

|  | Form of co-financing | **Planned co-financing** | | **Notes/Explanations** | **Share of Total approved co-financing (%)** |
| --- | --- | --- | --- | --- | --- |
| **Planned (ProDoc)** | **Actual** |
| **Component 1** | Cash | US$28,300,000 | US$34,433,751 | US$34,334,047 – replacement of outdated pump stations; US$99,704 – support related Green polygon | 122 percent |
| **Component 2** | Cash | US$35,000,000 | US$870,285 | US$870,285 – modernization of the water supply system in Kaahka |  |
| **Component 3** | Cash | US$200,000 | 0 |  | 2 percent |
| **Component 4** | Cash | US$8,300,000 | 0 |  |  |
| **Project management** | Cash | US$200,000 | 0 |  |  |
| In-kind | TBD | US$35,743 | US$35,743 – office space and utilities/communication worktime of the MAWE specialists |  |
| **TOTAL** | **Cash** | US$**72,000,000** | US$**35,339,779** |  | **49 percent** |

#### **Cost effectiveness**

The project is considered to be cost-effective in terms of procuring the best available services and goods, by balancing the quality of submitted offers/proposals and financial offers (a rule of 70 /30 percent is applied by the UNDP). There are some risks associated with achieving the planned levels of GHG emission reductions by the demonstration projects as well as replication efforts at this stage, as was discussed, but there is reasonable chance that these risks will be addressed in the remaining time frame. The project should assess however, cost-effectiveness of the key pilot activities leading to GHG emission reduction after collecting a sufficient set of monitoring data, while assessing the effects of the new practices and technologies introduced at the pilot sites. This issue was covered under the respective subsections for each pilot, in ***Section 4.2.*** So, from this perspective, cost effectiveness would be possible to assess at the time of terminal evaluation.

In terms of consultancy costs, the project has disbursed US$248,783 for international and US$314,701 for local consultants (or 39 and 42 percent respectively of originally budgeted resources). Hence the project has sufficient budget resources for the remaining time to involve the best expertise available at the market: specific areas of need were discussed in ***Section 4.2 (****see also Recommendations 1 and 2)****.*** Other important project costs include contractual services for individuals and companies, equipment, travel, publications and workshops.

A summary of total disbursements vs. the budgeted costs is provided in *Table 26****.*** The MTR team noticed the budget overrun of US$755,500 for the Contractual Services provided by companies. Most likely, companies were contracted to provide both equipment and construction works, but the cost of their services has been charged from the Contractual Services accounting line: if so, this budget overrun amounts need to be re-allocated from the *Equipment* accounting line.

In the next phase of project implementation, some re-allocation in annual budgets is expected so that remaining financing is apportioned for activities that still require to be accomplished.

### **Stakeholder Engagement and Synergies**

***Stakeholder engagement***. As was mentioned throughout the previous Sections, the project currently interacts with a limited number of stakeholders- much more limited than it was envisioned in the Stakeholder Engagement Plan from the ProDoc (see Table 28). It has been demonstrated that there are benefits to be reaped from the closer engagement with the MoE, the Institutes of Solar Energy and Desert. On a related matter, the project contracts on specific tasks local experts (often from the SIWMD), without a chance to discuss and hear various views on the subject matter in the form of workshops and alike (see *Recommendation No 7*). The project could be more proactive in supporting the development of the WDP2018-2024, explicitly offering support to the Government, which will also facilitate achieving the objectives of the project (see *Recommendation No 14).*

#### 

***Synergies***. The project could do better in exploring and utilizing synergies with other projects (see *Recommendation No 11*). This is first and foremost about the UNDP/GEF SCRL project. EERE and SCRL should be closely coordinated. In some sense they currently employ different approaches in identifying what would be the advisable to grow and with what irrigation regime under various climatic circumstances:

* the EERE utilizes traditional field experiments (with a top-down aproach, supporting the GoT and its institutions first, while farmers are the ultimate target audience); while
* the SCRL uses the very well- known and tried-and-tested worldwide FAO Aqua*C*rop model (with farmers as its primary taregt audience).

These approaches are not mutually exclusive. The Green Polygon in Geokdepe, could have been also used to test whether the AquaCrop model provides adequate forecasts – in line with the results in Geokdepe. To the extent it is possible, this line should be pursued at this stage (while it is recognized that there might be complications related to different (than what was collected in Geokdepe) input data. FAO AquaCrop model could be used for predictions in other soil and climatic circumstances with participation of the EERE. Testing is already planned on a small scale by SCRL in the Polygon of the Agricultural Institute in Dashoguz, for fruit trees. With some funding from the MAWE, the EERE team could also conduct tests on the crops tested at Geokdepe there. As discussed in the Section 4.2, this will inform the development of TAPs under the Component 3.1 of the EERE. It is recommended that UNDP organizes regular meetings between the EERE and the SCRL teams to iron out the details of coordination. The first such meeting should happen the soonest possible.

The project should also engage with the following projects and initiatives:

* ***GIZ project on Transboundary Water Management in Central Asia*** (currently in its third phase. 2017- 2019). In its 2nd phase it promoted Water Basin Management and Planning in Murgab Basin in Mary velayat.[[50]](#footnote-50) Among other measures, for Khanhowuz irrigation scheme, IWRM and re-use of drainage water was promoted, coupled with training on river basin planning and management and facilitating dialogue and exchange of experience. Phase III of the programme focuses primarily on sustaining the experiences gained in the previous phases. There are potential conceptual linkages with the TAPs under Component 3 and activities planned under Component 4 of the EERE;
* ***GIZ supported a long-term project on sustainable pasture management in Central Asia.*** Since its inception in 2002, this project has supported the development of locally-based pasture management solutions at two (2) sites in Turkmenistan, one in the Kopet-Dag mountains and the other- in the central Karakum Desert.There are potential linkages with the pilot planned in Karakum under EERE;
* ***The U.S. Agency for International Development (USAID)*** runs various initiatives in Turkmenistan pertaining to water management, especially with regards to training and technology transfer, including on low-water irrigation; and
* ***Embassy of Israel has recently committed to support the SAU with five (5) experts, specializing in low water irrigation*** (based on the interview of the MTR team; no further detail is available.

### **Project level monitoring and Evaluation Systems**

The project is subject to standard UNDP monitoring and evaluation (M&E) procedures. The planned activities and achievements are regularly reported and approved by the PB. The AWPs, APRs, and PIRs are regularly developed and submitted for approval. The MTR was organized in a timely manner.

***Programmatic monitoring*.** Periodic monitoring has been carried out through site visits by the UNDP CO, at times joined by the representatives of the PB and other stakeholders. This should be put on a more systematic basis (see Recommendation No.8.3). UNDP RCU has not conducted an annual visit to the project sites, even though there is an agreed Plan for M&E activities in the project's IR (as mentioned earlier, this is related to the fact that in 2017 there was a part-time IC performing RTA duties): recently a new RTA was assigned for the project, and in that light it is recommended that a schedule of visits by the RTA is agreed upon and incorporated to Annual Work (see Recommendation No 8.3).

The monitoring tools of the project should be better aligned with the national systems, but in Turkmenistan these in turn need improvements**.** The national system to monitor climate change effects and responses are addressed by the *State Commission to Guarantee the Implementation of Commitments of Turkmenistan,* which was created in compliance with the UN Environmental Conventions and Programmes, but was not truly functional at the time of the MTR. No operational structure to coordinate and monitor the adaptation and mitigation indicators and measures has been established yet.[[51]](#footnote-51) The national statistics system does not collect GHG emission data or even include indicators that are necessary to produce a GHG inventory- a major gap overall at present. Moreover, the methodology used to conduct ecological expertise does not address CO2, as GHG are not considered as pollutants.[[52]](#footnote-52) While the SCEPLR, as part of its mandate of developing and implementing State environmental policy, monitors the protection and rational use of natural resources (including water, land and forest resources), it is done on a rather ad hoc basis. The NSCC, which is being revised currently is expected to contain a detailed monitoring system of climate change actions and indicators.

***Risk management.*** While the risks identified at in the ProDoc and the IR are all valid, the lists do not include such key risks, as those associated with potential non - replication of the pilots, and the sheer scale of ambition of the project and hence the resources needed. Also. the risks with the waterflow issues in Kaahka were overlooked at the stage of designing the ProDoc. The risk log has not been updated since the IR. ***The project level monitoring could have been better in terms of better and mor***e ***regular identification and recording of emerging risks in ATLAS, together with mitigation measures; also, other ATLAS logs should be quarterly updated to monitor issues, lessons learned etc.*** The MTR team recommends updating the risk log and ratings; close monitoring and developing better formulated adaptive measures to minimise the risks. It is necessary, *inter alia*, to ensure that the project is ready to act on alternative scenarios (which need to be considered), when the initial plans face significant challenges (*see Recommendation No 8.2).*

***Monitoring of financial management.*** The UNDP CO generates its own quarterly financial reports from the ATLAS. These expenditure records, together with ATLAS disbursement records of direct payments, served as a basis for monitoring expenditure and revisions to the budget. The latter took place annually or on an ad-hoc basis, considering progress in disbursing funds and changes in the operational work plan, and also depending upon the rate of delivery. The UNDP CO has also required quarterly delivery projections, along with work plans (derived from the AWPs) and procurement plans, all of which have served as additional monitoring tools, in particular, to assess the progress of the project. During the annual budget revisions, the PM included resources detailed by UNDP support actions including direct project costs (covered M&E of the project as well).

**Adequacy of the M&E budget and its use.** The budget disbursements for M&E measures are presented in *Table 27.* *It indicates that the following budgets lines are underutilized (discussed at length in the report): (a)* ***Measurement of Means of Verification for Project Indicators and corresponding baseline studies*** and (b) ***Monitoring missions from the Regional Coordination Unit (RCU)****.* There is also a ***low delivery rate for the Learning Costs***, confirming the need in the recommendation made earlier in the Section 4.2, that the project should step up its actions in organizing more learning events. Note that the cost of the MTR was initially allocated for only an international consultant, but funds were re-allocated to hire national expertise for the MTR.

### **Communication**

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***Internal communication.*** The project could improve the communication with the RCU (with more discussions on the needs in advices) and the PB Members (as discussed) see *Recommendation 9,1.*

***External communication.*** The visibility of the EERE’s has been somewhat low during the period being reviewed, based on the interviews under this MTR. Ideally the project should have monthly flyers/newsletters to be distributed through emails. It is advisable that the UNDP CO hires a communications intern to work with the EERE on a regular basis, including supporting the production of flyers and newsletters (see *Recommendation No 9,2*). The UNDP CO Communication specialist leads communication planning and implementation for all the projects, which leaves not much time per project. The latest Communications Plan for the EERE, as developed by the Communications specialist, is presented in Table 16: as could be observed it is very brief. ***It is advisable that for the EERE a*** ***more comprehensive Communications and Knowledge Sharing Plan*** ***is developed*** (see *Recommendation 9),* especially given the nature of the project with the expectation to produce many novelty ideas, information, etc., potentially of interest for different types of stakeholders in different ways [NB: the IR has a template, as in Table 29].#

*Table 16: Existing Communications Plan for EERE*

|  |  |  |  |
| --- | --- | --- | --- |
| **Key action** | **Goal No** | **Timeline** | **Estimated budget** |
| Interactive map for Geokdepe site | 2 | Throughout the year | 10 000 TMT (US$2881.8) |
| World water forum | 2 3 | March 2018 | 0 |
| Launch of the site in Kaahka | 2 | Spring 2018 |  |
| Launch of the site in Geokdepe | 2 | Spring 2018 |  |
| Pump audit publication | 2 | Fall 2018 | TMT 2000 (US$576.4) |
| Video on progress in Kaahka | 2 | November 2018 | TMT 2 000 (US$576.4) |
|  |  |  |  |

*Source: UNDP CO Turkmenistan, Exchange rate used for conversion: 3.47 (https://freecurrencyrates.com/en/exchange-rate-history/USD-TMT/2018*

In particular:

* ***This to be-developed Communications and Knowledge Sharing Plan should include not only the activities planned, but also distribution channels*** ***and target audiences.*** The publications should be publicized not only by the project/UNDP CO, but also, and perhaps more importantly, distributed through the channels of the MAWE and the MoE. The MAWE, in particular, while does not have an extension service, uses various means to communicate and share new knowledge among the rural residents: via the agronomists and water sector professionals at *velayat* and *etrap* levels, using emails, annual gatherings, etc. and
* ***The current Communications Plan does not feature (a) production of various videos to be aired by TV, through specialized program; (b) newspaper articles: and (c) web stories.*** All of these are advisable. At midterm, only a few stories were available on the UNDP CO website[[53]](#footnote-53) as well as a few newsletter articles.[[54]](#footnote-54)

According to the ProDoc, ***in its final year, the project is supposed to hold*** ***a closing Conference to share its results with invitees from around the region and world as well as from within Turkmenistan***: preparations to this event should start well in advance. It is recommended (also in the earlier sections) for the project to conduct more regular workshops and roundtables: this will not only help to gauge the views on various approaches, but also make the project more visible

***Table 17 Ratings for Project Implementation and Adaptive Management***

| **Measure** | **Rating** | **Achievement Description** |
| --- | --- | --- |
| **Project Implementation & Adaptive Management** | **MS** | Implementation of some of the components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action. There are aspects of project management that need improvement |

*Table 17* sums up the rating for Project Implementation and Adaptive Management

## **Sustainability**

### **Likelihood of Sustainability**

The GoT, under the leadership of the President Gurbanguly Berdymuhamedow, has declared conservation and rational use of water and energy a national priority, as a means to support the fundamental goals of stable, secure water supply and sustainable, expanded agricultural production. The GoT has dedicated significant budget for technological upgrades in water infrastructure, primarily related to improving supply side delivery, mostly on the upgrade of pumping stations and lining of canal systems, and more recently, large scale investment in high efficiency irrigation technologies, including (subsoil) drip irrigations systems, mobile sprinklers, and wastewater capture and reuse (over US$4 billion has been pledged toward these priorities). In this context, the GoT demonstrates keen interest in the pilots, so their maintenance in the future do not raise concerns.

The fact that the project already contributes to the development of the WDP 2018-2024 (although informally for now) provides sufficient grounds for the optimism about the sustainability of the pilots and their replication in the most part. The fact that the project encompasses four (for now) regulatory acts (with a few more planned, see *Table 18*), as well as the fact that some of the pilots are likely to lead to revisions of normative base are also important building blocks for sustainability.

The project in its design has a strong emphasis on capacity building, which is another building block of sustainability. This is happening already, in terms of learning on the pilot sites, but in the remaining timeframe will need to be forumulated in the form of the CDP and training of much larger number of local specialists than the current 50. Knowlede sharing would also be a component of capacity building.

There are however risks to sustinability which are dicussed in the Subsections below.

*Table 18: Regulatory acts developed/planned/considered by the project.*

|  |  |  |
| --- | --- | --- |
|  | Name | Status |
| 1 | technical regulations of irrigation infrastructure | Adopted by MAWE |
| 2 | regulation for scheduled preventive maintenance and repair of water systems and facilities; | Drafts developed |
| 3 | operational regulations for pump stations; |
| 4 | echnical regulations of drainage infrastructure. |
| 5 | Changes to Building Regulations (SNIP) in the part of the design of newly constructed and reconstructed land reclamation systems and structures (Drip irrigation and Sprinkler irrigation systems) | Planned by the team of project experts/SIWDM |
| 6 | standard design scheme for gravity-based water pipeline, in foothill and mountainous areas including (1) standards for pressure damper (absorber) structures and (2) calculations for laying pipes (mainly polymer ones) in rocky soils |
| 7 | Revision of the SNT 2.06.04 – Melioration system and facilities | Recommended by the MTR team based on the interview |
| 8 | Revision of the SNIP 2.06.03-85 – Hydro land reclaiming system operation] |
| 9 | Revison of the existing “Regulation of technical operation of the electric facilities of consumers” available for the water sector could also be revised in the part related to energy conservation |

### **Risks to Sustainability**

#### **Financial risks to sustainability**

The strong growth performance, sustained over a decade, helped to lift Turkmenistan, a country of approximately five (5) million inhabitants, from a low income to an upper middle-income status. Growth has been driven by natural gas exports, which amount to over 90 percent of exports, with the extractive sector accounting for nearly half of GDP. Gross Domestic Product (GDP) per capita rose from US$970 in 2002 to nearly US$7,000 in 2013, and then US$16,532 in 2015.[[55]](#footnote-55) It was at US$ 6389 in 2016 however,[[56]](#footnote-56) reflecting low hydrocarbon prices, with GDP growth rate slowing down to 6.4 percent in 2017.

The realization of the stated priorities require huge amounts of state investment in upgrading and integration of infrastructure. While the Government has made an enormous commitment so far, more woud be needed. [Note that the updated for the midterm CDF, provided to the team features reduced scores for the “*Availability of finding for of adequate funding for energy efficiency, irrigation water use, GHG emission reduction -related interventions (both state funding and innovative resource mobilisation schemes*”].

Certain financial risks are also present in relation to funding available to daikhan associations to ensure compliance with the new to-be-adopted regulation, e,g related to Operation and Maintenance (O&M) of the water canals

#### **Socio-economic risks to sustainability**

***Lack of diversity in agriculture.*** Subsidies have led to thousands of hectares of land under orchards, horticulture and fodder crops diverted to production of winter wheat and cotton.[[57]](#footnote-57) This policy was somewhat relaxed over recent years, with the GoT beginning to recognize the need to diversify the agricultural sector, driven by increasing frequency of droughts in agricultural producing regions, and the associated economic losses experienced by the state. The lack of diversity is still an issue, however, with implications for sustainability, affecting the incentives of the end-users of irrigation services.

***Econmies of scale/affordability***. Turkmenistan has almost no large agricultural enterprises engaged in primary production. In 1997-1998 the status of most farmers was changed to "lease-holders." However, in practice, the rural economy continues to operate primarily under state control. A few private producers and farm businesses have emerged in fruits and vegetable, livestock and processing sectors over the last decade, but they are not as yet organized in associations. Given the increasing water shortages and priorities assigned to cash crop production, the smallholder subsistence farmers bear a disproportionate burden of intensifying water deficits. The new technologies are often expensive and the smallholders individually cannot afford them, while there are no water users associations or genuine farmers unions to purchase collectively. There is a Union of Industrialists and Entreprenurs of Turkmenistan which the project should engage more, however (see *Recommendation No.7*)

***Behavior change.*** There are also certain risks connected to the adoption of new technologies by the farmers in terms of behavior change. This is not helped by the fact that there is no Extension Service under the MAWE for the awareness raising and training of farmers on a systematic basis (with the system relying on annual events as well as the vertical structure – a few agronomists and water specialists at the level of *velayats* and *etraps*). This poses a risk in terms of widespread dissemination of the results and findings of the project to ensure that every single farmer becomes aware.[[58]](#footnote-58) On its end the project should do better in terms of communication and knowledge sharing , as argued and discussed earlier (see Section 4.3.)

#### **Institutional framework and governance risks to sustainability**

***Political risks*** There are political risks associated with water intake at the Iranian side from the river affecting the availability of sufficient water flow on the Turkmenistan side. The risk is low, however, as the withdrawals are regulated by interstate agreements.

***Governance risks.*** There are certain risks, as discussed in Section 4.3, with the GoT (the MAWE) ownership over those planned outputs of the project, which are connected with new policy frameworks (especially related to reforms concerning planning, tariffs, and administrative roles of various agencies). There are also risks associated with the accountability and transparency of GoT decision making, and the extent of availability of accurate data and information.

***Weak Information sharing among the State research institutions*** Information sharing and coordination seems to be not very efficient among the scientific research institutions in Turkmenistan, which are under different umbrellas: Ministries; the NAS; and the higher educational institutions. This is a feature of many former Union of Soviet Socialist Republics (USSR) counties, posing a risk to sustainability in that there is synergistic potential being underutilized.

#### **Environmental risks to sustainability**

There are environmental risks associated with climate change affecting the availability of water for Kaahka and Amudarya.

The rating for the likelihood of sustainability is summarized in *Table 19*

*Table 19 Ratings for Sustainability*

| **Measure** | **MTR Rating** | **Achievement Description** |
| --- | --- | --- |
| **Sustainability** | **ML** | Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review. |

# **Conclusions and Recommendations**

## **Conclusions**

At its midterm, the EERE has made significant progress towards achieving its planned results, but the focus has been primarily on three (3) pilots (the Green polygon in Geokdepe, the water pipeline in Kaahka, as well as the energy audits of 121 pumps with the replacement of 5-10). There has been very little progress on the remaining two (2) pilots (solar powered water supply and purification systems in Karakum and identification of new canal materials with subsequent support on starting local production). There has been little progress in the part of the institutionalization/policy frameworks except for the drafting four (4) legislative acts under the Water Code. Only fifty (50) people have been trained so far. In part, this uneven performance, is related to the project being overly ambitious (in particular, in the part of the Outputs 3.1, 4.2., 4.3. and 4.4.), especially compared to the current level of staffing as well as the fact that the project had been without a PM for approximately seven (7) months.

While the results in the Green Polygon in Geokdepe are impressive and particularly important for the agricultural production on salinized lands, similar to those in Geokdepe (potentially leading to the change of certain norms), the applicability of these results to other areas (and in particular, in relation to developing the TAPs), needs to be addressed more robustly: combining the experimental testing with using modeling tools, like FAO’s AquaCrop is one potential avenue for this.

The project is somewhat skewed towards water efficiency, with less focus on climate change mitigation and, even less so, on land degradation: in the remaining period it is recommended that this balance is restored with more involvement of the MoE (including with the training of its experts); development of legislative acts related to the pumps’ performance, as well as more comprehensive tracking of LD indicators.

There are no firm data on water saving as yet across all the pilots, but the tentative results from Geokdepe and Kaahka are promising, and there are no concerns in terms of meeting the endline targets. As for the energy saving and GHG reduction, while similarly, there are no firm data at midterm, there are some concerns related to endline targets for direct reduction of GHG, given that (a) the size of the plot in Geokdepe is smaller, with 145 ha instead of 170 (but the replication, as planned, does not raise doubts) and (b) that the pumps of the wells’ based water supply in Kaahka will be operating during 3-4 months a year in (here there are also concerns about indirect reduction, given that there are no assurances as yet that the planned replication will materialize). As for the audit program, here also, the amounts of direct GHG reduction might be affected, given the plans at midterm to potentially replace a smaller number of pumps than planned (given that the GoT already replaces the remaining pumps with its own resources, meting the indirect reduction targets looks possible).

The Government co-financing at midterm, while impressive at US$35.3mln, still falls short of the planned at midterm (US$42.0 million). The endline target of US$72.0 million would be likely if the replication of gravity base canal materializes; otherwise there are significant risks.

The list of the stakeholders with whom the project actively engages, is somewhat narrow (narrower than envisioned in the ProDoc) and this need to be remedied. On a related matter, the project needs to conduct more workshop- type events to discuss approaches to certain issues before finalizing. The project could do better in utilizing synergies both with other UNDP projects, and the projects funded/implemented by other agencies.

## **Recommendations**

***Corrective actions for the design, implementation, monitoring and evaluation of the project***

1. **Accelerate the work on the remaining 2 pilots:** 
   1. ***For the RE system for the solar powered water supply and purification system:*** hire a national or international (to be decided by the project manager in consultation with the to-be -hired international CTA) for quality assurance; engage the specialists from the Institute of Solar Energy in the installation of the planned two (2) systems. If conditions permit, construct the third system (with the donated pump) in cooperation with the Institute, of a combined wind-solar type. Upon completion, within a year document technical design and economic performance assessments and disseminate according to the Communications and Knowledge Sharing Plan (as in *Recommendation 9.2*), including to the ministries, as a possible basis for expanded state investment and installation. After one (1) year, conduct a survey among the residents in the pilot sites to capture socioeconomic and gender outcomes;
   2. ***For canal lining***, hire an international technical consultant to guide the market research and identification of the suitable materials. Allocate sufficient time for rigorous testing in various locations (of potentially several types of materials). It is recommended that the endline target is revised to “*technical and economic specifications for the production lines (2) of new lining materials are prepared*” instead of “*2 production lines operational and 400 km lined*.” Estimate GHG emission effect from the lining of the materials under testing.
2. **Accelerate the work on Components 3 and Component 4*.*** For the Components 3.1; 4.1; 4.2; 4.3 and 4.4 (1) hire a national or an international consultant(s) [to be decided by the PM. in consultation with the to-be-hired international CTA) to guide the implementation]; and (2) conduct national workshops to share ideas and approaches before finalizing the methodologies:
   1. ***For Component 3.1. on TAPs***, assess the suitability of using FAO’s AquaCrop model and if justified, conduct training for the national experts involved in this activity;
   2. ***For Components 3.2 and 3.3***. (a) Develop the CDP and implement it. In the part of the revision of the curricula at the higher educational institutions, establish cooperation with the Ministry of Education. (b) Develop not one (in the end) but more knowledge (lessons learnt) documents, covering at a minimum each pilot:
   3. ***For Component 4.1 on regulations,*** select `one -two building codes (SNTs, SNIPs),aiming at improving standards and specifications of water pumps, as well as regular energy audits of water stations and support their revision and subsequent adoption (ideally with the support of an international consultant). Consider also the revision of the existing “*Regulation of technical operation of the electric facilities of consumers*”. Estimate GHG emission effect of applying the already developed and the to-be-developed/revised ones;
   4. ***For Component 4.2 on the “Program for water measurement***”, the selection of the demonstration sites needs to be accelerated, together with technical designs and installation of the measurement equipment. It is recommended to amend the endline target with words “***Programme for water measurement and Payment”;***
   5. ***For Component 4.3 “Policy framework under the Water Code to support widespread deployment of low-water irrigation, canal linings, and enhanced drainage nationwide”,*** accelerate the formal submission of the recommendations on the “Required budget allocations” to the GoT. The recommended consultant would guide the development of: procedures for technical assessment; criteria for financial justification; and targets for investment and deployment;
   6. ***For Component 4.4. on the recommendations for administrative reform in IWRM/SLM,*** instead of the intended Policy framework, develop two regulations on: (a) agency roles; and (b) planning targets to emphasize integration, optimization, and sustainability of IWRM.
3. **Ensure that the “mitigation” aspects of the project are addressed adequately, on par with the adaptation goals, in line with the ProDoc*,*** involving the MoE and respective research and higher educational institutions more, e.g. (in addition to the regulations suggested under the Component 4.1):
4. Ensure systematic on-site practical training for local specialists (from the MoE, the Energy Inspection, etc.) in conducting step-by-step energy audits for water pumps using simplified calculations (for instance, Excel-sheets);
5. After the energy audits are finalized, complete technical assessments of the modernized pumps to facilitate replication (through the MAWE or private investments) and disseminate according to the to-be-developed Communications and Knowledge Sharing plan (as in Recommendation 9.2); and
6. PhD students and university students from the Energy Institute in Mary benefitting from learning at the Geokdepe Polygon
7. **For the already completed Pilots at Geokdepe and Kaahka, ensure regular and rigorous monitoring and documenting of the results and lessons*.*** In particular:
   1. ***For Geokdepe (Output 1.1):*** compile and disseminate results as a written report, and as material for training seminars for water district officials, system designers, and farmers according to the to-be-developed Communications and Knowledge Sharing Plan (as in Recommendation 9.2); and
   2. ***For Kaahka (Output 2.1):*** (a) Ensure that the usage of pumps and the corresponding reduction in GHG emissions is closely monitored, (b) Generate accurate flow data, (c) After a year conduct a survey among Kaahka residents to capture socioeconomic and gender outcomes; and (d) Work closely with the MAWE to help identify a replication project and, possibly, support the design works.
8. **Ensure that adequate measures are in place to record and achieve the planned GHG reductions*.*** In particular, ensure that:
   * + - 1. the responsibility for monitoring and reporting are included the TOR of one of the project team;
         2. as a matter of priority, the baseline GHG emissions for the pilots (with a note for energy audits, that the representativeness of the sample of audited pumps needs to be ensured) are calculated;
         3. upon the completion of the pilots, as well as the achievement of the targeted replication, the actual GHG reduction are estimated; and
         4. GHG reductions from the adoption of regulations (as in *Recommendation No.2.3*) and canal lining in the part of testing (as in *Recommendation No.1.2*) are estimated.
9. **Ensure adequate staffing*.*** Hire

(a) an international CTA to provide strategic management and direction to the PM to help strengthen and improve the overall project management, ensuring that the international CTA spends significant time in country in order to make a significant contribution to the overall improvement of the project; and

(b) an additional national staff to work on the Outputs 3.1, 4.3 and 4.4; as well as

(c) a communications intern, supporting specifically EERE.

1. **Enlarge the scope of the stakeholders the project works with directly and consults with.** The stakeholder engagement plan from the ProDoc should serve as a guide. There are benefits to be reaped from the closer engagement with the MoE and the Institutes of Solar Energy and Desert. The project should also engage with larger circles of individual experts.
2. **Improve Planning, monitoring and reporting*.*** In particular:
   1. **Reporting:**
      * + 1. Improve the RRF by: removing repeating indicators and overlaps; choosing the indicators for training; and incorporating indicators to capture institutional reform (see *Table 19*);
          2. Improve the quality of the PIRs in terms of level of detail, reporting of risks and recording of lessons learned;
          3. Ensure monitoring of the indicators currently in the LD and CCM tracking tools; including by conducting a household survey in Kaahka, and Karakum in a year time after the completion of the pilots, collection information not only on household incomes, but also on: “*percent of residents reporting increased availability of water for drinking* “*percent of women beneficiaries reporting less time spending on collection of water*”;
          4. monitor more LD indicators, e.g. “*Habitat Protected*” and “*Vegetable Cover*”; and
          5. monitor water quality in Kaahka.
   2. **Planning:** (a) use multiyear planning tools; (b) develop better risk management strategies; and (c) use the RRF as a management tool; and
   3. **Monitoring**: (a) ensure that monitoring is more participatory; and (b) develop a visit plan by RTA.
3. **Improve internal and external communications**
   1. **Internal communication:** (a) Ensure that the PB receives reporting against results framework and (b) improve the communication with the GEF Istanbul Regional Center in general, and through missions at least once a year to visit the project, in particular; and
   2. **External Communication**: Develop and implement a comprehensive Communications and Knowledge Sharing Plan, that will cater for diverse audiences and specify communication/distribution channels, working closely with UNDP Senior Communications Advisors in New York. Implement the activities through the project, but also ensure that the GoT agencies have quality materials to distribute through their own networks and channels.
4. **Rationalize Budget allocations** by using breakdown by fiscal years (as in the IR) and along the priorities identified in MTR**.**
5. **Develop close synergies with UNDP SCRL project (with regular meetings) as well as other agencies active in related fields in Turkmenistan,** e.g. the GIZ funded projects in Turkmenistan on water basin management and pasture management; USAID funded activities related to water management). Plus, given that Embassy of Israel has recently committed to support the SAU with five (5) experts specializing in low water irrigation, explore the opportunities for cooperation.
6. **Extend the project for 18 months** given the delays and in the light of the sheer ambition of the current project design, if there are available budget resources for no-cost extension. The conditions for the extension should be that all of these recommendations are implemented in full and no extension shall be implemented unless it can be shown that all recommendations have been fully implemented. In addition, the UNDP CO/the PM should present a clear justification and detailed plan regarding the extension.

#### **Actions to follow up or reinforce initial benefits from the project**

1. **Investigate combining the “experimental” approach of the EERE and the modelling tools** (e.g. FAO AquaCrop). Explore the opportunities of (a) using the Green Polygon in Geokdepe to test whether AquaCrop provides adequate forecast (i.e. in line with the EERE results in Geokdepe); and (b) testing the EERE results (both with and without the model) in Dashoguz (finances permitting); and (c) using FAO Aqua Crop for the development of TAPs under the Output 3.1.

*Table 20: recommended actions for RRF improvement*

|  |  | Action related to RRF improvement |
| --- | --- | --- |
| **Corrective measures** | 1 | Eliminate indicator 12 |
| 2 | Instead of the indicators 5 and 21, formulate 2 indicators, capturing the number of regulations separately for the Water Codex, and energy efficiency |
| 3 | Specify a different midterm target for Indicator 10 (e.g. 100 audits conducted) while the end of project should have also a target on the number of specialists trained in energy audits (150) |
| 4 | For the Indicator 17 on the “Number *of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes (#)”*   * The midterm indicator “*1 such project already identified, design completed and funding agreed”* to become end of the project indicator * Stipulate “suitable canal lining materials for Turkmenistan identified and matched to factory production opportunities” as a midterm target. * Delete the part on “…400 kilometers of canals newly lined” from the endline target from the PIR |
| 5 | Finalize the list of indicators capturing training, which differ now between the Inception report and the PIR. It is recommended that the following 3 are used   * No 20 (form the Inception Report) “*share of positive feedback from training participants* (percent)” * No 21 (No 20 form the PIR but to be revised): indicator in the PIR “Number of trainees” |
| 6 | Clarify and add target (2) for the sites for Indicator “Programme for water measurement is developed and made operational at focus demonstrational sites” (No 22 in the PIR and No 23 from the RRF of the Inception report”). |
| 7 | Ensure that the targets for co-financing (*Indicator 6*) are in line with those stipulated in the ProDoc (endline US$72million) and midterm US$42 million |
| 8 | Ensure that the baseline and the endline target for energy saving are as in the ProDoc 6,9 and 3.4 GJ/year respectively |
| 9 | Correct the baseline for the indicator No 8 from the PIR “*Reduction of water used for specific soil types (m3/ha/year)*” to 0 |
| 9 | Ensure that all the baselines are calculated with the sources of data and methodology identified. |
| 10 | Ensure that the project objective is formulated consistently across documents. |
| 11 | Add indicator for Output 4.4, e.g. ““Regulations, other sub-legislative acts, and/or state programmes adopted and/or enforced on pumps, tariffs, and IWRM”, as in the ProDoc |
| 12 | Add an indicator to capture Output 4.4., e.g.   * “*Regulations, other sub-legislative acts, and/or state programmes adopted and/or enforced on pumps, tariffs, and IWRM, as in ProDoc and* * *Extent of availability of clearly defined and assigned roles and responsibilities for energy efficiency, irrigation water use, GHG emission reduction related issues*” (from the CDF) |
| **Suggested additions#** | **13** | Add an indicator to Capture Outcome 1 “*Enhancement of the national knowledge base and delivery of new technical information on appropriate technology for irrigation, pumps, and solar-powered water pumping and purification to water management agency staff and farmers”.* For example, *“No of Knowledge products produced and disseminated in hard copy and by electronic media”* |
| 14 | Include the following capacity development indicator “*Extent of availability of adequate monitoring & evaluation of the energy efficiency, irrigation water use, GHG emission reduction interventions in the country*”, from the CDF |

***Proposals for future directions underlining main objectives***

1. **Explore the opportunities of closer engagement of the UNDP CO/the EERE in the development of the Water Development Program (WDP 2018-2024)** through greater dialogue and participation in the relevant working groups, toboost the level of national ownership over the policy frameworks, planned to be developed; and

#### E**ngage with the MAWE more closely and at high levels,** to ensure strong buy-in as a crucial element for mainstreaming policy frameworks and regulations, and for Government complying with the commitments. Consider requesting that the MAWE nominates a Deputy Minister for NPC.

# **ANNEXES**

## **Annex 1: TOR**

**Project name**: Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan

**Post title:** International Consultant for the Midterm Review (MTR) of full-sized UNDP-GEF project

**Type of contract:** Individual Contract (IC)

**Assignment type:** International Consultant

**Country / Duty Station**: Home Based with one mission of minimum 10 working days to Turkmenistan (not including weekends)

**Expected places of travel (if applicable)**: Ashgabat, Turkmenistan with site visits to project sites at Kaahka and Geokdepe

**Languages required**: English

**Starting date of assignment**: 1st June 2018

**Duration of Contract**: 25 working days spread over a three months period from the start date of the assignment

**Duration of Assignment**: 27 working days of which a minimum of 10 working days must be spent in Turkmenistan (15 home based days, 2 travel days, 10 working days based in Turkmenistan)

**Payment arrangements**: Lump-sum contract (payments linked to satisfactory performance and delivery of results)

**Administrative arrangements:** Travel and logistics arrangements will be made by the UNDP CO in accordance with all UNDP rules and procedures.

**Evaluation method**: Desk review with interview with the 3 highest technical scoring candidates

1. **INTRODUCTION**

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the full-sized project titled Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan (PIMS#4947) implemented through the Ministry of Agriculture and Water Economy of Turkmenistan, which is to be undertaken over a three months period in 2018. The project started on 17 July 2015 and is in its third year of implementation. In line with the UNDP-GEF Guidance on MTRs, this MTR process was initiated before the submission of the third Project Implementation Report (PIR). This ToR sets out the expectations for this MTR. The MTR process must follow the guidance outlined in the document *Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*

[http://web.undp.org/evaluation/documents/guidance/GEF/mid- term/Guidance\_Midtermpercent20Reviewpercent20\_EN\_2014.pdf](http://web.undp.org/evaluation/documents/guidance/GEF/mid-%20term/Guidance_Midterm%20Review%20_EN_2014.pdf).

**2. PROJECT BACKGROUND INFORMATION**

The $6.18 million USD UNDP GEF Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan started in July 2015 and is scheduled to finish in July 2021. 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 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 tons of CO2 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: (a)** Reduce GHG emissions associated with water management (448,000 tons of CO2e per annum by the end of the project)’ and (b) Prevent and remediate salinization of lands

The project’s activities are organized into four components.

* Component 1 will introduce ***new technologies in irrigated agriculture and pumping*** *for energy efficiency, water conservation, and sustainable land management (SLM).*
* Component 2 will scale-up investment in ***new and expanded efficient water-management infrastructure.***
* Component 3 will deliver ***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 will work from the top down, defining and implementing policies, programmes, and investment plans for integrated water management and SLM at the national level.

**3. OBJECTIVES OF THE MTR**

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project’s strategy, its risks to sustainability and propose adaptive management to better increase the chances of the project being successful. Part of the adaptive management may involve proposed revisions and amendments to the project results framework.

**4. MTR APPROACH & METHODOLOGY**

The MTR must provide evidence-based information that is credible, reliable and useful. The MTR consultant will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the consultant considers useful for this evidence-based review). The MTR consultant will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that must be completed before the MTR field mission begins.

The MTR consultant is expected to follow a collaborative and participatory approach[[59]](#footnote-59) ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), the UNDP Country Office(s), UNDP-GEF Regional Technical Adviser on Climate Change Mitigation, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR.[[60]](#footnote-60) For this reason, 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 (Ministry of Agriculture and Water Economy, State Committee on Nature Protection and Land Resources, Ministry of Energy, State Agriculture 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 stakeholders, academia, local government and CSOs, etc.

Additionally, the MTR consultant is expected to conduct field missions to Kaahka and Geokdepe project sites.

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

**5. DETAILED SCOPE OF THE MTR**

The MTR consultant will assess the following four categories of project progress. See the *Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for extended descriptions.

**i. Project Strategy**

Project design:

* Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
* Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
* Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?
* Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, considered during project design processes?
* Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of *Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for further guidelines.
* If there are major areas of concern, recommend areas for improvement.

Results Framework/Logframe:

* Undertake a critical analysis of the project’s logframe indicators and targets, assess how “SMART” the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
* Are the project’s objectives and outcomes or components clear, practical, and feasible within its time frame?
* Examine if progress so far has led to or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.
* Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART ‘development’ indicators, including sex-disaggregated indicators and indicators that capture development benefits.

**ii. Progress Towards Results**

Progress Towards Outcomes Analysis:

* Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix and following the *Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*; colour code progress in a “traffic light system” based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as “Not on target to be achieved” (red).

Table. Progress Towards Results Matrix (Achievement of outcomes against End-of-project Targets)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Project Strategy** | **Indicator[[61]](#footnote-61)** | **Baseline Level[[62]](#footnote-62)** | **Level in 1st PIR (self- reported)** | **Midterm Target[[63]](#footnote-63)** | **End-of-project Target** | **Midterm Level & Assessment[[64]](#footnote-64)** | **Achievement Rating[[65]](#footnote-65)** | **Justification for Rating** |
| **Objective:** | Indicator (if applicable): |  |  |  |  |  |  |  |
| **Outcome 1:** | Indicator 1: |  |  |  |  |  |  |  |
| Indicator 2: |  |  |  |  |  |
| **Outcome 2:** | Indicator 3: |  |  |  |  |  |  |  |
| Indicator 4: |  |  |  |  |  |
| Etc. |  |  |  |  |  |
| **Etc.** |  |  |  |  |  |  |  |  |

**Indicator Assessment Key**

|  |  |  |
| --- | --- | --- |
| Green= Achieved | Yellow= On target to be achieved | Red= Not on target to be achieved |

In addition to the progress towards outcomes analysis:

* Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.
* Identify remaining barriers to achieving the project objective in the remainder of the project.
* By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

**iii. Project Implementation and Adaptive Management**

Management Arrangements:

* Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.
* Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
* Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

Work Planning:

* Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.
* Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?
* Examine the use of the project’s results framework/ logframe as a management tool and review any changes made to it since project start.

Finance and co-finance:

* Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
* Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
* Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?
* Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

Project-level Monitoring and Evaluation Systems:

* Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
* Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

Stakeholder Engagement:

* Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
* Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
* Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

Reporting:

* Assess how adaptive management changes have been reported by the project management and shared with the Project Board.
* Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)
* Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

Communications:

* Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
* Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
* For reporting purposes, write one half-page paragraph that summarizes the project’s progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.
* Discuss the advantages and disadvantages of extending the project;

**iv. Sustainability**

* Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
* Discuss what needs to be done to ensure the sustainability of the project;
* In addition, assess the following risks to sustainability:

Financial risks to sustainability:

* What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project’s outcomes)?

Socio-economic risks to sustainability:

* Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long-term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

Institutional Framework and Governance risks to sustainability:

* Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.

Environmental risks to sustainability:

* Are there any environmental risks that may jeopardize sustenance of project outcomes?

**Conclusions & Recommendations**

The MTR consultant will include a section of the report setting out the MTR’s evidence-based conclusions, in light of the findings.[[66]](#footnote-66)

Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report’s executive summary. See the *Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for guidance on a recommendation table.

The MTR consultant should make no more than 15 recommendations total. One of the recommendations should discuss the possible extension of the project up to a maximum of +18 months. Under what conditions, should an extension of the project be considered and for how long?

**Ratings**

The MTR consultant will include his/her ratings of the project’s results and brief descriptions of the associated achievements in an *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. No rating on Project Strategy and no overall project rating is required.

Table. MTR Ratings & Achievement Summary Table for Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan project

|  |  |  |
| --- | --- | --- |
| **Measure** | **MTR Rating** | **Achievement Description** |
| **Project Strategy** | N/A |  |
| **Progress Towards Results** | Objective Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 1 Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 2 Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 3 Achievement Rating: (rate 6 pt. scale) |  |
| Etc. |  |
| **Project Implementation & Adaptive Management** | (rate 6 pt. scale) |  |
| **Sustainability** | (rate 4 pt. scale) |  |

1. **TIMEFRAME**

The total duration of the MTR will be approximately 27 days (25 working days + 2 travel days) over a period of three months with an estimated start date of 1st June 2018 and the contract shall be for a period of three months from the date of signing the contract. Of this total of 27 days, a minimum of 10 working days, not including weekends, should be spent by the international consultant in Turkmenistan on one mission. It is possible, by the mutual agreement of the international consultant and the UNDP CO to break the mission down into two missions (e.g. – one of 8 days and one of 2 days) if this is more convenient to both Parties but this is for discussion between both Parties and if it did take place it should be done in such a way that the overall number of days does not change.

The tentative MTR timeframe is as follows:

|  |  |
| --- | --- |
| **TIMEFRAME** | **ACTIVITY** |
| April 20th 2018 | Application closes |
| May 25th 2018 | Select and contract MTR Consultant |
| May 25th 2018 | Distribution of all documents and reports to the MTR Consultant |
| 1st June 2018 | MTR inception report and workplan prepared |
| 10 working days in June 2018 | MTR mission to Turkmenistan shall be a minimum of 10 working days, not including weekends. |
| Before the end of June 2018 | Mission wrap-up meeting. Presentation of initial findings at the end of the MTR mission. |
| Before the end of July 2018 | Preparation and submission of the draft report by the international consultant. |
| Before the middle of August 2018 | Incorporating audit trail from feedback on draft report. |
| Before the end of August 2018 | Preparation & Issue of Management Response |
| Before the end of August 2018 | Concluding Stakeholder Workshop (not mandatory for MTR Consultant) |
| Before the end of August 2018 | Finalization of MTR report. Expected date of full MTR completion |

|  |  |
| --- | --- |
| **ACTIVITY** | **TENTATIVE TIMEFRAME** |
| Preparation to the MTR: documents review and preparing MTR Inception Report | During the first week after signing a contract |
| 10 working days - MTR mission to Ashgabat, Turkmenistan: stakeholder meetings, interviews, field visits to Geokdepe and Kaahka | Within three weeks of the commencement of the work (June 2018) |
| Mission wrap-up meeting & presentation of initial findings | End of MTR mission (before the end of June 2018) |
| Submission of the draft report | Within four weeks after end of MTR mission, expected to be by the end of July 2018. |
| Final Report | Within two weeks after receiving feedback from the counterparts on the draft report, expected to be by the end of August 2018. |

Options for site visits should be provided in the Inception Report.

1. **MIDTERM REVIEW DELIVERABLES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Deliverable** | **Description** | **Timing** | **Responsibilities** |
| **1** | **MTR Inception Report** | MTR consultant clarifies objectives and methods of Midterm Review | No later than 2 weeks before the MTR mission: | MTR consultant submits to the Commissioning Unit and project management |
| **2** | **Presentation** | Initial Findings | End of MTR mission: (June 2018) | MTR consultant presents to project management and the Commissioning Unit |
| **3** | **Draft Final Report** | Full report (using guidelines on content outlined in Annex B) with annexes | July 2018. | Sent to the Commissioning Unit, reviewed by RTA, Project Coordinating Unit, GEF OFP |
| **4** | **Final Report\*** | Revised report with audit trail detailing how all received comments have (and have not) been addressed in the final MTR report | August 2018. | Sent to the Commissioning Unit |

\*The final MTR 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.

1. **MTR ARRANGEMENTS**

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

The commissioning unit will contract the consultants and ensure the timely provision of per diems and travel arrangements within Turkmenistan for the MTR consultant. The Project Team will be responsible for liaising with the MTR consultant to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

1. **TEAM COMPOSITION**

An independent international consultant with experience and exposure to projects and evaluations in other regions globally will lead the MTR. The international consultant will be supported by project team. The international consultant cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project’s related activities.

## **Annex 2: Agenda for the visit**

|  |  |
| --- | --- |
| ***July 23, 2018*** | |
| 01:55 | Arrival of Ms. L. Melikyan to Ashgabat |
| 15:00-16:00 | Meeting with Mr. Vitaliy Babayev, mechanical engineer for electrical and diesel pumps  *Venue: Nisa Hotel* |
| 16:30-17:30 | Meeting with employees of the Ministry of Energy of Turkmenistan  *Venue: Ministry of Energy of Turkmenistan* |
| ***July 24, 2018*** | |
| 9:15-10:00 | Meeting with former PM, Mr. Farhat Orunov currently SARD project Specialist  *Venue: SARD office* |
| 10:15-11:15 | Meeting with Rovshen Nurmuhamedov, UNDP Programme Specialist *Venue: UN Building* |
| 12:15-13:00 | Meeting with project staff |
| 13:00-14:00 | Lunch |
| 14:30-15:30 | Meeting with Meret Akmyradov, NPC of the project  *Venue: Ministry of Agriculture and Water Economy of Turkmenistan* |
| ***July 25, 2018*** | |
| 7:00-11:00 | Visiting the project’s pilot site in Geokdepe |
| 8:00-9:00 | Meeting with Muhammet Tanrykulyyev, Irrigation Engineer at Geokdepe |
| 13:00-14:00 | Lunch |
| 14:30-15:30 | Meeting with the staff of the Mejlis of Turkmenistan  *Venue: Building of Mejlis* |
| ***July 26, 2018*** | |
| 9:00-12:30 | Visiting the project’s pilot site in Kaahka |
| 12:30-13:00 | Meeting with the staff of the Khyakimlik etrap Kaahka of the Ahal velayat  *Venue: Building of Khyakimlik, Kaahka Town* |
| 13:00-14:00 | Lunch |
| ***July 27, 2018*** | |
| 10:00-10:30 | Meeting with Mr. Kepbanov lawyer in the field of agriculture and water management  *Venue: Nisa Hotel* |
| 11:00-12:00 | Meeting with WDI Director and Deputy Director  *Venue: Turkmensuvylymtaslama institute* |
| 13:00-14:00 | Lunch |
| ***July 30, 2018*** | |
| 15:30-16:00 | Meeting with Mr. Baymurat Kurbanov Construction Engineer for control over construction works.  *Venue: Nisa Hotel* |
| 16:00-16:30 | Meeting with Mr. Gurbangeldi Allaberdiyev expert on monitoring greenhouse gas emissions  *Venue: Nisa Hotel* |
| ***July 31, 2018*** | |
| 10:00-11:00 | Meeting with the staff of the Academy of Sciences of Turkmenistan  *Venue: Building of Academy of Sciences* |
| 11:30-12:30 | Meeting with the staff of the State Committee for Environmental Protection and Land Resources  *Venue: State Committee for Environmental Protection and Land Resources* |
| 13:00-14:00 | Lunch |
| 1430-1530 | Skype call Dmitri |
| 15:40-17:00 | Meeting with Geldi Myradov, |
| 1900 | Dinner with Slobo |
| ***August 1, 2018*** | |
| 10:00-1030 | Meeting with Mr. Pena Gulkhanov, head of finance unit UNDP  *Venue: UN Building* |
| 1030-1130 | Meeting with Ms. Nazik Avlyakulova, Communication Associate  *Venue: UN Building* |
| 11:30-1300 | *Work at UNDP* |
| 1300-1430 | Lunch |
| 15:00-16:00 | Meeting with Mr. Chary Taganov, NC - Scientific Consultant  *Venue: Nisa Hotel* |
| ***August 2, 2018*** | |
| 1020-1110 | Rahman |
| 11:30-12:30 | Meeting with the employees of the Turkmen Agricultural University  *Venue: State Agricultural University* ***CONFIRMED*** |
| 13:00-14:00 | Working Lunch with Geldi |
| 14:00-1600 | Work in project office |
| 16:00-1630 | Institute of Desert |
| 1630-1800 | Work on the ppt |
| ***August 3, 2018*** | |
| 9:30-10:30 | Meeting with Ms. Amangul Ovezberdyyeva, PM of SCRL project and SCRL project team  *Venue: SCRL project office* |
| 11:00-12:00 | De-briefing meeting with Environment Portfolio OR Project staff only |
| 1200-1300 | Meeting with Ms. Elena Panova, UNDP RR  *Venue: UN Building ?????* |
| 14:00-15:00 |  |
| ***August 4, 2018*** | |
| 02:55 | Departure of Ms. L. Melikyan from Ashgabat |

## **Annex 3: List of persons interviewed**

**Government of Turkmenistan**

1. **Muhammedmeret Akmyradov**, Head of International Water Cooperation, MAWE
2. **Atamuhamet Sariev**, Head of Production and Technical Department, MoE
3. **Berdy Berdiyev**, Head of International Relation Department, State Committee for Protection of Environment and Land Resources
4. **Geldi Nobatov,** Director, State Institute of Water Management Design
5. **Georgiy Kurtovezov,** Deputy Director, State Institute of Water Management Design
6. **Muhammet Durikov,** Director of Desert Institute
7. **Durdymuhammet Muhiyev**, Khyakimlik of Kaahka etrap of the Ahal velayat, Department of Agriculture, Chief Specialist
8. **Hekim Shaglydjov**, Head of Department of Agriculture, Khyakimlik of Geokdepe etrap of the Ahal velayat

**National Academy of Sciences of Turkmenistan**

1. **Dr. Nurgeldi, Seyitgeldiyev,** Head of State Solar Energy Institute
2. **Dr. Tagan Annaguliyev**, Acting Senior Academic Secretary
3. **Dr. Rahmanguly Esedullayev**, Head of Department, Academic Secretary

**Mejlis of Turkmenistan**

1. **Azat Seydibayev**, Head of Committee on Protection of Environment, Nature Management and Agro-Industrial Complex
2. **Sapargeldi Taganov**, Member of Committee on Protection of Environment, Nature Management and Agro-Industrial Complex
3. **Nerche Ovlyakuliyev**, Specialist of Committee on Protection of Environment, Nature Management and Agro-Industrial Complex
4. **Nury Komekov**, Member of the Committee on International and Parliamentary Relations

**State Agricultural University of Turkmenistan**

1. **Amangeldi Kerimov**, Lecturer
2. **Oraz Furdiyev,** Lecturer
3. **Shamyrat Tariyev,** Lecturer
4. **Saparmyrat Orazsahedov,** Lecturer
5. **Guvanch Nommakliyev,** Lecturer

**UNDP**

1. **Vitalie Vremis**, Deputy Resident Representative, UNDP CO Turkmenistan
2. **Rovshen Nurmuhamedov**, UNDP Programme Specialist on Environment and Energy
3. **Slobodan Tadic**, Acting Deputy Resident Representative, UNDP CO Turkmenistan
4. **Rahmanberdi Hanekov**, Program Management Officer
5. **Nazik Avlyakulova,** Communication Associate
6. **Penamuhammet Gulkhanov**, Head of finance unit UNDP
7. **John O’Brien,** Regional Technical Advisor, UNDP/GEF Regional Hub for Europe and CIS
8. **Marina Olshanskaya,** former Regional Technical Advisor, UNDP/GEF Regional Hub for ECIS

**UNDP/GEF EERE staff and experts**

1. **Geldi Myradov**, Project Manager
2. **Muhammet Artykov,** Program Specialist
3. **Akmyrat Yazhanov**, Program Specialist
4. **Mamed Shaharov**, Field Assistant
5. **Charyyarkuli Taganov,** NC - Scientific Consultant
6. **Vitaliy Babayev**, mechanical engineer for electrical and diesel pumps
7. **Muhammet Tanrykulyyev**, Irrigation Engineer at Geokdepe
8. **Yolbars Kepbanov**, Legal expert
9. **Baymurat Kurbanov,** Construction Engineer for control over construction works.
10. **Gurbangeldi Allaberdiyev,** expert on monitoring greenhouse gas emissions
11. **Dzmitry Halubouski,** International expert on GHG emission estimation

**UNDP/GEF SCRL project**

1. **Ovezdurdy Jumadurdiyev**, Project Specialist
2. **Gozel Atamuradova**, Project Specialist

**Other**

1. **Anton Kharitonov,** Engineer/sales, Grundfos (UK) representative office in Turkmenistan
2. **Farhat Orunov**, former Project Manager, currently EU/GIZ SARD project Specialist

## **Annex 4: List of Documents reviewed**

1. PIF
2. UNDP Initiation Plan
3. UNDP Project Document
4. UNDP Environmental and Social Screening results
5. Project Inception Report
6. All Project Implementation Reports (PIR’s)
7. Annual progress reports
8. CDRs and Annual Budget reviews (PBBs)
9. Annual Workplans
10. Work plans of the various implementation task teams
11. Audit reports
12. Finalized GEF focal area Tracking Tools at CEO endorsement and midterm
13. Oversight mission reports
14. Lessons Learnt reports
15. All monitoring reports prepared by the project
16. Financial and Administration guidelines used by Project Team
17. Project operational guidelines, manuals and systems
18. UNDP country programme document(s)
19. Minutes of the Project’s Board Meetings and other meetings (i.e. Project Appraisal Committee meetings)
20. Project site location maps
21. Calculation of the baselines identified after the inception phase
22. List of training courses with the information on participants and scoring sheets
23. The list of projects consultants (experts and companies) and their ToRs
24. Thematic reports produced by the project experts
25. Main national policy papers

|  |  |  |
| --- | --- | --- |
|  |  |  |

## **Annex 5: Financial information**

*Table 21: Summary of funds as in approved Project Document, in US$*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source of Funding | Amount  Year 1 | Amount  Year 2 | Amount  Year 3 | Amount  Year 4 | Amount  Year 5 | Amount  Year 6 | Total | percent |
| GEF | 467,400 | 2,847,700 | 1,564,100 | 462,500 | 404,900 | 438,400 | 6,185,000 | 8percent |
| UNDP | 15,000 | 17,000 | 17,000 | 17,000 | 17,000 | 17,000 | 100,000 | 0.1percent |
| GoT | 12,000,000 | 15,000,000 | 15,000,000 | 15,000,000 | 15,000,000 | TBD | 72,000,000 | 91.9percent |
| TOTAL | 12,482,400 | 17,864,700 | 16,581,100 | 15,479,500 | 15,421,900 | 455,400 or more | 78,285,000 | 100percent |

T*able 22: Annual project budgets as in approved Project Document, 2015-2021 (6 calendar years), in US$*

| *Project Outcomes* | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* | *Year 6* | *Total* | *percent Total Budget by Outcomes* |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Outcome 1: Technology Transfer | 159,390 | 1,372,590 | 239,290 | 158,490 | 119,290 | 136,790 | **2,185,840** | ***35percent*** |
| Outcome 2: Scaling-up investment in improved water management infrastructure | 131,860 | 1,248,860 | 1,052,360 | 101,260 | 96,860 | 77,560 | **2,708,760** | ***43percent*** |
| Outcome 3: Planning and capacity-building | 63,195 | 92,995 | 132,695 | 72,995 | 58,995 | 87,495 | **508,370** | ***8percent*** |
| Outcome 4: National policy and regulatory framework | 60,695 | 85,795 | 92,295 | 82,295 | 82,295 | 89,095 | **492,470** | ***8percent*** |
| Project Management | 67,260 | 64,460 | 64,460 | 64,460 | 64,460 | 64,460 | **389,560** | ***6percent*** |
| GEF | 52,260 | 47,460 | 47,460 | 47,460 | 47,460 | 47,460 | **289,560** |  |
| UNDP | 15,000 | 17,000 | 17,000 | 17,000 | 17,000 | 17,000 | **100,000** |  |
| Total | **482,400** | **2,864,700** | **1,581,100** | **479,500** | **421,900** | **455,400** | **6,285,000** |  |
| *percent of Total Budget by Yr* | ***8percent*** | ***45percent*** | ***25percent*** | ***8percent*** | ***7percent*** | ***7percent*** |  |  |

*Table 23: Annual project budgets as in approved Inception Report, 2015-2021 (7 fiscal years), in US$*

| *Project Outcomes* | *2015* | *2016* | *2017* | *2018* | *2019* | *2020* | *2021* | *Total* | *percent Total Budget* |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Outcome 1: Technology Transfer | 69,840 | 743,050 | 806,290 | 221,030 | 119,290 | 136,790 | 66,550 | **2,162,840** | ***35percent*** |
| Outcome 2: Scaling-up investment in improved water management infrastructure | 87,210 | 183,105 | 1,052,360 | 1,167,015 | 96,860 | 77,560 | 67,650 | **2,731,760** | ***43percent*** |
| Outcome 3: Planning and capacity-building | 31,595 | 83,573 | 132,695 | 82,417 | 58,995 | 87,495 | 31,600 | **508,370** | ***8percent*** |
| Outcome 4: National policy and regulatory framework | 27,895 | 64,173 | 92,295 | 103,917 | 82,295 | 89,095 | 32,800 | **492,470** | ***8percent*** |
| Project Management | 33,460 | 57,699 | 64,460 | 69,221 | 64,460 | 64,460 | 35,800 | **389,560** | ***6percent*** |
| GEF | 33,460 | 42,699 | 47,460 | 52,221 | 47,460 | 47,460 | 18,800 | **289,560** |  |
| UNDP | 0 | 15,000 | 17,000 | 17,000 | 17,000 | 17,000 | 17,000 | **100,000** |  |
| Total | **250,000** | **1,131,600** | **2,148,100** | **1,643,600** | **421,900** | **455,400** | **234,400** | **6,285,000** |  |
| *percent of Total Budget by Yr* | ***4percent*** | ***18percent*** | ***34percent*** | ***26percent*** | ***7percent*** | ***7percent*** | ***4percent*** |  |  |

Table 24: Annual project budgets as approved by Project Board, 2015-2018, in US$

| *Project Outcomes* | *09/2015* | *2016* | *2017* | *06/2018* | *Total 2015-2018* | *percent of Total Approved Budget per Outcome* |
| --- | --- | --- | --- | --- | --- | --- |
| Outcome 1: Technology Transfer | 83,395 | 743,050 | 816,074 | 782,050 | 2,424,569 | 111percent |
| Outcome 2: Scaling-up investment in improved water management infrastructure | 64,853 | 183,105 | 1,322,047 | 563,244 | 2,133,249 | 79percent |
| Outcome 3: Planning and capacity-building | 48,361 | 83,573 | 88,673 | 162,581 | 383,188 | 75percent |
| Outcome 4: National policy and regulatory framework | 10,000 | 64,173 | 49,316 | 106,470 | 229,959 | 47percent |
| Project Management: | 39,448 | 77,934 | 81,334 | 71,060 | 269,776 | 69percent |
| GEF | 32,478 | 57,699 | 61,099 | 71,060 | 222,336 | 77percent |
| UNDP | 6,970 | 20,235 | 20,235 | 0 | 47,440 | 47percent |
| *Total* | ***246,057*** | ***1,151,835*** | ***2,357,444*** | ***1,684,405*** | ***5,440,741*** | ***87percent*** |

T*able 25: Actual annual project disbursements by outcomes, 09/2015 - 06/2018, in US$*

| *Project Outcomes* | *09/2015* | *2016* | *2017* | *06/2018* | *Total* | *percent of Total Approved Budget* |
| --- | --- | --- | --- | --- | --- | --- |
| Outcome 1: Technology Transfer | 57,961.04 | 427,144.20 | 720,132.02 | 512,765.00 | **1,718,002.26** | 79percent |
| Outcome 2: Scaling-up investment in improved water management infrastructure | **58,518.04** | **91,748.69** | **719,302.13** | **427,720.00** | **1,297,288.86** | **48percent** |
| Outcome 3: Planning and capacity-building | 50,804.55 | 42,157.10 | 188,900.42 | 98,035.00 | **379,897.07** | 75percent |
| Outcome 4: National policy and regulatory framework | **2,757.98** | **10,477.13** | **117,081.35** | **36,134.00** | **166,450.46** | **34percent** |
| Project Management: | 26,199.36 | 78,463.24 | 140,807.39 | 44,043.00 | **289,512.99** | 74percent |
| GEF | 26,199.36 | 49,555.97 | 101,860.06 | 44,013.00 | **221,628.39** | 77percent |
| UNDP | 0 | 25,907.27 | 38,947.33 | 30.00 | **81,854.60** | 65percent |
| *Total* | ***196,240.97*** | ***649,990.36*** | ***1,891,356.44*** | ***1,118,637.00*** | ***3,856,284.77*** | ***61percent*** |
| *percent of Total Approved Budget by PB* | ***80percent*** | ***56percent*** | ***80percent*** | ***66percent*** | ***71percent*** |  |

*Table 26: Actual disbursement of selected cost items vs. originally budgeted costs*

| Cost Item | 2015 | 2016 | 2017 | 2018 | Total | percent of allocated GEF amount |
| --- | --- | --- | --- | --- | --- | --- |
| International consultants | 54,880 | 82,632 | 91,771 | 19,500 | 248,783 | 39percent |
| Local consultants | 3,237 | 44,337 | 186,749 | 80,378 | 314,701 | 42percent |
| Contractual services –Individual | 21,144 | 93,138 | 127,051 | 68,184 | 309,517 | 59percent |
| Travel | 19,800 | 32,778 | 82,942 | 27,589 | 163,109 | 80percent |
| Contractual Services | 0 | 59,923 | 194,517 | 831,497 | 1,085,937 | 329percent |
| Equipment | 36,738 | 216,110 | 1,033,528 | 310,542 | 1,596,918 | 48percent |
| Communication and Publications | 6,026 | 6,620 | 14,337 | 3,462 | 30,445 | 45percent |
| Learning Costs | 25,149 | 0 | 2,409 | 2,335 | 29,893 | 18percent |

*Table 27 A status of budget disbursement for M&E measures requiring budget allocation at midterm*

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of M&E activity** | **Responsible Parties** | **Budget US$**  **Excluding project Staff time** | **Status of Budget disbursement** |
| Inception Workshop | CTA, Project Team, UNDP CO | ≈US$ 7,000 | Budget disbursed |
| Measurement of Means of Verification for Project Indicators and corresponding baseline studies | CTA and Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members | US$20,000 distributed within individual activities | Measurements are to be postponed and conducted after Mid-term point |
| Mid-year project review by Project Board at Mid-Year PB Meeting | CTA, Project Team, UNDP CO, RTA | US$ 12,000 | To be disbursed after Mid-term review |
| Annual Project Review by PB in End-of-Year PB Meeting | CTA, Project Team, UNDP CO, RTA | US$ 12,000 | Partially disbursed and to be re-allocated to next years |
| Monitoring missions from RCU | CTA, Project Manager, UNDP CO, RTA | US$ 20,000 | Partially disbursed and to be re-allocated to next years |
| Financial Audit | UNDP CO, RTA, IRH Financial Team | US$30,000 | The project is not subject to an external financial audit, budget partially re-allocated for UNDP CO financial monitoring services |
| Mid-term Evaluation | CTA, Project team, UNDP CO, International/National Consultant(s) | US$ 30,000 | Budget disbursed |
| Visits to field sites | CTA, UNDP CO, Project Team, Government representatives | US$ 30,000 | Budget partially disbursed |

## **Annex 6: Stakeholder Involvement Plan and Sample Communication strategy framework from the Inception Report**

*Table 28: Stakeholder Involvement Plan*

|  |  |  |
| --- | --- | --- |
| **Stakeholder** | **Envisaged role and potential areas for co-operation during project implementation** | |
| **plan** | **actual** |
| Ministry of Water Economy of Turkmenistan | National implementing partner. A senior representative of this Ministry will serve as Chair of Project Board. Will provide overall project oversight and coordination with national initiatives and strategies regarding water management. Will join UNDP project team in leading design and execution of all project components at both national and velayat levels (including demonstration/investment projects for low-water irrigation, municipal water supply, and canal linings, as well as regional action plans and national policies). | Member of Project Board. |
| Ministry of Agriculture of Turkmenistan | Member of Project Board. Will participate in design and delivery of all project activity at the farm level, as well as accompanying training for farmers. Will join UNDP, the Ministry of Water Economy, and other ministries in development of national, regional, and local action plans on sustainable land management. Will coordinate all connections between the project and local farmers’ associations. |
| Ministry of Economy and Development of Turkmenistan | Member of Project Board. Water specialists from this Ministry will participate in design and delivery of all project activity. Ministry will provide support especially in projects related to infrastructure and scaling up of investment activity. | Not represented in the PB  No involvement at this stage |
| Ministry of Energy and Industry of Turkmenistan | Member of Project Board. Will join UNDP in leading monitoring and assessment of energy savings from all project activity. Will join UNDP and Ministry of Water Economy in development of pump specifications. Will join UNDP in identifying and supporting opportunities for scaling up energy-saving technologies and approaches demonstrated in pilot projects. | Member of Project Board  No active role in monitoring of energy savings |
| Ministry of Communal Services of Turkmenistan | Member of Project Board. Will join Ministry of Water Economy and UNDP in overseeing design and implementation of municipal water supply projects (Kaahka pilot and replication). | Not represented in the PB  No involvement at this stage |
| Ministry of Nature Protection of Turkmenistan | Member of Project Board. Will provide support in design and assessment of all project activity with regard to climate change mitigation and sustainable land management. Will participate in drafting and review of sub-legislative acts and other policies developed under the project. Will support UNDP and other ministries in development of regional action plans for both water management and sustainable land management. | Member of Project Board  No active role in design and assessment of all project activity with regard to climate change mitigation and sustainable land management |
| Ministry of Education of Turkmenistan | Will be invited to membership in Project Board. All new curricular material on water management and sustainable land management developed by the UNDP project team and authorized national partners will be submitted to this Ministry for approval for official integration into national educational programs. | Was not invited to PB  It is planned that the new curricula material will be approved by the Ministry. No involvement as yet |
| State Concern “Turkmengaz” | Will be invited to membership in Project Board. Will provide technical support for monitoring and evaluation of energy savings. Will provide overall coordination in conjunction with other national initiatives on energy efficiency. | Was not invited to PB  No involvement at this stage |
| “Sun” Institute of the Academy of Sciences | Will be invited to membership in Project Board. Will provide technical and logistical support in design and implementation of photovoltaic water supply demonstration project for desert pasture. Will provide further support in assessment and design of replication projects. | Was not invited to PB  No involvement at this stage |
| State Institute of Water Management Design (of the Ministry of Water Economy) | Will be invited to membership in Project Board. In conjunction with national and international consultants, will lead design and implementation of demonstration projects on low-water irrigation, municipal water supply in Kaahka, and canal linings. | Member of the PB  Key project partner, leading Component 1 (Geokdepe). Involvement also in Component 2 (both pilots) and Component 3 (TAPs) |
| Local farmers’ associations in all five velayats | The UNDP project team, with the support of the Ministry of Agriculture, the Ministry of Water Economy, and their local branches, will engage local farmers’ (daikhan) associations at all stages of all activity related to agriculture, irrigation, drainage, and sustainable land management. This engagement will include initial briefings on the whole project and its components; invitations to provide feedback on demonstration project design and timetables; invitations to provide feedback on regional and local action plans for water management and sustainable land management; and delivery of training integrated into all aspects of program design and implementation. For demonstration projects, formal letters of understanding outlining mutual commitments will be jointly prepared and signed. | local farmers’ associations not actively involved at all stages of all activity |
| Turkmen Agricultural University | Will participate in the development of new curricular material on low-water irrigation and drainage. Upon approval by the Ministry of Education, will deliver this new material through existing and/or new specialties and degree programs. | One PhD student  Curricula update is planned |
| Dashoguz Agricultural Institute | Will participate in the development of new curricular material on low-water irrigation and drainage. Upon approval by the Ministry of Education, will deliver this new material through existing and/or new specialties and degree programs. | One PhD student |
| Institute of Energy | Will participate in the development of new curricular material on low-water irrigation, drainage, and renewable energy systems. Upon approval by the Ministry of Education, will deliver this new material through existing and/or new specialties and degree programs. | No participation as yet |
| Institute of Livestock Management | Will participate in the design, implementation, and evaluation of the demonstration project on solar-powered water supply for desert pasture, especially with regard to defining and assessing technical specifications for the water and forage needs of livestock. | No participation as yet |
| Union of Industrialists and Entrepreneurs of Turkmenistan | Will be invited to participate in the design, implementation, and especially dissemination of demonstration projects, especially with regard to new technologies to be introduced in the areas of low-water irrigation, municipal water supply, canal linings, modern pumps, and solar-energy installations for water supply and purification. | No participation as yet |
| NGO “Tebigy Kuwwat” | The primary elaborator of specific aspects of the proposed demonstration project on solar-powered water supply for desert pasture. In conjunction with UNDP, the “Sun” Institute of the Academy of Sciences, and other national and international contracted firms, will take the lead in design, implementation, and evaluation of this demonstration project, as well as modified versions for replication elsewhere. | No participation as yet |

Table 29 SAMPLE Communication strategy framework from the Inception Report

|  | Stakeholder | Possible Key Message | Means of communication | Action |
| --- | --- | --- | --- | --- |
| 1 | Government officials, e.g.:  Ministry of Water Economy  Ministry of Nature Protection  Ministry of Agriculture  Ministry of Finance  Ministry of Emergency Situations  Other relevant ministries and agencies | EERE and key activities (sustainable energy, GHG emission reduction, water efficient practices and tools), including pilot projects, are capable to sustain and foster country’s economic growth. They need upscaling and replication based on the positive experience. | News bulletins  E-mails  Briefings  Official TV media  Official governmental newspapers | TBD |
| 2 | Research and Academia | EERE provides a platform for research and adaptation of modern tools and techniques | Additional students in key research (mainly water institute, institute of sun, etc.)  Diploma and projects for students  Publications in scientific journals  Participation in scientific conferences and knowledge exchange | TBD |
| 3 | Rural communities | EERE will increase the resilience of local communities due to application of resource efficient and modern tools, and, by doing so, will bring additional economic benefits in a longer term. | Community leaders’ meetings  Radio programmes  Participatory communication tools | TBD |

## **Annex 7. Progress towards results Matrix and MTR Rating**

| **Project Strategy** | **Indicator[[67]](#footnote-67)** | **Baseline Level from Inception report** | **Midterm target, 2018 from the IR** | **Midterm Level & Assessment from PIR 2018 to be provided** | **End-of-project Target** | **Achievement Rating[[68]](#footnote-68)** | **Justification for Rating** | **Source of verification** | **Risks and Assumptions** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Project Environmental Objective**  *Reduction of GHG emissions associated with water management and Prevention and remediate of salinization of lands*  Project Development Objective  Provide for sufficient and environmentally sustainable water supply to support and enhance social conditions and economic livelihood of the population of Turkmenistan | T me give you a quick call | **6,9 (and not 4.50 as in IR RRF)** | Energy consumption calculation is introduced on regular basis in each pilot project under implementation | Key project activities that will result in energy savings, including replication of water-saving irrigation technologies and electric pump replacements were started in end-2017 and mid-2018. Methodology and arrangements for energy use monitoring were put in place in mid-2018 for data collection in the course | 3.4 – (and not  2.2 as in IR RRF) | MU | Not achieved since 2 pilots are only starting. And for the others it has been less than a year since the completion | Pump audits and other evaluation of energy consumption in water sector  Measurements of water consumption | 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. More precise and better-substantiated definition of quantitative baselines may be needed at project inception. |
| 2. Reduction of GHG emissions (tonnes) | 6,900,000 per year | 150,000 | GHG emission reduction estimation methodologies and a monitoring plan have been designed (in draft). GHG emission reductions have only just started to accrue for some of the pilot activities (at “green polygon” and Kaahka) since mid-2018. Both systems are in their start-up phases, Achieved GHG emission reductions will thus be estimated and reported in the next year’s PIR. | 448,000. The baseline is estimated in yearly values; however, the project will report in direct reductions of GHG emissions. | MU | Not achieved since 2 pilots are only starting. And for the others it has been less than a year since the completion | 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 (m3/ha/year) | 120,000 | 85,000 | Research methodology was prepared to estimate the improvement in water use efficiency and productivity. Estimated baseline water consumption is over 993K m3/year (assuming standard/traditional water use and crop production practices). Metering of water, energy and productivity started in 2018 under newly installed low-water irrigation systems. Results including energy and GHG estimates, will be analyzed by the end of 2018. | 48,000. An estimation of the exact area of land under interventions needs to be finalised in 2016. | MU | Not achieved since 2 pilots are only starting. And for the others it has been less than a year since the completion | Evaluation reports on demonstration projects. |  |
| 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 | 50 | In Geokdepe site, 145 ha of arable land, has been allocated by the GoT for the Green Polygon pilot project. Detailed plan for research at was prepared. Land reclamation continued in 2018 with large scale cultivation of various crop types on the territory of nearly 100 ha. | 145 | S | 100 ha achieved | *Ditto* |  |
| 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 (#) | Technical specifications defined for at least 2 (1 at national level) regulations to update, legal procedures 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. | Initial inventory of legislation, as well as mandates of relevant governmental institutions in the field of energy efficiency, irrigation water use, GHG emission reduction has been carried out. In 2017 the project started development of four regulatory acts on operation, maintenance and repair of water systems and facilities. One document was already sent to Ministry of Justice for ratification, while remaining three are being reviewed by relevant national agencies | 6 (with at least 1 national and others - sub-national). | S | 4 drafts (of which one is adopted at the MAWE level) | 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. |
| 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 | US42million (and not USD 1,500,000 as in IR RRF) | The Government is currently developing Water Development Program of Turkmenistan for 2018-2030 that envisages rational use of water resources, improving land reclamation techniques and other issues of improving the national water sector in the long term. The project tries to find figures on state investments to increased water and energy efficiency, as well as improved land reclamation techniques, but obtaining data on government expenditures is nearly impossible | US$72 million (and not 6M as in IR RRF) | MS | Note that the targets differ. US$42 is taken from ProDoc. The project achieved 35.4, which is close. | Financial reports of the Project, national statistics on state (budget) investments. | This is about 100percent 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 | Implementation of at least 1 pilot projects started with beneficiaries of 10,000 (100,000) | Infrastructure project on municipal water supply leading to reduction of water losses and associated energy consumption and benefiting about 35,000 people of Kaahka was launched in April 2018. | 35,000 (350,000) | S | Achieved with Kaahka alone | Project reports, social surveys, M&E reports |  |
| **Component 1: Technology transfer and knowledge development in support of innovation in EE water management and SLM (cont’d).** | 8. Reduction of water used for specific soil types (m3/ha/year) | TBD | 20percent due to implementation of at least of 2 pilot projects | Research methodology has been prepared to estimate the improvement in water use efficiency and productivity as a result of project-supported demonstration site -officially launched in June 2018 and large-scale cultivation of various crop types on 145 ha started. Results of initial year of cultivation will be collected by the end of 2018. | 40percent | MU | it has been less than a year since the pilot is ongoing | Project reports, research results, communication materials, M&E reports | After estimating soil types at the demonstration sites, the Project will estimate the current level of irrigation norms applied. This baseline study has been included in AWP 2016. |
| 9. Normalised energy consumption reduced (compared with average values for similar soil types) | TDB | 15percent | Baseline energy use by irrigation water pumps was studied: currently in draft in need to be finalized. Efficiency of old pumps has been estimated to drop nearly 30-40percent below design parameters. Demonstration site with all required infrastructure was officially launched in June 2018 and large-scale cultivation of various crop types on 145 ha started. Data collection on energy consumption of initial year of cultivation has started. | 30percent | MU | it has been less than a year since the pilot is ongoing | Project reports, research results, communication materials, M&E reports | After estimating soil types at the demonstration sites, the Project will estimate the current level of energy consumption. This baseline study needs have been included in AWP 2016. |
| 10. Number of pump audits completed by project: total and (diesel pumps) - # (#) | 0 | Suppliers identified, contracts for pump delivery concluded | In close coordination with the Ministry of Agriculture and Water Economy, 121 pumps including 46 diesel pumps were audited in 2017. | 100 in total (25 diesel) | S | 121 audited | Project reports, communication materials, M&E reports |  |
| 11. Energy saving achieved by replacement and/or fixing of old pumps (percent) | 0 | Suppliers identified, contracts for pump delivery concluded | Tender for replacement of obsolete pumps with modern EE pumps was announced in the 2d week of August 2018 to allow completion by the end-2018. Based on the estimates, energy efficiency of new pumps is around 40percent higher than existing obsolete pumps (73percent versus 29percent). Pump audit of newly installed pumps to measure energy saving from pump replacement exercise is planned for the end-2018. | 20percent | MS | Procurement in progress | Project reports, research results, communication materials, M&E reports | The exact number of pumps will be defined during the pump audits, within which 100 pumps (and at least 25 diesel ones) will be analysed. |
| 12. Area of land protected or reclaimed from salinization as a result of demonstration projects (# ha) | 0 | 150 ha: obviously a mistake. Same baseline for the same indicator but under the No4 Is 50 ha | In Geokdepe site, on 145 ha, the scope and sequence of the envisaged research and demonstration activities at the Geokdepe site including activities on reclamation of soil from salinization have been defined and commenced in 2017 Larger scale of reclamation measures continued in 2018 by using traditional and low-water irrigation techniques totaling nearly 100 ha of land. | 300 (145 for the same indicator but under No 4) | S | 100 ha in Geokdepe | Evaluation of demonstration projects and national statistics |  |
| 13. Number of people directly benefiting from measures on renewable-energy water supply in remote locations (#) | 0 | 500 | Practical implementation of renewable-energy related activities in selected two villages will be completed in 2018. Besides, initial agreement has been reached with private company on free of charge supply and installation of integrated water pumping and purification system powered by solar energy in third remote location in Karakum desert. | 1100 | MU | The pilot has only commenced | Project reports, social surveys, communication materials, M&E reports | Total population of the village of Byori. |
| **Component 2: Scaling-up investment in improved water management infrastructure** | 14. Reduction in water loss between withdrawal and entrance point of the Kaahka town Water Treatment facility (percent). | 50percent | Implementation of Kaahka project is at the level of 30percent completed (an informed estimate) | Kaahka gravity pipeline that was officially launched in April 2018 will almost entirely eliminate infiltration losses | 5percent | S | Completed at Mid-term, ahead of planned time | 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 | Implementation of Kaahka project is at the level of 30percent completed (an informed estimate) | Baseline - nearly 2,873 MWh. The gravity-driven water supply system was launched in April 2018. Data collection and analysis is required by at least end of April 2019 (direct energy savings). Due to extremely low water availability in the river supplying the system, performance during initial period has been below optimal level (existing water supply well pumps had to be kept running). Water availability is expected to improve toward the end of the year, so the average annual performance of the new water supply system is likely to reach design parameters, including for energy and GHG savings. | 486 MWh/year | S | Completed at Mid-term, ahead of planned time |  |  |
| 16. Number of similar projects initiated in other similar (or mountainous areas) districts of Ahal and Balkan velayats of Turkmenistan (#). | 0 | Draft design completed, all stakeholders agree on details, funding also agreed | The project documented all relevant information on realization of the gravity water pipe project including costs, benefits, economic and environmental impact to encourage government implement similar projects in other mountainous areas. The project staff will regularly follow up with the Ministry of Agriculture and Water to be aware of any new project similar to Kaahka gravity pipeline | At least 1 similar project under implementation | MU | Replication is at the level of ideas at best as yet by the Government. No assurances were given for replication | 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 (#) | 0 | Procurement started, contracts concluded | In 2017 project team visited all three plants under the Ministry of Agriculture and Water Economy to study their capacities and find possibilities of cooperation on establishment of new production lines. By the end of 2018 project plans to identify concrete activities related to modern canal lining to add them to AWP 2019. | 2 production lines established | MU | This plot is at the initial stages as yet | Project reports, communication materials, M&E reports |  |
| **Component 3 - Planning and capacity-building at the regional and local levels, plus evaluation and compilation of lessons learned** | 18. Number of regional Integrated Water Distribution Plans developed and formally submitted for approval (#) | Not applicable. | Methodology tested in one Velayat (of 3 selected earlier) as a pilot | Methodology on development of Water distribution plans on inter-farm, district and regional level is underway and expected to be competed in 2018. The methodology will help the Ministry of Agriculture and Water Economy to develop regional Integrated Water Distribution Plans. | At least 3 velayat TAPs developed and submitted for approval, recommendations are developed for other 2 velayats (Lebap and Balkan) | MU | Midterm target not achieved | National media, project reports, M&E reports, communications |  |
| 19. Share of key stakeholders/institutions with relevant mandates involved trained jointly by the MWE/Project (percent)  [**NOT IN PIR] and not being monitored** | MAWE, SIWMD – the only agencies aware of the project. | 25percent | CDF was developed, but not a CDP as yet. Over 50 national specialists representing MAWE and the Water Design Institute, Ministry of Nature Protection and local farmers have been trained since the beginning of the project in various topics related to sustainable water management, SLM and energy efficient irrigation techniques for various crops. Series of trainings and workshops for over 100 national water engineers in all five regions is planned for the end of 2018. | 100percent based on results of stakeholder analysis (to be carried out in 2016) | MS | 50 were trained, relation to the target unclear | Training events documents, registration at trainings | Stakeholder analysis with defining roles of all stakeholders in the project - government agencies, academia, and other relevant institutions and organisations. |
| 19\*. Number of participants and new content of training seminars  **Not in RRF from the IR** |  |  | No information |  | MS | more than 50 were trained |  |  |
| 20. of positive feedback from training participants (percent)  **NOT IN PIR] and not being monitored** | 0 | At least 70percent | 89.3percent | 90percent | S | Mid-term target surpassed |  | Feedback and/or Evaluation forms are to be filled in by training participants at every training event. These are to be processed and reported on. |
| **Component 4 - National policy and regulatory framework established for integrated water resource management** | 21. Number of regulations, norms, and/or standards developed and adopted in support of the new Water Code (#) | 0 | 1 regulation, norm, and/or standard developed | Based on the previous analysis of existing legislation, the project developed and submitted to the MAWE four regulatory acts, all 4 related to Water Codex. Three regulations are currently being reviewed by relevant national stakeholders while one act was already submitted to Ministry of Justice for ratification | At least 3 acts related to pump audits, crop-specific irrigation norms, and water/energy saving practices to lead to GHG emission reduction. | S | 4 regulations developed, of which 1 adopted by the MAWE | 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. |
| 22. 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 | Required budget allocations submitted to the Government and accepted for consideration | The Government is currently developing Water Development Program of Turkmenistan for 2018-2030 that envisages rational use of water resources, improving land reclamation techniques and other issues of improving the national water sector in the long term. The project tries to find figures on state investments to implement the Programme, but obtaining data on government expenditures is nearly impossible. | Yes | MS | There is a formal commitment of the government to submit estimates | Commitment letters, state budget lines, communications with key agencies |  |
| 23. Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No). | No | Water measurement equipment is made operational | *No* | Yes | MU | Midterm target not achieved | Commitment letters, state budget lines, communications with key agencies |  |

**Indicator Assessment Key**

|  |  |  |
| --- | --- | --- |
| Green= Achieved | Yellow= On target to be achieved | Red= Not on target to be achieved |

## **Annex 8: Evaluation Matrix**

|  | **Indicators** | **Sources** | **Methodology** | **Response / Finding** | **Opportunities for Improvement** |
| --- | --- | --- | --- | --- | --- |
| **Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results?** | | | | | |
| ***Project Design:*** | | | | | |
| To what extent is the project in line with national and local priorities? | *Alignment with national policies and local development plans* | *ProDoc and AWPs, National strategies, regional development plans* | Comparative analysis |  |  |
| **Evaluation Question** | *Alignment with GEF focal area outcomes and outputs* | *GEF documents, ProDoc, AWP* | *Comparative analysis* |  |  |
| Have synergies with other projects and initiatives been incorporated in the design? | *Evidence of stakeholder mapping in the ProDoc and examples of synergistic activities planned* | *ProDoc, Inception report, interviews with donors during the MTR* | *Comparative analysis* |  |  |
| Were lessons from other relevant projects properly incorporated into the project design? | *Evidence of lessons from other projects listed and considered in the design stage* | *ProDoc, Inception report, interviews with donors and UNDP during the MTR* | *Comparative analysis* |  |  |
| were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, considered during project design processes? | *Evidence that the project design was informed by the perspectives of local stakeholders* | *KIIs, ProDoc and Inception report* | *Comparative* *analysis* |  |  |
| Have issues materialized due to incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document? | *Evidence of comprehensive risk analysis and mitigation measures in the ProDoc and AWPs* | *Annual PIRs, AWPs and ProDoc* | *Comparative* *analysis* |  |  |
| **Results Framework:** | | | | | |
| Are the project objective and outcomes clear, practicable, and feasible within its time frame? | *level of coherence between project objectives and outcomes, and resources* | *ProDoc, Inception report, KIIs, PIRs,* | *Comparative analysis* |  |  |
| Are the project’s logframe indicators and targets appropriate? | *Evidence of the project logframe capturing key results at output and outcome level* | *ProDoc, Inception report, AWPs* | *Comparative analysis* |  |  |
| How “SMART” are the midterm and end-of-project targets (Specific, Measurable, Attainable, Relevant, Time-bound)? If applicable, what specific amendments or revisions to the targets and indicators are recommended? | *Evidence of the project targets being SMART* | *ProDoc, Inception report, AWPs* | *Review of the targets* |  |  |
| **Mainstreaming** | | | | | |
| To what extent were broader development and gender aspects factored into project design? Has there been progress so far that has led to or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women’s empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis? | *Evidence of alignment with broader development agenda, including gender roles* | *ProDoc and AWPs, UNDP CPAPs and CPD, and UNDAF, PIRs and CCM and LD tracking tools* | Comparative analysis |  |  |
| **Progress towards Results** **To what extent have the expected outcomes and objectives of the project been achieved thus far?** | | | | | |
| **Progress towards Outcomes Analysis:** | | | | | |
| Are the logframe indicators for midterm met? If not then why? Are the midterm targets from the GEF Tracking Tool met? If not why? | *Evidence of meeting the midterm targets, evidence of concurrence of interviewee feedback on the factors* | *KIIs, PIRs, tracking tools* | *Triangulation, contribution analysis, “Progress towards results analysis”* |  |  |
| Considering the aspects of the project that have already been successful, what ways in which can the project further expand these benefits? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation,* |  |  |
| **Remaining Barriers to Achieving the Project Objective:** | | | | | |
| Which remaining barriers are hindering achievement of the project objective in the remainder of the project? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation,* |  |  |
| **Project Implementation & Adaptive Management** | | | | | |
| **Management Arrangements, GEF Partner Agency:** | | | | | |
| Has there been an appropriate focus on results? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation,* |  |  |
| Has the UNDP support to the Executing Agency/Implementing Partner and Project Team been adequate? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation,* |  |  |
| Has the quality and timeliness of technical support to the Executing Agency/Implementing Partner and Project Team been adequate? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation,* |  |  |
| How has the responsiveness of the managing parties to significant implementation problems (if any) been? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (esp. the Board meetings minutes)* | *Triangulation, comparative analysis* |  |  |
| Are there salient issues (e.g. project duration and scope) that have they affected project outcomes and sustainability? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation, comparative analysis* |  |  |
| **Management Arrangements, Executing Agency/Implementing Partner:** | | | | | |
| Were the capacities of the executing institution(s) and its counterparts properly considered when the Project was designed? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (e.g. Capacity Development Framework at baseline, ProDoc and Inception report)* | *Triangulation, comparative analysis* |  |  |
| Were partnership arrangements properly identified and roles and responsibilities negotiated prior to Project approval? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (e.g., ProDoc)* | *Triangulation, comparative analysis* |  |  |
| Were counterpart resources, enabling legislation, and adequate project management arrangements in place at Project entry? | *concurrence of interviewee feedback and evidence from document review* | KIIs, documents (e.g. Capacity Development Framework at baseline, ProDoc and Inception report) | *Triangulation, comparative analysis* |  |  |
| Has there been an appropriate focus on timeliness? | *concurrence of interviewee feedback and evidence from document review; as well as evidence of using appropriate management tools* | *KIIs, documents (esp., Annual Work Plans)* | *Triangulation,* |  |  |
| Have management inputs and processes, including budgeting and procurement been adequate? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (esp., Annual Work Plans and Baard meeting minutes)* | *Triangulation,* |  |  |
| Has overall risk management been proactive, participatory, and effective? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation, comparative analysis* |  |  |
| Has there been sufficient candour and realism in annual reporting? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents* | *Triangulation, comparative analysis* |  |  |
| Has there been adequate mitigation and management of environmental and social risks as identified through the UNDP Environmental and Social screening procedure? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (e.g. UNDP Environmental and Social screening document)* | *Triangulation, comparative analysis* |  |  |
| **Work Planning** | | | | | |
| Has the project experienced delays in start-up and/or implementation? What were the causes of the delays? And, have the issues been resolved? | *concurrence of interviewee feedback and evidence from document review* | *KIIs, documents (AWPs and PIRs; Board Meetings minutes))* | *Triangulation, comparative analysis* |  |  |
| Are work-planning processes results-based? If not, how could the work planning be reoriented to focus on results? Has the project team used the project’s results framework/ logframe as a management tool? | *concurrence of interviewee feedback and evidence form document review; as well as evidence of using appropriate management tools* | *KIIs, documents (esp., Annual Work Plans and PIRs)* | *Triangulation, comparative analysis* |  |  |
| Have there been any changes to the logframe since project start, and have these changes been documented and approved by the project board? | *evidence from document review;* | *ProDoc, Inception report, AWPs and PIRs. KIIs* | *Triangulation, comparative analysis* |  |  |
| **Finance and Co-finance:** | | | | | |
| Have strong financial controls been established allow the project management to make informed decisions regarding the budget at any time, and allow for the timely flow of funds and the payment of satisfactory project deliverables? | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs, Board meeting minutes* | *Triangulation, comparative analysis* |  |  |
| Are there variances between planned and actual expenditures? If yes, what are the reasons behind these variances? | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs,* | *Triangulation, comparative analysis* |  |  |
| Has the project demonstrated due diligence in the management of funds, including annual audits? | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs, Board meeting minutes* | *Triangulation, comparative analysis* |  |  |
| Have there been any changes made to the fund allocations as a result of budget revisions? Assess the appropriateness and relevance of such revisions. | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs, Board meeting minutes* | *Triangulation, comparative analysis* |  |  |
| Has pledged co-financing materialized? If not, what are the reasons behind the co-financing not materializing or falling short of targets? | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs, Board meeting minutes* | *Triangulation, comparative analysis* |  |  |
| **Project-level Monitoring and Evaluation Systems** | | | | | |
| Was the M&E plan sufficiently budgeted and funded during project preparation and implementation thus far? Are sufficient resources being allocated to M&E? Are these resources being allocated effectively? | concurrence of interviewee feedback and evidence from document review | *PIRs, CDRs, AWPs, KIIs* | *Triangulation, comparative analysis* |  |  |
| Are the M&E systems appropriate to the project’s specific context?  Do the monitoring tools provide the necessary information? Do they involve key partners, stakeholders including groups (e.g. women indigenous peoples, children, elderly, disabled, and poor)?  Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required?  How ell are the development objectives built into monitoring systems: How are perspectives of women and men involved and affected by the project monitored and assessed? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, KIIs* | *Triangulation, comparative analysis* |  |  |
| To what extent have follow-up actions, and/or adaptive management measures, been taken in response to the PIRs? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, KIIs* | *Triangulation, comparative analysis* |  |  |
| **Stakeholder Engagement:** | | | | | |
| Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, KIIs* | *Triangulation, comparative analysis* |  |  |
| Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, Board meeting minutes*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| How has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives? Are there any limitations to stakeholder awareness of project outcomes or to stakeholder participation in project activities? Is there invested interest of stakeholders in the project’s long-term success and sustainability? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, Board meeting minutes*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| **Reporting** | | | | | |
| How have adaptive management changes been reported by the Project Team and shared with the Project Board? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, Board meeting minutes*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| How well have the Project Team and partners undertaken and fulfil GEF reporting requirements? | evidence from document review | *Board meeting minutes and other documents*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| How have PIRs been shared with the Project Board and other key stakeholders? | concurrence of interviewee feedback and evidence from document review | *Board meeting minutes and other documents (GEF regional office)*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| How have lessons derived from the adaptive management process been documented, shared with key partners and internalized by partners, and incorporated into project implementation? | concurrence of interviewee feedback and evidence from document review | *PIRs, AWPs, Lessons Learned reports, Board meeting minutes*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| **Communication:** | | | | | |
| Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and long-term investment in the sustainability of project results? | concurrence of interviewee feedback  evidence from document review  *evidence of appropriate feedback tools used* | *PIRs, AWPs, Board meeting minutes, other documents*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?) | *concurrence of interviewee feedback*  *evidence from document review*  *evidence of appropriate communication tools* | *PIRs, AWPs, Board meeting minutes, other documents*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| Are there possibilities for expansion of educational or awareness aspects of the project to solidify a communications program, with mention of proper funding for education and awareness activities?  What aspects of the project might yield excellent communications material, if applicable? | *concurrence of interviewee feedback* | *Board meeting minutes, KIIs* | *Triangulation,* |  |  |
| **Sustainability** | | | | | |
| **Risk Management** | | | | | |
| Are the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module the most important? And, are the risk ratings applied appropriate and up to date? If not, explain why. | *Evidence of adequate risk identification* | *Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module*  *KIIs* | *Triangulation, comparative analysis* |  |  |
| **Financial Risks to Sustainability:** | | | | | |
| What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project’s outcomes)? What additional factors are needed to create an enabling environment for continued financing? | *concurrence of interviewee feedback*  *evidence from document review* | *KII* | *Triangulation,* |  |  |
| Has there been the establishment of financial and economic instruments and mechanisms to ensure the ongoing flow of benefits once the GEF assistance ends (i.e. from the public and private sectors, income generating activities, and market transformations to promote the project’s objectives)? | *concurrence of interviewee feedback*  *evidence from document review* | *KII,*  *PIRs and other documents (e.g. updated Capacity Development Framework)* | *Triangulation* |  |  |
| **Socio-Economic Risks to Sustainability** | | | | | |
| Are there any social or political risks that may jeopardize sustainability of project outcomes? | *concurrence of interviewee feedback*  *evidence from document review* | *KII* | *Triangulation,* |  |  |
| What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? | *concurrence of interviewee feedback*  *evidence from document review* | *KII* | *Triangulation,* |  |  |
| Is there sufficient public/ stakeholder awareness in support of the objectives of the project? | *concurrence of interviewee feedback*  *evidence from document review* | *KII* | *Triangulation,* |  |  |
| Are lessons learned being documented by the Project Team on a continual basis? | concurrence of interviewee feedback and evidence from document review | *Lessons Learned reports, KIIs* | *Triangulation, comparative analysis* |  |  |
| Are the project’s successful aspects being transferred to appropriate parties, potential future beneficiaries, and others who could learn from the project and potentially replicate and/or scale it in the future? | *concurrence of interviewee feedback*  *evidence from document review* | *KII* | *Triangulation,* |  |  |
| **Institutional Framework and Governance Risks to Sustainability** | | | | | |
| Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize project benefits? | *concurrence of interviewee feedback*  *evidence from document review* | *KII*  *CDF* | *Triangulation, comparative analysis* |  |  |
| Has the project put in place frameworks, policies, governance structures and processes that will create mechanisms for accountability, transparency, and technical knowledge transfer after the project’s closure? | *concurrence of interviewee feedback*  *evidence from document review*  *evidence of the project using appropriate frameworks, policies, governance structures and processes* | *KII, document review* | *Triangulation, comparative analysis* |  |  |
| How has the project developed appropriate institutional capacity (systems, structures, staff, expertise, etc.) that are likely to be self-sufficient after the project closure date? | *concurrence of interviewee feedback*  *evidence from document review* | *KII*  *CDF*  *Other documents (PIRs, government papers)* | *Triangulation, comparative analysis* |  |  |
| How has the project identified and involved champions (i.e. individuals in government and civil society) who can promote sustainability of project outcomes? | *concurrence of interviewee feedback*  *evidence from document review* | *KII, document review* | *Triangulation, comparative analysis* |  |  |
| Has the project achieved stakeholders’ (including government stakeholders’) consensus regarding courses of action on project activities after the project’s closure date? | *concurrence of interviewee feedback*  *evidence from document review* | *KII, document review (esp. the Board meeting minutes)* | *Triangulation, comparative analysis* |  |  |
| Does the project leadership have the ability to respond to future institutional and governance changes (i.e. foreseeable changes to local or national political leadership)? Can the project strategies effectively be incorporated/mainstreamed into future planning? | *concurrence of interviewee feedback*  *evidence from document review* | *KII, document review* | *Triangulation, comparative analysis* |  |  |
| **Environmental Risks to Sustainability:** | | | | | |
| Are there environmental factors that could undermine and reverse the project’s outcomes and results, including factors that have been identified by project stakeholders? | *concurrence of interviewee feedback*  *evidence from document review* | *KII, document review* | *Triangulation, comparative analysis* |  |  |

## 

## **Annex 9: Example Interview Guide used for data collection**

**Relevance: Project and its strategy**

1. What is your connection to the project?
2. How important do you the project is for Turkmenistan?   
   What do think about the project design? Are the resources adequate? Are there important activities missing? What would you suggest to adjust?
3. What other similar projects is your agency involved in? Is the project ensuring links with it?

**Results**

1. What were the main important achievements so far and why do you think so?
2. What were the main challenges and why in achieving the planned results?
3. Is the project likely to achieve all the planned results on time, to your knowledge? If not, what would be your recommendations?
4. In which can the project further expand is positive outcomes already achieved?
5. In which way can the project address the barriers on the way of achieving the results?
6. Has the project lead to capacity building of local specialists? What could be done differently?

**Management arrangements**

1. How would you assess the role played by UNDP and MAWE? What could be done better?
2. Has there been an appropriate focus on results?
3. What were the external factors affecting the project performing on time?
4. Is the composition of the Project Board, and the staffing of the project, as well as the level of engagement of experts adequate?

**Planning, monitoring and reporting**

1. How do you assess the management of the project? Is it responding to emerging challenges well enough? What could be done better?
2. How would you asses the planning of the project? What do you should be improved?
3. Is the project monitoring the activities adequately? Is your agency involved in monitoring? Is there anything that should eb done differently?
4. Have you seen the reports of the project? If yes, what do you think about them? Do you have suggestions on improvement?

**Finance and co-finance**

1. Has your agency pledges co-financing at the project conception stage? If yes, is it on track to be materialized? If not, why?

**Stakeholder engagement**

1. What do you think about the project’s engagement with the national entities and experts? Is it diverse and adequate? What could be done differently?
2. How has the current level of stakeholder engagement affected the results and national ownership?

**Communication**

1. Is communication regular and effective? What could be done differently?
2. Do you think the project is visible enough? What could be done differently?

**Sustainability**

1. Are the main achievements likely to be sustained? Why do you think so?
2. What is the likelihood of financial and economic resources being available once the GEF assistance ends to sustain the project results? Why do you think so?
3. Are there any social or political risks that may jeopardize sustainability of project outcomes?
4. What is the risk that the level of stakeholder ownership will be insufficient to allow for the project outcomes/benefits to be sustained?
5. Is there sufficient public/ stakeholder awareness in support of the objectives of the project?
6. Are the project’s successful aspects being transferred to appropriate parties?

**Other**

1. In the remaining period, what should the project focus on?
2. Do you have any other comment that what not raised in the interview?

## **Annex 10 MTR Rating guidance and scales**

| **Measure** | **MTR Rating** | **Achievement Description** |
| --- | --- | --- |
| **Project Strategy** | N/A |  |
| **Progress Towards Results** | Objective Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 1 Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 2 Achievement Rating: (rate 6 pt. scale) |  |
| Outcome 3 Achievement Rating: (rate 6 pt. scale) |  |
| Etc. |  |
| **Project Implementation & Adaptive Management** | (rate 6 pt. scale) |  |
| **Sustainability** | (rate 4 pt. scale) |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Ratings for Progress Towards Results:** (one rating for each outcome and for the objective) | | | |
| 6 | | Highly Satisfactory (HS) | The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as “good practice”. |
| 5 | | Satisfactory (S) | The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings. |
| 4 | | Moderately Satisfactory (MS) | The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings. |
| 3 | | Moderately Unsatisfactory (HU) | The objective/outcome is expected to achieve its end-of-project targets with major shortcomings. |
| 2 | | Unsatisfactory (U) | The objective/outcome is expected not to achieve most of its end-of-project targets. |
| 1 | | Highly Unsatisfactory (HU) | The objective/outcome has failed to achieve its midterm targets and is not expected to achieve any of its end-of-project targets. |
| **Ratings for Project Implementation & Adaptive Management:** (one overall rating) | | | |
| 6 | | Highly Satisfactory (HS) | Implementation of all components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as “good practice”. |
| 5 | | Satisfactory (S) | Implementation of most of the components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action. |
| 4 | | Moderately Satisfactory (MS) | Implementation of some of the components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action. |
| 3 | | Moderately Unsatisfactory (MU) | Implementation of some of the components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action. |
| 2 | | Unsatisfactory (U) | Implementation of most of the components is not leading to efficient and effective project implementation and adaptive management. |
| 1 | | Highly Unsatisfactory (HU) | Implementation of none of the components is leading to efficient and effective project implementation and adaptive management. |
| **Ratings for Sustainability:** (one overall rating) | | | |
| 4 | Likely (L) | | Negligible risks to sustainability, with key outcomes on track to be achieved by the project’s closure and expected to continue into the foreseeable future |
| 3 | Moderately Likely (ML) | | Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review |
| 2 | Moderately Unlikely (MU) | | Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on |
| 1 | Unlikely (U) | | Severe risks that project outcomes as well as key outputs will not be sustained |

## **Annex 11: UNEG Code of Conduct for Evaluators/Midterm Review Consultants**

**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 limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**MTR Consultant Agreement Form**

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## **Annex 12: MTR Report Clearance Form**

*(to be completed by the Commissioning Unit and UNDP*

**Midterm Review Report Reviewed and Cleared By:**

**Commissioning Unit**

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

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

**UNDP-GEF Regional Technical Advisor**

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

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

1. Section 4 “Work plan and budget”, GoT co-financing is broken down by years. [↑](#footnote-ref-1)
2. Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects, 2014, UNDP-GEF Directorate. [↑](#footnote-ref-2)
3. Analysis of causal contribution aims to demonstrate whether or not the evaluated intervention is one of the causes of observed change. Contribution analysis relies upon chains of logical arguments that are verified through a careful confirmatory analysis. Based on John Mayne, “Addressing Attribution Through Contribution Analysis: Using Performance Measures Sensibly’, The Canadian Journal of Program Evaluation Vol. 16 No. 1 Canadian Evaluation Society, 2001 [↑](#footnote-ref-3)
4. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country\_profile&CCode=TKM [↑](#footnote-ref-4)
5. Withdrawal volumes from transboundary rivers are negotiated within the Interstate Commission for Water Coordination, which includes Turkmenistan, Uzbekistan, Kazakhstan, Kyrgyzstan, and Tajikistan. Under current agreements, total diversion volume at medium and high-water levels from the Amu-Darya and other sources is about 27 billion m3 per year, while in dry years, the volume is significantly reduced. [↑](#footnote-ref-5)
6. Groundwater originates in the nation’s mountain ranges – the Kopet-Dag, Great Balkan, and Koytendag – as well as foothill plains, river valleys, and along the routes of major irrigation canals due to channel losses. There are more than 100 active groundwater springs in Turkmenistan. [↑](#footnote-ref-6)
7. According to forecasts of the Hydrometeorological Center of Uzbekistan, [↑](#footnote-ref-7)
8. Amu Darya is the main source of irrigation for a number of countries in the region. The planned development of upstream hydro-electric projects in Tajikistan threatens the potential stability of downstream flows. The expected 15percent reduction in flow of the Amu Darya by 2030 will have dramatic impacts on agriculture and food production in Turkmenistan. Other river flow rates are expected to decline at even faster rates [↑](#footnote-ref-8)
9. Turkmenistan’s networks of canals and drainage collectors, as well as its wells, are served by approximately 3500 pumping stations with a total installed electric power capacity in excess of 250 MW. Infrastructure was outdated with insufficient maintenance and in some areas running on diesel (1179 pumps, most consuming about 14 liters of diesel fuel per hour of operation. [↑](#footnote-ref-9)
10. or district production management agencies (DPMAs), [↑](#footnote-ref-10)
11. UNDP attempted to support formation of these with a funding from the Adaptation Fund (AF), but this was somewhat premature; the groups exist but these are not WUAs in the accepted meaning of the term). [↑](#footnote-ref-11)
12. In fact, Turkmenistan is the only Central Asian country where the irrigated area in 2007 to 2008 was substantially above the 1990 level [↑](#footnote-ref-12)
13. Estimated based on IEA data on electricity consumption. Sources: CO2 emissions from fossil fuel combustion. IEA 2012; IEA. Energy Balances for Non-OECD Countries 2012. [↑](#footnote-ref-13)
14. 2nd National Communication to UNFCCC. [↑](#footnote-ref-14)
15. caution is advised in relation to this figure, due to inconsistencies between conditions in Turkmenistan and assumptions of the IPCC methodology [↑](#footnote-ref-15)
16. Soil salinization is made worse by high groundwater levels, with groundwater under evaporative influences of solar radiation and wind. [↑](#footnote-ref-16)
17. UNECE. Environmental Performance Review for Turkmenistan, 2012. [↑](#footnote-ref-17)
18. the normative requirement is 40 linear meters of drainage channels per hectare of irrigated land, but the actual average is only around 20 [↑](#footnote-ref-18)
19. Until recently, most drainage water has been directed from farms via channels to hundreds of unlined open drainage collectors in natural depressions in desert or rangelands. Altyn Asyr Lake (Golden Age Lake, or Turkmen Lake) in the Karashor Depression in the northern part of the country is to provide a huge reservoir of water that will be recycled for irrigation after partial desalination treatment (receiving drainage waters from around the country). Construction began in 2000 and is estimated to take at least 15 years It may have a major ameliorative effect with significantly less land subject to eventual salinization; and better-preserved groundwater quality (also helping ensure that water table will not rise). [↑](#footnote-ref-19)
20. within watersheds; in parts of the system that interconnect among various sources; as well as between various levels of government [↑](#footnote-ref-20)
21. Action plans may also be linked to each other across districts or regions, where inter-district flows of water and other geographic conditions warrant. [↑](#footnote-ref-21)
22. Phase I (2008-2012) supported the participant countries in the following areas: Policy strategies and legislation based on IWRM and Water Framework Directive (WFD) principles; Intersectoral co-operation to improve water and health and implement the UNECE/WHO Protocol on Water and Health; National policies on transboundary waters in accordance with the UNECE Water Convention and other international environmental instruments; developing and implementing economic instruments in water policies, and facilitation of investment in water infrastructure and services. [↑](#footnote-ref-22)
23. Inception report’ (p.3) [↑](#footnote-ref-23)
24. UN Water (2014): “Water and Energy” [↑](#footnote-ref-24)
25. The ProDoc discusses replicability in terms of applicability of the lessons from the project in other countries (especially Middle East and Central Asia, which also depend on large-scale water management and irrigated agriculture), with a caveat that the unique geographic features and economic history of Turkmenistan make this project unique and unlikely to be replicated as a boilerplate in other countries. [↑](#footnote-ref-25)
26. http://www.fao.org/land-water/databases-and-software/aquacrop/en/ [↑](#footnote-ref-26)
27. this statement refers to indicator no 4, and not 12. The latter as was mentioned this indicator repeats with the second one having a midterm target of 150, which is obviously an omission) under “ [↑](#footnote-ref-27)
28. https://uk.grundfos.com/about-us.html [↑](#footnote-ref-28)
29. Communication from the MAWE received on August 3, 2018, by EERE [↑](#footnote-ref-29)
30. meeting of the MTR team with the Director of the Institute of Solar Energy [↑](#footnote-ref-30)
31. report by Ms. Irina Murkayeva, Chief Project Engineer of Kaahka pipeline. [↑](#footnote-ref-31)
32. TOR for an International expert – hydrology engineer for performing hydrological and water-related calculations, issued December 2016 [↑](#footnote-ref-32)
33. Final Report on Hydrological and Water Related Calculations for Proposed Pipeline at Kaahka by Suzanne Tynan BSc. MSc. (Env Sci) MSc. (Hydro) PGeo. EurGeol. For UNDP Turkmenistan, 2/6/2017 [↑](#footnote-ref-33)
34. in the words of his TOR*: " …[develop]...water use plans for traditional and water-saving irrigation technologies of administrative districts (etraps, velayats) and water basins according to the Water Code of Turkmenistan…covering the practice of water management at the level of individual farms and inter-farm irrigation systems, including collector-drainage channels”* [↑](#footnote-ref-34)
35. Correspondence with Charyyarkuli Taganov. August 2018 [↑](#footnote-ref-35)
36. Correspondence with Charyyarkuli Taganov, August 2018: “*The Team plans to determine the parameters in the soil-plant-air system necessary for adapting the modelling technique - to select the optimal irrigation parameters*”. [↑](#footnote-ref-36)
37. Correspondence with Charyyarkuli Taganov, August 2018: The following clarification was obtained “*At the end of the irrigated season of plants cultivated in the experimental plot …the set of initial data…, will allow…to prepare preliminary recommendations for the cultivation of crops in conditions of saline soils and the near occurrence of mineralized groundwater with the use of drip irrigation and sprinkling. In 2019, if opportunities are created, testing of the results can start in the Dashoguz velaya*t” [↑](#footnote-ref-37)
38. Potential training topics (from the ProDoc): monitoring, maintenance, and selection of pumps; design, monitoring, and maintenance of irrigation systems; irrigation scheduling; integration and “smart” systems; particular elements of relevant new policies and adopted action plans; and international best practices not directly reflected in the pilots of Components 1 and 2 [↑](#footnote-ref-38)
39. It was envisioned that (a) the specifications for replacement of the pumps will emphasize decommissioning of diesel pumps wherever possible; and (b) specifications for new pumps will also focus on integration with end use needs, including correct sizing and use of variable-speed pumps in order to optimize efficiency [↑](#footnote-ref-39)
40. “…*Implementing measurement on the needed scale and at required levels of precision will be a major organizational challenge, as it would require not only the installation of new devices (flumes and weirs for open channels, meters for pipes), but also the creation of processes and institutions for checking the devices and generating bills. Integrated planning would also be needed so that as the country makes the transition to low-water piped irrigation, measurement could be planned and implemented accordingly…*”. [↑](#footnote-ref-40)
41. Low-water irrigation in agriculture (Output 1.1), Servicing and/or replacement of electric pumps (Output 1.2), Servicing and/or replacement of diesel pumps (Output 1.2), Photovoltaic water pumping and purification for desert pasture areas (Output 1.3), Renewable gravity-driven municipal water supply, replacing wells and electric pumps (Output 2.1). [↑](#footnote-ref-41)
42. The midterm target from the RRF of the RRF specifies US$1.5 for midterm as co-financing target and US6.0 for the endline target for co-financing, which are not conformed in other documents or interviews [↑](#footnote-ref-42)
43. 29 August 2016, 23 February 2016, 16 February 2017, 11 October 2017 and 13 February 2018 [↑](#footnote-ref-43)
44. Including (a) hiring a new CTA when the contract with the initial one was discontinued; and (b) also, potentially appointing an interim Project Manager after the first one resigned before a new one would have been hired. [↑](#footnote-ref-44)
45. According to the IR: “*Based on discussions and consultations between the national partners and UNDP Country Office (CO) Management, activities at the research site have been agreed to be an important focus of the project in 2016, with the other two remaining pilot activities on irrigation canal lining and production lines to be planned for the following years*”. [↑](#footnote-ref-45)
46. GEF grant for PPG amounted to 150,000 US$ with matching co-financing of 20,000 US$ from the government. [↑](#footnote-ref-46)
47. Section IV of the approved Project Document [↑](#footnote-ref-47)
48. ProDoc, Section 4 Work plan and budget. As mentioned the Section 4.1.3 the target of GoT co-funding (6,000,000 US$) in RRF of the Inception Report is inconsistent with the total GoT co-financing (72,000,000 US$) allocated for the GEF project, and moreover, differs from the target (72,000,000 US$) to be reported in PIR. Therefore, the further analysis of co-financing is based on the target of co-financing in PIR, which does not conflict with the signed project document. [↑](#footnote-ref-48)
49. Confirmed by the PM in the email, August 22, 2018 [↑](#footnote-ref-49)
50. http://wecoop2.eu/sites/default/files/documents/events/presentations/8.percent20Carolinepercent20Milow\_Presentationpercent20onpercent20GIZpercent20TWMCApercent20Programme.pdf [↑](#footnote-ref-50)
51. The Commission is mandated to coordinate national efforts in meeting targets of the NSCC as well. Currently, no national-level adaptation and mitigation plans to support the Strategy implementation are adopted. The national GHG inventory is developed on an ad hoc basis (usually coordinated by the SCEPLR within GEF-funded projects of National Communications to the UNFCCC). The State Commission mentioned above. [↑](#footnote-ref-51)
52. Appropriate environment information is published in an annual statistical yearbook on environmental protection and the use of natural resources and as a part in a statistical yearbook of Turkmenistan. It contains statistical data related to the environment, namely on water abstraction and wastewater discharge, land use, reforestation and air emissions from stationary sources. However, it is insufficient in terms of monitoring water management and land management indicators. [↑](#footnote-ref-52)
53. http://www.tm.undp.org/content/turkmenistan/en/home/presscenter/pressreleases/2015/11/23/undp-launches-a-new-project-on-energy-efficiency-in-water-management-system-of-turkmenistan.html [↑](#footnote-ref-53)
54. <http://orient.tm/en/2017/11/26/2962.html> [↑](#footnote-ref-54)
55. <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD> PPP (current international $). Growth has slowed slightly during the last 2 years [↑](#footnote-ref-55)
56. <http://www.worldbank.org/en/country/turkmenistan/overview> [↑](#footnote-ref-56)
57. Climatic conditions have historically allowed the country to produce high quality fruit and vegetable products and prior to collapse of the Soviet Union, Turkmenistan was a major exporter of fruit and vegetables to northern parts of the Soviet Union. Over recent years, land allocated to produce winter wheat was increased almost five times largely at the expense of areas dedicated to feed, fruit and vegetable crops. [↑](#footnote-ref-57)
58. UNDP is currently planning to address the issue of the absence of the Extension Service, provided that funding would become available through the Adaptation Fund. [↑](#footnote-ref-58)
59. For ideas on innovative and participatory Monitoring and Evaluation strategies and techniques, see [UNDP Discussion Paper: Innovations in Monitoring & Evaluating Results](http://www.undp.org/content/undp/en/home/librarypage/capacity-building/discussion-paper--innovations-in-monitoring---evaluating-results/), 05 Nov 2013. [↑](#footnote-ref-59)
60. For more stakeholder engagement in the M&E process, see the [UNDP Handbook on Planning, Monitoring and Evaluating for Development Results](http://www.undg.org/docs/11653/UNDP-PME-Handbook-(2009).pdf), Chapter 3, pg. 93. [↑](#footnote-ref-60)
61. Populate with data from the Logframe and scorecards [↑](#footnote-ref-61)
62. Populate with data from the Project Document [↑](#footnote-ref-62)
63. If available [↑](#footnote-ref-63)
64. Colour code this column only [↑](#footnote-ref-64)
65. Use the 6-point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU [↑](#footnote-ref-65)
66. Alternatively, MTR conclusions may be integrated into the body of the report. [↑](#footnote-ref-66)
67. Populate with data from the Logframe and scorecards [↑](#footnote-ref-67)
68. Use the 6-point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU [↑](#footnote-ref-68)