Annual Project Progress Report

Project title:	**Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan**
Award ID:	**00080840**
Project ID:	**00090400**
Implementing partner:	**State Committee on Water Management of Turkmenistan**
Period covered in this report:	**January – December 2020**
Date of last Annual Report:	**30 December 2019**
Date of the last Project Board meeting:	**19 February 2020**
Date of last Quality Assurance and rating:	**12 September 2020 (PIR). The Regional Technical Advisor has rated Development Objective (DO) as Moderately Satisfactory (MS) and Implementation Progress (IP) as Satisfactory (S)**

1.Project Performance

a) Please state the expected Output of the Project, set indicators and corresponding CP Outcome (as per project document/AWP):

COMPONENT 1: Technology transfer and knowledge development in support of innovation in EE water management and SLM in agriculture

OUTPUT 1.1: Technology proving site and educational platform for low-water irrigation and SLM in agricultural croplands developed and implemented

Output indicators 1.1.

- Reduction of water used for specific soil types
- Normalised energy consumption reduced compared with average values for similar soil types
- Area of land protected or reclaimed from salinisation as a result of demonstration projects

Output targets 1.1.

- Demonstration project achieves comparable yields with 40-50 percent less irrigation water consumption than specified by norms.

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

Third year of cultivation reconfirmed significant positive outcomes of low-water irrigation systems tested at demonstration site. Yield and water consumption figures vary by crop types and irrigation technologies used. Crops harvested with drip and sprinkler irrigation consumed in average over 60% less water for unit of product if compared with traditional furrow irrigation.

- Normalized energy consumption reduced by 30 percent relative to similar sites.

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

Based on the results of the third year of field tests at Geokdepe demonstration site, application of low-water irrigation systems along with water saving piping system and energy saving pumping equipment reduced by around 70 percent normalized energy consumption relative to similar sites with traditional types of irrigation and infrastructure.

- 300 ha of land protected or reclaimed from salinisation as a result of demonstration projects

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

As a result of the reporting year activities and previous years reclamation works, ameliorative condition of all arable lands of 145 ha Geokdepe site was improved. In addition, at the whole territory of green polygon the cross sections of open drainage collectors were cleared of weeds. Reconstruction of the collector-drainage canals completed back in 2016 allowed the entire territory to provide the necessary drainage of excess groundwater and lower its level, thereby eliminating the possibility of secondary salinization of soils. It became possible not only to collect collector-drainage water on green polygon, but also to improve the quality of collector-drainage water of neighbouring lands of an area of almost 270 hectares. In addition, operation of collectors 2D-3-6 and GKS-2-1 led to a decrease in the level of groundwater in adjacent neighbouring lands (at 70-80 m distance from the edge of the collectors) with a total area of 18.5 hectares. All these activities allowed to exceed the target.

OUTPUT 1.2: Audits and servicing of pumps of various sizes in both interdistrict water networks and on farms in all velayats of Turkmenistan

Output indicator 1.2. Number of pump audits completed by project (total and diesel pumps) and energy saving achieved by replacement and/or fixing of old pumps

Output targets 1.2:

- At least 100 pump audits completed by project, including audits of 25 diesel pumps

a) Were the indicators and output achieved? Yes ■ No☐ Partially ☐

b) If no or partially, please explain why?

Project experts in close coordination with and assistance of the (former) Ministry of Agriculture and Water Economy conducted audit of efficiency and energy consumption of 121 pumps including 44 diesel and 77 electric pumps in 2017. International experts estimated old pumps to be around 30-35% less efficient compared to the nominal design efficiencies.

- 20 percent energy saving achieved by replacement and/or fixing of old pumps

a) Were the indicators and output achieved? Yes ■ No☐ Partially ☐

b) If no or partially, please explain why?

Based on the recommendations of international consultants on energy audit of pumps and in consultation with key national partner, the project replaced 5 physically worn and technologically obsolete pumps by brand new energy efficient ones in 2019. New pumps will go through audit to identify direct energy savings and prepare recommendations for the government for replication via state or private

investments. Based on the average energy specifications of baseline pump-sets (about 100 kW) and new pumps (40 kW), it is expected to achieve over 50% energy saving.

OUTPUT 1.3: Renewable-energy applications of water pumping and purification in remote pasture areas

Output indicator 1.3. Number of people directly benefiting from measures on renewable-energy water supply in remote locations

Output target 1.3.: 1100 people directly benefiting from measures on renewable-energy water supply in remote locations

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

The project completed installation of photovoltaic systems (PV) for water pumping and purification in the villages of Bashkak, Yel and Kelleli in Akhal velayat with total number of residents over 1200 people.

COMPONENT 2: Scaling-up investment in improved water management infrastructure to reduce water losses, energy use, and land degradation

OUTPUT 2.1: Installation of pipeline and/or channel lining for municipal water supply in Kaakhka, replacing unlined channels and wells, with documentation of results and presentation of recommendations and cost analysis for replication

Output indicators 2.1.

- Reduction in water loss between withdrawal and entrance point of the Kaakhka town Water Treatment facility
- Direct energy savings due to decommissioning of up to 41 wells
- Number of similar projects initiated in in other similar (or mountainous areas) districts of Akhal and Balkan velayats of Turkmenistan

Output targets 2.1.

- Less than 5 percent of water is lost between withdrawal and end use in Kaakhka.

a) Were the indicators and output achieved? Yes ■ No☐ Partially ☐

15km long water supply pipeline for the Kaahkha district successfully launched in 2018. It practically eliminated water loss between withdrawal and water treatment facilities.

- Water supply reliability is increased, while 41 wells can be decommissioned. Direct energy savings of 486 MWh per year, and reduction of associated GHG emissions by 240 tonnes.

a) Were the indicators and output achieved? Yes ■ No☐ Partially ☐

Operation of the new gravity-driven water supply system since April 2018 has shown that decommissioning of the entire set of around 40 well pumps, that had been supplying the town with water, is not possible due to variable water availability in the river that the new system draws water from. During low-water levels in the river (mostly Summer months), part of the well pumps needs to be kept running to ensure that the town gets sufficient water.

Original target set for this activity in the approved project document was 11,250 tCO2, which was to be generated through complete decommissioning of 41 electric pumps with average rated capacity of 1.5 kW during the project lifetime. Since the actual average capacity of the well pumps appears to be substantially larger (9.5 kW) and with half of pumps remaining in operation on average across the year, the resulting estimated GHG mitigation impact appears to be larger than the originally targeted in the project document. Thus, based on the calculations of International Expert on GHG emission reduction, Kaahka water pipeline result in annual energy savings of about 1000 MWh, and reduction of associated GHG emissions by 785 tCO2/year.

- At least 1 similar project initiated in other similar (or mountainous areas) districts of Akhal and Balkan velayats of Turkmenistan.

a) Were the indicators and output achieved? Yes ☐ No☐ Partially ■

b) If no or partially, please explain why?

Preliminary estimates display up to 50% of water economy, with lifetime direct GHG emission reductions from operation of the combined water supply system in Kaakhka town are anticipated at 15,694 tCO2. Given its high replication potential in the country, a dialogue with the government is now underway to upscale this water-energy nexus effect.

OUTPUT 2.2: Lining of interdistrict canals for reduction of water losses and land salinization, including various technologies

Output indicator 2.2.

- Number of production lines established (from at least 3 potential options) to produce materials for modern canal linings and pipes
- Kilometres of canals newly lined

Output target 2.2:

- Testing of at least three types of materials for canal linings and pipes. Initiation of mass production of new materials and/or cost reduction by 20 percent of mass-producing existing materials, involving at least two types of products.

a) Were the indicators and output achieved? Yes ☐ No ☐ Partially ■

b) If no or partially, please explain why?

Based on the recommendations of National and International Experts in Irrigation Canals, the project started procurement of materials and equipment for initiation of production of two lining materials. The forms for production of pre-cast hexagonal concrete slabs were already purchased and supplied to Concrete Plant of State Water Committee, the project's key national partner. The procurement of a HDPE (waterproof membrane) extrusion line (to produce membranes with thickness of up to 1 mm) is in progress. Due to Covid-19 related constraints the delivery of equipment is expected in February 2021. The project also hired IC Specialist on Polymers and Extrusion who guides and provides technical support to project team during the establishment of production of polymer materials at the plant.

- Domestic production and installation expanded by 50 percent for at least two types of technologies for canal linings, pipelines, or other materials to reduce losses of water in transit. New lining of at least 400 km of canals. Reduction of water losses from newly lined canals by more than 50 percent.

a) Were the indicators and output achieved? Yes ☐ No ■ Partially ☐

b) If no or partially, please explain why?

The project plans to establish domestic production of lining materials at the beginning of 2021. Lining of irrigation canals with the new materials may happen in mid-2021 the earliest.

<u>COMPONENT 3:</u> Planning and capacity-building at the regional and local levels, plus evaluation and compilation of lessons learned

OUTPUT 3.1: Technology Action Plans, including consideration of SLM, developed and implemented at the regional and local levels

Output indicators 3.1. Number of regional Integrated Water Distribution Plans developed and formally submitted for approval

Output targets 3.1. At least 3 velayat Integrated Water Distribution Plans developed and submitted for approval, recommendations are developed for other 2 velayats (Lebap and Balkan)

a) Were the indicators and output achieved? Yes ☐ No ☐ Partially ■

b) If no or partially, please explain why?

Project prepared 1st edition of a methodology for the development of on-farm and inter-farm water use plans and demonstrated it to national water specialists.
During this assignment, project used the validated in 1991 baseline materials on the norms and timing of irrigation of agricultural crops and irrigation technologies. The State Water Committee advised that in the newly developed Water Use Planning methodology new irrigation rates should be used, considering the results of modern studies of irrigation rates for agricultural crops using drip irrigation and artificial sprinkler irrigation systems for the current climatic conditions of the region. Based on that, in 2020, project conducted studies to determine the irrigation norms for traditional furrow irrigation and water-saving drip and artificial sprinkling irrigation. During the research work, project used the results of field experiments conducted in 2018 - 2020 at 145 ha research site. This year, the on-farm Water-use Plan was tested at 145 ha research site and the results of this research have passed the initial examination and were submitted to the State Water Committee for approval. Approval is expected on March-April 2021. During 2021, project plans to complete work on the development of the final version of the Water-use Planning Methodology in the context of farms, inter-farm irrigation systems of etraps (districts), velayats and basin systems and the results of these activities will be used to complete work on the development of integrated regional plans for sustainable water resources management, considering SLM at the level of etraps. Therefore, in 2021, at least 1 comprehensive plan for water use and water distribution at the velayat level will be developed and submitted for approval, and recommendations for the other 2 velayats will be developed.

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 indicators 3.2.

- Key stakeholders/institutions with relevant mandates involved/trained jointly by the Project
- 90% positive feedback from training participants

Output target 3.2. 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

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

Over 360 national specialists representing State Water Committee, Ministry of Agriculture and Nature Protection, Water Design Institute, students of Agricultural University and farmers have been trained locally and abroad since the beginning of the project in various topics related to rational water management, energy efficient irrigation techniques, pump maintenance and SLM. Positive feedback rate from training participants is around 93%. Series of local trainings focused on low-water irrigation technologies, energy efficient pump operation, canal seepage control and various aspects of SLM will be arranged in 2021 for nearly 100 national water and agriculture experts and farmers.

OUTPUT 3.3: Project evaluation and compilation of lessons learned
No indicators and targets are specified in RRF for the Output 3.3 in the project document.

a) Were the indicators and output achieved? Yes ☐ No☐ Partially ■

b) If no or partially, please explain why?

Mid-Term evaluation took place in mid-2018. The project progress was recognized and delays in project realization were noted with useful recommendations on further project implementation.

The project experts carry out site-specific technical evaluations of energy savings, water savings and land melioration under specific outputs. The project also conducts regular evaluation of GHG emission reduction from the pilot projects. GHG impact will be estimated and reported accordingly.

Lessons learned are continuosly documented by project experts and discussed at meetings with project stakeholders.

<u>COMPONENT 4:</u> National policy and regulatory framework established for integrated water resource management

OUTPUT 4.1: Standards and regulations for pump performance and maintenance adopted and enforced
Output indicator 4.1: Number of regulations, norms, and/or standards developed and adopted in support of the new Water Code

Output target 4.1: At least 3 secondary legislative acts related to irrigation infrastructure incl. pump audits, crop-specific irrigation norms, and water/energy saving practices to lead to GHG emission reduction developed and submitted for approval.

a) Were the indicators and output achieved? Yes ■ No☐ Partially ☐

b) If no or partially, please explain why?

Based on detailed inventory of legislation, as well as mandates of relevant governmental institution in the field of energy efficiency, irrigation water use, GHG emission reduction developed in 2016, in 2017 the project developed four regulatory acts to support Water Code, including (i) operational regulations for pump stations; (ii) regulation for scheduled preventive maintenance and repair of water systems and

facilities; (iii) technical regulations of irrigation infrastructure; and (iv) technical regulations of drainage infrastructure. Upon receipt of comments and inputs from state agencies, the project updated the sub-legislative acts and submitted to State Committee on Water Management.

The regulatory documents in the field of integrated management and protection of water resources were developed, agreed with the interested ministries, departments and their structural divisions and submitted for approval for a total of 9 works during the reporting period. These documents have been prepared considering the use of modern water and energy saving technologies in the agricultural and water sectors of the country to reduce greenhouse gas emissions into the atmosphere.

To address issues on the introduction of integrated water resources management (IWRM) and sustainable land management (SLM), work was carried out to develop new standards for irrigation of agricultural crops, orchards, vineyards, and perennial plantations considering climate change and global warming, methodologies for organizing water accounting in irrigation systems and compiling water balance of water bodies. Also, the national partner was presented with the “Regulations on territorial water management organizations, water protection zones and coastal water protection zones of water bodies”. The developed documents will allow developing a strategic framework for measuring water consumption and monitoring energy consumption in the water sector.

The developed Construction Norms of Turkmenistan "Amelioration systems and structures" and an updated version of its application "Operation of irrigation and drainage systems", as well as Construction norms "Instructions for the design and construction of anti-seepage devices made of polyethylene (polymer) film for artificial reservoirs (watercourses)" were submitted to the Ministry of Construction and Architecture so that national organizations can use modern norms and standards in the design and construction of water infrastructure facilities, including energy efficient pumping units, drip irrigation and artificial sprinkling systems, improve water use efficiency and help in reduce of greenhouse gas (GHG) emissions in the water sector.

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

No indicators and targets are specified in RRF for the Output 4.2 in the project document.

In 2018 the Project initiated discussions among water sector experts on approaches to develop policy framework for metering water consumption, monitoring energy consumption in the water sector, and transition to end-use tariffs. Work on development of regional Integrated Water Distribution Plans (Output 3.1) will also contribute to creation of enabling conditions for transition to end-use tariff system.

The project established water metering systems at all of the project pilot sites.

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

Output indicator 4.3: 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).

Output target 4.3: Yes

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

In 2019 the government adopted the National Program for the Development of Agriculture of Turkmenistan for 2019-2025, which, in addition to traditional agricultural activities, also envisages rational use of water resources, improving land reclamation techniques and other issues to improve the country's irrigated agriculture sector in the medium term. It is planned to spend 6.8 billion manat (over 1.9 billion US dollars) for the implementation of this program, mainly from the state budget of the country.

OUTPUT 4.4. Administrative reform for implementation of integrated water resource management and sustainable land management adopted and implemented
Output indicator 4.4: Programme for water measurement is developed and made operational at focus demonstrational sites.

Output target 4.4: Programme for water measurement is developed and made operational at focus demonstrational sites (Yes/No)

a) Were the indicators and output achieved? Yes ■ No ☐ Partially ☐

b) If no or partially, please explain why?

Baseline data collection program for the Kaahka pilot project was prepared and initiated in 2016 through installation of water measuring devices at the source and lower stream of the open-water channel that supply drinking water to the town of Kaahka. These meters enabled the project to accurately measure and calculate the average monthly water flow and supported final decision on pipeline construction. Water metering was further improved with construction of water distribution point as part of the Kaahka water pipeline project completed in April 2018.

Testing of water measurement devices at Geokdepe demonstration site started in 2017 when piped irrigation network was built. Additional water meters were installed along with drip and sprinkler irrigation systems in June 2018. Collection of water consumption figures intensified with planting of various crops irrigated with water saving types.

In 2018 EERE project specialists discussed with national water, agriculture and legal experts potential ways of improvement/revision of agency roles for IWRM. Preliminary agreement was reached about partnership of EERE project with SCRL project and Regional Environmental Center for Central Asia (CAREC) that is planning to work on promotion of IWRM principles within its joint USAID-CAREC project “Water, education and cooperation”. In November 2019 UNDP Turkmenistan signed a three-year MoU with CAREC to strengthen synergetic cooperation between UNDP and CAREC and maximize impact in a number of areas such as policy and legal framework improvement, technology and knowledge transfer, building new skills and others. As a result, in 2020, with the support of CAREC the project developed and published 300 copies of "Recommendations for the design of drip irrigation systems for agricultural crops, vineyards, orchards and perennial plantations for the conditions of Turkmenistan" methodological document that was disseminated among water/agriculture authorities, farmers and specialized universities. This methodology is based on the results of field research works in Geokdepe site during 2018-2020.

2.Progress Reporting

a) Please summarize the main achievements during the project cycle:

The project has delivered four major strategic milestones including:

1. In April 2018 a gravity-flow water pipeline was launched for the town of Kaakhka to save water by prevention of ground water losses, shut down the operation of around 40 water pumps and reduce associated GHG emissions. The initiative has both mitigation and adaptation effect. Given that the country has a number of other settlements in similar conditions, potential for replication is high. The currently ongoing monitoring of the new pipe operation will serve as grounds for entering into a dialogue with national counterparts with regard to possible upscale of this measure.
2. A 145 ha research site was launched in early June 2018, with various irrigation systems and infrastructure up and running. The project has started the process of research and analysis on how these irrigation systems interact with various crop types. This multi-year process will be documented, with findings to be presented to Government for strategic adjustments of the countries agricultural development, including changes to be proposed in the educational sector.
3. The project replaced five obsolete low-efficient pumps used for water supply for irrigation purposes. Newly installed modern energy efficient pumps increased efficiency and reliability of water supply in specific rural areas. It also reduced energy consumption and associated GHG emission due to lower energy consumption of new pumps (40 kWt) compared to replaced ones (over 100 kWt) with the same productivity. It is expected that this major exercise will further lead into GHG reductions from replications in the water pumps sectors, which currently occupies one of the leading places in emissions.
4. The project also promotes innovations such as the use of renewable energy for water pumping and treatment in remote areas for household needs. At the end of 2019 the project completed installation of photovoltaic systems (PV) for water pumping and purification in the villages of Bashkak, Yel and Kelleli, Akhal velayat totalling over 1200 residents. It is envisaged that it will improve water availability in areas with highly limited access to water and reduce associated GHG emissions from diesel fuel used for pumps and household energy supply. It will also contribute to socio-economic growth of targeted communities due to significant money savings from free of charge solar energy versus expenses for diesel fuel and its delivery to remote villages, regular maintenance and replacement of diesel power generators.

The project developed four regulatory acts to support Water Code, including (i) operational regulations for pump stations; (ii) regulation for scheduled preventive maintenance and repair of water systems and facilities; (iii) technical regulations of irrigation infrastructure; and (iv) technical regulations of drainage infrastructure. It is expected that these regulations when approved by the State Water Committee will improve efficiency of use of water infrastructure and contribute to GHG reduction in water sector.

The project contributed substantially to the work of Water Design Institute on update of SNT (national construction norms and standards) on Land-reclamation systems and facilities to the Ministry of Construction. The final draft of SNT after undergoing a legal examination and corrections was resent to the Ministry of Justice. New building code if approved will allow national organizations to use modern norms and standards in the design and construction of water infrastructure facilities incl. energy efficient pump units, drip and sprinkler irrigation systems to increase rational use of water and promote reduction of GHG emission.

The project demonstrated benefits of laser land levelling technology to water specialists and farmers when up to 30% water saving and 25% yield increase is attainable. As a result, in 2019 Ministry of

Agriculture and Nature Protection purchased first batch of 40 units of laser land levelling equipment. The project conducted training for operators to avoid equipment breakdowns from improper operation and excessive fuel consumption.

With substantial facilitation of the project, UNDP Turkmenistan signed a three-year MoU with CAREC, international organization successfully promoting issues of environmental management and sustainable development in the Central Asia region. Synergetic cooperation between UNDP and CAREC will maximize impact in a number of areas such as policy and legal framework development, technology and knowledge transfer, building new skills and other. Besides, with project efforts UNDP signed MoU with German company KSB specialising in water pumping technologies with intention to reduce carbon footprint in Turkmenistan, install KSB equipment at various project sites and to demonstrate energy efficient water metering and pumping including use of renewables. Moreover, in December 2020, within the framework of conference "Preservation of the unique nature and ecological system of Turkmenistan is the key to sustainable development" organized by the Ministry of Agriculture and Environment Protection of Turkmenistan and dedicated to the 25th anniversary of the Neutrality of Turkmenistan, UNDP has signed MoU with State Water Committee on cooperation in the field of improving the management, protection and use of water resources.

3. Project Risks and Issues

The project Risk Log is maintained throughout the project implementation to capture potential risks to the project and associated measures to mitigate risk. The Project Manager shall maintain and update the Risk Log and ensure that risks are identified, communicated and managed effectively.

A number of potential risks are listed below.

Description of risk	Type and category	Risk management actions	Current situation
Complexity and multi-dimensional nature of the project, which may lead to non or under delivery of some of the planned objectives and goals	Organisational	Mobilisation of stakeholders and regular engagement with all partners via the inception workshop and later as members of the Project Boards. Numerous face-to-face meetings at different levels: Project Manager, experts as well as meetings of UNDP Senior Management with high rank government authorities	Reducing
Delays in implementation of planned activities due to lengthy internal decision-making process resulting non-delivery	Operational and Organisational	Weekly meetings and discussions with the Senior Management.	Completed
Lack of adequate support from the National Partners	Operational and Strategic	Efforts by the SM in raising the issue during high level meetings and exchange of NVs, and discussions of project team members with the counterparts, request to substitute NPC	Reducing

Government commits funds to water conservation and energy conservation at a level insufficient to achieve significant scaled-up effects. Due to the general economic situation in the country, not enough budgetary funds might be allocated for replication of pilot project activities. Besides, growing difference between the official and market exchange rates may hamper private investments in sustainable energy and water technologies	Financial	Even though some pilot project activities might be replicated under the private financing (e.g. EE irrigation), the major part has to be financed by the State (Central or Regional) budget, especially aimed at increase of EE at the pumping stations. Therefore, general economic situation in the country is of crucial importance for scaling-up similar activities. External factors, e.g. decrease of prices (and/or sales) on natural gas and oil worldwide, may lead to the decrease of the State budget of Turkmenistan and consequently, there would be less funding available for the enhancing sustainable energy and water management practices (installation of EE and RE technologies). To mitigate this risk, the EERE project will implement comprehensive Monitoring and Evaluation (M&E) of the pilot (demo) projects and communicate its results to all stakeholders and potential investors/beneficiaries. The focus of the materials prepared for this purpose, will be on energy savings achieved as well as cost-efficiency. In case of proper awareness raising / marketing campaign, sustainable irrigation will be put in the high priorities and its financing secured. Furthermore, tightening of foreign exchange regime by national financial authorities led to occurrence of black-market rate for foreign currency which is now five times higher than official rate. Potential private investors in these technologies (mostly farmers), which have their financial resources in national currency, likely have to purchase the foreign currency at the market rates, that in turn, may make such investments financially not feasible. To mitigate this risk, the EERE project will conduct detailed financial analysis including sensitivity analysis and promote only those technologies with high IRR and NPV.	Ongoing

The project Issue Log is maintained throughout the project implementation to capture potential issues to the project and associated response measures. The Project Manager shall maintain and update the Issue Log and ensure that issues are identified, communicated and managed effectively.

A number of potential issues are listed below.

Description of issue	Type and category	Response / Countermeasures	Current situation
Restrictions in official currency transactions and consequent occurrence of	Financial	This is an external factor that neither UNDP nor Project team can have an impact on. The only countermeasure that can be taken is wider distribution of tender announcements among	No change

dual/black market exchange rate.		foreign companies. As foreign companies can be paid in hard currency, it will mitigate negative impact of black-market exchange rate.	
Kaahka pipeline handover to the Government is delaying	Regulatory	Senior Management raised the issue on several occasions (the latest was the meeting with Minister of Agriculture and Water Economy in Dec 2018) with the high rank Government authorities and was promised to get resolution soon	Completed, Water Management Dept of Kaahka accepted water pipeline
Project registration extension is overdue	Regulatory	Senior Management raised the issue on several occasions with the high rank Government authorities and was promised to get resolution soon	No change, but expected to reduce
Delay in project registration extension affected some project activities	Regulatory	The process of handover of some major project assets (tractor, irrigation infrastructure in Geokdepe and some others) is suspended due to delay in receiving of project registration certificate. Senior management raised this issue at high level meeting with the Government.	No change, but expected to reduce
Some major project activities can be delayed due to requirements of the National Customs Service.	Regulatory	Customs authorities require project registration certificate for custom clearance of goods and materials purchased for project activities, otherwise cargo can be kept until submission of required document. Senior management raised this issue at high level meeting with the Government.	No change, but expected to reduce
Automatic agro-weather station does not transmit data collected at the field.	Operational	Agro-weather station installed at Geokdepe Green polygon stopped data transmission after several months of proper functioning. UNDP sent NV to TM Cell mobile operator.	No change, but expected to reduce

4.Lessons learned and follow-up steps (if applicable)

a) Please provide the lessons learned and further steps after the project's closure.

№	Lessons Learned	Follow-Up Steps
1.	Since Kaahka pipeline reduced infiltration loss nearly to zero, water savings were redirected to irrigation of around 850 ha of agricultural fields and created around 50 additional seasonal workplaces.	In addition to water and energy consumption figures monitored in Kaahka, the project will look at the improvement of living conditions of residents.
2.	Key implementing partners, Ministry of Agriculture and Water Economy and its Water Design and Research Institute, most likely will not be able to do significant contributions to project	The project will try to get key implementing partners involved in project activities with in-kind

	activities that entail financial implications due to their weak financial standings.	contributions, for instance mobilize their workers for tree planting or other field works at Geokdepe site or use their vehicles/tracks for delivery of needed products, etc.
3.	Establishment of production line of HDPE membrane requires support of international expert with multi-country experience and technical knowledge.	The project hired International Consultant on Polymers and Extrusion with hands-on international experience
4.	The Government linked Byori village to the central power grid right after the project completed installation of photovoltaic system (PV) for water pumping.	After consultation with local authorities, the project replaced/reinstalled the PV system from Byori to Kelleli village, so the equipment is now used where it is really needed.
5.	Due to the low amperage in the power grid system of Koneurgench etrap Dashoguz region, modern energy efficient pump installed there does not work.	Local authorities have fixed the issue of amperage level. The pumping station is now well functioning.

5. Transfer of Assets or other related matter

a) Please state on any past or future transfer of assets made within the project cycle (Attach list of equipment, cooperation frameworks with beneficiaries, etc.)

See attachment 1

6. Financial management

Budget item	Total approved in 2020 (in USD)	Expenses + commitments	Budget utilization in % to planned
Component 1	127,750	83,425	65
Component 2	234,720	280,606	120
Component 3	92,495	23,424	25
Component 4	94,095	32,414	34
Project management	36,849	19,890	54

Total delivery in 2020	**585,909**	**439,759**	**75**
In % to total project budget	**9.32**	**7.00**	

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Date: 08.01.2021

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Date: 08.01.2021