ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	Regular project
Country:	Turkmenistan
Title of Project/Programme:	Scaling Climate Resilience for Farmers in Turkmenistan
Type of Implementing Entity:	MIE
Implementing Entity:	UNDP
Executing Entity/ies:	Ministry of Agriculture and Environment Protection of Turkmenistan
Amount of Financing Requested:	$7,000,040 (in U.S Dollars Equivalent)

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Project / Programme Background and Context:

Summary

1. This project seeks to build resilience to climate change among the emerging class of small and medium private farmers in Turkmenistan, including women farmers. Over the past 60 years, intensive warming has been observed all over the country. Future climate scenarios project an increase in average annual temperature and in the number of extremely hot days, a reduction in annual average rainfall, an increase in average evaporation rates, an increase in the frequency and intensity of drought and flood spells, and a reduction in river flow rates. These climate changes are projected to result in reduced yields, improved conditions for pests and diseases, crop failures and diminished productivity. Shortages in irrigation will also increase the degradation of valuable arable land in the form of intense salinity, soil erosion, degradation and reduction of natural grasslands, decrease the productivity of pastures, and will lead to a less efficient livestock industry. Of particular concern are the increase in water demand and the reduction in water availability which taken together, may result in a significant deficit of agricultural irrigation water. The higher evaporation rate predicted as a result of climate change is likely to increase the water requirements for irrigating crops by 30-40%, thereby aggravating existing water scarcity and irrigation concerns. Increased water demand of up to 60% is expected for vegetables, a growing subsector.

2. Approximately 50% of the Turkmen population are involved in agriculture, with a large and increasing number now engaged in the non-state crop and livestock sector as the country undertakes an economic transition towards agricultural diversification and privatization. This project directly reflects climate change adaptation priorities as set out in the Turkmen NDC submitted as part of the Paris Agreement, and supports the government's strategic aim of moving towards diversification and privatization in agricultural sector, self-sufficiency and import substitution across a range of agricultural areas.

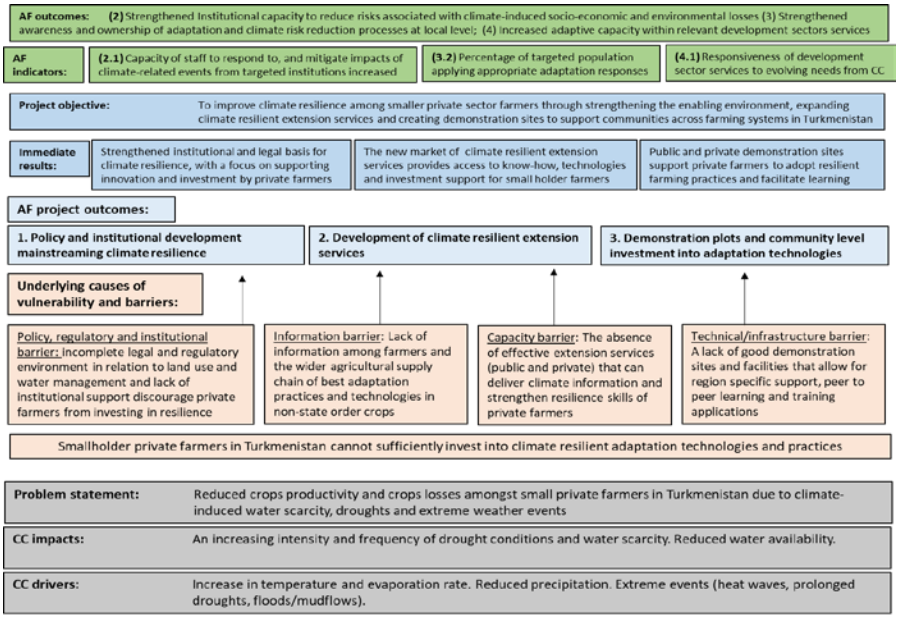
3. The project will seek to strengthen the institutional and legislative base for encouraging climate resilience among private farmers by addressing key barriers in the land and water sector. It will support the development of a competitive market for climate resilient extension services to transition private farmers towards more resilient agriculture practices and water use. It will do

this by working with a range of public and private providers to build capacity and mainstream climate resilience into agricultural support services. The project will at the same time develop a series of demonstration plots and training centers for climate resilient technologies and best practices across Turkmenistan, help improve access to climate information among private farmers and encourage community and cooperative level investments in resilience. The project will take into consideration gender sensitive barriers to accessing such information and will encourage participation by women through the clear setting of targets and mainstreaming gender considerations where appropriate.

4. Project direct beneficiaries will include 20,000 micro, small and medium private farming enterprises across Turkmenistan (including at least 30% female headed enterprises), which employ approximately 100,000 farmers (including at least 30% female farmers) and provide livelihoods for 100,000 families. Thus, the project will increase climate resilience of 500,000 people in Turkmenistan rural communities[1]. Indirectly, the project will enhance adaptation capacities and climate risk knowledge among a much larger number of smallholder and household farmers by setting up accessible extension services and demonstration plots and enhancing their food security.

5. The project builds on the earlier successful Adaptation Fund investment which promoted more resilient water use and seeks to scale these practices much more broadly through systemic change. The Union of Industrialists and Entrepreneurs, which represents private sector interests in Turkmenistan, will act as a key intermediary and facilitator, ensuring that the agricultural sector in Turkmenistan can transition towards more resilient practices. Figure 1 sets out the theory of change for the proposed project.

Figure 1: Theory of Change for the proposed project

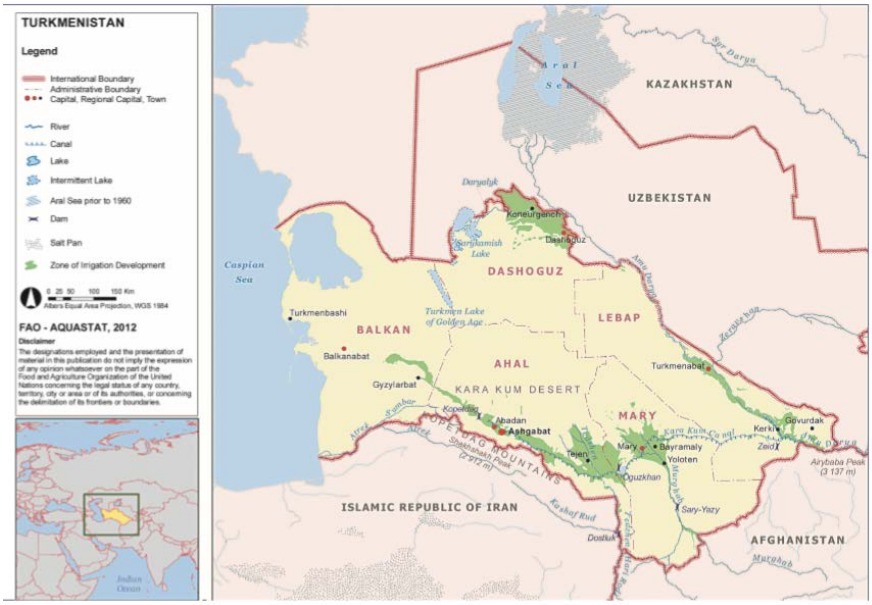


[1] An average family size in Turkmenistan is 5 people.

Overview of Turkmenistan

6. *Country profile:* Turkmenistan is a country in Central Asia bordering with the Republic of Kazakhstan to the North, Uzbekistan to the northeast and east, with the Islamic Republic of Afghanistan to the Southeast, and the Islamic Republic of Iran to the south. From the west Turkmenistan is bounded by the Caspian Sea. The total area of Turkmenistan is 491.2 thousand km. Administratively, the country is divided into five regions (velayats) - Dashoguz, Lebap, Mary, Akhal, and Balkan. The population is approximately 5.8 million, of which just under 50% are rural. Turkmenistan depends directly on irrigated agriculture for food security and the economic livelihoods of about half of its citizens.

Figure 2: Turkmenistan water resources and administrative regions (velayats)



7. *Water resources:* Water resources in Turkmenistan are mostly formed of surface runoff from the Amudarya, Murgab, Tejen, Kashan, Kushka, Etrek, and Sumbar rivers, which, together with small streams are flowing down from the North-eastern slopes of the Kopetdag, as well as groundwater. The total volume of water resources of Turkmenistan is 25 km^3, of which the Amudarya constitutes the majority (88%). Ground water resources represent only 2.5% of total estimated reserves. All major rivers are cross-border, and more than 95% of water resources originate outside the country. River flow is used primarily for agricultural purposes, but also for drinking water and industry. Turkmenistan has among the highest water consumption per capita in the world, reflecting its relatively inefficient use. Used water is collected from agriculture (6km^3/year) and industrial/domestic use (0.3km^3/year) through a collector drainage network. Of this, only 0.2% is subsequently used for irrigation.

Table 1: Mean annual runoff in the Aral Sea basin (km3/year), FAO

Country	River basin			Total Aral Sea basin	
	Syr Darya	Amu Darya	Tedzhen-Murghab	km^3	%
Kazakhstan	3.30			3.30	2.8
Kyrgyzstan	27.42	1.93		29.35	24.8
Tajikistan	1.01	*59.45		60.46	51.0
Turkmenistan		0.68	0.3	0.98	0.8
Uzbekistan	4.84	4.70		9.54	8.1
Afghanistan		11.70	3.1	14.80	12.5
Islamic Republic of Iran			n.a.	-	-
Aral Sea basin	**36.57**	**78.46**	**3.4**	**118.43**	**100.0**

8. *Land and soil resources:* In terms of geography, 80% of Turkmenistan consists of flat desert and semi-desert plains lying between 0-200 m above sea level. Approximately 20% of the territory is occupied by mountains. Soils in Turkmenistan have a very low content of humus, which is caused by low levels of precipitation and high surface temperatures. Soils in Turkmenistan are soft and sandy, and a considerable amount of irrigation water is lost to infiltration into deep soil layers inaccessible to crop roots. This in turn limits the development of vegetation. The total area of agricultural lands is estimated at c. 40 million ha of which desert pastures accounts for 96% (c. 38 million ha). Approximately 1.7 million ha are irrigated. The main areas of irrigated agriculture are the Amudarya, Murgab, Tejen and Etrek oases and the Kopetdag foothill plain. A further 15 million ha have the potential for arable development, but water availability is a constraint. Salinity is a significant problem.

Figure 2: Aral Sea river basin

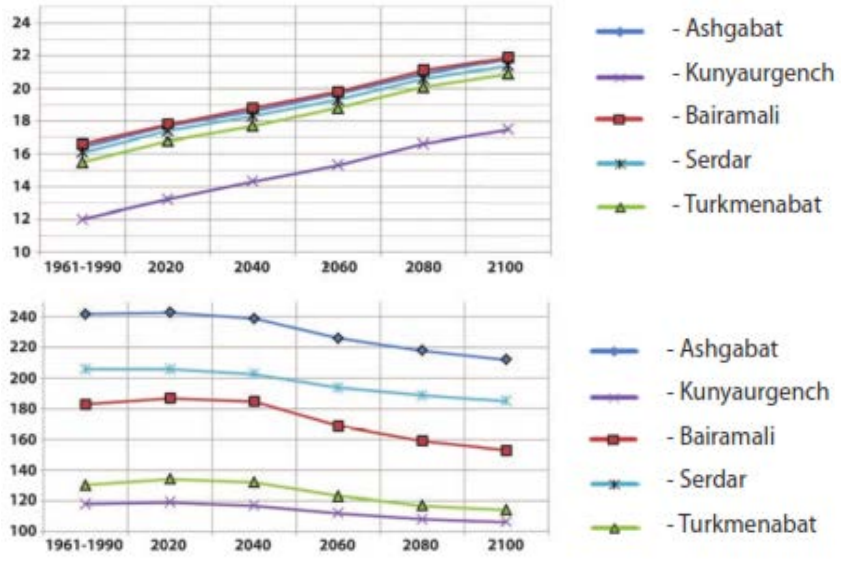
Turkmenistan and Climate Change

9. *Turkmenistan already has an extreme and varied climate.* Turkmenistan is characterized by sharply continental and extremely dry desert climate, although there are sharp differences between the Northern and Southern parts of the country. The northern part of the country, located in the Siberian anti-cyclone area, is characterized by severe and long winters with continuous snow cover and average yearly temperatures fluctuating between 13°C – 16°C. The southern part of the country, on the other hand, is characterized by mild winters with only occasional snow cover and average yearly temperatures ranging between 18°C – 22°C. Drought is a semi-permanent across large parts of the country. In the warm season (from May to September), daytime air temperatures often exceed 40C and occasionally surpass 50C in the south-eastern Karakum desert. The coldest month is January, with minimum temperatures in the North (Dashoguz velayat) falling as low as -36C.

10. *Turkmenistan is already experiencing significant climate change:* Since 1950, there has been a significant warming trend, with average temperatures increasing by more than 2C over pre-industrial levels. This represents a more rapid rate of warming than in many other parts of the world. Temperature increases have been accompanied by a reduction in rainfall, compounding problems already associated with the existing hot and dry climate. The trend shows that in recent years variability in monthly precipitation has increased, with increasing severe events. For example, since 1969, the Amudarya basin has repeatedly experienced seasonal floods, causing damage to farmlands, homes, public utilities and infrastructure.

11. *Future projections show increasing temperatures and falling precipitation:* Compounding the existing impacts of climate change, the 2016 Third National Communication (TNC) projects continuing increases in temperature (by up to 5C by 2100) and reductions in precipitation (with significant falls of more than 20% post 2040). Flows in the Amu-Darya river, the main source of agricultural irrigation water, are also expected to fall by up to 10-15% by 2050, with declines of between 5-8% expected in other rivers that are already fully used for irrigation purposes.

Figure 3: Historic and projected Changes in temperature (C) and precipitation (mm) under B1 and A1FI scenarios (Source Third National Communication to the UNFCCC).

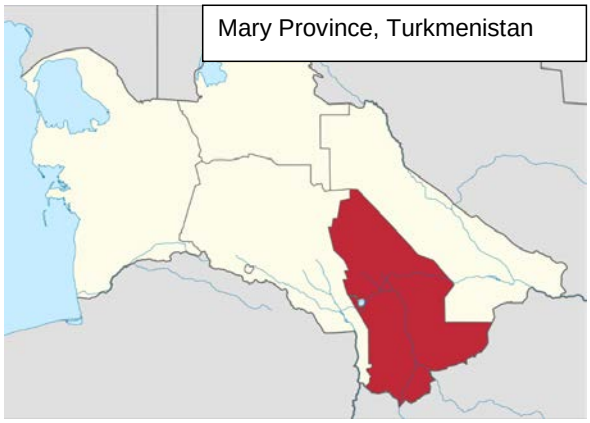


12. *These changes will be accompanied with an increase in extreme events:* Temperature and precipitation trends are expected to be accompanied by increasing frequency and severity of natural disasters (droughts, floods, storms). Extreme weather events are expected to increase in frequency and magnitude, in particular: a 10% p.a. increase in the number of flash floods and mudflows – especially in the mountainous areas, a 5% p.a. increase in heavy rains and a 1.6% p.a. increase in intense heat periods. Please refer to **Annex 5** for a detailed climate outlook of Turkmenistan.

Profile of Turkmenistan farming communities

13. *Turkmen farming communities are based around the former collective management structures developed in the 1950s:* Following from the pattern of collectivized agriculture, most agricultural communities in Turkmenistan are based on the structures of the Daikhan farm or Daikhan Association. These may be structured around crop or livestock production. Daikhan structures engaged in agriculture tend to be smaller in geographic size with a proportion of land dedicated to irrigated agriculture and populations of between 10-50,000 in the associated communities. Livestock-based Daikhan structures are much larger in geographic size (e.g. 100,000 ha+) but tend to have lower populations 1-5000 reflecting the more extensive nature of livestock farming and the fact that the majority of land use given to desert pasture.

14. *Of particular interest to the project is the **Mary Province** in Eastern Turkmenistan which will be a focus of the project in terms of investments in state managed demonstration plots as well as community level investments under Component 3.* Mary Province has been selected on the basis of its vulnerability to climate change (in particular drought) as well as the important role that it plays in agricultural production within Turkmenistan. It has 23% of the total population, and the highest proportion of rural population (72%), reflecting its agricultural status. The province provides between 15-25% of total production of key agricultural products including wheat, vegetables, fruits and berries, grapes, melons, eggs, meat and milk.



15. While the selection of specific communities (e.g. Daikhan farms) under Component 3 will be done as part of a structured vulnerability assessment process, the following example provides a typical example of a Daikhan association community in the Mary Province with which the project might expect to engage with investment and resilience planning support:

Example of typical agricultural community in Mary Province: Zakhmet Daikhan Association

Zakhmet Daikhan association in Mary province was founded in 1950 and operates as a collective farm fulfilling both state order crops as well as engaged in private sector agriculture, selling produce at market prices. The Daikhan association consists of 5800 ha of land, or which approximately 63% is currently irrigated. The agricultural community suffers from significant salinsation of land to a depth of 1.5-2.5m as a result of use of heavily mineralised irrigation water, and flood-based irrigation approaches. Approximately 50% of the territory has medium or high levels of salinsation which impact upon productivity. Within the communities associated with the Daikhan Association, there are approximately 10,000 people, made up of 4000 families and/or entrepreneurs that rent land from the Daikhan structure.

Key climate risks identified through consultation with farmers in Zakhmet farm include drought, increased temperatures, extreme events (heavy precipitation), and salinisation, compounded by weak investment in infrastructure and maintenance and poor management of water resources. Key resilience requirements prioritised by the community included the rehabilitation of water management systems, the shift to more efficient irrigation, and the introduction of more drought resistant crops.

Engagement with communities will not be limited to the Mary Province, however, and the project may also engage with communities in those provinces and districts where private sector demonstration sites are established. Further detail on the profile of typical Daikhan Associations in other provinces (agriculture and livestock) is provided in Annex 10.

The problem that the proposed project will address:

16. *Supporting private sector farmers to adapt to climate change:* This project will seek to address the challenges of climate variability and climate change being faced by the emerging class of micro, small and medium private sector farmers operating outside of the state crop sector in Turkmenistan. There are currently no official statistics available for the number of private farmers in Turkmenistan, nor gender disaggregated data. Approximately 50% of the working population is engaged in agriculture (an estimated 1 million people). Agriculture represents

10% of all female employment in Turkmenistan according to the World Bank.[2] In practice all farmers engage in small scale production of non-state order crops and or livestock as households alongside engaging on both state order and commercial crops and livestock through Daikhan Farm or leaseholder models. These goods are both for self-consumption and sale in local markets. For larger producers, they are fed into public and private food processing industries. Key crops include vegetables (potatoes, tomatoes and garlic), sugarcane, apple, dates, pear, alycha, silverberry, apricot, walnut, pistachio, and figs. Silk production (sericulture) is also common. Among livestock, rearing of karakul sheep is widely popular while other animals include cattle, goats, chickens, horses and camel.

Figure 4: Main structures of agricultural production in Turkmenistan. Source FAO (2012)

	Households	Daikhan farms	Leaseholders
Land ownership	Privately owned	Long-term lease from the state	Lease from the peasant association
Land quality	Arable	Arable + unirrigated desert	Arable
Farm size	0.5-1 ha	20-50 ha	3-10 ha
Crop mix	Horticulture, some grain	Grain, cotton, some horticulture	Grain, cotton, some horticulture
Livestock	Yes	Very little	In household plots only
Orientation	Semi-subsistence	Commercial	Commercial
State orders	None	None; "voluntary" for strategic commodities	Obligatory for strategic commodities; none for other
Sales arrangements	Market	State channels (direct), market for surplus and non-strategic product	State channels (through peasant association), market for non-strategic products
Farm inputs, services	Market	State channels (direct), market	State channels (through association), market

17. There is an increasing number of private farmers ('entrepreneurs') engaging in more commercial farming on the basis of the Daikhan farm and leaseholder model. This number has been estimated by the Union of Entrepreneurs and Industrialists as being between 20,000-30,000 and they are currently engaged in surveying to assess the current market structure. These are farmers who are making capital investments in private sector agriculture at a small and medium scale (e.g. land improvement, irrigation, greenhouses), and employing others to develop commercially oriented businesses. There is also some level of market consolidation underway. The total number of people working in the private sector is therefore much higher than this figure suggests. These farmers produce a wide range of fruit and vegetable crops, support livestock and are increasingly looking at downstream added value packaging and processing. They are increasingly active across all regions of the country. The sector is rapidly

[2] https://data.worldbank.org/indicator/SL.AGR.EMPL.FE.ZS

expanding due to ongoing economic reform and diversification, and in particular an increasing government focus on import substitution.

18. Agricultural production is increasing steadily (5.1% in 2017), with private sector production (enterprises within the Union of Industrialists and Entrepreneurs increasing 31.9%). This includes both primary production (livestock and poultry farming, vegetable and fruit production, melon and water melon growing) as well as downstream processing (milk products, meat processing, bakery, processed foods wine production etc.). There has been considerable investment in greenhouses for fruit and vegetable production by local entrepreneurs such as the Dovletly Farmers Association in Dashoguz Velayat which will produce 800 tons of tomatoes per year in greenhouses. Recent government statements indicate that the private share of agriculture was estimated to have reached 90%.

19. *Agriculture is the most vulnerable sector to climate change.* Despite the recent growth trends, given the reduction in water availability and associated impacts on land and water quality, the future sustainability of the sector depends on more resilient approaches to agriculture being adopted at scale. Agriculture is the main consumer of water in Turkmenistan and consequently the most susceptible to climate change impacts. Climate change is likely to significantly alter the balance between demand and supply of water resources for agriculture in Turkmenistan. Average temperature, number of extreme heat days and water availability are the key factors that determine agricultural productivity. The key climate challenges are set out below:

Table 2: Impacts of climate change on water and agriculture

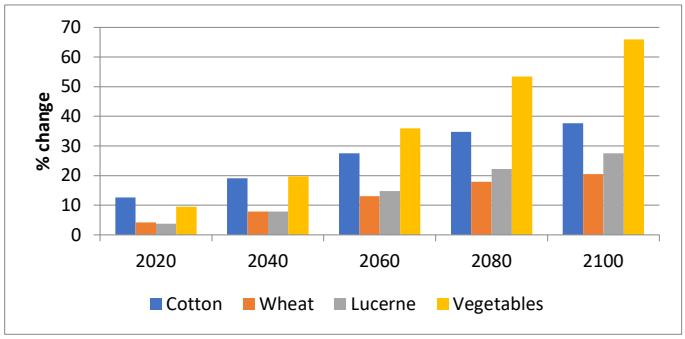
Climate-related stresses	Impacts on the agriculture sector
Increase in temperature and evaporation rate	Decrease in water supply; Changes in glacial fed river flows; Decrease in soil moisture; Increase in land degradation; Decrease in agricultural productivity; Increase in salination; Decrease in livestock productivity and pasture yield; Decrease in biodiversity[3];
Changing precipitation patterns	Increase in drought frequency; Increase in flood frequency; Decrease in agricultural productivity.
Extreme events a) Heat waves b) Prolonged droughts	Increase in heat waves resulting in: - Decrease in water supply and quality; - Decrease in crop and livestock productivity[4]; - Decrease in desert pasture productivity; Increase in number of prolonged droughts resulting in: - Decrease in water supply and quality; - Decrease in crop and livestock productivity; - Decrease in vegetation cover - Increase in land degradation and desertification.

[3] Loss of biodiversity is a cause of degradation of habitats due to deforestation, soil erosion and water pollution.

[4] Sheep breeding will be adversely affected by frequent heat waves and longer hot periods due to its dependence on the productivity of natural grasslands.

20. *Demand for water is likely to increase:* The higher evaporation rate predicted due to climate change is likely to increase the water requirements for irrigating crops by 30-40%, thereby aggravating existing water scarcity and irrigation concerns.[5] Increased water demand of up to 60% is expected for vegetables, a growing subsector. In the case of cotton and wheat, the two most important crops in the country, water demand is expected to increase by close to 20% and 10% per unit of area by 2040, respectively. By 2100 these figures will be close to 40% and 20%. Irrigation norms for key crops are likely to have to increase by 13% by 2030-2040.

Figure 5. Expected water demand increases for A1F1 scenario for key crops.



Source: Turkmenistan Second National Communication

21. *At the same time water availability is likely to decrease:* On the supply side, increasing temperatures, a decrease in precipitation, and the likely reduction in surface water availability are all likely to lead to an increase in aridity and accelerate desertification. River flows are expected to reduce drastically. An increase in the evaporation rates will also contribute to a significant reduction of water available for irrigation. According to estimates from Uzbekistan, the flow of the Amy Darya is likely to decrease by 15% by 2050. Flow rates of other rivers are expected to decline at even faster rates (up to 30% reduction). Turkmenistan is also likely to be heavily impacted by changes in the glacier systems in the Pamir Alai in the longer term.[6] The average reduction in run off rates in terms of surface water collected in national storage and distribution systems is expected to be 10%, whereas during vegetation periods the reduction in run off rates will reach 30-40%.

22. *These factors are very likely to reduce agricultural productivity.* Further drying of soils as a result of climate change impacts is likely to significantly affect the main cotton and grain cultivating areas.[7] Research in Uzbekistan indicates that yields are expected to fall for all crop types (cotton, wheat, apples, tomatoes and potatoes) across all agro-ecological zones by up to 13% by 2050. Current crop choices and agricultural practices are adapted to specific latitudinal

[5] Turkmenistan Country Analysis. United Nations, 2008.

[6] The First National Communication to UNFCCC, Turkmenistan, 1998

[7] Initial National Communication of Turkmenistan under the United Nations Framework Convention on Climate Change. Phase 2: Capacity building in priority areas of the economy in response to climate change. 2006.

climatic zones. However, any shift in these zones is likely to place pressure on existing practices and systems.[8]

23. *Pastoralism is also likely to be adversely affected by climate variability change.* Because of increasing temperatures and a reduction in rainfall, grassland productivity is expected to be reduced by 10-15% by 2050.[9] In dry years the expected reduction of forage volume is by a magnitude of 3–5, ultimately leading to a decline in sheep breeding production. As a result of increasing aridity in Turkmenistan, the yield of desert pastures has already decreased over the past decade. The predicted increase in annual average temperature and in the number of extremely hot days is expected to reduce wool production and livestock reproductive rates by 10-20% and 5-25%, respectively.[10]

24. *These impacts are expected to result in significant economic losses:* Negative impacts on agricultural productivity are expected, both in the crops sector and in animal husbandry. These have the potential to translate into significant economic losses. Under a business as usual scenario, a reduction in wheat production by nearly 4 million tons, and in cotton production by 3 million tons might be expected during the 15-year period (2015-2030)[11]. The economic damage related to the climate-induced decline in crops production could reach $2.5 billion per year by 2030, reaching a total of $20 billion (discounted) over the period 2015-2030. It may lead to decrease in livestock numbers and productivity of livestock due to water scarcity.

25. Climate losses are compounded by other anthropogenic factors: The impacts of the above climatic threats are exacerbated by a range of anthropogenic factors that will reduce Turkmenistan's natural resilience to withstand current climate variability and future climate change impacts. Non-climate change-related challenges include unsustainable agricultural practices, poorly maintained irrigation infrastructure, environmental degradation, including the long-standing impacts of the Aras Sea basin environmental crisis, and weak adaptive institutional capacity. These are explored in more detail below.

Adaptation solution: reversal of the problem

26. *Private sector farmers are now the key driver of increasing economic development and climate vulnerability in the agriculture sector:* The adaptation solution sought by this project is increased resilience to climate change impacts among the growing class of private sector farmers operating outside of the state crop sector in Turkmenistan.

27. These climate change driven challenges can be addressed through the development of an enabling environment that encourages private sector investment in resilience through the provision of climate smart extension services that specifically target the emerging class of small holder private farmers in Turkmenistan. These solutions would include:

    a. A clear legal and regulatory basis to encourage and allow private farmers to invest in longer term resilience measures;

[8] Initial National Communication of Turkmenistan under the United Nations Framework Convention on Climate Change. Phase 2: Capacity building in priority areas of the economy in response to climate change. 2006.

[9] UK89 GCM (Turkmenistan's Initial National Communication, 1998).

[10] Turkmenistan: Initial National Communication on Climate Change, 1998.

[11] UNDP (2016). Socio-economic analysis of climate change impacts in the agricultural sector

b. An institutional mandate and strategy within the Ministry of Agriculture and Environment Protection to promote resilience in the non-state crop and livestock sector;

Deleted: Water Resources

c. Greater awareness of resilience best practices and technologies in the non-state crop and livestock sectors among policy makers, farmers and agricultural experts;

d. An accessible, flexible and cost-effective platform for providing agricultural extension services across the different regions of Turkmenistan;

e. Effective mainstreaming of climate change resilience into agricultural development practice and extension services in the non-state crop and livestock sector;

f. High visibility accessible demonstration sites across Turkmenistan allowing for the showcasing of best available adaptation technologies, training, and peer-to-peer learning.

Barriers to the adaptation solution

28. *Many barriers exist to keep private farmers from adopting resilient agriculture practices:* There are several barriers that prevent the development of climate smart agriculture among the emerging sector of smallholder private farmers. In addition to a basic lack of capacity and awareness among farmers, we recognize three key structural barriers which are described in more detail below:

    a. Legal, Regulatory and Institutional Barriers

    b. Weak public and private provision of climate resilient extension services

    c. Lack of access to best practice demonstration sites and training centers

Legal, regulatory and institutional barriers:

29. There is underdeveloped legal and regulatory environment in relation to land use, water management, creating disincentives for private farmers to invest in resilience. The Ministry of Agriculture and Environment Protection has a weak institutional mandate to provide adaptation support to farmers, particularly for those in the private sector.

Deleted: Water Resources

30. Currently, Turkmenistan does not have a legal and institutional framework that manages climate adaptation in a holistic, integrated and comprehensive manner. There is a clear disconnect between policy, law, planning, budgeting and climate change adaptation needs; and there is no mechanism for monitoring vulnerability and adaptation indicators and using such data in development planning. In addition, adaptation opportunities are further hindered by inadequate use and availability of evidence-based methodologies and toolkits. The National Adaptation Plan (NAP) is under development.

31. There remain several issues in relation to formulation and implementation of the land code and water code (including the lack of clear sub-regulations to support implementation). Where changes in the legislative and regulatory environment are made, these are not well communicated to private sector farmers. This creates disincentives for private farmers to invest in resilience. There have been some legislative advances over recent years (e.g. revisions to the Water Code supporting transitioning to water metering and tariffs and collective investments by water user associations facilitated by the previous Adaptation Fund project) but these could be further strengthened, alongside revisions to the Land Code.

32. The regulatory environment also is characterized by weak coordination and harmonization between legislative documents as well as a lack of implementation and weak enforcement of policies and secondary legislation. There is a lack of clear process for collecting information and updating risk and vulnerability information, and for the elaboration and prioritization of adaptation measures.

33. In terms of financing, the government has enjoyed relatively little access to international development finance. OECD analysis undertaken in 2017 Turkmenistan receives much less climate related development finance compared to other countries in Eastern Europe, the Caucasus and Central Asia (EECCA), only 2% of the average between 2013-14. This to some extent reflects Turkmenistan's focus on financing climate actions from domestic sources.[12]

Lack of private sector oriented resilient extension services

34. There is a lack of awareness of climate resilient approaches (best practices and technologies) and the absence of delivery and distribution platforms (both public and private) for extension services that can strengthen resilience skills and awareness of private farmers. This is compounded by a lack of consideration of climate change within existing agricultural practices, training approaches and information materials. There is only limited capacity to advise farmers on climate change and sustainable water/land management practices.

35. Currently, private farmers are expected to find their own access to information on climate resilient technologies and best practices (e.g. through the internet). Wealthier commercial farmers are able to access international expertise and technology (e.g. from Iran, Turkey and Israel), but at a high price. Hundreds of thousands of small-holder farmers lack the capacity to procure equipment, including advanced irrigation equipment and field machinery needed to maximize productivity. As a result, they are slower to innovate. Language issues remain a significant barrier to accessing international expertise. There are few domestic providers of support to private sector farmers, with farmers having to learn by trial and error and from peer–to-peer farmer networks. There is also a lack of clarity around gender aspects in relation to capacity and access to new knowledge, best practices and technologies.

36. There is also limited access to climate information products tailored for the private sector. Turkmenhydromet has received significant investment in equipment financed by the Government of Turkmenistan. However, the agency lacks the capacity to develop tailored and user-oriented climate information services for the private sector. Currently, generic forecasts and warnings are shared among government agencies and media, but with little effort made to contextualize these services to end users engaged in specific types of agriculture or livestock.

A lack of a national network of demonstration sites and facilities for training, capacity building and research

37. Existing state-managed research sites, while having access to land, remain primarily focused on state order crops (cotton, wheat, sugar beet), are poorly funded and lack technical and scientific capacity. Larger private agricultural companies who are investing in best available technologies and sourcing expertise internationally have no interest in sharing their expertise (for commercial and competitive reasons).

38. As a result, smaller scale farmers have little or no access to best practice demonstration sites and there is little opportunity for peer-to-peer learning. There has been some development of demonstration sites (for example under the UNDP/GEF financed programme on of energy efficient and water efficient technologies in agriculture) which might be used as a model.

[12] https://www.oecd.org/environment/outreach/Turkmenistan_Financing_Climate_Action.Nov2016.pdf

However, such examples are isolated. There is a need for a broader set of sites across Turkmenistan (both public and privately operated) that can facilitate access and learning for a range of stakeholders. Coverage is particularly important given that poorer farmers in Turkmenistan can struggle to gain access to communication facilities and information technology and may face cost and logistic challenges to travel large distances to reach major demonstration centers.

Baseline

Importance of private sector agriculture is growing

39. Agriculture, while representing c.10% of GDP employs nearly 50% of the population. The agricultural sector in Turkmenistan has historically been dominated by state order crops (cotton, wheat, sugar beet) where most people are employed. The focus on the state sector, the use of quotas, low government-mandated prices together with state provision of free inputs (water, fertilizer) has reduced the incentive for innovation and resulted in a relatively low level of capacity and very slow uptake of new technologies and best practices. Low farm gate prices prevent farmers from fully realizing upside benefits from improvements in productivity, and subsidies shield them from downside losses. The costs of innovative technologies are often prohibitively high in relation to the revenues available. According to FAO, the farmers' income would be higher if they were paid at world market prices and received no subsidies.[13] As a result, the state sector has suffered from relatively low productivity, high labour intensity, high use of inputs and inefficient use of water and soil resources.

40. As a response to these structural challenges, increasingly state lands are being reallocated to other vegetable and fruit crops to facilitate import substitution. The fruit and vegetable subsectors are the most independent of the agricultural sectors Turkmenistan with almost 100% of production generated privately both by independent farmers and leaseholders. More than 80% of all livestock products are also now produced by private farmers. Private sector farmers operate to market prices (both inputs and outputs), with limited state support. The private sector is also active in the food, meat processing, confectionery and other downstream processing industries. The economic importance of the private sector has been increasing steadily over recent years, and larger enterprises have good access to finance, apply advanced technology and practices, and can be highly profitable.

41. The GoT is supporting a gradual transition towards more market-based approaches. The GoT have already initiated reform in its water and agriculture policies that includes privatization and diversification of agricultural production and reconsidering water and energy subsidies.[14] In 2015-2016, the state policy of Turkmenistan was aimed at strengthening import substitution and export orientation, diversification of agriculture. Some land has been allocated on a leasehold basis for non-state crops to be grown in each of the five provinces based on regional soil and climatic conditions. Crops include maize, barley, lucerne and other forage crops, aimed at promoting crop rotation and thus improving soil quality. State-owned livestock farms are currently being considered for privatization. The drive towards diversification, added value processing and export orientation is intensifying as a risk management strategy against over reliance on natural gas exports.

Policy, regulatory and financing environment for private agricultural resilience

[13] FAO, Turkmenistan agricultural sector review, 2012.

[14] http://www.dw.com/en/turkmenistan-leader-wants-to-end-free-power-gas-and-water/a-39152012

42. Turkmenistan has a long-term commitment to addressing climate change: In 2012, the Government approved the National Climate Change Strategy (NCCS) that lays out the policy framework for building climate resilience and a low-emission economy. Agriculture has also featured prominently in the three National Communications submitted to the UNFCCC in 2006, 2010 and 2015. These have all included vulnerability assessment of the agriculture sector, along with adaptation recommendations and policy actions. Turkmenistan was also a signatory to the Paris Agreement on Climate Change in 2016 and submitted its NDC as part of the UNFCCC process setting out its priorities relating to investment in resilience of agriculture and water management. The NDC includes a strong section on adaptation to climate change and highlights vulnerability of the agriculture and water sectors. The National Adaptation Plan (NAP) is under development as part of the GCF readiness process.

43. The state has made investments into the agriculture sector over the last few years, including a number of large states programmes investing in agricultural technology (e.g. tractors, drip irrigation and sprinkler systems). However, these have been directed primarily into the state sector and related enterprises. Private sector farmers are expected to invest their own resources or to borrow at highly subsidized interest rates through the state-owned agricultural bank (Daikhanbank).

44. The Government offers several subsidized loan programmes for different types of agricultural production. The state commercial agricultural bank Daikhanbank is by far the largest channel of the state loans to the agricultural sector. Approximately 10 percent of Daikhanbank loans are issued to private farmers and entrepreneurs, while the majority of funds is channeled to large agricultural collective associations (daikhan associations) producing state-order crops. However, the share of private borrowing has been gradually growing.

45. The most favorable preferred credit is issued by Daikhanbank to farmers and collective associations producing state-order crops for the purchase of agricultural equipment, tools, and devices, water-conserving irrigation equipment, and pipelines, for a 10-year term based on expected equipment lifetimes, with annual levelized repayments and an annual interest rate of 1 percent. Financing of other types of agricultural activity – such as husbandry of livestock and fowl, production and recycling of agricultural products beyond the state-order crops, and various other services carried out by private agricultural enterprises and individual smallholder farmers – are also subject to concessional lending, for ten-year terms with an annual interest rate of 5 percent. Loans to private farmers and individual smallholder farmers require collateral.

46. In addition, the Union of Industrialists and Entrepreneurs of Turkmenistan, through its associated bank called Rysgalbank, is running its own loan programme with Government funds targeting more sophisticated private farmers who are dues-paying members of the Union, and who grow mostly high-margin crops such as fruits and vegetables. The current financing instruments serve well the larger private farms and enterprises, which have no problems with collateral. The Union has been developing more accessible loan products with the aim of outreaching small farmers.

47. Whereas collective farms have the legal framework and collateral to invest, small holder farmers lack the collective legal structures to borrow and invest in more efficient practices and investments. One issue is that many investments are at a larger scale that the individual plot (e.g. water supply, drainage, land preparation) and therefore require collective investment and planning. Water User Groups (WUGs) recognized under the new Water Code (and piloted under the earlier Adaptation Fund project) could act as a vehicle for collective land management and investment. However, this would require further legal and capacity development. To conclude, private farmers have access to state concessional finance to invest into the

adaptation technologies but require regulatory incentives, information and technical advice to facilitate their investment decisions.

Institutional mandates for promoting climate resilience in private agriculture

48. In January 2019 the new Ministry of Agriculture and Environment Protection of Turkmenistan (MAEP) was established as a result of merging the former Ministry of Agriculture and Water Resources (MOAWR) and the State Committee for Environmental Protection and Land Resources of Turkmenistan. The new MAEP assumed the functions of the former MOAWR and SCEPLR and has overall responsibility for the agriculture sector. However, it has to be noted that MOAWR's mandate was heavily focused on the state crop sector (cotton, wheat), and it had less role to play in relation to the private sector (fruit, vegetables, livestock) which has been allowed to develop independently. MOAWR was closely involved in developing the National Climate Change Strategy and provided inputs into relevant documents (e.g. National Communication, NDC, NAP). The Union of Industrialists and Entrepreneurs of Turkmenistan is leading the development of private sector agriculture in practice, but does not have significant capacity or mandate in the area of climate resilience.

49. Overall responsibility for the development, management and coordination of environmental and climate change policy used to be with SCEPLR until January 2019 and is now with the MAEP, the national focal point for the UNFCCC.[15] This includes climate change adaptation, as well as monitoring and management of non-agricultural land resources.

50. The National Committee for Hydrometeorology (Turkmenhydromet) was also merged into the new MAEP in 2019 as the Hydrometeorological service under the Ministry of agriculture and environmental protection. It is responsible for meteorological, hydrological, and agro-meteorological monitoring, developing forecasts for hydrometeorological events, surface water flow probabilities, accurate climate data for use in planning for crop sowing and harvesting, and, providing general hydromet information to the public. It is also tasked with developing scientific and technological cooperation in the area of hydrometeorology with neighboring countries, systemized exchanges of hydrometeorological information, complying with common methodologies of hydrometeorological observations, and hydrometeorological data collection and dissemination.

51. State Committee for Water Economy of Turkmenistan was established in January 2019 as part of the reform in agriculture and water sector (by detaching corresponding departments from the former MOAWR). The Committee is responsible for the overall water management and distribution, including development of policies on water management, planning and management of state irrigation systems. The Committee above all has a mandate over water tariffs and pricing policies.

52. However the practical institutional and resourcing arrangements for mainstreaming climate resilience into private sector agriculture are not clear. Neither the National Climate Change Strategy nor any of the other relevant documents elaborate on specific implementation modalities, roles or responsibilities. The growing role of the Union of Entrepreneurs and Industrialists in private sector development (including agriculture) complicates the institutional picture.

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53. All stakeholders lack awareness of and capacity to support the adoption of climate resilience within the private sector. Some of the capacity challenges are set out below:

Table 1: Capacity issues related to climate change policy and institutions

Sector Specific (Technical)	Core Organizational Functions
Enabling Environment	
• There is a need to strengthen climate related monitoring systems for sectorial implementation activities • Limited awareness about climate change adaptation and linkages with existing programs and activities	• Lack of clarity for institutional and operational arrangements for the climate change adaptation • The existing administrative/technical capacity for reporting to the UNFCCC is insufficient • Level of understanding of sectorial based climate impact and vulnerability
Organizational	
• Limited understanding of current capacities and climate change adaptation needs at sector and local levels and almost no awareness of adaption fundamentals • Insufficient data about sector specific climate impacts and their economic implications, including damage and loss analysis, especially at the local level and including gender specificity • No available financing schemes for supporting integration of climate change adaptation measures into key economic sectors • Limited gender desegregated data relevant for initiation of gender sensitive climate change actions • There is a need for Training of Trainers programs in climate change fundamentals for national training institutions and selected sector staff to improve sectorial capacities	• Climate related participatory decision-making and stakeholder input processes for managers and decision makers are unclear • Limited cross-sectorial collaboration on climate adaptation and DRR programming at national and sub-national levels • There is no climate related focal person (or department) in each sector • Lack of financial incentives for initiation of climate change adaptation activities, per sector, disaggregated per national and local level • Gaps in the availability and communication of hydro-meteorological risk information, especially at the local level
Individual	
• Language barriers prevent staff access to relatively low-cost knowledge and training; further limiting the pool of qualified staff available to attend international training • Gender barriers prevent women's access to: 1) decision making on the level of household and Daikhan farms in shaping the sustainable development of their	• Deficit in the required trained personnel (numbers and expertise) to meet climate related and adaptation related challenges and functions • Lack of trained personnel (number and expertise) to meet gender challenges and functions

Sector Specific (Technical)	Core Organizational Functions
communities. 2) strengthening of women-farmers ability to realize their rights 3) control over the resources and benefits of development.	

Source – UNDP Stocktaking Report (2017)

Existing platforms for provision of climate resilient extension services

54. The Government of Turkmenistan has provided limited extension services support through district administrations and Daikhan associations, mostly targeted at state order crops. However, these do not generally provide best practice techniques. There has been limited development of private extension services for agricultural and livestock production. Larger commercial farmers have begun to access expertise and technology from overseas (particularly Turkey, Iran and the Middle East). However, these services are expensive and typically beyond the reach of small and medium scale private farmers.

55. State research institutes under the Ministry of Agriculture and Environment Protection and the State Committee for Water Economy have some technical knowledge around different types of agricultural practices and water saving technologies. However, they do not have the mandate or capacity to provide advice for private farmers, and their methods are often outdated or based on Soviet-era standards. Key institutes include:

    a. Teaching institutes (e.g. Turkmen Agricultural Institute)

    b. Agricultural scientific research institute

    c. Water design and research institute “Turkmensuwylymtaslama”

56. The Agricultural scientific Research Institute has been historically responsible for developing best practices for supporting state crops (e.g. seed selection for cotton and wheat) and managing best practice demonstration plots. The institute maintains some interest in other areas of agricultural production outside the state mandate, but these are limited in size and scope. The Water design institute has a focus on effective water management (e.g. efficiency of large-scale water transport (supply and drainage) as well as farm level systems. Both have sub-national facilities across Turkmenistan which have the potential to be used for demonstration plots.

57. Agricultural universities in Ashgabat and Dashoguz are the main academic institutions to provide new generations of water and land related professionals for the country. Both of these entities are in possessing of training and research sites to allow for student-level scientific work and studies. These will as well be explored in terms of potential conversion into sites for extension services. The site in Dashoguz can have direct focus on mitigating the adverse effect from the Aral Sea crisis through application water, land and other resource efficient technology and practices.

58. Daikhanbank employs agronomists in all local branches to support agricultural lending, but their capacity and mandate is limited. Otherwise, there is little or no domestic consultancy capacity. Some opportunities exist. For example, EBRD is supporting the commercial development of SMEs in the agriculture sector. The Union of Industrialists and Entrepreneurs is also beginning to provide its members operating in the agriculture sector with limited services (e.g. laboratory,

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testing and certification services), but these are aimed primarily at larger agricultural businesses.

59. Commercial agricultural development is currently being heavily shaped and influenced by the Union of Entrepreneurs and Industrialists of Turkmenistan. The Union is a non-governmental organization which is emerging as the dominant player in the development of private agricultural markets in the country. It provides membership and business support services through a large central office in Ashgabat and regional offices in each of the Velayats. Reflecting its growing role in the agriculture sector, it is currently diversifying to offer a range of technical extension services (e.g. product certification, testing laboratories) in line with the GoT export-based strategy. The Union has typically focused on larger companies in the agricultural sector, many of which are already operating to a high standard using purchased foreign expertise and equipment. The Union is currently undertaking a national audit of all non-state farmers across the country and is committed to extend its membership services to smaller farmers free of charge, recognizing this as a core growth sector. They estimate the total number of commercial farm enterprises and entrepreneurs to be in the region of 20,000-30,000.

60. Turkmenhydromet has the mandate for developing the national system for weather and climate modelling, including its application to the agriculture sector. This involves early warning systems, forecasting and agrometeorological modelling. It has received significant investment from the government of Turkmenistan into new radar and equipment. However, it does not currently produce tailored information for end users in non-state sectors such as the private agriculture and lacks a complete network of agro-meteorological monitoring stations to provide a full picture of the impact of climate on soil and growing conditions.

Learnings from earlier Adaptation Fund project

61. The proposed project builds on an earlier Adaptation Fund project that ran from 2012-2017 - "*Addressing climate change risks to farming systems in Turkmenistan at national and community level*". The project aimed to overcome the above barriers to addressing immediate and long-term adaptation needs in the water sector in Turkmenistan in order to achieve greater water efficiency and productivity under climate change induced aridification. The project strengthened water management practices at national and local levels in response to climate change induced water scarcity risks to local farming systems in Turkmenistan. It did this by working at national level water policy and local community level action to improve water efficiency and supply services.

62. The project was structured so that the majority of its activities were at a community level to deliver concrete adaptation benefits to identified communities in three typical agro-pastroral regions (mountainous, desert and oasis). The project worked directly with selected communities to help improve their resilience to increasing aridity and water stress through identifying and implementing effective and locally acceptable adaptation measures.

63. The AF project focused on the development of community level water management approaches in those regions where there is significant potential for diversified non-state agriculture, horticulture and livestock management. It sought to ensure water availability for the non-state sector by addressing the lack of fiscal incentives for more efficient water use in the state sector and developing progressive tariffs.

64. The project evaluation identified several successes:

    a. The project developed a package of amendments, additions and changes to the draft Water Code of Turkmenistan (the concept of "association of water users and water users groups WUA", rights of water users on the establishment of WUAs / WUGs, the transition

of water management to the basin principle, the right to transfer on the balance or for the use of the inter-farm collector and collector-drainage networks, fixing the norms of the differentiated approach in determining the tariffs for water supply services, etc.). these were adopted by Parliament of Turkmenistan in October 2016

b. Project experts contributed to the adoption of Law on Pastures by introducing amendments and recommendations into it

c. Based on the VCA assessment, the socio-economic report on impacts of climate change risks onto local economies of three project regions was prepared including cost-benefit analysis of all adaptation measures/investment activities conducted in pilot regions of the project

d. More than 35,000 people at pilot communities of the project greatly benefitted from concrete adaptation measures related to water management and efficient use of land and water resources in the context of climate change such as construction of water basins, dams, wells, water storage tanks, nursery, drip irrigation, sand fixation, water regulating devices, drainage collectors, land levelling, etc. with some element of community level replication

e. A series of trainings conducted during lifespan of the project enabled to strengthen capacities of local population in pilot communities to efficient use of water and land resources and their resilience to adverse effects of climate change. More than 40% of participants in project activities were women.

f. More than 10 booklets and brochures related to concrete adaptation measures and best practices in this field were printed in three languages – Turkmen, Russian and English and distributed to beneficiaries in the communities, to educational institutions, to government agencies.

g. 8 water user's groups (WUG) were established in pilot communities of the project with defined goals and organizational structure. As a group, they could develop and implement investment projects with funding from external sources and local contribution. WUGs were designed to incorporate at least 30% of women in their management.

h. Innovation was introduced in pilot Region Karakum by lining the bottom of 2 desert water ponds with HDPE geomembrane and with special cover to avoid evaporation which will help to increase water availability in desert conditions

65. There were a number of lessons learned from the project that will be incorporated into this proposal. These include the following:

a. Changing the legislative basis to recognize climate impacts is a long multi-year process and depends upon national policies and processes and efforts need to be begun early, and combined with other legislative reform programmes or processes;

b. It is important to work both at the local and national level to promote scaling and ensure ownership of the policy agenda by key institutions in terms of agricultural and water resilience;

c. Community level adaptation measures work out more efficiently through grant arrangements as this allows communities to take ownership of the project, since they are directly involved in carrying out the labour and contributing their own resources for co-financing;

d. There is strong potential for replication and peer-to-peer learning in relation to climate resilient water management and agricultural adaptation measures implemented in pilot regions such as drip irrigation, water harvesting;

e. The importance of working through existing (community, public and commercial) structures rather than developing new platforms or systems to deliver climate resilience to ensure ownership and effective delivery.

66. The first AF project demonstrated effectiveness and efficiency of a number of climate resilient farming technologies and concluded with the recommendations for replication and scaling-up through strengthened climate risk informed agricultural extension services. The AF project final evaluation noted, above all, that "…*The positive results of implemented adaptation measures in all three pilot regions have expanded the number of participating and supporting the continuation of the project in general and more specifically, replicating it elsewhere in the country. There is some evidence of the neighboring Etraps getting interested but the concern is that the same level of interest is not as yet emanating from communities further away, pointing to the acute need in sharing the experience with all the communities: this should indeed be the role of the government through an extension service but in Turkmenistan such service is non-existent. It is important that UNDP…documents all the lessons learnt … and disseminates these widely... Additionally, the Government could be supported in strengthening its agricultural extension services…"*

Project / Programme Objectives:

67. The project objective is as follows: 'To increase the climate resilience of vulnerable smallholder farmers in the non-state crop and livestock sector by strengthening the enabling environment, developing access to climate smart advisory services and building regional and community-level demonstration sites to allow for peer-to-peer learning.'

68. The project will achieve the following results:

A. Strengthen the institutional and legal basis for climate resilience in Turkmenistan, with a specific focus on supporting innovation and investment by private farmers;

B. Develop the market for climate resilient extension services that provide access to know-how, technologies and investment support for small holder farmers;

C. Establish public, private and community led demonstration sites that support private farmers to adopt climate resilient farming practices and facilitate practical learning and research linkages

Project / Programme Components and Financing:

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)

1. Mainstreaming climate resilience into policy and institutional framework	**Output 1.1.** Climate resilience is mainstreamed into policies and regulations in agriculture, water and land management sectors; new gender-responsive regulatory incentives for farmers are in place. **Output 1.2:** Capacity built for key government ministries and other relevant institutions to promote climate resilience in private sector agriculture (taking into consideration gender aspects).	Outcome 1: The enabling environment developed to encourage and facilitate private sector investments into climate resilient agricultural development *Indicator target 1.1.* a). At least 3 gender-sensitive laws or sub regulations amended or developed supporting climate resilience for private sector farmers by 2024. b). At least 2 gender-sensitive guidance notes prepared explaining legislative changes in the water and land code to small scale private farmers. *Indicator target 1.2.* A gender-sensitive Strategic Concept to support climate resilience among smallholder farmers is developed and agreed with MAEP and other stakeholders. *Indicator target 1.3.* a) 50% increase in institutional capacity (measured through an institutional capacity assessment scorecard) b) At least 50 officials and other key national/regional stakeholders trained on improving the enabling environment (including at least 30% women)	$644,000
2. Development of climate resilient extension services	**Output 2.1:** A public-private network of at least 50 extension service providers is trained to deliver climate risk management and adaptation information and advice to farmers, ensuring equal benefits for men and women **Output 2.2.** 20,000 farming enterprises and entrepreneurs (including female led) receive climate risk information and resilience advice through improved and accessible extension services, best practice guidance and improved climate information services.	**Outcome 2:** Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farming enterprises and entrepreneurs (including women) in adopting climate smart agriculture practices. *Indicator target 2.1.* a) At least 50 organizations or consultants agree to participate and are trained to deliver climate resilient agriculture extension and advisory services in all 5 regions of Turkmenistan. Gender sensitivity of advisory services will be ensured through engendering the training's materials. b) On-line portal / virtual library of resilient technologies operationalized *Indicator target 2.2.* a) At least 20,000 private sector farmers access information on climate resilient best practices and best available technologies and change behavior or adopt new approaches (of which at least 30% women)	$2,916,950

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		b) At least 2000 private sector farmers receive direct field training in climate resilient agriculture and best practices of which 80% are small-scale farmers in vulnerable regions of Turkmenistan. (At least 30% women)	
3. Demonstration plots and community level investment into adaptation technologies	**Output 3.1:** At least 1 MAEP research institute site developed providing access to best available technologies and practices for non-state order crops and supporting improved research links. **Output 3.2:** At least 3 larger private sector farming enterprises invest in demonstration sites for specific technologies (e.g. high efficiency irrigation, renewable energy, greenhouse technologies) that form a basis for local learning and best practice dissemination. **Output 3.3:** At least 3 resilient best practice sites developed by private farmer collectives or groups of small holder farmers through collective community planning and investment.	**Outcome 3:** Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers *Indicator target 3.1.* a). At least 1 new demonstration site (min 20 ha) developed on the base of existing Government of Turkmenistan Agricultural Institute facilities showcasing best practice technologies and approaches in non-state crop sector. b). At least 3 accessible demonstration sites developed in partnership with larger private sector agricultural companies to showcase specific crop or livestock specific technologies c). At least 3 community level cooperatives or groups of private sector farmers (gender balanced) design and implement climate resilient best available agriculture measures *Indicator target 3.2.* At least 15 different technologies or best practices are covered collectively by investments in demonstration sides *Indicator target 3.3.* At least 1000 farmers visit project demonstration sites for field training and to learn about best practices and technologies (at least 30% women)	$2,331,700
4. Project Execution cost			$559,000
5. Total Project/Programme Cost			$6,451,650
6. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			$548,390
Amount of Financing Requested			$7,000,040

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Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	2019
Mid-term Review (if planned)	2021
Project/Programme Closing	2025
Terminal Evaluation	2024

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

Component 1: Policy and institutional development to mainstream resilience

69. Component 1 will support the development of the legal and institutional basis for climate resilience in Turkmenistan. It will focus on building frameworks that encourage private sector farmers to invest in climate resilience and to manage water and land resources in an effective way.

70. Under the previous Adaptation Fund project, major progress was made in relation to the development of the Water Code, creating incentives for more efficient use. The project prepared a range of amendments related to the development of water user groups, the transition towards water basin management, the ownership rights of on-farm water infrastructure and the development of differentiated water tariffs. Approximately 80% of project recommendations were adopted in 2016 by the Mejlis (Parliament) as part of the revision process.

71. However, further work is necessary on both the Water and Land Codes, particularly with regards to secondary regulations which are critical for their practical implementation and uptake by private sector farmers. Work is also needed to communicate the implications to farmer groups and their service providers, as well as to build capacity among regulators in relation to the evolving landscape for private agriculture. Component 1 has two outputs:

Output 1.1. Climate resilience is mainstreamed into policies and regulations in agriculture, water and land management sectors; new regulatory incentives for farmers are in place.

72. Building on the earlier successes in relation to reform of the Water Code, the project will provide support to legislators to promote more effective management of land and water resources by private farmers. This will involve ongoing support to revision of the Land Code, together with the development of sub-legislative acts and regulations that allow the revised Land and Water codes to be implemented effectively. Key objectives include encouraging entrepreneurship and investment by strengthening land tenure rights, supporting the development of legal structures to facilitate collective planning and investment, and promoting the shift towards market-based pricing for water access. This is likely to include providing support for the development of the following laws and sub-regulations:

    i. In the field of land resource management, activities are likely to include:

        i. Typical land lease contract for private farmers;

        ii. Regulations on the procedure for maintaining the state land cadaster;

        iii. Draft Law of Turkmenistan "On Soil Protection";

iv. The Law of Turkmenistan "On Amendments and Additions to the Law of Turkmenistan" On Daikhan Farms "(2013).

j. In the area of water resource management, activities are likely to include

i. Model agreement between state water management organizations and water users on the supply of irrigation water;

ii. Typical water use rules for water user groups;

iii. Draft Law of Turkmenistan "On Associations of Water Users (WUAs)";

iv. Tariffs for water supply services to water users;

v. Methodology for calculating the tariff for water supply services;

vi. The procedure for charging fees for water supply services to water users;

73. It is also important that both farmers and extension service providers understand the practical implications of emerging legislation on their ability to invest in better land and water management. The Water and Land Codes are written in such a way that their implications are not easily understood by the farming community. Nor are changes in legislation easily or quickly translated into activity on the ground. The project will therefore prepare a series of practical guides for farmers and other agricultural stakeholders on the implications and practical application of emerging legislation. These will be prepared from a farmer-oriented perspective, translating the implications of new legal frameworks into practical opportunities and process guides for leaseholders and other farmers. Examples might include emerging opportunities are associated with changes in land tenure, and water access. Two Turkmen language guides are proposed:

a. Commentary on the Land Code of Turkmenistan.

b. Commentary on the Water Code of Turkmenistan.

Output 1.2. Capacity built for key government ministries and other relevant institutions to promote climate resilience in private sector agriculture

74. To date, the Ministry of Agriculture and Water Resources has typically focused on management and technical support for the state crop sector (primarily cotton and wheat). This has involved setting quotas, providing inputs, overseeing quality control and undertaking scientific research. Over the last decade, MoAWR has begun to consider and integrate the impacts of climate variability and climate change on state-order crops into its operations. This reflects the priorities under the high-level National Climate Change Strategy (2012). It has, however, dedicated fewer resources to supporting the non-state crop sector as this has been outside its primary mandate and the sector has developed without direct state involvement. Going forward, there is a key role for the MAEP to play in helping coordinate and promote the development of resilience best practices and norms for the non-state agriculture and livestock sector. The strategic concept will identify the approaches that are most likely to result in private farmers obtaining good access to the best available resilience know-how, technology and finance. The project will therefore work with MAEP to develop a strategic implementation concept to include:

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a. Strategic objectives and organizing principles of a resilience strategy for private agriculture and livestock production;

b. Potential stakeholders that could be involved in promoting climate resilience to smallholder farmers, including roles and responsibilities;

c. The potential coordinating role of MAEP from a regulatory, governance and advisory perspective;

d. Resourcing requirements and sources of support;

e. An assessment of capacity needs within MAEP and other key stakeholders to promote resilience in the non-state crop sector;

f. Guidance on approaches to identifying and transferring best practices and innovative technologies.

75. Drawing upon the above capacity assessment, the project will build capacity among a range of key stakeholders relevant to the development of resilient agriculture for private sector farmers. This will be done through a series of seminars, training workshops and guidance notes. Participants are likely to include the Ministry of Agriculture and Environment Protection (MAEP), State Committee for Water Economy and other key government stakeholders (e.g. Ministry of Economy, State Hydrometeorological Service). Other key institutional stakeholders (e.g. Union of Industrialists and Entrepreneurs) will also be included. Capacity building will be organized around themes relevant to the development of climate resilience private agriculture. Topics are likely to include:

a. Detailed approaches to water tariffs to encourage water saving

b. Best practice technologies for non-state crops

c. Developing legal structures for private farmer collectives/WUGs

76. The project will closely coordinate with other ongoing initiatives (e.g. NAP development) to ensure that capacity building and policy support activities are complimentary and mutually reinforcing.

Component 2: Climate resilient extension services

77. Component 2 aims to develop platforms and processes that will support the large-scale dissemination of climate resilience knowledge and best practices to the most vulnerable small holder private farmers in Turkmenistan. This will be done by including resilience as an integrated part of agricultural extension services delivery.

78. Given the current weak state of extension services in Turkmenistan, and the ongoing dynamic transformation from public to private sector farming, the project will identify and build the capacity of those potential extension service providers best suited to operating in those regions, sub-sectors (crop, livestock) and market segments (micro, small and medium scale farmers) relevant to the project. The primary focus of the project will be upon targeting micro, small- to medium- scale farmers currently unable to access high quality advisory and technology support. This will include the emerging class of Daikhan farmers who operate on longer term leases and have the option to make their own crop choices.

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79. Of particular importance will be the targeting of resources at those farmers most vulnerable to the impacts of climate change. To do this, we will use criteria by which extension service providers will target those beneficiary farmers and SMEs. This will be through the use of a high-level **vulnerability risk screening process** that will be undertaken at the level of the individual farmer or SME, or average profile of farmer at a community level (e.g. Dayhan Association). The following **criteria** will be applied by the Union of Industrialists and Entrepreneurs and other potential extension service providers to select eligible farmers for support:

    a. *Geographic exposure:* Operating in geographical regions with demonstrable exposure to climate impacts (particularly water-related). It is expected that given the severe impacts of climate change in Turkmenistan, most small-scale farmers will be eligible on the basis of this criterion. As part of the selection process for participation in the program, the project will be informed by an assessment of the key climate risks to agriculture on a province by province basis to ensure there is clear guidance around key risks and priorities that might inform differentiated for inclusion by province;

    b. *Sectoral exposure:* Engaged in primary productive activities that are exposed to climate impacts (agriculture, horticulture, livestock rearing), or engaged in downstream agricultural processing but where water availability is a core concern, based on a clear set of climate impacts and risks;

    c. *Socio-economic vulnerability:* Below a certain size (e.g. individual farmers or small SMEs of <10 farmers) and below an average income threshold for the farmers involved (both owners and employees). Support will be targeted at reaching and promoting access to the poorer and more vulnerable groups. Income thresholds for classification will be determined with the Union of Entrepreneurs and will be set as part of the inception phase to reflect prevailing currency movements given current market volatility;

    d. *Gender balance:* Extension service providers will screen to ensure that at least 30% of those receiving support (either heads of enterprises or individual entrepreneurs) are women.

80. The criteria are high-level and designed to be suitable for application as part of process to support scaling resilience to a national level program dealing with a potential decentralized population of thousands of individual commercial farmers and SMEs across the various provinces of Turkmenistan. The approach recognises that all small farmers in Turkmenistan are highly vulnerable to the effects of climate change, given the hydro-meteorological conditions in which they operate, and the socio-economic profile of the sector. Within a scaled national system, it is not feasible to pro-actively undertake detailed vulnerability and risk assessment for each individual farmer or SME individually as this would incur very high transaction costs. Vulnerability will therefore be to a large extent self-reporting, with a quality assurance process.

81. It is envisaged that the process for selection and inclusion in the program will be as follows:

    a. The Union of Entrepreneurs (or other private sector consultancies, agricultural companies or public bodies seeking to provide climate resilient extension services) will market participation in the program to their farmer members, clients or networks using materials developed in conjunction with the program team;

b. Each individual farmer or SME will then make an application to the program in the local language (online or by paper application) setting out the profile of their current operation (size, scale, main crop or livestock types), together with an easy to understand resilience checklist detailing the impacts that they face (such as water availability and quality, soil salinsation, erosion, extreme heat, desertification and soil erosion). This process may be facilitated by the extension service provider;

c. A parallel application track will also be made for application at a community, collective farm, or other farmer association level where larger groups of private farmers can participate in the programme in a more collective and structured way. This will look at the average socio-economic and climate risk profile of farmers within the group;

d. Applications will be reviewed by the extension service provider to ensure that they meet the minimum criteria for participation (e.g. geographic and sector exposure, social economic profile) before inclusion in the program;

e. As part of a quality insurance process, the UNDP AF program team will undertake a **monitoring review** of a statistically robust sample of participants from all extension service providers to check to what extent resources are being targeted at the most vulnerable (in terms of both socio-economic and climate risk vulnerability) and take corrective action where this is not the case. This monitoring mechanism will also ensure that farmers have access to facilities developed under Component 3. This will be done on an annual basis;

f. Participants will be eligible for inclusion in the programme if they meet the minimum criteria set down in the above process.

82. Mobile resilience extension services will have a more robust selection criteria and be aimed at the poorest farming communities and those with the greatest limitations in terms of access to knowledge and best practices (i.e. distant from urban centres, poor infrastructure (access to roads, communications).

83. The project envisages the following two Outputs under this Component:

Output 2.1. A public-private network of extension service providers is trained to deliver climate risk management and adaptation information and advice to farmers

84. *Extension services provider identification:* The project will develop an extension service provider database (both public and private). This will include an assessment of skills and resources available in the market, as well as a gap analysis to identify current strengths and weaknesses in service provision. To do this, the project will market the concept of advisory services to potential providers and explore the possibility of a formal project membership or association structure. It is envisaged that this would be maintained and developed for the duration of the programme by the Union of Industrialists and Entrepreneurs and could serve as a formal membership structure on programme completion. Based on the review, the project will make agreements where appropriate with identified service providers who will then participate in capacity building activities and bid for project resources as appropriate. Several potential types of providers of climate resilience extension services have been identified:

a. The Union of Industrialists and Entrepreneurs: could itself act as provider of extension services or operate more as a coordinating and capacity building platform for third party providers, matching supply and demand;

b. Private sector consultancies and agricultural companies: Both existing agricultural producers (e.g. those already involved in developing best practices in their own operations and supply changes), as well as business consultancies expanding into more technical agricultural services could play a role as advisors. Providers could include current members of the Union, consultancies (e.g. those supported by the EBRD SME business services programme) as well as financial institutions (e.g. agronomists employed by Daikhanbank). While these organizations have strong membership, consultancy and service skills, they may lack the technical capacity and knowledge to promote climate resilient agriculture to their clients;

c. Public sector institutions and academic bodies: Public sector suppliers might include national and regional structures within the Ministry of Agriculture and Environment Protection (MAEP) that currently provide support services for the state crop sector, and their representatives in district administrations, collective associations and regional mechanization centers. It might also include the various Agriculture and Water research institutes and universities (mostly operating under the auspices of MAEP). These institutes have regional affiliates of varying capacity and quality. Public sector institutions tend to have some level of technical knowledge with regards to agricultural planning and techniques. However, approaches may draw heavily upon historic methods, advisory support can lack practical focus and relevance, and such institutions may lack the commercial and service capacity to meet service expectations of private sector farmers. Special attention will be given towards developing climate-resilient extension services in the Aral Sea basin area and appropriate entities will be identified in this regard, taking into account the specific nature of water and land related concerns.

85. *Non-state farmer needs and gap analysis:* The project will undertake farmer needs assessment, focused on private farmers and small holders. This will incorporate an assessment of climate vulnerability, current capacity (knowledge and resources), and other constraints. Regional patterns will be identified based on growing conditions and agriculture types. Needs will be stratified by size of farm, regional aspects etc. This will inform the basis for targeting further component elements (best practices, capacity building, resource provision): Needs are likely to revolve around the following issues:

a. Assessment of land, soil and water conditions

b. Crop selection and planning (e.g. timing and rotation)

c. Economic analysis (yield, input costs, profitability)

d. Business planning

e. Use of efficient irrigation technologies

f. Improving structure and lining of irrigation channels

g. Adoption of renewable energy technologies (e.g. solar pumping, desalination)

h. Opportunities for greenhouse development

i. Land management and preparation (e.g. laser levelling)

j. Water rotation optimization

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k. Tilling and water evaporation management

l. Efficient use of pipes and siphons for water transfer

m. Water and forage assessment for livestock in desert pastures

86. *Capacity building for identified extension service providers on climate risk management and adaptation technologies:* The project will provide training and support services to potential extension service providers, primarily in the private sector. Training will be provided in Ashgabat or in the respective regions, with the potential for international study tours to understand how extension services are provided in similar contexts. This training will be supported by technical expertise and coordinated through the National Union of Industrialists and Entrepreneurs. Topics for training are likely to include:

    a. Impacts of climate change on the agriculture sector;

    b. Best practice methods and technologies to build resilience;

    c. Community engagement, participatory planning approaches;

    d. Extension service business model and service offering.

Output 2.2: More than 20,000 farming enterprises and entrepreneurs receive climate risk information and resilience advice through improved and accessible extension services, best practice guidance and improved climate information services.

87. This Output will be achieved through the following activities with the objective of reaching out to the majority of small holder private farmers through different means of delivery of climate information.

88. *Financial support for delivery:* The programme will make available funds to support the inclusion of resilience into agricultural extension services provision. It will seek to organize this based on payment by results (i.e. per farmer supported to a minimum quality threshold), with some level of co-finance depending on the profile of the extension service provider. These funds may be used for a range of purposes:

    a. *Expanding reach* – Supporting the marketing and provision of extension services to a wider group of farmers than might usually be considered (i.e. cross-subsidy to move down the income chain to reach poorer and more vulnerable farmers). These farmers will be selected on the basis of exposure and vulnerability criteria as set out earlier (climate impact, exposure, socio-economic vulnerability, gender balance);

    b. *Expanding scope* – Developing institutional capacity (e.g. staff resource) to provide climate resilient extension services alongside existing business support services in the agricultural sector, or to move from other sectors into agricultural support;

    c. *Investing in demonstration technology* – Capital support for the acquisition of climate resilient technologies, or development of demonstration plots that can be used for farmer training and capacity building.

89. *Mobile resilience advisory:* In addition, the programme will make available funds to support the development of a mobile resilience training service to be operated by the Union or other identified extension service providers. The programme will support a vehicle and training

team, equipped with demonstration materials, technologies and develop modular courses that can be implemented over short periods (up to 1 week) in a given location. This will be done to increase reach and provide flexibility for delivery of services for poorer and more vulnerable 'harder to reach' communities that might otherwise struggle to access more centralized services or travel for training. It would be expected that such a service could service up to 20 communities a year over a 3-year period, directly reaching more than 1000 farmers and having significant spill over impacts for their wider communities. These communities will be selected on the basis of their socio-economic vulnerability (i.e. poorer and smaller scale farming groups lacking adaptive capacity).

90. *Best practices resource library:* The project will compile and maintain a virtual library of best practice training and information materials relevant to Turkmen agro-ecological conditions and farming practices. This will partly draw upon technical material already developed under the previous Adaptation Fund project and would be maintained by the Union or by other designated body after project completion. These resources will be made available to all extension service providers and farmers in a range of formats (online, in print). Activities will include:

    a. Identification of existing best practice materials and their adaptation/translation into Turkmen language;

    b. Development of 'How to guides' for common crop and livestock types;

    c. Commissioning of targeted research and marketing materials where these do not exist;

    d. Database of best practice demonstration sites and research resources that extension providers/farmers can access in country.

91. *Development of tailored hydromet products for private sector farmers*: The programme will support Turkmenhydromet to undertake the development of pilot climate information services targeting private sector farmers. These products and services will be user-led (in terms of the type of information required and the format in which it is presented) to ensure that the value of information is preserved down the information chain. The programme will work to identify the most suitable formats, distribution channels and potential financing models for future scale up. The type of information delivered might include:

    a. Early warning notice for severe weather forecast

    b. Advisory on planting and harvesting timescales

    c. Advisory on decision making with regards to crop choice

Component 3: Regional demonstration plots and community level investment into adaptation technologies

92. Component 3 aims to build awareness, create demand for and facilitate investment by private farmers in climate resilient practices and technologies at the regional and community level. It does this through the establishment of sustainable, open-access demonstration sites, supporting the adoption of best practice in each province, and by encouraging the dissemination of best practice to local private farmers. Each demonstration and learning site will be designated to service the technological and training needs of its targeted province. For example, the site in Dashoguz province will focus above all on promoting resilient solutions

relevant to the Aral Sea basin area. It will partner with both public and private sector institutions to develop facilities that are accessible to farmers for training purposes, and by supporting farmer groups or collectives to make community level investments in resilience that can in turn facilitate peer-to-peer learning. This demand side activity complements and strengthens the impact of the 'supply side' extension services under Component 2.

93. Key technologies and approaches will be demonstrated at the community level. Further details are provided in the Annex 6. Example technologies might include:

    a. Water storage technologies (tanks, underground storage)
    b. Lining technologies for water transport and canals
    c. Efficient irrigation techniques (e.g. drip, sprinkler)
    d. Greenhouse technologies
    e. Renewable energy technologies (e.g. pumping, irrigation, desalination)
    f. Land stabilization: e.g. Tree planning and sand dune fixation
    g. Use of bio-hummus and other organic fertilizers
    h. Resilient seeds and agricultural management practices
    i. Development of sustainable wells and water pipes
    j. Water management (sluices) and metering
    k. Laser levelling and land management
    l. Agro-meteorological posts (in conjunction with Turkmenhydromet)

94. The siting of demonstration plots (whether state, private or community-led) will be informed by the potential for access by poorer and more marginalised groups. This will include both location (i.e. proximity to vulnerable communities) as well as access arrangements (i.e. willingness to host extension service providers and providing training and capacity building for vulnerable communities). The access of vulnerable farmers and associated groups to these demonstration plots will be monitored on an annual basis through a formal review mechanism (alongside the monitoring mechanism envisaged in Component 2), with corrective action undertaken where such access is not being prioritised.

95. The selection of potential technologies and investments will be based on a full assessment of their likely benefits, including the use of cost-benefit analysis to prioritise interventions. This will be done for both public, private and community level investments. See Section C for further details on cost-benefit analysis and the prioritisation criteria for cost effectiveness of proposals under Component 3.

Output 3.1. At least 1 MAEP research institute site developed providing access to best available technologies and practices for non-state order crops and supporting improved research links

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96. The project will develop a regional best practice demonstration plot (likely in the Mary Province) on the basis of an existing MAEP research institute facility (Yoloten) in a desert

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irrigated oasis. Mary has been selected as it is the province where private sector agriculture and food processing are most developed and have the highest concentration in Turkmenistan. The region has good access to irrigation water and is likely to deliver the greatest benefit. The site will be approximately 20-40 ha in size. This facility will focus on the specific climate resilience challenges associated with key non-state crop types practices and explore the potential for diversification into higher value-added crops. A larger polygon will be established around the site where small scale private farmers can then develop their own operations drawing upon expertise from the main facility. These polygons will provide land for private farmers to manage on a semi-commercial basis with the technical support of the demonstration plot staff and technology. The project will explore joint business models (e.g. profit share between farmer and demonstration plot service) to encourage sustainability of the polygon structure, whilst providing incentive for private farmers and small holders to engage. The sites may also serve as the basis for academic and scientific research (thereby helping to strengthen the institutional knowledge base).

Figure 3: Yoloten Etrap and Surrounding Daikhan Associations (Desert Oasis)

97. The profile of the demonstration site would reflect the agro-ecological zone and farming practices of the location selected. This sub-component would draw upon the experience of the UNDP managed GEF project 'Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan'. Under this project, a Green Polygon pilot project was established on 145 ha of arable land 50km from Ashgabat. The land was allocated to pilot new technologies in irrigated agriculture and pumping for energy efficiency, water

conservation, and sustainable land management. The site would also be open to extension service providers supported under Component 2 to help facilitate their training and capacity building work. The project will arrange for practical demonstrations, supported by advice on climate change and resilient agriculture. These facilities will also be used to provide training to extension service providers (trainer of trainers) supported under Component 2.

98. A review will be undertaken for technologies and methods piloted at the site to review the technical and economic potential (e.g. cost benefit analysis, GHG mitigation benefits, water saving benefits, economic benefits). This cost effectiveness analysis will help prioritise and inform the selection of the most impactful investments.

Output 3.2. Private sector-led best practice demonstration facilities:

99. The project will work with larger private sector agricultural and agro-processing companies to co-invest in at least three best practice climate resilience demonstration sites in different regions of Turkmenistan. Private farms and agricultural companies will provide land and support while the project will provide expertise and guidance for setting up the plots, the additional costs of resilient technologies and support the costs of training and development at the sites. The selection of investments will incorporate cost-benefit analysis. These sites will provide access for field training and best practice dissemination for small scale farmers (under Component 2) but also form the basis for commercial operations for the companies involved. Companies will be encouraged to support the dissemination of climate resilient practices as part of their agricultural supply chain development (i.e. to secure reliable inputs) or through the use of out-growers.

Output 3.3. Adaptation investments in community scale farmer-led cooperatives:

100. The project will work with smaller private farming cooperatives or other similar private farmer-led collective groups to develop investment plans for development of climate resilient best practices at the community level. These groups will be screened and prioritized on the basis of their vulnerability to ensure that resources are targeted at those most at risk from climate impacts. They are likely to be located in the Mary region (Yoloten), thereby allowing for synergies with the publicly developed demonstration site.

101. These groups or cooperatives will be selected on the basis of an open and transparent selection procedure managed by the project team in conjunction with relevant regional authorities. Prospective communities will be invited to undertake a high-level climate risk and socio-economic assessment with facilitating support from the project. Selection will be made on the basis of clear criteria to include:

a. Climate impact assessment: Identifying communities facing particularly severe climatic impacts (e.g. drought, soil degradation, flood risk)

b. Sector exposure: Communities where agricultural systems and livelihoods have concentrated exposure to identified climate risks

c. Socio-economic vulnerability: Income levels and level of adaptive capital/opportunities for economic diversification

102. Support will be given to climate adaptation planning (vulnerability assessment, best practice identification and prioritisation, business planning). Adaptation investment plans will incorporate cost-benefit analysis to ensure that funds are prioritised towards the most beneficial areas whilst ensuring a high degree of community ownership. Using the adaptation

investment plans developed, the project will make investment funds available. Locations will be selected based on climate vulnerability assessment (including both climate and socio-economic assessment). Funds will be made available for collective infrastructure that can benefit groups of farmers, rather than for individual plots, unless there is significant demonstration value. Private farmers will be encouraged to apply collectively, either based on Water User Groups (WUGs) as piloted under the previous phase of the Adaptation Fund or using other collective private farmer institutional structures. Funds will be made available based on competitive grant, with farming groups expected to be able to demonstrate resilience gains alongside socio-economic benefits in order to secure funds. There will be expectation of co-financing from private farmers (in the form of labour or other inputs). Typical investments that might be supported include:

a. Water collection and storage (tanks, pasture wells)

b. Efficient water delivery (metering, pipes, canal lining)

c. Efficient irrigation (sprinkling, drip)

d. Greenhouse technologies

e. Renewable energy technologies

f. Horticultural techniques to improve yield

g. Effective soil preparation (e.g. laser levelling) and fertilizer use

h. Drainage and desalination techniques (e.g. canal lining and maintenance)

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

Socio-economic benefits

103. The programme, through the provision of agricultural extension services, climate-resilient agriculture capacity building and investment in innovative technologies and cooperatives at the local level (among other key outputs), is likely to result in economic benefits for up to 20,000 private farming enterprises, entrepreneurs as well as supporting the wider communities in which they operate and where they employ workers. These farming enterprises employ approximately 100,000 farmers and provide livelihoods for 100,000 families. Thus, the project will increase climate resilience of 500,000 people in Turkmenistan rural communities[16]. Indirectly, the project will enhance adaptation capacities and climate risk knowledge among a much larger number of smallholder and household farmers by setting up accessible extension services and demonstration plots and enhancing their food security, hence catalysing a shift among smallholder farmers towards sustainable, climate-resilient agriculture, with exponential benefits. These groups represent the most vulnerable economic

[16] An average family size in Turkmenistan is 5 people.

communities in Turkmenistan. Such socio-economically disadvantaged farmers currently cannot effectively benefit from existing state support (e.g. subsidised loans) due to their low incomes and subsequent lack of assets. They lack access to resources and know-how to invest in climate resilient practices and technologies, and in terms of how to manage water and land resources in an efficient way.

104. Farm-level resilience will be increased by implementing measures designed to improve the capacity of private sector farmers to deal with increased heat and reduced water availability, as well as increasing soil degradation. The project will both raise the awareness among farmers of potential methods to maximize water efficiency (e.g. efficient irrigation and land management techniques, more climate resilient varieties, improved horticulture and livestock methods) as well as supporting demonstration plots (public and privately managed) and financing community level investments where these technologies and approaches can be piloted alongside water collection and distribution activities. Farmers will also be supported to gain improved access to finance and business planning services through existing government-led agricultural support and financing programmes.

105. Improving the resilience of private farmers is likely to result in reduced economic losses associated with lack of water, greater agricultural productivity, increased revenue, greater employment, as well as allowing diversification of income sources. Greater resilience will also result in a reduction in economic losses associated with climate shocks and stresses. At a national level, these losses are believed to be substantial, estimated at $2.5 billion USD per annum by 2030. The damage to agricultural assets at the household level would be reduced significantly, though it is not possible to quantify the reduction in financial terms at this stage. Analysis under the earlier Adaptation Fund project indicated that cost benefit ratios for typical investments would be in the range of 4:1 (i.e. avoided damages and improved productivity benefits of $4 for every $1 invested). Further cost benefit analysis will be undertaken for individual investments made in demonstration plots across the project portfolio (state, private, community-level).

106. As outreach increases, there is the potential for replication across Turkmenistan to support the large and growing proportion of the population engaged in private sector agriculture. The Union of Industrialists and Entrepreneurs estimates between 20,000-30,000 agricultural companies and entrepreneurs engaging in commercial non-state agriculture (ranging from large agricultural companies to smaller farmers).

107. From a social perspective, the project will target regions and farming communities that are particularly vulnerable from a social and climate change perspective (high poverty, high vulnerability) for example through the use of mobile extension services. The project will encourage cooperative and community-based risk planning and investment methods that facilitate cooperation between groups of private sector farmers. This approach has the potential to support scaling and efficiency and greater community cohesion among smaller decentralised smallholder farmers.

Environmental benefits:

108. The techniques and technologies that will be promoted through climate resilient extension services and demonstrated through demonstration plots and community level benefits are likely to have significant environmental benefits at the local level. Key activities and associated environmental benefits are as follows:

a. Efficient Irrigation – Reduced water use and conservation, reduced salinization

b. Boundary planting and reseeding – reduced erosion, land fixation, biodiversity

c. Improved land management – reduced fertilizer use and lower chemical inputs

d. Improved drainage – Reduced salinization and soil degradation

109. Integrated, equitable and efficient use of water resources is a key environmental issue in Turkmenistan, with significant impacts on an array of environmental factors, including climate change resilience, land degradation and biodiversity. Turkmenistan has one of the highest water use rates in the world, with 90 per cent of the country's water resources going to irrigation, and the inefficiency and water waste of current irrigation systems being one of the most acute national natural resource management problems. The project directly addresses this issue with the promotion of efficient irrigation systems, decreasing water use per output and hence putting the integrated environmental benefits of water-use efficiency at the center of project design. Furthermore, the project aims to build awareness as well as create demand for climate resilient practices and technologies at the regional and community level, ensuring that the importance of efficient water use is forefront in the planning of all stakeholders in addressing Turkmenistan's environmental degradation.

110. In addition to the water losses, the extensive use of outdated irrigation technology has led to the salinization of more than 60 per cent of agricultural land. In addition to soil salinity, waterlogging has increased in the last decade from roughly 25 per cent to 50 per cent of the irrigated land, resulting in a decline in crop yield of 20-30 per cent. Improving the use of water and more sustainable farming methods, through extension services, investments in capacity building and technology, and the creation of demonstration centers for better irrigation technology, is likely to result in lower levels of mineralization and salinization of soils associated with poor water management practices and overuse of chemical fertilizers, with further significant environmental benefits.

111. In addition to improving water and agricultural practices, effective water and land management, provision of extension services and capacity-building through a water-use efficiency and climate resilience lens has the additional benefit of improving awareness of wider environmental sustainability and practices within targeted communities and the sub-basin in which they are situated.

112. Regarding biodiversity co-benefits, it has been recognized that the biodiversity of Turkmenistan has declined significantly over the past century due principally to desertification, land degradation and overexploitation. By directly addressing the root causes of desertification and land degradation through the improvement of water use and agricultural techniques, as well as through better integrated water and land use planning, including the introduction of regulatory instruments to decrease water use, the project also has potential co-benefits to support national biodiversity conservation strategies in a synergistic manner, by addressing the degradation of habitats on which Turkmenistan's biodiversity depends.

Gender considerations:

113. Turkmenistan adopted legislation and a National Action Plan for Gender Equality for 2015-2020 that was approved by the Resolution of the President of Turkmenistan in January 2015. In the pilot farmer associations and livestock farm, women account for, on the average around 51-52% of the population. They are mainly engaged in housekeeping, teaching, and

administrative support services. Many more women form part of the unpaid family labour in home farming and lease of agricultural lands.

114. The different responsibilities that women generally have in agricultural activities include: (a) participation in planting and harvesting activities in the production of state crops (around 30% by women), and particularly in growing vegetables and fruit crops in the private household plots (in the latter case, 65-70% of cultivation in household plots is done by women); (b) at the household level, many hours a day in the preparation of food for the farm workers, raising livestock and poultry, fetching water and engaging in non-farm activities; (c) some women are responsible for managing farm finances and marketing products from private household plots; (d) despite these roles, women have limited role in control of land and decision making on agricultural practices; and (e) have limited access to capacity-building services and training.

115. The different roles that women play in agriculture require a targeted set of adaptation and resilience measured addressing their needs. This indicates a need for rethinking the gendered roles of women in small holder agriculture and their access to resources, training and inclusion in local political processes which govern their relationship to land and water, beyond domestic needs. Regional experience shows that insufficient attention is paid to participation of women in user association management, and that without leadership examples women do not try to enter into boards or become user association managers. It has also been noted that management positions within the municipal authorities and Daikhan Associations are occupied predominantly by men. Thus, women at the local level have generally less access to decision-making, capacity building and knowledge. This can be explained by both current conditions of land and water use and poor awareness and knowledge among women.

116. Gender considerations, noting the above assessment and constraints, will be fully mainstreamed into project implementation. The programme will provide opportunities for women to learn about climate resilience and integrate best practices into their operations, and ensure that women are also able to access the capacity building and training, required to practice climate-resilient agriculture, as well as to diversify their livelihoods in more resilient ways. The project will ensure that there is gender balance in project activities (e.g. seminars, community level events) including access to project financial assistance. Gender considerations will inform any community level vulnerability analysis linked to local infrastructure or demonstration plot development through consultation regarding needs and preferences on types of training and investment. The project will also gather gender-disaggregated data for evaluation purposes and use gender sensitive indicators (particularly around beneficiaries) to facilitate planning, implementation and monitoring.

117. As necessary the project will partner with local NGOs and women's cooperatives in order to integrate and support on-going local initiatives, and to make capacity-building and agricultural extension activities gender-sensitive (adjusting factors such as content and training times to ensure that the needs of female beneficiaries are equally accounted for). The following national and local NGOs could be engaged into gender mainstreaming, community engagement and capacity building work of the project: "Nature Conservation Society of Turkmenistan", "Bosphorus", "Keik okara", "Yenme", "Dap-dessur". These NGOs have been active in the areas of environmental information and awareness, environmental education, SME support, rural development, women empowerment and could be engaged in the community outreach and gender mainstreaming work of the project.

118. The project will be built upon the lessons and successful approaches to gender mainstreaming and women participation piloted by the first Adaptation Fund project, including promotion of women participation and leadership in the management of water users' groups and farming cooperatives. The project will engage with eight water user's groups (WUG) established in pilot communities Nohur, Karakum and Nohur in the framework of the previous AF Project, members of which went through numerous trainings on establishment and management of WUG, decision making and gender involvement in efficient use of water and land resources and their resilience to adverse effects of climate change.

119. In terms of ensuring gender mainstreaming, a number of practical steps will be undertaken. The project team and partners (Union of Industrialists and Entrepreneurs) have committed to delivering following:

a. Commitment to integrate gender sensitive considerations into the design of new laws, regulations and associated explanatory materials relating to agricultural sector strategy development.

b. Targets for inclusion of women in training and capacity building initiatives among policy makers (minimum 30%)

c. At least 30% of farmers and farming entrepreneurs receiving climate resilient extension services being women

d. Gender balanced approach to selection of participating private sector partnerships (female led enterprises) and community demonstration plots

e. At least 30% of those receiving field training being women.

Implementation strategies to deliver these targets will be designed and delivered by the project team in conjunction with key project partners. This will be done through the clear setting of targets in project agreements, payment by results and regular monitoring of progress.

Risk mitigation

120. In regard to environmental and social risk assessment and mitigation, the programme is committed to complying with the Environmental and Social Principles (ESP) of the Adaptation Fund, with UNDP's Social and Environmental Standards (SES), as well as with applicable national and international policies, laws and regulations.

121. All potential environmental and social risks have been outlined in the Social and Environmental Report (Annex 7), which includes a screening checklist of possible risks, identifies any potential risks tied specifically to project activities, and the assessment and management measures to address those risks. It also describes how the project mainstreams environmental sustainability, human rights and gender equality into project design and associated environmental and social co-benefits. The environmental and social risks have been reviewed in the risk register and will be fully monitored during programme implementation, with formal review of any potential issues by the project team and the project board.

122. Based on the Environmental and Social screening process, it has been determined that the proposed project has limited potential for causing adverse impacts to the environment, natural habitats and/or ecosystems and ecosystem services. Rather, the project will likely have significant benefits in regards to enhancing natural habitats and ecosystems services

through improved and more efficient use of water resources. Given that the project has a few potential adverse impacts, which are small in scale, not widespread, and easily mitigated the project should be considered a Category B project, with only limited assessment required. Regardless, risks will be monitored according to potential impacts noted in the SES report (Annex 7). If any of the pilot demonstration activities require further assessment and management (such as ground water extraction or significant increases in surface water use), an Environmental and Social Management Framework has also been provided in Annex 8.

123. The project would likely not generate potential adverse trans-boundary or global environmental impacts and the possibility that the project may result in secondary or consequential development activities that could lead to adverse social and environmental effects, is also very limited. The project is also unlikely to generate cumulative impacts with other known existing or planned activities in the area.

124. The proposed project will not result in significant greenhouse gas emissions nor would exacerbate climate change impacts, but rather has been designed to mitigate anticipated impacts of climate change. Furthermore, the benefits from improved agriculture and land management can include reduced green-house gas emissions from the soil and improved carbon storage. The project will therefore indirectly increase social and environmental resilience to climate change now and in the future through mitigation benefits, in addition to its explicit goal of enhancing environmental and social resilience in the face of climate change through adaptive agricultural practices.

125. The project does not involve large-scale infrastructure development, but may involve some small-scale infrastructure in pilot/demonstration plots. The project will not involve support for employment or livelihoods that may pose a potential risk to health and safety of communities and/or individuals or to biodiversity and ecosystem functions.

126. The project will not potentially involve temporary or permanent physical displacement, nor will there be the need for land acquisition– even in the absence of physical relocation. Project demonstration activities will be implemented on state land under the management of the Ministry of Agriculture and Environment Protection, which would not exacerbate land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources.

Deleted: Water Resources

127. There is some possibility of restriction of access to water through the introduction of tariffs for water supply services to water users, and such a tariff which regulates water use is essential to ensuring future supply for all rural farmers. Regardless, the possibility of marginalization will be monitored, as well as accounted for in the tariff structure, to ensure that the most vulnerable water users are not marginalized, through the incorporation of ability-to-pay data gathered through consultation.

128. More detailed environmental and social assessment, which may take the form of an Environmental and Social Impact Assessment (ESIA) depending on the scale and type of infrastructure, will be undertaken with regards to any direct investments in infrastructure (e.g. demonstration plot development) as to ensure that potential direct and indirect negative impacts are mitigated. For further information on environmental and social risk mitigation, please refer to the Social and Environmental Screening Report Annex 7.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

129. The project is designed to ensure that its investments are undertaken in the most cost-effective manner, and that project approaches and institutional mechanisms are easily replicated and scaled up using existing facilities and platforms in country. The project will use existing national and local institutional arrangements for delivery of project interventions, rather than creating additional and costly alternative project-specific alternatives. These include:

a. Developing a strategic concept for private sector farming climate resilience through the MAEP and other relevant government stakeholders

b. Using the networks and reach of the Union of Industrialists and Entrepreneurs to promote climate resilience to private sector farmers and their communities

c. Partnering with state institutes and larger private sector entrepreneurs to develop demonstration plots that can serve as showcase facilities and training sites;

130. Investment in climate resilience in Turkmenistan is likely to be highly cost-effective. Economic modelling under the previous Adaptation Fund project indicated that the projected water deficit has the potential to result in significant economic losses. In the absence of new policies and measures, the economic costs could reach $2.5bn per annum by 2030 or a cumulative $20bn (discounted) for the period 2015-2030. These are the 'costs of inaction'. While the costs of adaptation were large ($600m per annum by 2020), they are significantly lower than the costs (benefit cost ratio 4:1)

131. Climate resilient agriculture targeted at the most vulnerable micro-, small- and medium-sized non-state farmers will be encouraged using lower cost adaptation measures, alongside more capital-intensive infrastructure, drawing on lessons and economic analysis from the earlier Adaptation Fund project. At a farm level, cost-benefit analysis of specific adaptation measures undertaken across three agro-ecological zones indicates positive socio-economic returns, with some adaptation measures delivering high benefit cost ratios (>10:1) based on water saving and yield improvements, with short payback periods of less than 5 years. Some examples are set out below:

Table 2: Cost benefit analysis for selected agriculture and water adaptation measures

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
Construction of drip irrigation systems	40-50% increase in fruit and vegetable yield/ha	29%	8:1	5
Construction of dams with water reservoirs	Increase in water availability leading to expanded cultivation area	140%	21:1	2
Repair of dams and reservoirs	Increase in water availability leading to expanded cultivation area	227%	20:1	1
Repair and lining of water storage basins	Reduction in water losses, leading to increased supply and expanded area under cultivation	15%	4:1	8

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Construction of new wells for sheep pasture	Increase in pasture availability supporting 200 head per well	12%	1.2:1	7
Repair of water regulation sluice gates	More effective use of water	24%	4.6:1	3
Reconstruction of the on-and inter-farm drainage collectors in	30% increase in cotton yield/ha	21%	1.8:1	5
Laser levelling and planning of cotton and wheat fields in Sakar Chaga (150 ha)	Reduction in water use and increase in productivity	11%	1.1:1	7

132. Further information of the socio-economic assessment of adaptation measures in the context of climate change and increasing water scarcity conducted by the first Adaptation Fund project is included in Annex 6.

133. The project will undertake ex-ante additional cost benefit analysis as part of the design of individual demonstration plots (state, private, community level) under Component 3 prior to investment and will monitor outcomes during implementation. This will ensure that all investments maximise the socio-economic benefits to the relevant beneficiaries. The process that will be followed is set out in more detail below:

a. Under component 3, stakeholders will be invited to develop and submit proposals for funding that can increase the resilience of their operations whilst serving as demonstration plots for wider community learning;

b. The development of these proposals will be facilitated by the project team, including both technical experts but also with the support from an experienced national economist to provide capacity for stakeholders to undertake effective cost benefit analysis where this capacity does not exist;

c. Each proposal for funding will include an ex-ante cost benefit analysis (based on the likely avoided losses and productivity returns at the community/firm/state entity level). It should be noted that the economic returns are highly context specific and therefore challenging to apply the same assumptions across all projects (although they can provide an indicative indication);

d. The results of the cost-benefit analysis will be used as one factor in the selection and prioritisation of community level interventions and will influence which of the interventions are selected and presented to the project board for approval;

e. As part of the approval process, the cost-benefit analyses will be formally reviewed by the technical working group and an international economist as part of a quality assurance mechanism;

f. The selection criteria will be focused around the benefit-cost ratio (BCR) and the likely payback period (yrs.) of the interventions. Those interventions that cannot demonstrate a BCR in excess of 2:1 and a payback period of less than 10 years will not be funded. Proposals will be ranked on the basis of their economic returns as part of the selection process;

g. The cost-benefit analysis will be one of a broader set of criteria used to identify the cost effectiveness of individual interventions to be used by the Project Board. These criteria will include:

   i. *Targeting most vulnerable groups:* Extent to which the intervention will be relevant to/supportive of vulnerable groups of commercial farmers or SME's exposed to climate risk;

   ii. *Deliverability:* Assessment of the feasibility of the intervention from a technology and project management perspective (including timing and budget parameters);

   iii. *Alignment with national/local priorities:* Extent to which the intervention is aligned with national/and or local priorities in terms of resilient agricultural development (including evidence of co-development of proposals with key stakeholders);

   iv. *Economic case:* Evidence that the socio-economic returns are likely to be higher than the costs of the project (as evidenced by estimated payback period and benefit cost-ratios);

   v. *Sustainability:* Evidence that interventions are likely to be maintained over time post-project in terms of operations, maintenance and commercial viability;

   vi. *Replicability:* Extent to which proposals are likely to be replicated and/or scaled within the project area or through national structures.

h. The programme team, together with the beneficiaries will undertake ex-post analysis as part of the project following implementation to review and assess the actual socio-economic impacts of the interventions in order to learn from experience and feed through into future national planning;

i. Further examples typical cost benefit analysis undertaken under the previous Adaptation Fund project can be found in Annex 6.

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

134. The project has been developed in close partnership with a range of government agencies and is fully aligned with a range of national development plans and strategies related to climate change, agriculture, water and sustainable development. Key enabling strategies, plans and frameworks are set out below:

Climate change

135. *Third National Communication to the UNFCCC (2015):* The Third National Communication to the UNFCCC sets out a broad range of climate risks and provides an overview of the social, economic and environmental vulnerability of the agriculture sector. It sets out a broad range of adaptation measures to promote better water use and land

management in the context of reduced water availability and increasing temperatures. The project is fully in line with the high-level objectives.

136. *National Climate Change Strategy of Turkmenistan (2012):* The National Strategy sets out the overall risks and priorities associated with climate change in Turkmenistan. The strategy sets out how addressing climate change challenges is a core component of sustainable development and the need for the promotion of innovative technologies and know how. Within the agriculture sector, the strategy calls for the optimization and specialization of agricultural production, a focus on drought and salt resistant crops, improved land management (e.g. crop and pasture rotation), soil desalination and drainage efforts, pasture management. The project is fully in line with the objectives and approaches set out.

137. *Nationally Determined Contribution of Turkmenistan (2014):* Turkmenistan submitted its NDC to the UNFCCC in advance of the Paris COP. The NDC sets out the broad policy goals and targets for the period 2020-2030. Mitigation is based around an emissions intensity target, recognizing Turkmenistan's large fossil fuel reserves. Adaptation policy identifies agriculture and water resources as core sectors vulnerable to climate change Costs of adaptation are given a preliminary estimate of $10.5 billion USD.

Agriculture

138. The main legislative framework dealing with the agriculture sector relates to legislation on land and water, particularly, the Water Code (2004, updated 2016), the Land Code (2004) and the Law on Pastures (2015).

a. *Water Code of Turkmenistan:* The Water Code of Turkmenistan defines the structure of management of water resources and the distribution of functions and powers of governance in relation to water. In accordance to this legislation, the Ministry of Water Economy is responsible for regulation of the use of water, while the Ministry of Nature Protection is entrusted with the responsibility of protection of water resources. The Water Code stipulates that inter-farm irrigation and drainage networks belong to the state water management organizations, while water users having direct responsibility for operation of irrigation and drainage networks and hydro-technical facilities, at their own costs, with technical support from the water management authorities, although in practice this might not always be the case. In August 2012, Turkmenistan acceded to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes. By joining the Convention, Turkmenistan undertook to review the Water Code to meet some of the basic provisions of the Convention, including the rational use of water by the transition to the basin principle of water resources management, involvement of water users in the management of water resources, and improving tariffs for water supply services to ensure its more efficient use. This review was completed, and recommendations adopted in 2016. The programme of the development of water management of Turkmenistan for 2018 – 2030 is currently under development.

b. *Land Code of Turkmenistan:* The Land Code is aimed at the rational land use and the protection, preservation and improvement of the natural environment. The Land Code stipulates measures for efficient use of land resources, procedures for state land management, maintenance of state land resources and monitoring, measures for improving soil fertility and conservation of natural resources. The Land Code includes a system of legal, organizational, economic and technological and other measures for rational use of land resources, protection from adverse anthropogenic impacts and

improvement of soil fertility. It recognizes two owners of land, the citizens of the Turkmenistan and the State.

c. *Law on Pastures:* The Law on Pastures stipulates measures for the rational utilization, enrichment and sustainable development of natural pastures for use by livestock, and the avoidance of degradation and destruction of pastures. The Code defines measures to ensure that rational utilization is based according to a number of prescriptions, including determination of carrying capacity, regulations regarding use of pastures, measures to enhance productivity and sustainability of lands, and the collective role of local government entities and grazing right holders or lessees in the effective management of these lands.

National development strategy

139. The National Programme "The Strategy of Economic, Political, and Cultural Development of Turkmenistan Until 2030" sets out targets in relation to agricultural outputs. The Programme envisages an increase in agricultural production of more than 15 times only due to utilization of the current natural resource and accelerated industrial potential. Wheat production is planned to grow 2.9 times and cotton production – 4.9 times by 2020 as compared with 2000. A considerable proportion of irrigated agricultural lands is planned to be transferred to private sector enterprises. The private sector tenants will include joint-stock companies, daihan (farmer) cooperatives and unions. These categories of land users are expected to introduce more effective and efficient water use technologies and water saving practices. At a broader level the Strategy states that the overarching national development goal is to shift to a growth model based on innovation and sustainable development. The specific objectives are the continual and sustained development of all economic sectors, further integrating with the international community, improving the well-being of all citizens, increasing investments in human capital, enhancing the quality of public housing and utilities, and prudent use and conservation of natural resources. Key priorities include accelerating economic diversification, increasing economic competitiveness, and improving infrastructure by modernizing the energy, transport, information technology, and agriculture sectors.

140. Programme of Social and Economic Development of Turkmenistan, 2018-2024. This programme outlines Turkmenistan's social and economic development objectives for the next seven years and reflects the main principles, priority directions, required actions and expected outcomes. The primary objectives of this programme are to continue implementation of market reforms and transition to a market-led economy, economic diversification, improving human capital, and improving the living conditions of the population.

141. National Action Plan on Gender Equality, 2015–2020, sets the county's strategy on achieving gender equality. Developed in partnership with the National Institute for Democracy and Human Rights and the UN Population Fund, the plan lays out 15 targets and 60 activities that include increasing women's competitiveness in labour markets, improving maternal and child health outcomes, and the creation of gender-responsive legislation.

142. Other relevant laws include:

a. Daikhan Associations (2007)

b. Daikhan Farm (2013)

c. Nature Protection (2014)

d. Ecological Assessment (2014)

e. Sanitary Code of Turkmenistan of 2009,

f. Fishery and Preservation of Water Biological Resources of 2011,

g. Specially Protected Natural Areas (2012)

143. In addition, the legal acts of the President of Turkmenistan, in particular those focusing on the improvement of water legislation are relevant. These are the Regulations of the Ministry of Water Economy of 2000, the Regulation of "TurkmenGeology" State Corporation of 2012, the Regulations of the National Hydrometeorology Committee under the Cabinet of Ministers of 2011, and regulations of the Ministry of Nature Protection (2000) and other regulations dealing with the use and protection of water. These may regulate any investments in water related infrastructure undertaken by the programme.

E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

144. The project envisages some level of small scale capital investment in demonstration plots for the resilient technologies for agriculture and livestock management. These sites are likely to be relatively limited and on already partially degraded land under the management of the Ministry of Agriculture and Environment Protection (involving land remediation, irrigation and water storage investments).

Deleted: Water Resources

145. In addition, there will be some funds allocated to farmer cooperative investments associated with improved water and soil management. These are likely to be technology focused (e.g. new drip or sprinkler irrigation systems) rather than infrastructure focused. However, any capital works identified (e.g. drainage, water storage, wells) will be subject to the same safeguards.

146. All works will be subject to design and will meet local technical environmental and social laws and standards. Where relevant, local regulations will be followed. In the event that water extraction is expected, a hydrology review will be undertaken in association with the state water body Turkmengeology. In this case, an environmental impact assessment will be undertaken according to criteria indicated by the State Environmental Committee alongside an Adaptation Fund Social and Environmental Assessment. In the event of groundwater extraction, an Environmental and Social Management Plan, based on the Environmental and Social Management Framework, provided in Annex 8, will have to be prepared.

147. The Environmental and Social policy of the Adaptation Fund, as well as UNDP Social and Environmental Standards, calls for consultative processes in the development of projects/programmes with "particular reference to vulnerable groups, including gender considerations." These considerations have been outlined in the SESP Report in Annex 7, which also includes a record of relevant stakeholder consultations.

148. During the implementation phases of any project, a person or group of people can be adversely affected, directly or indirectly due to the project activities. The grievances that may arise can be related to social issues such as eligibility criteria and entitlements of selected beneficiaries, gender norm changes, access to project benefits by marginalized groups,

disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances may also be related to environmental issues such as impacts on water quality, damage to infrastructure due to construction or transportation of raw material, noise, decrease in quality or quantity of private/ public surface/ ground or surface water resources during implementation of livelihoods assets or water provision, damage to home gardens and agricultural lands etc. In order to address any grievances that may arise, in additional to any grievance mechanisms available at the local or national levels, all project stakeholders have access to the UNDP Stakeholder Response Mechanism (SRM) as well as the Adaptation Fund's grievance mechanism. These are both noted in the ESMF (Annex 8).

149. All UNDP supported donor funded projects are required to follow the mandatory requirements outlined in the UNDP Programme and Operational Policies and Procedures (UNDP POPP). This includes the requirement that all UNDP development solutions must always reflect local circumstances and aspirations and draw upon national actors and capabilities. In addition, all UNDP supported donor funded projects are appraised before approval. During appraisal, appropriate UNDP representatives and stakeholders ensure that activities have been designed with a clear focus on agreed results. The appraisal is conducted through the formal meeting of the Project Appraisal Committee (PAC) established by the UNDP Resident Representative. The PAC representatives are independent in that they should not have participated in formulation of the project and should have no vested interest in its approval. Appraisal is based on a detailed quality programming checklist which ensures, amongst other issues, that necessary safeguards have been addressed and incorporated into the design.

150. UNDP Country Office in Turkmenistan has practical experience with implementing/piloting of all technologies proposed for the AF project and listed under Component 3 in compliance with the national technical standards and regulations. Annex 6 of the project proposal refers to the lessons and evidence from earlier UNDP implemented pilots. The following process secures compliance with the corresponding standards and regulation:

(i) Upon identification of sub-projects/sites and prior to the investment the applicable national technical standards and regulations are defined and safeguards monitoring activities are defined and incorporated in the sub-project design;

(ii) Technical specifications/terms of references for the procurement and commissioning of technology installation include requirements for the sub-contractor to ensure compliance with all relevant national technical standards and regulations according to the national law. All the relevant national technical standards (including permits, licenses, etc. for construction, hydroengineering and other physical works) are specified in detail in UNDP tender documentation along with technical specifications of works required;

(iii) At the contracting phase UNDP verifies compliance of the sub-contractor with the national regulations (e.g. availability of appropriate licenses). Contracts are awarded to vendors, that possess full compliance with national technical standards for implementation of adaptation activities.

(iv) UNDP Country Office has an internal procedure for carrying out monitoring field visits and spot checks during the implementation of site activities by sub-contractors. The monitoring visit check lists include above all monitoring of compliance to technical standards;

(v) In case of high technical complexity of works and services, external experts (e.g. engineers) and/or national government staff are engaged for site monitoring.

F. Describe if there is duplication of project / programme with other funding sources, if any.

151. There are several ongoing initiatives of relevance to the proposed AF project, and efforts have been made to ensure that there is no duplication with other initiatives and that potential synergies are explored. Extensive stakeholder consultation has been undertaken with the major donors in the water and agriculture sector in Turkmenistan, including the European Union, selected bi-lateral donors (GIZ etc.). The primary activities of relevance are identified as follows:

European Union

152. Support to Further Sustainable Agricultural and Rural Development Phase III (2016-2020). This programme aims to support national strategic objectives in the agriculture sector. Its focus is on increasing productivity and competitiveness in agro-food production and marketing, as well as institutional development in line with Turkmenistan's diversification and export strategy. Activities are oriented towards added-value processing, investment and value chain development, rather than upstream resilience in crops and livestock. It does not have a climate change focus and the potential partners are larger more established commercial agro-industrial companies. There is little overlap, but some opportunity to partner in terms of identifying potential co-investment in demonstration sites or expansion of agricultural extension services.

UNDP

153. Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan (2016-2021): This SCCF funded project is supporting livelihoods in rural areas in the Lebap and Dashoguz velayats through the implementation of community-based adaptation solutions; (ii) Mainstreaming climate adaptation measures in agricultural and water sector development strategy and policy; and (iii) Strengthening national capacity for iterative climate change adaptation planning, implementation and monitoring in the country. The proposed programme has been developed to ensure that potential areas of potential overlap (e.g. legislative reform, piloting at a regional scale) are avoided and all activities are complementary. The Adaptation Fund project will focus on areas of legislation that are not currently or expected to be addressed by the SCCF project (i.e. primarily relevant to private sector farmers rather than those in the state-order crop system). It will also undertake any regional demonstration/community-based activities in regions where the SCCF project is not active (e.g. in Mary Velayat), but will explore the opportunities to cooperate and leverage activities already undertaken.

154. Sustainable Energy and Water Management Project (2015-2021). This GEF-funded project focusses on energy efficiency and renewable energy opportunities in the agriculture and water sectors. The project has some relevance as it is piloting the demonstration of water efficiency technologies and approaches in the Ahal Province near Ashgabat. The programme will overlap in time, but not directly in scope. The Adaptation Fund project will explore the possibility of using demonstration facilities developed in the Ahal Province to provide a learning environment for extension service providers and private sector farmers and entrepreneurs on resilient water technologies.

GIZ

155. Regional programme for sustainable and climate sensitive land use for economic development in Central Asia (2016-19). This regional programme seeks to support land users, government agencies and the private sector in Central Asia adopt integrated, economically and ecologically sustainable forms of land use, taking climate change into account. The primary focus is on participatory and sustainable management and the integration of different approaches within a given area. The project is not focused on private sector resilience and there is not expected to be any significant geographic or thematic overlap.

EBRD

156. Small Business Initiative (2015-18). The European Bank for Reconstruction and Development (EBRD), in partnership with the European Union support a small Business Initiative in Turkmenistan. The Small Business Initiative provides a comprehensive set of tools to promote the growth of small and medium-sized enterprises (SMEs), including financing businesses both directly and through financial institutions, providing business advice and supporting policy dialogue. As part of this, business services support is being provided on a cost sharing basis. While this is not thematically linked to the Adaptation Fund proposal, the project will explore the potential for relevant participants in the EBRD programme to act as extension services providers.

Table 3: Summary of Parallel Projects

Project	Funding agency	Outputs	Areas of complementarity with Adaptation Fund	Areas of potential duplication and risk mitigation
Scaling Climate Resilience for Farmers in Turkmenistan	Adaptation Fund	Strengthened legislative and institutional capacity to deliver private sector farmer resilience Development of climate resilient extension services platforms for private sector farmers Development of public and private sector demonstration sites, including community led initiatives		
Support to Further Sustainable Agricultural and Rural Development Phase III (2016-2020)	EU	Advisory support to large export-oriented agro-processors and value chain development facilitating import substitution in the agriculture sector	Potential for AF project to collaborate to identify private sector partners willing to host demonstration plots to support their supply chain and communities or to act as extension service providers	None – focus is on large and financially robust companies and not small vulnerable farmers and SME entrepreneurs. Support is on downstream added value processing.
UNDP - Supporting climate resilient livelihoods in	SCCF	Improved climate related socio-economic outcomes in the	Potential to use project sites in Lebap and Dashoguz to	SCCF is working with state order sector. AF project is private sector

Project	Funding agency	Outputs	Areas of complementarity with Adaptation Fund	Areas of potential duplication and risk mitigation
agricultural communities in drought-prone areas of Turkmenistan (2016-2021)		targeted agricultural communities in Lebap and Dashoguz velayats through the implementation of community-based adaptation solutions; Mainstreamed climate adaptation measures in agricultural and water sector development strategy and policy (primarily Land Code); and Strengthened national capacity for iterative climate change adaptation planning, implementation and monitoring	disseminate extension services and provide training Cooperation with project on institutional and legislative reform where relevant	focused and therefore limited overlap. AF project is focused on scaling extension services development at national level, rather than local community resilience Legislative and institutional capacity building is a potential overlap. SCCF project is focused primarily on the reform of the Land Code – AF project will address legislative areas not being addressed by SCCF (e.g. Water Code, Daihan Farm Laws - i.e. those with a private sector focus) as set out in proposal AF project will prioritize development of demonstration plots (public and private) and community investments in different velayats (provinces) where SCCF is not present e.g. Mary Province
UNDP - Sustainable Energy and Water Management Project (2015-2021).	GEF	Building knowledge base for energy and resource efficient technologies (e.g. pumping, solar) Investments in large scale water supply management (e.g. canals, pumps) IWRM training for regional officials and water system managers Policy support for IWRM	Ahal province demonstration investment plot provides insight into logistics of demonstration plot development (e.g. costs, timescales). Ahal site can be used as a training base for extension services on certain technologies	Limited – renewable energy and energy efficiency focus (e.g. large-scale pumping) in water pumping and conservation. Focus is primarily on supporting regional and municipal water managers responsible for municipal and interregional water networks on IWRM
Regional programme for sustainable and climate sensitive land use for economic	GIZ	Community level advisory support for pasture and forest management	Limited	None – programme is only implementing at a small scale in two communities (forestry

Project	Funding agency	Outputs	Areas of complementarity with Adaptation Fund	Areas of potential duplication and risk mitigation
development in Central Asia (2016-19).				and pasture management)
Small Business Initiative (2015-18).	EBRD	Generalist business advisory and consultancy support to SMEs, in Turkmenistan including in agriculture	Potential to provide access to national consultants in agriculture that might offer resilience extension services.	None

157. In summary, the project will be highly complementary to existing initiatives, whilst avoiding duplication in the few cases where this might exist. Where possible, the project will seek to build on the systems and infrastructure of past or ongoing initiatives (e.g. using existing sites for training and capacity building, engaging with existing programme participants as potential resilient extension service providers for the private sector). Where potential geographical duplication exists, the Adaptation Fund project will prioritize operations in provinces without 3rd party project activities (e.g. Mary Province). Where potential activities overlap (e.g. capacity building and policy support) the Adaptation Fund project will target thematic areas relevant to its core mandate (e.g. private sector resilience) and focusing on the implications of primarily legislation for the non-state sector. In all cases, the project team will liaise and coordinate with other projects to maximize synergies given that the reform process is a dynamic one. Ongoing discussions will be held with other stakeholders (such as the FAO and ADB) to monitor and align programming activities with potential emerging initiatives.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

158. The knowledge management strategy forms a core element of the project. While budgets and activities are mainstreamed across the three project components, in operational terms the implementation of the knowledge strategy will be managed and coordinated centrally within the core project team by dedicated staff resources (estimated at an average of 0.5 FTE over the course of the project), with the Project manager also playing an oversight role in coordination and delivery of the strategy. Technical inputs and products will be developed as part of the mandate of the international and national consultant teams.

159. During project implementation, the project team will work with project partners (primarily the Union of Entrepreneurs and the Ministry of Agriculture and Environment protection) in the development and dissemination of knowledge products as well as through online systems. Consultations with these partners confirm that they are both committed to building and disseminating knowledge on climate resilient practices to private sector farmers within the project framework and beyond.

Deleted: Water Resources

160. Both partners already have good capacity to engage with knowledge development and dissemination activities on the basis of their existing mandates and institutional structures. Where necessary, UNDP will provide capacity support to knowledge partners to maximise the effectiveness of outreach and communication through their channels.

a. The *Union of Industrialists and Entrepreneurs* has a core development mandate to support knowledge generation and dissemination to its members and the wider emerging private agriculture sector. They are already building training capacity and knowledge products in other related areas (e.g. the modernization of agriculture). Materials developed would form part of this knowledge offering and would be continued to be used and disseminated following project completion;

b. The *Ministry of Agriculture and Environment Protection* also maintains a mandate for standards and wider best practices in the agriculture sector, including a broad range of education and technical materials. It has been agreed that products and approaches developed by the project would form part of this body of materials and used by the Ministry as part of their broader mandate, and again would continue to be promoted after project completion.

Deleted: *Water Resources*

161. Lessons learned will be captured across the three main components and will include the following:

a. *Component 1:* Outreach and communication to private sector farmers on the implication of water and land reform and the adoption of climate resilient practices;

b. *Component 2:* Virtual library of best practices and best available technologies for climate resilient agriculture in Turkmenistan; dissemination through the network of the Union of Entrepreneurs and other institutional partners, mobile dissemination and training unit;

c. *Component 3:* Lessons learned from the development of demonstration sites and associated polygons (both public and private).

162. In addition, the project's annual reporting will create summaries of lessons learned. The project will systematically document key lessons, good practices and challenges experienced in enabling climate resilience among private sector farmers and moving towards more progressive resilience policies at national level. The Adaptation Learning Mechanism (ALM) http://www.adaptationlearning.net and other relevant platforms will be used for knowledge dissemination.

163. As the primary adaptation programme in Turkmenistan, the AF project envisages a process of dissemination of findings both to the Turkmenistan Government and to the wider donor and civil society community. This approach directly follows recommendations of the final evaluation of the first Adaptation Fund project in Turkmenistan. It is expected that the GoT Steering Committee will act as the main point of dissemination for the participating Ministries together with the Parliament. The project team will hold regular briefings with the Steering Committee in this regard. Component 1 will involve close cooperation with the Steering Committee in terms of addressing institutional development and scale up of practices proven to be effective under Components 2 and 3.

164. In parallel, regular meetings will be held with relevant programmes within UNDP, the EU, GIZ, who represent the most active funders of water, agro-forestry and climate related technical assistance. This will allow for AF project findings to inform the scope and to be incorporated into the design phase of other donor initiatives where relevant.

165. Key findings will be prepared in a format for dissemination to key stakeholder audiences. These may include government officials, private sector farmers and providers of water

management and agricultural support services. It is also envisaged that a number of training and consultation events will be held under the various component work-streams, and the outcomes of these events will be captured.

166. The project will maintain a website on which all relevant reports, documents and findings will be posted for access by interested parties.

167. With regards to longer term sustainability of knowledge transfer and uptake, the following strategy is envisaged:

a. Learning materials developed to explain regulatory and legislative development will be transferred to the Ministry of Agriculture and Environment Protection as well as other partner institutions (e.g. Union of Industrialists and Entrepreneurs) for further dissemination and/or update. It has been agreed that these will be continue to be disseminated as part of the mandate of these institutions and form part of their knowledge offering;

Deleted: Water Resources

b. Capacity and materials developed around extension services provision and resilient agriculture within the private sector will be mainstreamed into the Union of Industrialists and Entrepreneurs and other providers of advisory support to private sector farmers. These materials and climate resilience best practice guidance notes will continue to be maintained and disseminated as part of a broader sustainable extension services offering which the Union is currently developing;

c. Lessons learned from the development of demonstration sites and community level interventions will be transferred to the Ministry of Agriculture and Water Management where they can serve as the basis for improving the development of resilience for private sector farmers through the relevant research institutes and other Ministry structures. The Ministry has already discussed and confirmed their willingness to engage on this approach;

d. All lessons learned will be used as input to consultative workshops and meetings with project stakeholders and disseminated to other donors and relevant agencies.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

168. This proposal has been developed in full consultation with a broad range of stakeholders in Turkmenistan over several visits and consultation events. A record of key stakeholder consultations, which occurred in the development of the proposal, has been provided in Annex 9.

169. During the project proposal development process, detailed stakeholder consultations were organized at national, provincial and local levels. The project development process included numerous local community meetings/visits, two missions of international consultants, and extensive stocktaking and validation stakeholder consultations with relevant government counterparts, and representatives of the private sector and civil society. Furthermore, during

these consultations gender specific vulnerabilities and needs were identified. During these consultations the roles and responsibilities of key stakeholders and the specific mechanisms and strategies for their direct involvement in project activities were identified. Considerations of vulnerability, participation and gender empowerment in the formulation of activities will be a key focus area, while gender mainstreaming tools will be applied in the development of technical guidelines for integration of climate change adaptation into planning processes. The project will ensure that both men and women are able to participate meaningfully and equitably, have equitable access to project resources, and receive equal social and economic benefits.

170. Key institutions consulted in the development of this proposal include:

a. Ministry of Agriculture and Environment Protection and its predecessor the Ministry of Agriculture Water Resources of Turkmenistan

b. State Committee for Environment Protection and Land Resources

c. Committee for Nature Protection of the Cabinet of Ministers of Turkmenistan

d. Union of Entrepreneurs of Turkmenistan (National and regional affiliates)

e. Ministry of Nature Protection of Turkmenistan

f. National institute of Deserts, Flora and Fauna

g. National committee for Hydrometeorology

h. Institute of Agriculture under MAEP

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i. Dayhanbank

j. Rysgal bank

k. GIZ funded project: Regional programme for sustainable and climate sensitive land use for economic development in Central Asia

l. Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan (UNDP/SCCF)

m. Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan (UNDP/GEF)

n. EU funded Project: 'Support for further sustainable Agriculture and Rural development in Turkmenistan – Phase III'

o. Aarhus Centre in Turkmenistan

p. Representatives of private sector farmers and entrepreneurs in Mary, Ahal, Dashoguz Regions

q. Representatives of Nature Protection Society (a civil society organization)

r. Representatives of Youth Union (a civil society organization)

List of community consultations conducted during the project development and validation:

Date	Community	Number of people attended
July 20, 2017	Nohur, Ahal Province	18 people (3 women)
August 5, 2017	Karakum, Ahal Province	20 people (9 women)
September 7, 2017	Sakarchage, Mary Province	23 people (15 women)
September 19, 2017	Watan, Lebap Province	25 people (16 women)
September 20, 2017	Parahat, Lebap Province	25 people (5 women)
October 17, 2017	Yagtylyk, Dashoguz Province	24 people (4 women)
October 18, 2017	Garagum, Dashoguz Province	26 people (5 women)
December 20, 2017	Ashgabat	30 people (5 women)
March 19, 2018	Kaahka, Ahal Province	20 people (7 women)
April 27, 2018	Geokdepe, Ahal Province	24 people (8 women)

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

171. The programme costs are additional to other costs associated with private sector agriculture development and the success of the intervention from an adaptation perspective is not dependent on co-financing activities by other parties. The proposal aims to build on existing platforms (public and private) to meet the additional costs of adaptation.

172. It is expected that going forward, project partners (e.g. the Ministry of Agriculture and Environment Protection, the Union of Industrialists and Entrepreneurs, and the Institute of Agriculture) will make their own investments (both financial and in kind) into the development of private sector agriculture. The project will fund the full costs of adaptation, such as legislative reform and capacity development for promoting climate resilience within wider agriculture sector development, as well as the full costs of any investments in pilot, community or demonstration sites that allow for better mainstreaming and uptake of resilience into private sector agriculture.

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173. The project is structured to allow a high proportion of funds to flow into capacity building, policy development and institutional activities associated with the promotion of climate resilience for private sector farmers.

174. As such, the components are expected to result in a significantly higher adaptation benefit than would otherwise be the case under a baseline scenario. A significant component of agricultural community vulnerability remains structural in nature (lack of adequate policy, institutional frameworks, dissemination platforms), and requires investment in these enabling aspects to change behavior, and build awareness of best practice, both among policy makers and agricultural communities. Further cost of adaptation reasoning is set out below.

Component 1

175. *Baseline (Without AF funding):* The legislative basis and enabling environment for climate resilience (i.e. the land code and water code and associated sub-regulations) would continue to develop slowly but would not provide sufficient support to accelerate the adoption of climate resilience by private sector smallholder farmers. Changes in the enabling environment supporting resilience would continue to be poorly disseminated and communicated to relevant groups, resulting in a lack of understanding about potential opportunities. The Government of Turkmenistan would continue to provide limited technical resilience-oriented support for state-order crops but would not focus on the livelihoods of the emerging and rapidly growing class of smallholder private farmers operating outside the state order crop system. The system for developing resilience within private sector agriculture would remain uncoordinated from an institutional perspective and would lack an overall coordinating and resourcing strategy. Policy makers and other key stakeholders would continue to lack insight into potential resilience best practices, best available technologies and strategic opportunities to develop sector potential and productivity.

176. *AF Additionality (With AF Funding):* With the AF project, the enabling environment would be strengthened in a more coordinated and accelerated manner, with potential benefits and opportunities communicated to private farmers in ways that are easily understood and absorbed (e.g. around land rights, water rights etc.). There would be a more strategic focus on building resilience in the non-state agriculture sector, with clear focus on methods and institutional roles and responsibilities. Awareness of best practices and best available technologies, as well as potential barriers to their implementation would be increased among senior national and regional policy makers.

Component 2:

177. *Baseline (Without AF funding):* The development of climate resilient advisory and extension services in Turkmenistan would be relatively slow, with private sector farmers reliant on accessing international expertise and technologies from neighboring countries (Iran, Turkey, Israel) at high cost. Poorer, smaller scale private sector farmers would effectively be unable to access good advice due to the costs associated with establishing these services on a (semi)-commercial basis. What extension services support might be available would not incorporate climate resilience best practices. Vulnerable famers would continue to engage in inefficient agricultural, land management and water use practices, and deploy out of date technologies, preventing them from maximizing productivity under climate stresses and shocks.

178. *AF Additionality (With AF funding):* There would be much more rapid expansion of climate resilient extension services, with significantly broader coverage of small- and medium-scale farmers. The market for the provision of climate smart agricultural services will develop more rapidly, along with the development of local language advisory, technology distribution and financing solutions. Greater access would be provided to farmers for field-based learning, both through extension service providers and mobile units. A sustainable market and platform for the long-term provision of climate resilient extension services and advisory will develop.

Component 3:

179. Baseline (Without AF funding): Under the baseline, there would be significantly slower development of demonstration and training sites that could showcase best practice technologies. The existing research and demonstration plots managed by government tend to be poorly funded and using dated practices and technologies, and do not have an

educational or peer to peer learning mandate. There are some facilities developed under current programmes (e.g. the SCCF project site in Ahal province), however these only provide limited local coverage. More advanced private sector agriculture companies would have no incentive to provide access to their facilities for the purposes of training or supply chain development.

180. AF Additionality (With AF funding): The number and quality of best practice demonstration sites would expand much more quickly, with the possibility to achieve full national coverage through a mix of state institute, private agricultural sector and farmer-led facilities. Farmers and extension service providers would have the opportunity to visit these facilities which would be made available as training sites in conjunction with extension service providers.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

The programme has been designed to ensure sustainable outcomes in the following ways:

181. Component 1 (Policy strategy and institutional elements for climate resilience) will provide greater long-term clarity and transparency as to the pathways for development of climate resilient agriculture (e.g. through improved rights to land tenure, water access). It will also develop a long-term strategy for the dissemination of climate resilience for private sector farmers and livestock producers owned by key ministries and other stakeholders. Capacity building will allow for better long-term decision making and resource allocation.

182. Component 2 (Development of climate resilient extension services) will explore sustainable models for the development of climate resilient extension services through public and private platforms. The programme will pursue a range of options and models to deliver capacity building and sector development (e.g. through state owned technical institutes, Union of Entrepreneurs, private sector consultants) with a view to assessing the potential costs and benefits of each and promoting the models that are best suited in different geographical and sub-sector contexts. The project will seek to support those delivery models and platforms that emerge as being most competitive and cost effective in reaching and driving demand for investment in resilience in any given market sector and geography. The letter of commitment from the Union of Entrepreneurs is included in the Annex 11 to this proposal.

183. Component 3 (Demonstration plots): The demonstration sites are being designed to be sustainable and self-financing both from a public and private sector perspective. Ensuring clear institutional ownership will allow for long term planning and integration into wider operations. Sustainable financing strategies will differ depending on whether investments are made in public or private sector facilities:

184. *Public* sector demonstration plots will be set up on the basis of existing research institute facilities where there is already an operational structure and mandate to support knowledge generation and dissemination. While the project will provide capital investment support, the sustainability of the operating model will be based on maximizing the revenue associated with the sites (e.g. through crop and livestock production and sales). Similar demonstration site projects (e.g. the UNDP-managed EE/RE project in Ahal region) have implemented revenue sharing with smallholders engaged to work on the sites and their associated polygons (e.g. land lease fees, revenue sharing on sales) in return for farmer access to technology and advice from the managing institute. Early evidence indicates that these models are sufficient

to meet the operating costs of such demonstration sites (excluding the capital costs of establishment). The Ministry of Agriculture and Water management will also continue to maintain budgetary support for the research institutes hosting the public sector demonstration plots following project completion research institute, thereby ensuring sustainability over time with the potential to expand capital investment where these facilities demonstrate success.

185. *Private* sector led demonstration sites will be established and located within existing private sector agricultural operations. The demonstration plots will be farmed on a fully commercial basis, and at the same time be used to train and inform farmers and the wider agricultural community on emerging resilience technologies and best practices. Private sector participation in the project will be subject to formal letter of agreement between the project, the Union and the individual agricultural business involved.

186. These proposals have been discussed with the Union of Industrialists and Entrepreneurs and a number of their leading members in both Ashgabat and Mary. Based on these discussions, it is clear that there is a broad range of incentives for entrepreneurs and Inion members to engage with the project and develop demonstration sites. These include:

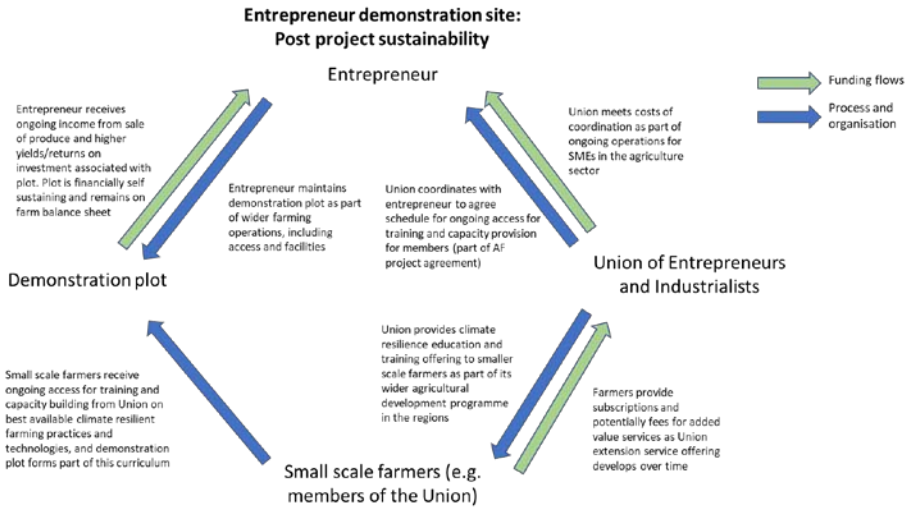
a. Receipt of financial and technical support from the AF project and experts
b. Access to best practice technologies and approaches
c. Improvement in productivity and yields
d. Increase in economic returns
e. Greater understanding of resilience threats and opportunities
f. Corporate social responsibility benefits of community level support
g. Opportunity to increase the resilience of supply chains (e.g. out-growers)
h. Partnership with the influential Union of Industrialists and Entrepreneurs
i. Public relations benefits from commitment to national government strategy
j. Visibility and quality signals from participation in international projects

187. There have been indications of interest by several leading member firms of the Union of Industrialists and Entrepreneurs (covering agriculture, horticulture and livestock) to participate in the programme, and the Union has set out its commitment to facilitating their participation (see letter of support). It can be anticipated that there will demand in excess of the number of envisaged sites (3) and therefore selection for participation would be based on clear and transparent criteria, with a call for proposals among UoIE members. Criteria would include:

a. Commitment to long term access provision for training and development
b. Level of co-investment in the facilities
c. Sectoral/thematic relevance of operations to regional farmers
d. Accessibility and geographic location (relative to poorer farming communities)
e. Assessment of governance and financial position.

188. In terms of post project sustainability, the Union of Industrialists and Entrepreneurs is fully committed to maintaining and expanding its overall extension service offering over time. It has been agreed that these demonstration sites, focused on the benefits of resilient agriculture, will become part of this structure. Post-project funding will be maintained from a mixture of support from the Union which is derived from a combination of government support and member fees and commercial revenues from the operation of the demonstration plots themselves. This model is set out in Figure 3 below:

Figure 4: Post project sustainability model for private sector managed demonstration plots.



K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

189. The screening of environmental and social impacts and risks is provided in Annex 7. and based on the scope, severity and number of potential risks, all of which are limited in nature and can be easily mitigated, the project is considered Category B, with limited assessment required. In the case that project activities, or the choice of irrigation technology, leads to an increase in the use of surface water, or any extraction of groundwater, such project activities will be subject to a more in-depth assessment, including hydrological studies, and an Environmental and Social Impact Assessment, as per national legislation. In this case the Environmental and Social Management Framework (ESMF) provided in Annex 8, should be used to develop a site-specific Environmental and Social Management Plan (ESMP).

190. In reference to project activities, there are no direct environmental and social risks associated with capacity building, or training activities. Legislative support, particularly the introduction of tariffs for water supply services to water users, which is standard practice in managing water scarcity, and an essential instrument in regulating water use, has a small risk of restricting access to the most socio-economically vulnerable farmers. In order to mitigate this risk, in developing a tariff structure, in addition to considering cost-recovery of water infrastructure and the communication of scarcity to water users, the ability-to-pay of farmers should also be taken into account.

191. Other limited adverse impacts relate to potential investments in small-scale demonstration pilot sites or community-level infrastructure. These will all be subject to environmental safeguards review during the planning phase and as part of implementation. We will explicitly ensure that any investments to not create additional risk or any other form of maladaptation, including flood risk. However, this is unlikely as Turkmenistan is primarily a desert and drought-affected farming system, with flood risk only in specific regions (e.g. in mountain farming systems and along the banks of the Amu Darya river). With regards to social risk,

given the introduction of new technologies, there is a low risk of, "elite capture" with the "plausible recurrent risk" of deviation and capture of the benefits accrued from the project by more influential actors. This risk is mitigable through the regularly monitoring required by the project, as well as through the project evaluation process. For the activities under Component 3 that are not fully defined in the proposal (e.g. the types of adaptation technologies have been defined, but specific locations, owners and site-specific scope of measures to be defined during the project implementation), the project will follow Adaptation Fund Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, UNDP safeguards policy and the national laws and standards. Prior to any on-site investment, the project will conduct (a) detailed screening/identification of risks and applicable principles (UNDP SESP screening will be updated and a screening against AF 15 principles will be conducted); (b) Impact assessment (scope of ESIA will depend on the results of risk screening for specific site-based measures; and (c) monitoring. UNDP Country Office in Turkmenistan will be responsible for the implementation and monitoring of the relevant environment and social risk assessments in compliance with the national law, UNDP and AF policies (see Annex 8 for ESMF). Risk screening will be updated regularly in the course of implementation prior to the implementation of on-site activities/investments and at least annually. The updated screening will be done against Adaptation Fund 15 principles/risk elements outlined below as well as against the national laws and regulations. UNDP ESP will be followed.

192. The project will avoid all physical and economic displacement, as all activities will occur either on land provided by beneficiaries or in collaboration with community groups as part of co-development activities.

193. An overview of the potential impacts with regard to the 15 environmental and social principles of the Adaptation Fund is provided below:

194. *Compliance with Law*: the project proposal and the attached ESMF (Annex 8) provides the list and description of the relevant national legislation. All works will be subject to design and will meet local technical environmental and social laws and standards. Compliance with the national technical standards and regulatory requirements on water extraction will need to be ensured and monitored during the project implementation and will be ensured as indicated in ESMF. UNDP Turkmenistan has direct experience with the implementation of similar project in compliance with the national law and regulations. Please see more detailed information in section E. above.

195. *Access and Equity*: The project will deliver or facilitate new more effective extension services to the private farmers, including demonstration of the adaptation technologies and equipment. It will work with the public and private extension network and will partner with the Union of Industrialists and Entrepreneurs for the delivery of these services and capacity building. There is a high demand for such services and for technical advice in Turkmenistan among both small subsistence farmers and larger well-established farms. There is a governance-related risk of favoritism or "elite capture" of deviation and capture of the benefits accrued from the project by influential actors or wealthier farmers. Access to the benefits delivered by the project (extension services and adaptation measures) need to be monitored. This risk is assessed as moderate because the project strategy and implementation framework builds in a process of vulnerability assessments, selection of beneficiaries to

secure access to most vulnerable farmers, participatory planning for community-level adaptation investments, monitoring and reporting on the access to benefits.

196. The project supports farmers associations as a collective group, through a participatory planning process. Specific criteria and guidelines will ensure that infrastructure and land-use decisions at the local level are made through a collective decision-making process that would be facilitated by technical staff provided by the project. Regular monitoring and oversight provided by the project is intended to ensure that benefits are fairly well distributed to all participating households, including women, as well as through the project evaluation process. The project includes provisions/criteria for the selection and participation of the vulnerable populations, supported by targeted outreach and promotion to poorer communities. As reflected in Component 2, a high-level vulnerability risk screening process will be undertaken. The four key criteria will be applied to this process, namely geographic exposure, sectoral exposure, socio-economic vulnerability and gender balance. The screening will as well include stakeholder mapping in order to identify the potential beneficiaries, rivals, disputants, marginalized, or vulnerable people. Results of this exercise will help the project come up with a strategy to ensure fair and impartial access to project benefits for all groups of beneficiaries as disclosed throughout the screening process. The project also establishes annual project monitoring mechanism to verify that poorer and more vulnerable farmers have access and are participating in extension services training under Component 2. Finally, as per the ESMF (Annex 8) the Grievance Redress Mechanism will be set up by the project to allow those that might have a complaint and/or grievance to be able to communicate their concerns and/or grievances through an appropriate process.

197. *Marginalized and vulnerable groups*: Water tariffs, and water efficiency regulations, under the legislative reform component might have some potential for restrictions of access to resources of vulnerable individuals or groups through the setting of tariffs for water supply services to water users. Also, managing the risk of water scarcity might require changing agricultural practices in a way that includes restricting or managing access to certain pasture lands, changing agricultural crops and practices that have potential to affect customary practices and/or resources. The potential structure and application of water tariffs must take into account the ability and the willingness to pay for water services. Experience from other countries indicates that not all water users are able and willing to pay for the use of water. The project will therefore explore and develop a progressive approach to agriculture water pricing. This approach will seek to cover the costs associated with operating (and potentially developing) the water distribution system, encourage water saving through economic measures and be phased in such a way as to meet the social concerns of affordability, particularly for the most vulnerable. The project will pilot climate adaptation in already established farmer associations where the land is already allocated on the basis of long-term leases, so issues of customary rights or land tenure are unlikely to be triggered by the project.

198. The project approach is to use a participatory planning and decision-making process, that will ensure that any potential restrictions on the use of resources will not be imposed on the members, but defined through a collective decision-making process at the community level. Any decisions on restriction of access will not be make without identification of compensatory/alternative measures and practices that provides sufficient revenues and/or livelihoods that is equal to, or more than revenues being generated from existing practice.

199. As outlined above under Access and Equity, a vulnerability risk screening process will be applied to identify vulnerable groups, and their needs, priorities and constraints as relevant to the project. The project will then ensure that these groups equally benefit from the project work. Priority will be given to measures for building resilience of marginalized and vulnerable groups to climate change effects, and developing ways of integrating these groups into the long-term development focus of the project. The project's monitoring tools will include a set of indicators to ensure and measure access to project benefits for marginalized and vulnerable groups as well as indicators on building resilience of these groups to climate change.

200. *Human rights*: According to the OHCHR website in relation to Turkmenistan, the most recent report of the Secretary-General on the human rights situation in Turkmenistan is dated back in October 2006, and the most recent Special Procedures report is dated January 2009, focusing on freedom of religion or belief. There are currently no standing invitation under Special Procedures extended to the country. (Source: https://www.ohchr.org/EN/Countries/ENACARegion/Pages/TMIndex.aspx). The project does not integrate any activities contrary to custom law or traditions. Participation in the project will be participatory, voluntary and free.

201. As mentioned under Access and Equity, a fair and impartial access to project benefits for all groups of beneficiaries (including minorities based on religious or other principles) will be ensured. The project will mainstream the human rights-based approach by enhancing the socio-economic rights of Turkmenistan's most climate change vulnerable population, by increasing water availability to rural farmers through climate resilient agricultural practices. That is, the project will increase climate resilience of 500,000 people in Turkmenistan's rural communities, representing the most vulnerable economic communities in Turkmenistan. As described in the baseline section, such farmers currently cannot effectively benefit from existing state support. They lack access to resources and know-how to invest in climate resilient practices and technologies, and in terms of how to manage water and land resources in an efficient way. Improved livelihood opportunities will facilitate the right to work and anticipated project impacts also expedite right to environmental protection and climate adaptation.

202. In doing so, the project aims to promote the social and economic rights of beneficiaries, including the right to habitat and economic security, as reducing land degradation results in improved and more stable crop yields and incomes. The project also places emphasis on stakeholder engagement and capacity building at the local level, to ensure that solutions reflect specific needs and priorities, enhancing the project's social benefits. Equal consideration for the most vulnerable stakeholders, including testing ability-to-pay of the poorest beneficiaries in regards to policy measures such as water tariff setting, is ensured to mainstream human rights-based approach in the project. Strengthening land tenure rights, supporting the development of legal structures to facilitate collective planning and investment, and promoting the shift towards market-based pricing for water access, also mainstream the human-rights based approach.

203. *Gender equity and women's empowerment*: Turkmenistan adopted legislation and a National Action Plan for Gender Equality for 2015-2020 that was approved by the Resolution of the President of Turkmenistan in January 2015. Turkmenistan was a member of the Executive Board of the UN Entity for Gender Equality and Empowerment of Women (UN Women) for the period of 2016-2018. http://www.unwomen.org/en/executive-board

204. In the pilot farmer associations and livestock farm, women account for, on the average around 51-52% of the population. They are mainly engaged in housekeeping, teaching, and

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administrative support services. Many more women form part of the unpaid family labour in home farming and lease of agricultural lands.

205. Gender considerations, noting the above assessment and constraints, will be fully mainstreamed into project implementation. The programme will provide opportunities for women to learn about climate resilience and integrate best practices into their operations, and ensure that women are also able to access the capacity building and training, required to practice climate-resilient agriculture, as well as to diversify their livelihoods in more resilient ways. The project will ensure that there is gender balance in project activities (e.g. seminars, community level events) including access to project financial assistance. Gender considerations will inform any community level vulnerability analysis linked to local infrastructure or demonstration plot development through consultation regarding needs and preferences on types of training and investment. The project will also gather gender-disaggregated data for evaluation purposes and use gender sensitive indicators (particularly around beneficiaries) to facilitate planning, implementation and monitoring. The Gender Action Plan is provided with the full proposal and will be updated regularly during the project implementation.

206. *Core labor rights*: Turkmenistan ratified all the eight ILO fundamental conventions (Source: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103551). The information on the ILO website with regard to application of labour standards in Turkmenistan reveal no major observations and issues. There is also no record of complaint on labour related issues. The project will ensure that national working standards (Labour Code) are respected. Also, Program will ensure that appropriate wages will be paid per assigned task and that no child labor will be employed. Security and safety standards will also be respected and enforced. The project will set up a Grievance Redress Mechanism to allow those that might have a complaint and/or grievance to be able to communicate their concerns and/or grievances through an appropriate process. The Complaints Register and Grievance Redress Mechanism set out in the ESMF (Annex 8) are to be used as part of the project and will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes.

207. *Indigenous people*: there are no indigenous people in Turkmenistan. The project intervention will not create any risks to or impacts on the minorities. The project will carry out vulnerability screening and set up annual monitoring and reporting to verify that more vulnerable farmers, including minorities where applicable, have access to all benefits delivered by the project including extension services.

208. *Involuntary resettlement*: there will be no involuntary displacement or resettlement related to this project.

209. *Protection of natural habitats*: Turkmenistan has four key laws in relation to habitats, namely the State Law on Nature Protection, the State Law on Protected Areas and Laws on Flora and Fauna. The latter three regulate the conservation and management of natural habitats. Turkmenistan is a party to Ramsar Convention, which entered into force in Turkmenistan on 3 July 2009. Turkmenistan currently has 1 site designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 267,124 hectares.

210. There are no critical natural habitat sites in the areas that the project will cover. Furthermore, the project sites will be selected from among the existing agricultural fields. Priority will be given to degraded and salinated lands to demonstrate and promote sustainable

water and land management practices. No risks to natural habitats will be triggered by this project.

211. *Conservation of biological diversity*: the project on the ground activities are limited within relatively small demonstration plots on the converted agricultural land. The project sites are not located in the protected areas or in the areas with significant biological diversity.

212. *Climate Change*: As a result of climate change, significant decreases in water supply are expected. The average reduction in run off rates in terms of surface water collected in national storage and distribution systems is expected to be 10 percent, whereas during crop growing season the reduction in runoff rates will reach 30-40 percent. Water scarcity might have negative impact on the implementation of new technologies and demonstration projects. The project will help address this risk by directly supporting water saving technologies. It will create meaningful benefits even if conditions tend to make the root problems worse. Adaptation is an explicit objective of the project, and the activities of the project will have direct benefits in terms of climate change adaptation as well as mitigation. Regardless, assessment of water availability and actual water use, will be an important task to make sure that proposed solutions have adequate and available resources base to operate.

213. *Pollution prevention and resource efficiency*: Outcome 3 of the project proposes investments in efficient irrigation techniques (e.g. drip, sprinkler). UNDP has accumulated solid experience in successful demonstration and promotion of water and energy efficient practices, which are expected to be used and scaled up through this project. The irrigation technologies that UNDP promotes are efficient in terms of rational water use and leave minimal or no drainage waters. Furthermore, more innovative and emission and waste-free ways are rigorously being investigated now within the ongoing projects, such as solar-powered water pumping and treatment facilities to satisfy both household and agricultural needs, primarily in remote desert areas, where traditionally diesel is used for similar purposes. Thus, the resource efficiency , will become the backbone for defining and implementing technologies and equipment at the project's proposed sites, each of which will have a dedicated action plan and a cost-estimate, inclusive of waste and pollution prevention measures. The overall project monitoring plan and site based monitoring mechanisms will include a set of indicators to measure and verify project performance against preventing waste and pollution.

214. However, there is a risk that the choice of irrigation technology may lead to an increase in the use of surface water. The significance of the potential environmental risks is moderate given that the focus of the project is increasing water use efficiency, but the overall use of water should be monitored. The design of demonstration projects featuring new water saving technologies will be based on careful hydrological studies in the chosen locations which would take into account the hydrographic parameters of the landscape, available water sources, their quantity and quality. Experienced local experts, drawing on international expertise as necessary, will carry out these engineering and hydrological studies. Irrigation technologies will also be monitored however for trends in water usage. In addition, Components 1-2 are aimed at supporting efficient water management practices and techniques to mitigate and minimize potential increase in water demand.

215. *Public health*: The project will cause no negative impact on public health. On the contrary, the project will contribute to enhancing the health situation, as it seeks to improve the social and economic environment as well as the physical environment. The project will primarily focus on restoring degraded and salinized lands, will promote application of efficient

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technologies and practices with no hazardous fertilizers and other chemical and mineral substances, and will thus improve the nutritional qualities of agricultural produce. The project will improve farmers' knowledge on those practices including on sustainable use of fertilizers. The project will facilitate the overall strategic objective of improving access to, and distribution of quality food as a result of better and more sustainable water, land and farming practices, and will thus increase food safety and minimize foodborne illness hazards.

216. *Physical and cultural heritage*: There are no sites with the physical and cultural heritage located in the areas of direct project interventions.

217. *Land and soil conservation*: The project on-the-ground interventions are limited within the demonstration plots on the productive/converted agricultural land. The project activities will not modify existing types of land use and will not interfere with the biodiversity conservation areas. Climate change adaptation practices and scaled up application of resilient water- and land-use technologies promoted by the project will have a positive effect on the reduction of land degradation and improvement of soil quality.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		✓
Access and Equity		✓
Marginalized and Vulnerable Groups		✓
Human Rights	✓	
Gender Equity and Women's Empowerment	✓	
Core Labour Rights	✓	
Indigenous Peoples	✓	
Involuntary Resettlement	✓	
Protection of Natural Habitats	✓	
Conservation of Biological Diversity	✓	
Climate Change		✓
Pollution Prevention and Resource Efficiency		✓
Public Health	✓	
Physical and Cultural Heritage	✓	
Lands and Soil Conservation		✓

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PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

218. The Ministry of Agriculture and Environment Protection (MAEP) is the government institution responsible for the implementation of the project and will act as the Executing Agency (EA). The Union of Industrialists and Entrepreneurs along with other relevant national entities will act as project partners and will become part of Project Board.

219. At the request of the Government of Turkmenistan, UNDP is the Multilateral Implementing Entity (MIE). The project is nationally executed by MAEP according to the UNDP national implementation modality (NIM), in line with the Standard Basic Assistance Agreement (SBAA, 1993) and the UN Partnership Framework for Development (UNPFD) 2016-2020 between the UN and the Government of Turkmenistan.

220. As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key oversight and specialized technical support services. These services are provided through UNDP's global network of country, regional and headquarters offices and units and include assistance in: project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of staff and consultants; general oversight and monitoring, including participation in reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

221. As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of execution modalities determined on country demand, the specificities of an intervention, and a country context. Under the national execution modality (NIM) proposed, UNDP selects a government entity as the Executing Entity based on relevant capacity assessments performed by UNDP. Please note that UNDP uses slightly different terminology to that used by the operational policies and guidelines of the Adaptation Fund. In UNDP terminology, the "executing entity" is referred to as the "Implementing Partner" in countries which have adopted harmonized operational modalities and the "Executing Entity" in countries which have not yet done so. The Executing Entity is the institutional entity entrusted with and fully accountable to UNDP for successfully managing and delivering project outputs. It is responsible to UNDP for activities including: the preparation and implementation of work plans and annual audit plans; preparation and operation of budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and personnel; financial and progress reporting; and monitoring and evaluation. As stated above, however, UNDP retains ultimate accountability for the effective implementation of the project.

222. MAEP will assume responsibility for the implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to the management unit, and inputs for, the implementation of all activities. MAEP will nominate a high-level official who will serve as the National Project Director (NPD) for project implementation. The NPD will chair the Project Board and be responsible for providing government oversight and guidance to the implementation. The NPD will not be paid from project funds but will represent a Government in kind contribution.

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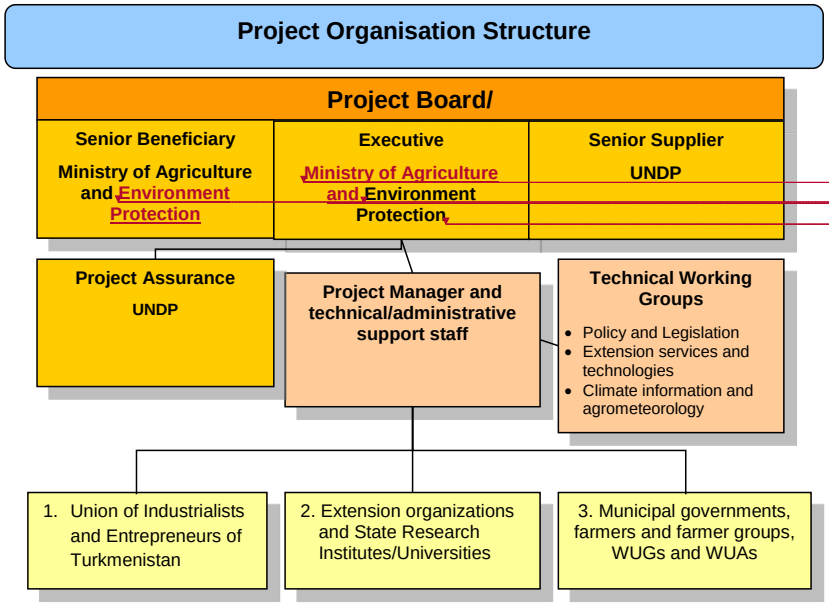
223. A **Project Board (PB**) will be convened by MAEP and will serve as the project's coordination and decision-making body. The PB meetings will be chaired by the NPD. It will meet according to necessity, but not less than once in 6 months, to review progress, approve work plans and approve major deliverables. The PB is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined. The PB's role will include: (i) overseeing project implementation; (ii) approving all work plans and budgets, at the proposal of the Project Manager (PM), for submission to UNDP-GEF in Istanbul Regional Hub; (iii) approving any major changes in plans or programmes; (iv) providing technical input and advice; (v) approving major deliverables; (vi) ensuring commitment of resources to support implementation; (vii) arbitrating any conflicts within the project and/or negotiating solutions between the project and any other stakeholders and (viii) overall evaluation.

224. **Project Assurance:** UNDP Turkmenistan will support project implementation by assisting in monitoring project budgets and expenditures, recruiting and contracting project personnel and consultant services, subcontracting and procuring equipment. UNDP Turkmenistan will also monitor the project implementation and achievement of the project outcomes/outputs and ensure the efficient use of donor funds through an assigned UNDP Programme Manager. UNDP will act as the Senior Supplier and Project Assurance.

225. **National Project Director** (NPD): The NPD will be a member of MAEP, assigned to the project for its period of duration. The NPD's prime responsibility is to ensure that the project produces the results specified in the project document to the required standard of quality and within the specified constraints of time and cost.

226. **Mechanisms for local participation:** the project will use the existing locally established mechanisms for local consultation and participation.



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227. The day-to-day administration will be carried out by a Project Manager (PM) and Project Assistant (PA), who will be located within the MAEP offices. As per Government requests, the staff will be recruited using standard UNDP recruitment procedures. The PM will, with the support of the PA, manage the implementation of all activities, including: preparation/updates of work and budget plans, record keeping, accounting and reporting; drafting of terms of reference, technical specifications and other documents as necessary; identification, proposal of consultants to be approved by the PB, coordination and supervision of consultants and suppliers; organization of duty travel, seminars, public outreach activities and other events; and maintaining working contacts with partners at the central and local levels. The Project Manager will liaise and work closely with all partner institutions to link the project with complementary national programmes and initiatives. The PM is accountable to UNDP and to the MAEP and the PB for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Annual Work and Budget Plans (AWP&ABP) The PM will further produce quarterly operational reports and Project Performance Reports (PPR). These reports will summarize the progress made versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring activities. The PM will be technically supported by contracted national and international service providers, based on need as determined by the PM and approved by the PB. Recruitment of specialist services will be done by the PM, in consultation with the UNDP and MAEP and in accordance with UNDP's rules and regulations.

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228. UNDP Direct Project Services as requested by Government: The UNDP, as the Implementing Entity for this project, will provide oversight and project cycle management services for the project as defined by the Adaptation Fund Board. In addition, the Government of Turkmenistan may request UNDP direct services for specific projects, according to its policies and convenience. The UNDP and Government of Turkmenistan acknowledge and agree that those services are not mandatory, and will be provided only upon Government request. If requested the services would follow the UNDP policies on the recovery of direct costs. These services (and their costs) are specified in the Letter of Agreement (Annex 4). As is determined by the AF Board requirements, these service costs will be assigned as Project Management Cost, duly identified in the project budget as Direct Project Costs. Eligible Direct Project Costs should not be charged as a flat percentage. They should be calculated based on estimated actual or transaction-based costs and should be charged to the direct project costs account codes: 64397 – 'Services to projects - CO staff' and 74596 – 'Services to projects - GOE for CO'.

B. Describe the measures for financial and project / programme risk management.

Risk	Risk Rate	Action
Reluctance of decision makers to adopt recommendations on new legislation or regulation	Medium	Active engagement of Ministry partners at senior level. Project design phase has included close consultations with Ministries and includes elements that are considered realistic within given timescales. The project builds upon the successful implementation of the first Adaptation Fund project which was able to support revisions to the Water Code around the establishment of Water User Associations and set the legal basis for water pricing.

Institutional conflict prevents the development of a strategy for climate resilience in the private agriculture sector	Medium	Strong focus on stakeholder consultation and alignment, bringing together MAEP and the Union of Industrialists and Entrepreneurs with other stakeholders
Due to staff turnover at the target Ministries the trained staff may leave for other job opportunities undermining installed technical capacity	Medium	Special training conditions and / or training for trainers will be arranged to leave the trained staff at the target Ministries.
Market for climate resilient extension services proves to be non-sustainable in the long run, particularly for poorer smaller-scale private farmers	Medium	Explore different operating models (state, private) to understand the costs and benefits, and the level of incentive support required to ensure sustainability
Lack of willingness among public and private sector partners to engage in developing demonstration sites.	Medium	Development of incentive packages and support to technology implementation and training. Design phase indicates that there is interest for collaboration across a range of partners
Farmers may not be interested in or may not afford any new efficient water irrigation technologies or any other technologies that will be demonstrated through this project	Medium	There is an evidence of emerging interest in efficient irrigation and greenhouse development in Turkmenistan both at the national policy level and among farmers. The project will work with Union of Entrepreneurs to promote value of shift to resilient agriculture. Collaboration will be established with Daihanbank and other government subsidised programmes for efficient agriculture investment to facilitate access to finance.

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C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.

229. Measures for environmental and social risk assessment and mitigation, complying with the Environmental and Social Principles (ESP) of the Adaptation Fund, with UNDP's Social and Environmental Standards (SES), as well as with applicable national and international policies, laws and regulations are outlined in the SES Report and ESMF provided in Annex 7. and Annex 8 respectively

230. The Social and Environmental Report lists all potential environmental and social risks and provides the assessment and management measures to address those risks. The environmental and social risks have been reviewed in the project risk register and will be fully monitored during programme implementation, with formal review of any potential issues by the project team and the project board.

231. Based on the Environmental and Social screening process, it has been determined that the proposed project has limited potential for causing adverse impacts to the environment, natural habitats and/or ecosystems and ecosystem services. Rather, the project will likely have significant benefits in regards to enhancing natural habitats and ecosystems services through improved use of water resources. Given that the project has a few potential adverse impacts, which are small in scale, not widespread, and easily mitigated the project should be considered a Category B project, with only limited assessment required at project inception. Regardless, risks will be monitored according to potential impacts noted in the SES report. If

any of the pilot demonstration activities require further assessment and management (such as groundwater abstraction) an Environmental and Social Management Framework (ESMF) has also been provided, which should be used as the basis for preparing a site-specific Environmental and Social Management Plan.

232. The proposed project has been designed to be in line with both the Environmental and Social Policy of the Adaptation Fund as well as the UNDP Social and Environmental Standards. All activities leading to significant or irreversible environmental and social risks have been eliminated, included project activities in environmentally critical areas, adverse public health or labour impacts, any physical or economic displacement and any infringement on human rights.

233. Gender considerations will be fully mainstreamed into project implementation, including opportunities for women to learn about climate resilience, as well as to diversify their livelihoods in more resilient ways. The project will ensure that there is gender balance in project activities including access to project financial assistance and gender considerations will be used in any community level vulnerability analysis linked to local infrastructure or demonstration plot development. The project will also use gender sensitive indicators (particularly around beneficiaries) to facilitate planning, implementation and monitoring.

234. The project was developed in a participatory manner in consultation with stakeholders, and a record of relevant consultations is provided in Annex 9. Furthermore, information required to access the grievance mechanism of both the Adaptation Fund and/or UNDP (in additional to any locally available grievance mechanisms) has been provided in the ESMF (Annex 8).

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

235. Project monitoring and evaluation (M&E) will be in accordance with established UNDP procedures and will be carried out by the Project team, verified by the MAEP and the UNDP Country office in Turkmenistan. Dedicated support by the technical adaptation teams in the UNDP Istanbul Regional Hub and UNDP-GEF New York will be provided on a regular basis.

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236. A comprehensive Results Framework for the project will define execution indicators for project implementation as well as the respective means of verification. A Monitoring and Evaluation system for the project will be established based on these indicators and means of verification.

237. Targeted M&E activities for the proposed project include the following:

- A Project Inception Workshop will be conducted within two months of project start up with the full project team, relevant government counterparts and UNDP. The Inception Workshop is crucial to building ownership for the project results and plan the first-year annual work plan. A fundamental objective of the Inception Workshop will be to present the modalities of project implementation and execution, document mutual agreement for the proposed executive arrangements amongst stakeholders and assist the project team to understand and take ownership of the project's goals and objectives.
- Another key objective of the Inception Workshop is to introduce the project team which will support the project during its implementation. An Inception Report will be prepared and shared with participants to formalize various agreements decided during the meeting.

- A UNDP risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified.
- Quarterly Progress Reports will be prepared by the Project team and verified by the Project Board.
- Project Performance Reports (PPR) will be prepared to monitor progress made since project start and for the previous reporting period. These annual reports include, but are not limited to, reporting on the following:
    - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative);
    - Project outputs delivered per project Outcome (annual);
    - Lessons learned/good practices;
    - Annual expenditure reports;
- Reporting on project risk management.
- Government authorities, members of Steering Committee/Project Board and UNDP staff will conduct regular field visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress.

238. In terms of financial monitoring, the project team will provide UNDP with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects by a legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

239. The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term.

240. Final External Evaluation will be conducted no later than 3 months before project closure.

The budgeted Monitoring & Evaluation plan is as follows:

Type of M&E activity	**Responsible Parties**	**Budget US$**	**Timeframe**
Inception workshop	Project Coordinator UNDP CO	$3000	Within first two months of project start up
Inception Report	Project team UNDP CO	None	Immediately following IW
Measurement of Means of Verification	Project Coordinator	None	State, mid and end of project

for Project Purpose Indicators			
Annual measurement of indicators	Project Coordinator	None	Annual prior to annual reports and the definition of annual work plans
Monthly/quarterly reports	Project team	None	End of each month
Annual reports	Project team CoRI UNDP CO	$2000 (total amount for all years)	End of each year
Meetings of project Coordination Committee	Project Coordinator UNDP-CO	None	After inception workshop and thereafter at least once a year
Technical reports	Project team External consultants	None	To be determined by Project Team and UNDP CO
Mid-term external evaluation	Project team UNDP CO External consultants	$24,000	Mid-point of project implementation
Final external evaluation	Project team UNDP CO External Consultants	$24,000	End of project implementation
Final report	Project team UNDP CO	None	At least one month before end of project
Publication of lessons learned	Project team	$18,000 ($3,000 per year)	Yearly
Audit	UNDP CO Project team	$42,000 ($7,000 per year)	Yearly
Visits to field sites	UNDP CO CoRI Project team	$12,000 ($2,000 per year)	Yearly
Total indicative Cost		**$125,000**	

NB: Above costs do not cover UNDP staff time. All UNDP staff costs associated with M&E are covered by the MIE Fee.

The M&E budget will be taken pro-rata from the three project component budgets, reflecting the size of the TA.

E. Include a results framework for the project proposal, including milestones, targets and indicators.

Objective: To improve climate resilience among smaller private sector farmers including women through strengthening the enabling environment, expanding climate resilient extension services and creating demonstration sites to support communities across farming systems in Turkmenistan					
	Indicators	**Baseline**	**Goals** **Project completion**	**Means of verification**	**Risks and assumptions**
Objective of the Project **To improve climate resilience among smaller private sector farmers including women through strengthening the enabling environment, expanding climate resilient extension services and creating demonstration sites to support communities across farming systems in Turkmenistan**	Number / % of targeted population applying appropriate adaptation responses (disaggregated by gender)	Agricultural development activity in the non-state crop sector does not incorporate considerations of climate risk or resilience best practice. Smaller private farmers tend to be more vulnerable to climate change impacts and lack adequate resources to access climate resilient extension services on a commercial basis. Women farmers are even more vulnerable because of inequality in terms of division of labor, access to decision making and to resources While some larger commercial farmers have begun to incorporate climate resilience best practices in agriculture, water and soil management, these are not accessible (to smaller scale private sector farmers, with female farmers being particularly disadvantaged	By the end of the project 10,000 farming enterprises including female-headed employing 50,000 farmers able to apply appropriate adaptation responses (minimum 30% women)	Farmer survey through extension service providers	Farming enterprises have access to funds to invest in or adopt new resilient agricultural technologies Farming enterprises are convinced of the need to invest in addressing climate risks and impacts Farming enterprises have access to technologies and know-how suitable for the Turkmen context
	Volume of new investment in adaptation measures and technologies by private farming enterprises and entrepreneurs as % of agricultural investment		Private farmers including women engaging with the programme increase their investment in climate smart agriculture by 50% compared to baseline.		
	Knowledge generated and transferred to other public and private stakeholders at the national level: number of institutional actors engaging with resilient farming		At least 20 national and regional institutions (public and private) participating in gender-sensitive resilience capacity building, policy development and reporting increased awareness and understanding of climate resilience	Project annual reports; Mid-term evaluation, final report. Participation in workshops, consultations and training	

		Small scale farmers lack the funds, organizing structures and incentives to invest collectively at scale to develop climate resilient agriculture.			
Outcome 1 **Outcome 1:** The enabling environment developed to encourage and facilitate private sector investments into climate resilient agricultural development.	**Indicator 1.1:** Number of laws and sub-regulations in the area of water and land management that are strengthened and communicated to private sector farmers.	Government has made progressive steps towards improving the legislation that underpins resilience (Water Code, Land Code). There is an opportunity to conduct gender analysis of legal acts, developed by the project. There is a need for secondary regulations to support implementation and incentivize farmers to invest in more climate resilience water and land management. Legislation also remains poorly understood by farming communities and is not communicated in an accessible format.There are currently no strategic or implementing arrangements for promoting resilience among private sector farmers at a national or regional level. Capacity among key national and regional stakeholders to understand best practices and best	**Indicator target 1.1.** a). At least 3 gender sensitive laws or sub regulations amended or developed supporting climate resilience for private sector farmers by 2024. b). At least 2 gender sensitive guidance notes prepared explaining legislative changes in the water and land code to small scale private farmers.	Project annual reports; Mid-term evaluation, final report. National law journal	Government of Turkmenistan and Parliament engage in a timely fashion to develop and implement climate resilience policy and sub-regulations Government of Turkmenistan institutions become engaged on the strategic development of resilience in the non-state farming sector.
	Indicator 1.2: A Strategic Concept to support climate resilience in non-state agriculture sector is adopted and capacity built among key stakeholders for its implementation.		**Indicator target 1.2.** A gender-sensitive Strategic Concept to support climate resilience among smallholder farmers is developed and agreed with MAEP and other stakeholders.		
	Indicator 1.3. **a)** % increase in institutional capacity to promote climate resilience in private sector agriculture b) Number of staff from targeted institutions trained to respond to		**Indicator target 1.3.** a) 50% increase in institutional capacity (measured through an institutional capacity assessment scorecard) b) At least 50 officials and other key national/regional stakeholders trained on improving the enabling	Institutional capacity assessment scorecard Capacity review Training test results	

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	impacts of climate-related events	available technologies remains weak	environment (including at least 30% women)		
Outcome 2 Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farming enterprises and entrepreneurs (including women) to adopt climate smart agriculture practices.	**Indicator 2.1:** Number and type of organizations providing climate resilient extension services to private sector farmers	The market for providing agricultural extension services to private sector farmers in Turkmenistan is underdeveloped with limited domestic capacity. There is no consolidated assessment of the climate risk challenges and gender specific needs of farmers operating in the non-state crop sector. Information materials on climate resilience best practices and best available technologies for non-state order crops and livestock are limited,	**Indicator target 2.1.** a) At least 50 organizations or consultants agree to participate and are trained to deliver climate resilient agriculture extension and advisory services in all 5 regions of Turkmenistan. Gender sensitivity of advisory services will be ensured through engendering of the training materials b) On-line portal / virtual library of resilient technologies operationalized	Project annual reports; Mid-term evaluation, final report; Assessment of capacities of extension services before and after AF project intervention Partner reporting and audit. On-line virtual library	The non-state agriculture sector continues to grow in scale and importance to become the dominant modality with a significant market for agricultural support services. Public and private sector institutions and consultants are willing to engage in the supply of resilient extension services. Farmers are willing to engage in learning

	Indicator 2.2. Number of beneficiaries of climate resilient extension and advisory services (split by gender and other socio-economic parameters (e.g. size of farm).	and are not easily accessible, particularly in local language. Gender sensitive relevant materials are even less accessible. Agricultural development activity in the non-state crop sector does not incorporate considerations of climate risk or resilience best practice. Smaller private farmers tend to be more vulnerable to climate change impacts and lack adequate resources to access climate resilient extension services on a commercial basis.	**Indicator target 2.2.** a) At least 20,000 private sector farmers access information on climate resilient best practices and best available technologies and change behavior or adopt new approaches (at least 30% are women) b) At least 2000 private sector farmers receive direct field training in climate resilient agriculture and best practices of which 80% are small-scale farmers in vulnerable regions of Turkmenistan (at least 30% women)	Project annual reports; Mid-term evaluation, final report; Community surveys Monitoring of visitors of the on-line virtual library	about climate resilience and adopting new practices.
Outcome 3 Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers	**Indicator 3.1:** Number of new accessible demonstration sites on climate resilient agricultural practices established across Turkmenistan	There are very few demonstration plots or research sites that allow for the dissemination of climate resilient best practices or best available technologies and most existing facilities are relatively old lack equipment and know how. What demonstration sites exist are not accessible to private sector farmers, leaving limited opportunities for field demonstration and peer to peer learning. While some larger commercial farmers have	**Indicator target 3.1.** a). At least 1 new demonstration site (min 20 ha) developed on the base of existing Government of Turkmenistan Agricultural Institute facilities showcasing best practice technologies and approaches in non-state crop sector. b). At least 3 accessible demonstration sites developed in partnership with larger private sector agricultural companies to showcase specific crop or livestock specific technologies c). At least 3 community level gender balanced cooperatives or groups of private sector	Project annual reports Field visits Mid-term evaluation, final report Community Surveys; Partner reporting Audit	MAEP is willing to support the development and repositioning of a research demonstration plot. Private sector farmers are willing to co-invest in resilience and share best practice in their regions and along their supply chains Communities are interested in designing and bidding for funds for community level

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		begun to incorporate climate resilience best practices in agriculture, water and soil management, these are not accessible (financially, awareness) to smaller scale private sector farmers, especially female farmers. Small scale farmers lack the funds, organizing structures and incentives to invest collectively at scale to develop climate resilient agriculture. One new demonstration plot on water efficient irrigation technologies was established by the UNDP/GEF project in Ahal Velayat	farmers design and implement climate resilient best available agriculture measures with at least 30% female participation		farming resilience projects.
	Indicator 3.2: Number of climate adaptation technologies or best practices applied/ demonstrated		**Indicator target 3.2.** At least 15 different technologies or best practices are covered collectively by investments in demonstration sides	Project annual reports. Mid-term evaluation, final report Field visits Demonstration site reports	
	Indicator 3.3: Number of farmers visiting project demonstration sites for field training and to learn about best practices and technologies (in conjunction with Component 2)		**Indicator target 3.3.** At least 1000 farmers visit project demonstration sites for field training and to learn about best practices and technologies (at least 30% women)	Project annual reports. Mid-term evaluation, final report Demonstration site reports Community Surveys;	

F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

The alignment is set out below.

Project Objective(s)[17]	**Project Objective Indicator(s)**	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount (USD)**
To improve climate resilience among smaller private sector farmers including women through strengthening the enabling environment, expanding climate resilient extension services and creating demonstration sites to support communities across farming systems in Turkmenistan	Number / % of targeted population applying appropriate adaptation responses (disaggregated by gender) Volume of new investment in adaptation measures and technologies by private farming enterprises and entrepreneurs as % of agricultural investment	Outcome 3. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Percentage of targeted population applying appropriate adaptation responses	7,000,040
	Knowledge generated and transferred to other public and private stakeholders at the national level	Outcome 3. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses 4.1. Responsiveness of development sector services to evolving needs from changing and variable climate	
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 1: The enabling environment developed to encourage and facilitate private sector investments into climate resilient agricultural development.	**Indicator 1.1:** Number of laws and sub-regulations in the area of water and land management that are further strengthened and communicated to private sector farmers	7.1 Improved integration of climate-resilience strategies into country development plans	7.1.1. No of policies introduced or adjusted to address climate change risks	644,000
	Indicator 1.2: A Strategic Concept to support climate resilience in non-state agriculture sector is adopted and capacity built among key stakeholders for its implementation.	7.1 Improved integration of climate-resilience strategies into country development plans	7.1.2 No of targeted development strategies with incorporated climate change priorities enforced	

[17] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

	Indicator 1.3. **a)** % increase in institutional capacity to promote climate resilience in private sector agriculture b) Number of staff from targeted institutions trained to respond to impacts of climate-related events	2.1 Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.2. No of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale) 2.1.1. No of staff trained to respond to, and mitigate impacts of climate related events (by gender)	
Outcome 2: Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farmers to adopt climate smart agriculture practices.	**Indicator 2.1:** Number and type of organizations providing climate resilient extension services to private sector farmers	4.1 Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.1. No and type of development sector services modified to respond to new conditions resulting from climate variability and change (by sector and scale)	2,916,950
	Indicator 2.2. Number of beneficiaries of climate resilient extension and advisory services (split by gender and other socio-economic parameters (e.g. size of farm).	3.1 Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1 No of news outlets in the local press and media that have covered the topic	
Outcome 3: Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers	**Indicator 3.1:** Number of new accessible demonstration sites on climate resilient agricultural practices established across Turkmenistan	4.1 Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale	2,331,700
	Indicator 3.2: Number of climate adaptation technologies or best practices applied/ demonstrated	4.1 Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by sector and scale	
	Indicator 3.3: Number of farmers visiting project demonstration sites for field training and to learn about best practices and technologies (in conjunction with Component 2)	3.1 Targeted population groups participating in adaptation and risk reduction awareness activities		

G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Award ID	00097117	Project ID	00100962
Project Title	Scaling climate resilience for farmers in Turkmenistan		
Business Unit	TKM10		
Project Title	Scaling climate resilience for farmers in Turkmenistan		
PIMS No.	6246		
Implementing Partner	Ministry of Agriculture and Environment Protection of Turkmenistan		

Outcome/ Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD	Total (USD)	Budget Notes
Outcome 1: The enabling environment developed to encourage and facilitate private sector investments into climate resilient agricultural development.	MAEP	62040	AF	71200	International consultant	35,000	40,000	48,000	10,000	18,000	5,000	156,000	1
				71300	Local consultant	45,000	55,000	40,000	10,000	10,000	15,000	175,000	2
				71400	Contractual services (individual)	28,000	28,000	28,000	28,000	28,000	28,000	168,000	3
				71600	Travel	7,500	9,000	7,500	4,000	2,500	2,500	33,000	4
				75700	Training, Workshops and Confer	16,000	17,000	16,500	4,000	5,500	-	59,000	5
				74200	Audio Visual&Print Prod Costs	3,000	11,000	10,000	5,000	5,000	3,000	37,000	6
				74500	Miscellaneous Expenses	2,000	3,000	3,000	3,000	3,000	2,000	16,000	7
					Total Outcome 1	**136,500**	**163,000**	**153,000**	**64,000**	**72,000**	**55,500**	**644,000**	

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Outcome 2: Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farmers to adopt climate smart agriculture practices	MAEP	62040	AF	71200	International consultant	60,000	95,000	78,000	60,000	58,000	45,000	396,000	8
				71300	Local consultant	80,000	220,000	205,000	195,000	110,000	90,000	900,000	9
				71400	Contractual services (individual)	50,000	50,000	50,000	50,000	50,000	50,000	300,000	10
				71600	Travel	43,550	65,050	48,550	45,750	44,250	20,000	267,150	11
				75700	Training, Workshops and Confer	39,000	55,000	39,000	33,500	29,500	14,800	210,800	12
				74200	Audio Visual&Print Prod Costs	12,000	21,000	21,000	21,000	17,000	11,000	103,000	13
				72200	Equipment and furniture	7,000	127,000	127,000	127,000	7,000	-	395,000	14
				72100	Contractual Services - Companies	5,000	105,000	105,000	100,000	-	-	315,000	15
				74500	Miscellaneous Expenses	5,000	5,000	5,000	5,000	5,000	5,000	30,000	16
					Total Outcome 2	**301,550**	**743,050**	**678,550**	**637,250**	**320,750**	**235,800**	**2,916,950**	
Outcome 3: Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience	MAEP	62040	AF	71200	International consultant	15,000	34,000	32,000	20,000	28,000	15,000	144,000	17
				71300	Local consultant	30,000	100,000	100,000	85,000	80,000	35,000	430,000	18
				71400	Contractual services (individual)	50,000	50,000	50,000	50,000	50,000	50,000	300,000	19
				71600	Travel	9,750	20,500	20,500	20,500	15,500	9,750	96,500	20
				75700	Training, Workshops and Confer	8,500	15,500	10,000	5,000	5,000	3,200	47,200	21

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outcomes for farmers				74200	Audio Visual&Print Prod Costs	3,000	3,000	3,000	3,000	3,000	3,000	18,000	22
				72200	Equipment and furniture	-	250,000	360,000	210,000	110,000	-	930,000	23
				72100	Contractual Services - Companies	-	120,000	120,000	100,000	-	-	340,000	24
				74500	Miscellaneous Expenses	4,000	4,500	4,500	4,500	4,500	4,000	26,000	25
					Total Outcome 3	**120,250**	**597,500**	**700,000**	**498,000**	**296,000**	**119,950**	**2,331,700**	
Project Execution Costs	**UNDP**	62040	**AF**	71400	Contractual services (individual)	42,000	42,000	42,000	42,000	42,000	42,000	252,000	26
				71600	Travel	5,000	5,000	5,000	5,000	5,000	5,000	30,000	27
				72500	Supplies	3,000	3,000	3,000	3,000	3,000	3,000	18,000	28
				72200	Equipment and furniture	10,000	3,000	3,000	3,000	3,000	2,000	24,000	29
				72800	Information Technology Equipment	10,000	3,000	3,000	5,000	3,000	2,000	26,000	30
				73100	Rental & Maintenance-Premises	2,000	2,000	2,000	2,000	2,000	2,000	12,000	31
				74500	Miscellaneous Expenses	1,000	1,000	1,000	1,000	1,000	1,000	6,000	32
				74956	Direct project cost	20,000	45,000	45,000	40,000	25,000	16,000	191,000	33
					Total project execution cost	**93,000**	**104,000**	**104,000**	**101,000**	**84,000**	**73,000**	**559,000**	
					Total Project Costs	**651,300**	**1,607,550**	**1,635,550**	**1,300,250**	**772,750**	**484,250**	**6,451,650**	

Total components	558,300	1,503,550	1,531,550	1,199,250	688,750	411,250	5,892,650
Project Execution Costs	93,000	104,000	104,000	101,000	84,000	73,000	559,000
Total project cost	651,300	1,607,550	1,635,550	1,300,250	772,750	484,250	6,451,650

Note	Atlas Code	Category	Total 6 years	Expenses Description (to be further completed at inception stage)
Outcome 1: The enabling environment to support climate resilient agricultural development to private sector farmers is strengthened. (US$ 644,000)				
1	71200	International consultant	156,000	Recruitment of an international consultant for advisory and resilience strategy support (including costs of the expert for mid-year and termination review)
2	71300	Local consultant	175,000	Local Consultant for legal advisory, to prepare guidance note, to support adaptation resilience strategy
3	71400	Contractual services (individual)	168,000	Recruitment of project technical staff (management and administrative staff) to implement activities under Outcome 1
4	71600	Travel	33,000	Travel of international expert to TKM, travel to capacity building events
5	75700	Training, Workshops and Confer	59,000	Policy discussion seminars, round table discussions on legislative activities (1 per year), round table discussions with MAEP on private agriculture resilience strategy and mandate, Capacity building events in Ashgabat and in the region
6	74200	Audio Visual&Print Prod Costs	37,000	Materials for the meetings (guides, final version of Strategy, etc.)
7	74500	Miscellaneous Expenses	16,000	Component 1 Miscellaneous costs (including bank charges, insurance)
Outcome 2: Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farmers to adopt climate smart agriculture practices. (US$ 2,916,950)				
8	71200	International consultant	396,000	Recruitment of international consultants for analytical and consultation to farmers, engagement with international suppliers, providing materials, best practice guidance, QA and review (including expert for mid-year and termination review)
9	71300	Local consultant	900,000	Local Consultants for legal, institutional and technical advisory, to support design and establishment of gender-responsive resilience extension services (including a gender expert)
10	71400	Contractual services (individual)	300,000	Recruitment of project technical staff (management and administrative staff) to implement activities under Outcome 2
11	71600	Travel	267,150	Travel of international experts to TKM, travel to the project sites and events in the region
12	75700	Training, Workshops and Confer	210,800	Regional workshops, consultations and trainings for service providers

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13	74200	Audio Visual&Print Prod Costs	103,000	Materials for the meetings, trainings
14	72200	Equipment and furniture	395,000	Database support, webservice and database support, climate resilience equipment for extension service providers, initial capital purchase of vehicle and equipment for training purposes
15	72100	Contractual Services - Companies	315,000	Extension service providers delivering resilience training to farmers
16	74500	Miscellaneous Expenses	30,000	Component 2 Miscellaneous costs (including bank charges, insurance)
Outcome 3: Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers (US$ 2,331,700)				
17	71200	International consultant	144,000	Recruitment of international consultants for design and selection technologies, QA and review (including expert for mid-year and termination review)
18	71300	Local consultant	430,000	Local Consultants for investment planning, management and oversight of implementation, including a gender expert
19	71400	Contractual services (individual)	300,000	Recruitment of project technical staff (management and administrative staff) to implement activities under Outcome 3
20	71600	Travel	96,500	Travel of international experts to TKM, travel to the pilot sites
21	75700	Training, Workshops and Confer	47,200	Community level consultations (vulnerability assessment, investment planning, gender analysis)
22	74200	Audio Visual&Print Prod Costs	18,000	Printing of project materials
23	72200	Equipment and furniture	930,000	Capital equipment for development of private sector sites and securing access for demonstration/training
24	72100	Contractual Services - Companies	340,000	Subcontracts to include design and supply costs
25	74500	Miscellaneous Expenses	26,000	Component 3 Miscellaneous costs (including bank charges, insurance)
Project Management (US$ 559,000)				
26	71400	Contractual services (individual)	252,000	Recruitment of project management and administrative staff
27	71600	Travel	30,000	Travel of Project staff to Project sites/monitoring missions
28	72500	Supplies	18,000	Purchase of office supplies for project operation
29	72200	Equipment and furniture	24,000	Purchase of office equipment and furniture for project staff

30	72800	Information Technology Equipment	26,000	Info-technological equipment for the project team
31	73100	Rental of premises	12,000	Rental of office premises
32	74500	Miscellaneous Expenses	6,000	Miscellaneous costs (including bank charges, insurance)
33	74956	Direct project cost	191,000	UNDP Direct Project Support Services – Please see Annex 4.

H. Include a disbursement schedule with time-bound milestones.

	Upon Agreement Signature	Upon start of project implementation for Year 1 activities	One Year after Project Start[a/]	Year 2[b/]	Year 3	Year 4	Year 5[c/]	**Total**
Scheduled Date	April 2019	June 2019	June 2020	June 2021	June 2022	June 2023	June 2024	
Project Funds		651,300	1,607,550	1,635,550	1,300,250	772,750	484,250	6,451,650
Implementing Entity Fee	219,356	33,216	81,985	83,413	66,313	39,410	24,697	548,390
Total	**219,356**	**684,516**	**1,689,535**	**1,718,963**	**1,366,563**	**812,160**	**508,947**	**7,000,040**

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[18] Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

Berdi Berdiyev Head of Department for Coordination of International Environment Cooperation and Projects, Ministry of Agriculture and Environment Protection of Turkmenistan, Designated Authority for Adaptation Fund in Turkmenistan	Date: 10 April 2019

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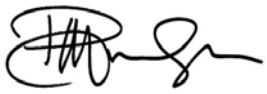
Deleted: August

Deleted: 2018

Deleted: Head of International Programme Coordination Department, State Committee for Environment protection and Land resources of Turkmenistan,¶

B. Implementing Entity Certification Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (including the National Strategy for socio-economic development up to 2030, the National Strategy of Turkmenistan on Climate Change and the first Turkmenistan NDC) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 Pradeep Kurukulasuriya Executive Coordinator & Director- Global Environmental Finance & Lead, Natural Capital and the Environment Bureau for Policy and Programme Support (BPPS)/ Global Policy Network United Nations Development Programme	
Date: *14 April 2019*	Tel. and e-mail: pradeep.kurukulasuriya@undp.org
Project Contact Person: Natalia Olofinskaya	

1. [6] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Tel. And Email: +90 543 532 3046 / nataly.olofinskaya@undp.org

Annex 1: Letter of Endorsement

TÜRKMENISTANYŇ
OBA HOJALYK WE DAŞKY
GURŞAWY GORAMAK
MINISTRLIGI

744036, Aşgabat şäheri, Arçabil şaýoly, 92-nji jaýy
Telefon: (+993 12) 44-74-04, 44-76-05; Faks: 44-74-01

TURKMENISTAN
MINISTRY OF AGRICULTURE
AND ENVIRONMENTAL
PROTECTION

92nd building, Archabil avenue, Ashgabat city, 744036
Telephone: (+99312) 44-74-04, 44-76-05; Fax: 44-74-01

"10" 04 2019 ý. № 01-1104/10

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Project "Scaling climate resilience for farmers in Turkmenistan"

We, the Head of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund and the Focal Point of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund, confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts and risks, posed by climate change in Turkmenistan.

Accordingly, we are pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by United Nations Development Programme and executed by the Ministry of Agriculture and Environment Protection of Turkmenistan.

Sincerely,

Magtymguly Bayramdurdyyev
Minister of Agriculture and Environment Protection of Turkmenistan
Head of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund

Berdi Berdiyev
Head of Department of Coordination of International Environment Cooperation and Projects,
Ministry of Agriculture and Environment Protection of Turkmenistan
Focal Point of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund

Annex 2: UNDP Fees for Support to Adaptation Fund Project

"Scaling Climate Resilience for Farming in Turkmenistan"

Category	Services Provided by UNDP	UNDP Fee (8.5%)
Identification, Sourcing and Screening of Ideas	Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF). Engage in upstream policy dialogue related to a potential application to the AF. Verify soundness & potential eligibility of identified idea for AF.	$27,419
Feasibility Assessment / Due Diligence Review	Provide up-front guidance on converting general idea into a feasible project/programme. Source technical expertise in line with the scope of the project/programme. Verify technical reports and project conceptualization. Provide detailed screening against technical, financial, social and risk criteria and provide statement of likely eligibility against AF requirements. Determination of execution modality and local capacity assessment of the national executing entity. Assist in identifying technical partners. Validate partner technical abilities. Obtain clearances from AF.	$82,258
Development & Preparation	Provide technical support, backstopping and troubleshooting to convert the idea into a technically feasible and operationally viable project/programme. Source technical expertise in line with the scope of the project/programme needs. Verify technical reports and project conceptualization. Verify technical soundness, quality of preparation, and match with AF expectations. Negotiate and obtain clearances by AF. Respond to information requests, arrange revisions etc.	$109,678
Implementation	Technical support in preparing TORs and verifying expertise for technical positions. Provide technical and operational guidance project teams. Verification of technical validity / match with AF expectations of inception report. Provide technical information as needed to facilitate implementation of the project activities. Provide advisory services as required. Provide technical support, participation as necessary during project activities. Provide troubleshooting support if needed. Provide support and oversight missions as necessary. Provide technical monitoring, progress monitoring, validation and quality assurance throughout. Allocate and monitor Annual Spending Limits based on agreed work plans. Receipt, allocation and reporting to the AFB of financial resources. Oversight and monitoring of AF funds. Return unspent funds to AF.	$246,776
Evaluation and Reporting	Provide technical support in preparing TOR and verify expertise for technical positions involving evaluation and reporting. Participate in briefing / debriefing. Verify technical validity / match with AF expectations of all evaluation and other reports Undertake technical analysis, validate results, and compile lessons. Disseminate technical findings	$82,259
Total		$548,390

Annex 3: Implementation schedule

	Yr-1				Yr-2				Yr-3				Yr-4				Yr-5				Yr-6				Total budget (USD)
	QR-1	QR-2	QR-3	QR-4	QR-1	QR-2	QR-3	QR-4	QR-1	QR-2	QR-3	QR-4	QR-1	QR-2	QR-3	QR-4	QR-1	QR-2	QR-3	QR-4	QR-1	QR-2	QR-3	QR-4	
Outcome 1: The enabling environment to support climate resilient agricultural development to private sector farmers is strengthened.																									
Output 1.1. Climate resilience is mainstreamed into policies and regulations in agriculture, w ater and land management sectors and communicated to farmers in an accessible w ay		77,000				82,000				82,000				1,000				1,000				-			243,000
Output 1.2.Capacity built for key government ministries and other relevant institutions on climate resilience in private sector agriculture		59,500				81,000				71,000				63,000				71,000				55,500			401,000
SUB-TOTAL:		**136,500**				**163,000**				**153,000**				**64,000**				**72,000**				**55,500**			**644,000**
Outcome 2: Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farmers to adopt climate smart agriculture practices																									
Output 2.1. More than 20,000 farming enterprises and entrepreneurs receive climate risk information and resilience advice through extension services support, access to best practice guidance and improved climate information services.		159,050				211,050				146,550				122,250				116,750				104,500			860,150
Output 2.2. : A public-private netw ork of at least 50 extensions service providers are trained to deliver climate risk management and adaptation information and advice to farmers		142,500				532,000				532,000				515,000				204,000				131,300			2,056,800
SUB-TOTAL:		**301,550**				**743,050**				**678,550**				**637,250**				**320,750**				**235,800**			**2,916,950**
Outcome 3: Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers																									
Output 3.1. State ow ned institute supported to develop demonstration site for best available technologies		90,250				398,500				391,000				213,000				121,000				89,750			1,303,500
Output 3.2. Larger private sector farmers invest in demonstration sites for specific technologies that form a basis for local learning and best practice dissemination		30,000				149,500				149,500				149,500				49,500				30,200			558,200
Output 3.3. Private farmer collectives or groups of small holders farmers collectively invest in community level demonstration sites						49,500				159,500				135,500				125,500				-			470,000
SUB-TOTAL:		**120,250**				**597,500**				**700,000**				**498,000**				**296,000**				**119,950**			**2,331,700**
EXECUTION COSTS:		93,000				104,000				104,000				101,000				84,000				73,000			559,000
GRAND-TOTAL:		**651,300**				**1,607,550**				**1,635,550**				**1,300,250**				**772,750**				**484,250**			**6,451,650**

Annex 4: UNDP Direct Project Support Services

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

HOW TO USE THIS LETTER OF AGREEMENT

- This agreement is used to provide appropriate legal coverage when the UNDP country office provides support services under national execution.
- This agreement must be signed by a governmental body or official authorized to confer full legal coverage on UNDP. (This is usually the Minister of Foreign Affairs, the Prime Minister /or Head of State.) The UNDP country office must verify that the government signatory has been properly authorized to confer immunities and privileges.
- A copy of the signed standard letter will be attached to each PSD and project document requiring such support services. When doing this, the UNDP country office completes the attachment to the standard letter on the nature and scope of the services and the responsibilities of the parties involved for that specific PSD/project document.
- The UNDP country office prepares the letter of agreement and consults with the regional bureau in case either of the parties wishes to modify the standard text. After signature by the authority authorized to confer immunities and privileges to UNDP, the government keeps one original and the UNDP country office the other original. A copy of the agreement should be provided to UNDP headquarters (BOM/OLPS) and the regional bureau.

Dear Mr. Magtymguly Bayramdurdyyev,

1. Reference is made to consultations between officials of the Government of *Turkmentian* (hereinafter referred to as "the Government") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant programme support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(a) Procurement of goods and services;

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the [*Insert title and date of the UNDP standard basic assistance agreement with the Government*] (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be affected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

_____

Signed on behalf of UNDP

Resident Representative

_____

For the Government

Mr. Magtymguly Bayramdurdyyev

Minister of Agriculture and Environmental Protection of Turkmenistan

"_____" _____ 2019

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between UNDP office in Turkmenistan, the institution designated by the Government of Turkmenistan and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project "Scaling Climate Resilience for Farmers in Turkmenistan" (Project ID # 00097117), "the Project".

2. In accordance with the provisions of the letter of agreement signed on [*insert date of agreement*] and the project document, the UNDP country office shall provide support services for the Project as described below.

3. Support services to be provided:

Support services (insert description)	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Human Resources			
a) TOR review and post classification + creation	Jun-19	34.35	240.45
b) Advertisement	Jun-19	119.96	839.72
c) Short-listing (including long-listing)	Jun-19	239.92	1,679.44
d) Writing test preparation (questions)	Jun-19	53.57	374.99
e) Writing test arrangement and administration	Jun-19	91.4	639.80
f) Test Evaluation	Jun-19	88.83	621.81
g) Interviewing	Jun-19	239.92	1,679.44
h) Reference check	Jun-19	40.06	280.42
i) Review recruitment case	Jun-19	25.85	180.95
j) Contract issuance	Jun-19	82.38	576.66
k) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):	Annual fee per employee per year)		0.00

Payroll validation, disbursement		157.04	5,653.44
Extension, promotion, entitlements		134.6	4,845.60
Performance evaluation		134.6	4,845.60
Leave monitoring		22.43	807.48
Leave monitoring - Absence data management in Atlas only		5.7	205.20
l) Staff HR & Benefits Administration & Management *(onetime fee, per staff. Services incl.* contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well)	Yearly	205.66	1,233.96
Total, HR:			**24,704.96**
2. Finance			
a) Payment to vendor and staff	Daily/Monthly	38.49	27,712.80
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	923.76
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	1,385.76
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	1,002.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	400.80
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	601.20
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	3,099.00
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	712.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	713.40
e) PCA reports review and certification	As per the working plan	25.8	516.00

f) F10 Settlement	As per the working plan	23.12	2,774.40
g) Issue/Apply Deposits Only	As per the working plan	21.74	434.80
Total, Finance:			**40,275.92**
3. Procurement			
a) Procurement not involving CAP - below US$ 50,000			
-Identification and selection	As per the working plan	282.29	42,343.50
- Issue Purchase Order	As per the working plan	41.95	6,292.50
- Follow-up	As per the working plan	41.95	6,292.50
b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan		0.00
- Identification & selection	As per the working plan	489.45	12,236.25
- Contracting/Issue Purchase Order	As per the working plan	104.07	2,601.75
- Follow-up	As per the working plan	104.07	2,601.75
c) Consultant recruitment	As per the working plan		0.00
- Advertising	As per the working plan	36.11	2,166.60
- shortlisting and selection	As per the working plan	157.13	9,427.80
- Contract issuance	As per the working plan	72.22	4,333.20
d) Procurement involving RACP (goods, services & consultant > US$150,000)	As per the working plan		0.00
- Identification & selection	As per the working plan	582.33	1,746.99

- Contracting	As per the working plan	60.67	182.01
- *Issue PO*	As per the working plan	48.01	144.03
- Follow up	As per the working plan	60.67	182.02
e) Asset disposal involving CAP	By the closure of the project	275.14	5,502.80
Total, Procurement:			**96,053.69**
4. Admin Support			
Issue/Renew IDs (UN LP, UN ID, etc.)_UPL	Yearly	38.2	1,375.20
Registration for stay in TKM	As per the working plan	71.83	2,873.20
Custom Clearance- Diplomatic cargo	As per the working plan	332.46	6,649.20
Visa request (excl. government fee)	As per the working plan	59.55	3,573.00
Transportation Arrangement	As per the working plan	15.9	1,908.00
Hotel Reservation	As per the working plan	17.63	1,040.17
Ticket request (booking, purchase)	As per the working plan	71.79	4,307.40
Travel request or authorization-Simple	As per the working plan	16.51	1,651.00
Travel cost estimates- Simple	As per the working plan	26.42	2,642.00
Travel cost estimates - Complex	As per the working plan	24.04	480.80
Travel request or authorization-Complex	As per the working plan	38.347	766.94
Miscellaneous Letters	As per the working plan	12.55	2,698.25
Total, Admin Support:		38.2	**29,965.16**
Total DPC			**191,000.00**

4. **Detailed breakdown of UNDP Country Office support services by the Components:**

Support to implementation of Outcome 1: The enabling environment to support climate resilient agricultural development to private sector farmers is strengthened.

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services per case/person in USD	Number of cases	DPC Total Amount in USD
1. Human Resources				
a) TOR review and post classification + creation	Jun-19	34.35	1	34.35
b) Advertisement	Jun-19	119.96	1	119.96
c) Short-listing (including long-listing)	Jun-19	239.92	1	239.92
d) Writing test preparation (questions)	Jun-19	53.57	1	53.57
e) Writing test arrangement and administration	Jun-19	91.4	1	91.40
f) Test Evaluation	Jun-19	88.83	1	88.83
g) Interviewing	Jun-19	239.92	1	239.92
h) Reference check	Jun-19	40.06	1	40.06
i) Review recruitment case	Jun-19	25.85	1	25.85
j) Contract issuance	Jun-19	82.38	1	82.38
k) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):	Annual fee per employee per year)			0.00
Payroll validation, disbursement		157.04	6	942.24
Extension, promotion, entitlements		134.6	6	807.60
Performance evaluation		134.6	6	807.60
Leave monitoring		22.43	6	134.58
Leave monitoring - Absence data management in Atlas only		5.7	6	34.20
l) Staff HR & Benefits Administration & Management *(onetime fee, per staff. Services incl.* contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well)	Yearly	205.66	1	205.66

TOTAL, Human Resources				**3,948.12**
2. Finance				
a) Payment to vendor and staff	Daily/Monthly	38.49	72	2,771.28
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	3	230.94
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	5	288.70
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	10	167.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	2	66.80
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	5	125.25
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	15	309.90
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	5	178.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	5	178.35
e) PCA reports review and certification	As per the working plan	25.8	6	154.80
f) F10 Settlement	As per the working plan	23.12	10	231.20
g) Issue/Apply Deposits Only	As per the working plan	21.74	5	108.70
TOTAL, Finance				**4,810.92**
3. Procurement				
a) Procurement not involving CAP - below US$ 50,000				
-Identification and selection	As per the working plan	282.29	15	4,234.35
- Issue Purchase Order	As per the working plan	41.95	15	629.25
- Follow-up	As per the working plan	41.95	15	629.25
b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan		0	0.00
- Identification & selection	As per the working plan	489.45	0	0.00

- Contracting/Issue Purchase Order	As per the working plan	104.07	0	0.00
- Follow-up	As per the working plan	104.07	0	0.00
c) Consultant recruitment	As per the working plan			0.00
- Advertising	As per the working plan	36.11	10	361.10
- shortlisting and selection	As per the working plan	157.13	10	1,571.30
- Contract issuance	As per the working plan	72.22	10	722.20
d) Procurement involving RACP (goods, services & consultant > US$150,000)	As per the working plan			0.00
- Identification & selection	As per the working plan	582.33	0	0.00
- Contracting	As per the working plan	60.67	0	0.00
- *Issue PO*	As per the working plan	48.01	0	0.00
- Follow up	As per the working plan	60.67	0	0.00
e) Asset disposal involving CAP	By the closure of the project	275.14	5	1,375.70
TOTAL, Procurement				**9,523.15**
4. **Admin Support**				
Issue/Renew IDs (UN LP, UN ID, etc.) _UPL	Yearly	38.2	5	191.00
Registration for stay in TKM	As per the working plan	71.83	4	287.32
Custom Clearance- Diplomatic cargo	As per the working plan	332.46	0	0.00
Visa request (excl. government fee)	As per the working plan	59.55	8	476.40
Transportation Arrangement	As per the working plan	15.9	10	159.00
Hotel Reservation	As per the working plan	17.63	10	176.30
Ticket request (booking, purchase)	As per the working plan	71.79	10	717.90

Travel request or authorization- Simple	As per the working plan	16.51	10	165.10
Travel cost estimates- Simple	As per the working plan	26.42	10	264.20
Travel cost estimates - Complex	As per the working plan	24.04	1	24.04
Travel request or authorization- Complex	As per the working plan	38.347	1	38.35
Miscellaneous Letters	As per the working plan	12.55	20	251.00
TOTAL, Admin Support				**2,750.61**
Total DPC for Outcome 1 :				**21,032.80**

Support to implementation of Outcome 2: Climate resilient extension services developed to benefit 20,000 small and medium sized non-state order farmers to adopt climate smart agriculture practices.

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services per case/person in USD	Number of cases	DPC Total Amount in USD
1. Human Resources				
a) TOR review and post classification + creation	Jun-19	34.35	2	68.70
b) Advertisement	Jun-19	119.96	2	239.92
c) Short-listing (including long-listing)	Jun-19	239.92	2	479.84
d) Writing test preparation (questions)	Jun-19	53.57	2	107.14
e) Writing test arrangement and administration	Jun-19	91.4	2	182.80
f) Test Evaluation	Jun-19	88.83	2	177.66
g) Interviewing	Jun-19	239.92	2	479.84
h) Reference check	Jun-19	40.06	2	80.12
i) Review recruitment case	Jun-19	25.85	2	51.70
j) Contract issuance	Jun-19	82.38	2	164.76

k) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):	Annual fee per employee per year)			0.00
Payroll validation, disbursement		157.04	12	1,884.48
Extension, promotion, entitlements		134.6	12	1,615.20
Performance evaluation		134.6	12	1,615.20
Leave monitoring		22.43	12	269.16
Leave monitoring - Absence data management in Atlas only		5.7	12	68.40
l) Staff HR & Benefits Administration & Management *(onetime fee, per staff. Services incl.* contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well)	Yearly	205.66	2	411.32
TOTAL, Human Resources				**7,896.24**
2. Finance				
a) Payment to vendor and staff	Daily/Monthly	38.49	323	12,432.27
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	3	230.94
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	7	404.18
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	30	501.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	5	167.00
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	10	250.50
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	70	1,446.20
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	5	178.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	5	178.35

e) PCA reports review and certification	As per the working plan	25.8	6	154.80
f) F10 Settlement	As per the working plan	23.12	57	1,317.84
g) Issue/Apply Deposits Only	As per the working plan	21.74	5	108.70
TOTAL, Finance				**17,369.78**
3. Procurement				
a) Procurement not involving CAP - below US$ 50,000				
-Identification and selection	As per the working plan	282.29	66	18,631.14
- Issue Purchase Order	As per the working plan	41.95	66	2,768.70
- Follow-up	As per the working plan	41.95	66	2,768.70
b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan		0	0.00
- Identification & selection	As per the working plan	489.45	10	4,894.50
- Contracting/Issue Purchase Order	As per the working plan	104.07	10	1,040.70
- Follow-up	As per the working plan	104.07	10	1,040.70
c) Consultant recruitment	As per the working plan			0.00
- Advertising	As per the working plan	36.11	30	1,083.30
- shortlisting and selection	As per the working plan	157.13	30	4,713.90
- Contract issuance	As per the working plan	72.22	30	2,166.60
d) Procurement involving RACP (goods, services & consultant > US$150,000)	As per the working plan			0.00
- Identification & selection	As per the working plan	582.33	2	1,164.66
- Contracting	As per the working plan	60.67	2	121.34
- *Issue PO*	As per the working plan	48.01	2	96.02
- Follow up	As per the working plan	60.67	2	121.34

e) Asset disposal involving CAP	By the closure of the project	275.14	5	1,375.70
TOTAL, Procurement				**41,987.30**
4. **Admin Support**				
Issue/Renew IDs (UN LP, UN ID, etc.)_UPL	Yearly	38.2	15	573.00
Registration for stay in TKM	As per the working plan	71.83	18	1,292.94
Custom Clearance- Diplomatic cargo	As per the working plan	332.46	10	3,324.60
Visa request (excl. government fee)	As per the working plan	59.55	25	1,488.75
Transportation Arrangement	As per the working plan	15.9	57	906.30
Hotel Reservation	As per the working plan	17.63	22	387.86
Ticket request (booking, purchase)	As per the working plan	71.79	23	1,651.17
Travel request or authorization- Simple	As per the working plan	16.51	45	742.95
Travel cost estimates- Simple	As per the working plan	26.42	45	1,188.90
Travel cost estimates - Complex	As per the working plan	24.04	9	216.36
Travel request or authorization- Complex	As per the working plan	38.347	9	345.12
Miscellaneous Letters	As per the working plan	12.55	100	1,255.00
TOTAL, Admin Support				**13,372.95**
Total DPC for Outcome 2:				**80,626.27**

Support to implementation of Outcome 3: Demonstration plots and collective investments enable scale up of climate resilience measures, support peer to peer learning and improve resilience outcomes for farmers.

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services per case/person in USD	Number of cases	DPC Total Amount in USD
1. Human Resources				
a) TOR review and post classification + creation	Jun-19	34.35	2	68.70
b) Advertisement	Jun-19	119.96	2	239.92
c) Short-listing (including long-listing)	Jun-19	239.92	2	479.84
d) Writing test preparation (questions)	Jun-19	53.57	2	107.14
e) Writing test arrangement and administration	Jun-19	91.4	2	182.80
f) Test Evaluation	Jun-19	88.83	2	177.66
g) Interviewing	Jun-19	239.92	2	479.84
h) Reference check	Jun-19	40.06	2	80.12
i) Review recruitment case	Jun-19	25.85	2	51.70
j) Contract issuance	Jun-19	82.38	2	164.76
k) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):	Annual fee per employee per year)			0.00
Payroll validation, disbursement		157.04	12	1,884.48
Extension, promotion, entitlements		134.6	12	1,615.20
Performance evaluation		134.6	12	1,615.20
Leave monitoring		22.43	12	269.16
Leave monitoring - Absence data management in Atlas only		5.7	12	68.40

l) Staff HR & Benefits Administration & Management *(onetime fee, per staff. Services incl.* contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well)	Yearly	205.66	2	411.32
TOTAL, Human Resources				**7,896.24**
2. Finance				
a) Payment to vendor and staff	Daily/Monthly	38.49	260	10,007.40
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	3	230.94
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	6	346.44
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	20	334.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	5	167.00
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	9	225.45
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	54	1,115.64
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	5	178.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	5	178.35
e) PCA reports review and certification	As per the working plan	25.8	6	154.80
f) F10 Settlement	As per the working plan	23.12	45	1,040.40
g) Issue/Apply Deposits Only	As per the working plan	21.74	5	108.70
TOTAL, Finance				**14,087.12**
3. Procurement				
a) Procurement not involving CAP - below US$ 50,000				
-Identification and selection	As per the working plan	282.29	54	15,243.66
- Issue Purchase Order	As per the working plan	41.95	54	2,265.30
- Follow-up	As per the working plan	41.95	54	2,265.30

b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan		0	0.00
- Identification & selection	As per the working plan	489.45	15	7,341.75
- Contracting/Issue Purchase Order	As per the working plan	104.07	15	1,561.05
- Follow-up	As per the working plan	104.07	15	1,561.05
c) Consultant recruitment	As per the working plan			0.00
- Advertising	As per the working plan	36.11	20	722.20
- shortlisting and selection	As per the working plan	157.13	20	3,142.60
- Contract issuance	As per the working plan	72.22	20	1,444.40
d) Procurement involving RACP (goods, services & consultant > US$150,000)	As per the working plan			0.00
- Identification & selection	As per the working plan	582.33	1	582.33
- Contracting	As per the working plan	60.67	1	60.67
- *Issue PO*	As per the working plan	48.01	1	48.01
- Follow up	As per the working plan	60.67	1	60.67
e) Asset disposal involving CAP	By the closure of the project	275.14	5	1,375.70
TOTAL, Procurement				**37,674.69**
4. **Admin Support**				
Issue/Renew IDs (UN LP, UN ID, etc.) _UPL	Yearly	38.2	10	382.00
Registration for stay in TKM	As per the working plan	71.83	15	1,077.45
Custom Clearance- Diplomatic cargo	As per the working plan	332.46	10	3,324.60
Visa request (excl. government fee)	As per the working plan	59.55	20	1,191.00
Transportation Arrangement	As per the working plan	15.9	45	715.50
Hotel Reservation	As per the working plan	17.63	20	352.60

Ticket request (booking, purchase)	As per the working plan	71.79	20	1,435.80
Travel request or authorization- Simple	As per the working plan	16.51	35	577.85
Travel cost estimates- Simple	As per the working plan	26.42	35	924.70
Travel cost estimates - Complex	As per the working plan	24.04	8	192.32
Travel request or authorization- Complex	As per the working plan	38.347	8	306.78
Miscellaneous Letters	As per the working plan	12.55	80	1,004.00
TOTAL, Admin Support				**11,484.60**
Total DPC for Outcome 3:				**71,142.65**

4. UNDP CO Support to NIM Project Management.

Support services	Schedule for the provision of the support services	Cost to UNDP of providing such support services per case/person in USD	Number of cases	DPC Total Amount in USD
1. Human Resources				
a) TOR review and post classification + creation	Jun-19	34.35	2	68.70
b) Advertisement	Jun-19	119.96	2	239.92
c) Short-listing (including long-listing)	Jun-19	239.92	2	479.84
d) Writing test preparation (questions)	Jun-19	53.57	2	107.14
e) Writing test arrangement and administration	Jun-19	91.4	2	182.80
f) Test Evaluation	Jun-19	88.83	2	177.66
g) Interviewing	Jun-19	239.92	2	479.84
h) Reference check	Jun-19	40.06	2	80.12
i) Review recruitment case	Jun-19	25.85	2	51.70
j) Contract issuance	Jun-19	82.38	2	164.76

k) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):	Annual fee per employee per year)			0.00
Payroll validation, disbursement		157.04	6	942.24
Extension, promotion, entitlements		134.6	6	807.60
Performance evaluation		134.6	6	807.60
Leave monitoring		22.43	6	134.58
Leave monitoring - Absence data management in Atlas only		5.7	6	34.20
l) Staff HR & Benefits Administration & Management *(onetime fee, per staff. Services incl.* contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well)	Yearly	205.66	1	205.66
TOTAL, Human Resources				**4,964.36**
2. Finance				
a) Payment to vendor and staff	Daily/Monthly	38.49	65	2,501.85
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	3	230.94
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	6	346.44
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	0	0.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	0	0.00
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	0	0.00
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	11	227.26
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	5	178.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	5	178.35
e) PCA reports review and certification	As per the working plan	25.8	2	51.60
f) F10 Settlement	As per the working plan	23.12	8	184.96

g) Issue/Apply Deposits Only	As per the working plan	21.74	5	108.70
TOTAL, Finance				**4,008.10**
3. Procurement				
a) Procurement not involving CAP - below US$ 50,000				
-Identification and selection	As per the working plan	282.29	15	4,234.35
- Issue Purchase Order	As per the working plan	41.95	15	629.25
- Follow-up	As per the working plan	41.95	15	629.25
b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US$ 50,000)	As per the working plan		0	0.00
- Identification & selection	As per the working plan	489.45	0	0.00
- Contracting/Issue Purchase Order	As per the working plan	104.07	0	0.00
- Follow-up	As per the working plan	104.07	0	0.00
c) Consultant recruitment	As per the working plan			0.00
- Advertising	As per the working plan	36.11	0	0.00
- shortlisting and selection	As per the working plan	157.13	0	0.00
- Contract issuance	As per the working plan	72.22	0	0.00
d) Procurement involving RACP (goods, services & consultant > US$150,000)	As per the working plan			0.00
- Identification & selection	As per the working plan	582.33	0	0.00
- Contracting	As per the working plan	60.67	0	0.00
- *Issue PO*	As per the working plan	48.01	0	0.00
- Follow up	As per the working plan	60.67	0	0.00
e) Asset disposal involving CAP	By the closure of the project	275.14	5	1,375.70
TOTAL, Procurement				**6,868.55**
4. Admin Support				

Issue/Renew IDs (UN LP, UN ID, etc.) _UPL	Yearly	38.2	6	229.20
Registration for stay in TKM	As per the working plan	71.83	3	215.49
Custom Clearance- Diplomatic cargo	As per the working plan	332.46	0	0.00
Visa request (excl. government fee)	As per the working plan	59.55	7	416.85
Transportation Arrangement	As per the working plan	15.9	8	127.20
Hotel Reservation	As per the working plan	17.63	7	123.41
Ticket request (booking, purchase)	As per the working plan	71.79	7	502.53
Travel request or authorization- Simple	As per the working plan	16.51	10	165.10
Travel cost estimates- Simple	As per the working plan	26.42	10	264.20
Travel cost estimates - Complex	As per the working plan	24.04	2	48.08
Travel request or authorization- Complex	As per the working plan	38.347	2	76.69
Miscellaneous Letters	As per the working plan	12.55	15	188.25
TOTAL, Admin Support				**2,357.00**
Total DPC for Project Management:				**18,198.01**

5. Description of functions and responsibilities of the parties involved:

As the national implementing (NIM) partner, the **Ministry of Agriculture and Environment Protection of Turkmenistan** (MAEP) will oversee all aspects of project implementation. MAEP is responsible for the protection of ecosystems, protection of surface and underground water resources and monitoring the environment and natural resources, and climate monitoring. In addition, it carries out environmental assessments of various projects. The MAEP structure includes 5 velayat (provincial) Environmental Protection agencies, The National Institute of Deserts, Flora and Fauna (NIDFF), Ecological control service. Among other tasks, provincial administrations units of the MAEP supervise the wastewater monitoring and control water use permit. They carry out systematic review and assessment of the environment in Turkmenistan, and develop standards for pollution control. MAEP will appoint a senior staff member to serve as the National Project Coordinator (NPC), who will be the lead individual responsible for overseeing the project.

Overall governance of the project will be carried out by the **Project Board**, which will include MAEP, other national agencies including the Ministries of Agriculture and Water Economy, Mejlis of Turkmenistan, National Committee on Hydrometeorology, Union of Entrepreneurs of Turkmenistan (National and regional affiliates), Agriculture University in Ashgabat, Agriculture Institute in Dashoguz and UNDP. The Project Board may invite other agencies to join as members, with the roster to be definitively set and approved no later than the project's inception period. The National Project Director will serve as Chair of

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the Project Board, with assistance from UNDP in organizing and running all meetings and other exchanges of information. Meetings of the Project Board will take place at least once annually in time for approval of the following year's Annual Work Plan. Additional meetings may be called as needed by the NPD.

UNDP will provide oversight and quality assurance, in accordance with plans approved by the Project Board. At the country level, UNDP's support to the project will be carried out through the UNDP Country Office (CO) in Ashgabat, under the supervision of the Programme Specialist for Environment and Energy and other senior staff, including the UNDP Resident Representative and Deputy Resident Representative as warranted. UNDP will also engage contractors to carry out independent Midterm and Final Evaluations of the project. The UNDP Regional Technical Advisor for Adaptation to Climate Change, based in the UNDP Istanbul Regional Hub, will provide technical support, assistance with coordination, and overall project monitoring to ensure consistency with expectations from UNDP and Adaptation Fund.

The day-to-day operations of the project will be carried out by six full-time dedicated project staff recruited for this project, headed by the **Project Manager**. The Project Manager will be responsible for carrying out the activities of the project as set forth in this Project Document and any revisions approved by the Project Board. At least one month in advance of the start of each project year, the Project Manager will prepare Annual Work Plans. These plans will be reviewed and approved by the Project Board and thereafter will be used by project staff as tools for planning, implementing, and tracking work flows. In addition, for each meeting of the Project Board, the Project Manager will prepare a full status report on project activity, including recent accomplishments, risks, and proposed mitigation measures. The Project Manager will also be responsible for preparing all required annual reports for MAEP, UNDP and Adaptation Fund.

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At the request of MAEP UNDP Country Office may provide administrative support to the Government with regard to various specific administrative functions, costs of provision of these services will be billed as Direct Project Costs according to this Letter of Agreement.

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Responsibilities of other entities of the Government are set forth in the table below.

Stakeholders/Partners	Roles and responsibilities	Involvement Plan and mechanisms
Ministry of Agriculture and Environment Protection (MAEP) of Turkmenistan	National implementing partner. Will provide overall project oversight, supervision, management and coordination with national initiatives and strategies. MAEP will lead the national Project Team in the design and execution of all project components at both national and velayat levels (including development of climate resilient extension services, as well as demonstration plots and collective investments to improve resilience outcomes for farmers). Will participate in the development and implementation of all project activities on all issues related to development of climate resilient extension services. Will be engaged in developing regional demonstration plots and investment activities.	MAEP is the project beneficiary, will chair the meetings of Project Board, will lead the Project Team in the design and execution of all project components at both national and velayat levels. In particular, MAEP is involved in the development of climate resilient extension services and pilot demonstration activities of the project to improve resilience outcomes for farmers.
State Committee for Water Economy of Turkmenistan	The Committee is responsible for the overall water management and distribution, including irrigation sector. The Committee's mandate cover development of water related policies, including water tariffs and water efficiency. The Committee will be an important stakeholder for the regulatory work of the project under Outcome 1.	The Committee is the project beneficiary, Member of the Project Board and is involved in the development of pilot activities of the project related to efficient irrigation.
Mejlis of Turkmenistan	Member of the Project Board. Will participate in the development and implementation of all project activities on all issues related to mainstreaming climate resilience into policies and regulations in agriculture. Will join the State Committee and other ministries and departments in developing and revising sub-legislative acts and regulations related to agriculture, water and land management sectors. Mejlis will provide overall supervision and coordination of the project with national initiatives and strategies. Mejlis will support the national project team in managing the development and implementation of all project components at both the national and regional levels.	Mejlis is the project beneficiary, member of the Project Board and is involved in the project activities related to development and revision of policies and regulations in agriculture sector.

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Stakeholders/Partners	Roles and responsibilities	Involvement Plan and mechanisms
Union of Entrepreneurs of Turkmenistan (National and regional affiliates)	Member of the Project Board. Will participate in the development and implementation of all project activities on all issues related to development of private climate resilient extension services. Will participate in the developing climate resilient extension services and regional demonstration plots and community level investments into adaptation technologies. Union of Entrepreneurs will provide overall supervision and coordination of the project with national initiatives and strategies. The union will support the national project team in managing the development and implementation of all project components at both the national and regional levels.	Union of Entrepreneurs is the project beneficiary, Member of the Project Board and is involved in the development of pilot activities of the project.
National Hydrometeorological Service under MAEP	Member of the Project Board. Will participate in the development and implementation of all project activities on all issues related to development of pilot climate information services targeting private sector farmers. The Service will provide overall supervision and coordination of the project with national initiatives and strategies related to hydrometeorological information services. The Service will support the project team in managing the development and implementation of all project components at both the national and regional levels.	The Service is the project beneficiary. Member of the Project Board and is involved in the project activities related to development of pilot climate information services targeting private sector farmers
Agriculture University in Ashgabat and Agriculture Institute in Dashoguz, Agriculture research institutes under the MAEP	Member of the Project Board. Will participate in the development and implementation of all project activities on all issues related to development of public-private network of extension services for farmers. Will participate in training and capacity building for the network of extension service providers to deliver climate risk management and adaptation information and advice to farmers. The Institutes will provide overall supervision and coordination of the project with national initiatives and strategies. The Institutes will support the project team in managing the development and implementation of all project components at both the national and regional levels.	The Institutes are the project beneficiaries. Member of the Project Board and is involved in the project activities related to development of public-private network of extension services for farmers.

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Maximum DPC amount to be charged to AF fund is USD 191,000.

Annex 5: Turkmenistan climate outlook and vulnerability to climate change

Turkmenistan is located in the west of Central Asia between the Caspian Sea and the Amu Darya River. The territory of Turkmenistan is a part of the Aral and Caspian Sea basin. It is predominantly a flat country containing deserts and oases, with mountainous zones along its border (mainly in the south). The Karakum Desert, one of the largest deserts in the world, occupies 80% of the country's total land area. The rest of the land area is covered by mountain. Turkmenistan has a sharply continental and extremely dry and hot climate.[19] Despite the desert nature that is distinctive for most of Turkmenistan, there are significant differences in average temperature in the northern and southern parts of the country. The northern part, located in the Siberian anticyclone area, is characterized by severe and long winters with continuous snow cover and average yearly temperatures fluctuating between 13°C and 16°C. The southern part of the country, on the other hand, is characterized by mild winters with only occasional snow cover and average yearly temperatures ranging between 18°C and 22°C.[20] In the warm period of the year (from May to September), the daily air temperature often exceeds 40°C, and has occasionally even surpassed 50°C (in Repetek, southeast Karakum Desert). Meanwhile, during the coldest part of the year, temperatures are usually below zero °C and have even been recorded at levels as low as -36°C[21] (in Dashoguz velayat).[22] In terms of the historical trends related to the average mean temperature, meteorological data series show a steady increase of 1.4°C since the 1960s.[23]

The annual precipitation across Turkmenistan also varies greatly, ranging from 76 mm to 380 mm. In the northern part of the country, most of the precipitation occurs in the periods from March to May and from October to February, with the summer months experiencing quite low levels of precipitation, accounting for only 8.4 % of the total annual amount.[24] In the southern parts of Turkmenistan, much of the precipitation falls between December and April (87.8 % of the total annual amount), with quite low levels seen during the summer months (only 1.9 % of the total amount). In addition, while the desert areas experience precipitation only in the winter, the mountainous areas are characterized by a high frequency of precipitation throughout the year, often causing flash floods and mudflows.[25] Trends show that variability in monthly precipitation has been growing and that the amount of precipitation during recent years has slightly increased, particularly in spring months, with the lowest precipitation values being observed in summer.[26] With the low total annual rainfall, 96% of Turkmenistan is characterized as arid land, making it the most arid of the five Central Asian countries. Drought is a semi-permanent condition in the country. There are few rivers, the largest being Amu-Darya, with little to no surface flows across most of the desert landscapes. Water is a scarce resource and is unequally distributed across Turkmenistan, with 95% coming from the Amu Darya river, and the remaining 5% from all other rivers, streams and springs. The southern Murghab, Tedzhen and Sumbar rivers, and the smaller

[19] Second National Communication of Turkmenistan to the United Nations Framework Convention on Climate Change (UNFCCC), 2010.
[20] Ibid.
[21] Ibid
[22] velayat refers to province.
[23] Turkmenistan Climate Adaptation Profile, Climate Change Knowledge Portal. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=TKM.
[24] Second National Communication of Turkmenistan to the UNFCCC.
[25] Ibid.
[26] Turkmenistan Climate Adaptation Profile. Climate Change Knowledge Portal. http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile&CCode=TKM.

rivers of the foothills of the Kopet Dag, are fully exploited for irrigation. The building of the Karakum Canal has changed the distribution of water resources across the country. It has removed the imbalance in the distribution of water between the larger areas of cotton growing land in one part of the country and the water resources in the other. Water shortages are common, particularly in the south and west of the country.

Over the past 60 years, intensive warming has been observed all over the country. The highest temperature rise, 2°C, is observed in the winter period. Overall, the climate is becoming drier with increased frequency of strong heat periods; flash runoffs and mudflows as well as rainstorms. In addition, the productivity of pastures and grazing sites which is closely linked to the changing weather conditions has been severely affected, with the dry years experiencing a reduction of the volume of forage by 3 - 5 times. Since 1969, the Amu Darya River basin has been repeatedly affected by seasonal floods, causing damage to farmlands, homes, public utilities and infrastructure.

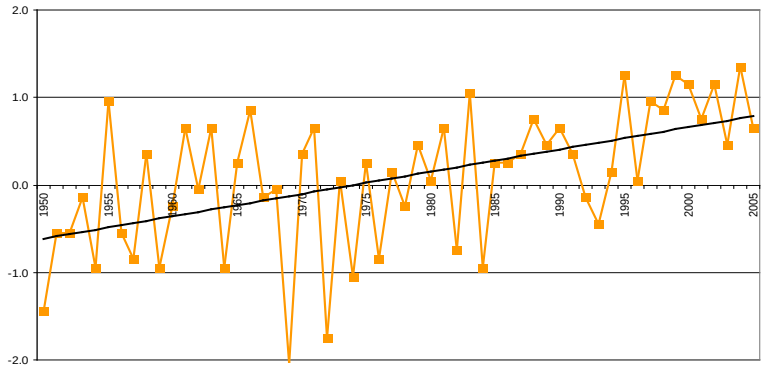

Fig. 1: Mean annual change in air temperatures (temperature deviation from average indicators recorded 1961 – 1990). Source: Ministry of Nature Protection

Climate change modeling indicates significant increases in temperature (Figure 2) and reductions in rainfall (Figure 3).

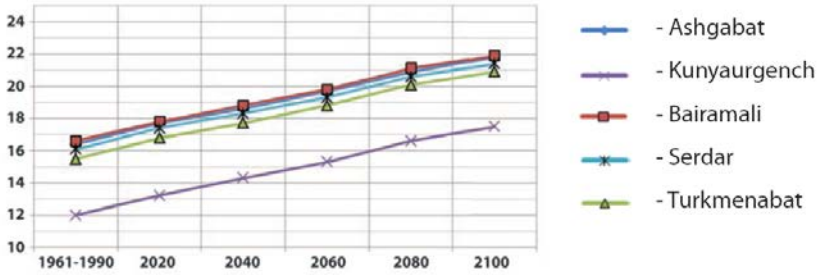

Fig. 2: The average annual air temperature for averaging scenario, ^{0}C, TNC, 2016

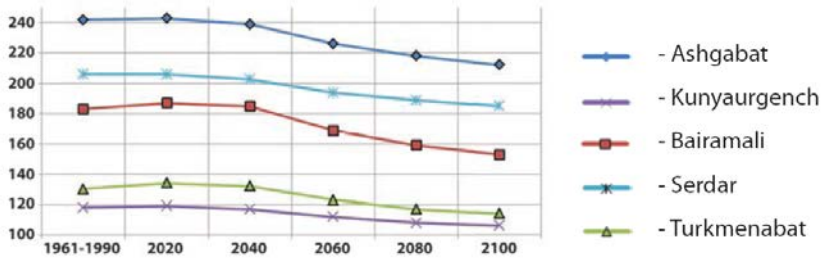

Fig. 3: The average amount of precipitation on averaged scenario, mm, TNC, 2016

Temperatures are expected to increase steadily in 2020-2100, and the amount of precipitation at first remains stable, fell sharply after 2030-2040 by up-to 22 mm by 2100. The air temperature on the averaged scenario will increase by 2020 by 1.23^{0}C, 2040 – by 2.21^{0}C, 2060 – by 3.22^{0}C, 2080 – by 4.51^{0}C, 2100 – by 5.35^{0}C. The runoff of Amu Darya river (the main source of Turkmenistan's surface water) is expected to decline by 10-15 percent by 2050[27].

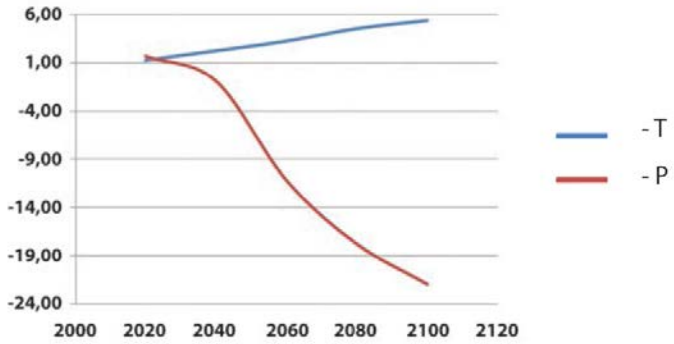

Fig. 4: Deviation from the normal average air temperature T (^{0}C) and precipitation P (mm) for Turkmenistan on averaged scenarios A1FI and B1, TNC

In summary, projected climate change impacts in Turkmenistan are project to include the following:

- An increase in average annual temperature, which will include an increase in the number of extremely hot days (i.e. days over 40^{o}C)[28];

[27] TNC, 2016

[28] These estimates are based on the findings of five general atmosphere and ocean circulation models (GCM) reported in Turkmenistan's Initial Communication on Climate Change (1998). The GCM with the most plausible results on temperature predictions was the UK89 model (equilibrium model of the United Kingdom Meteorological Agency). According to this scenario, temperature is predicted to increase by 5.5°C by 2050.

- A reduction in annual average rainfall;
- An increase in average regional evaporation rates of 48% by 2050;
- An increase in the frequency and intensity of drought and flood spells;
- A 10-15% reduction in flow rates for the Amu Darya river[29]; and
- A 30% reduction in flow rates of other rivers.

According to national estimates, unless there is an improved efficiency in irrigation systems, these factors are likely to result in a water deficit for agriculture of up to 5.5 km^3 per annum by 2050[30]. This is equivalent to approximately 20% of current water use in the agriculture sector. This water deficit has the potential to result in significant economic losses to the agriculture sector. Due to unproductive land equivalencies, over the period 2015-2030, this water deficit would result in output reductions equivalent to nearly 4 million tons of wheat and more than 3 million tons of cotton. An estimated overall decrease in productivity of irrigated agriculture will be in the range of 15-50%[31]. The livestock productivity will drop due to dwindling areas of pasture land and a 30% decrease in fertility of the existing pastures[32]. Climate change is therefore likely to reduce the volume of water availability for irrigation, and subsequent limit the number of crops produced. These trends will be accompanied by increased frequency and severity of climate induced disasters (drought, floods, strong winds).

Vulnerability of the Turkmenistan agricultural sector and communities

Despite the fact that only 4.1% of the land area is arable[33] and the challenging conditions, agriculture remains a key strategic sector of the economy, employing approximately 50% of the workforce and contributing 19% of Gross Domestic Product (GDP)[34] (USD $3.8 billion). Agriculture is the basis for the country's food security and an important supplier of raw materials for the processing industry. Livestock, wheat and cotton are the primary areas of economic activity. Pastures occupy a large territory of the country accounting for 78 percent of land reserves. Approximately 47.77% of Turkmenistan's population lives in rural areas and depend on agriculture for their livelihoods; with a significant part of rural population being particularly vulnerable due to a combination of socio-economic factors and climate change impacts. As agriculture is one of the most climate sensitive sectors, climate change will likely affect most vulnerable rural populations and have negative consequences on economic growth and their livelihoods.

During the last few decades, Turkmenistan has experienced widespread changes in land cover and land use following the socioeconomic and institutional changes in the wake of the disintegration of the Union of Soviet Socialist Republics (USSR) in 1991, and subsequently followed by a decade of drought and steadily increasing temperatures. These changes in the vegetated landscape are sufficiently broad to be detectable from orbital sensors at multiple scales. The agriculture sector in Turkmenistan is not currently at its maximum productive potential.

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[29] Second National Communication of Turkmenistan to the UNFCCC (2010)

[30] TNC

[31] CAREC, Gap Analysis on Adaptation to Climate Change in Central Asia

[32] CAREC, *ibid*

[33] World Bank, data.worldbank.org>indicators

[34] FAO, Turkmenistan Agriculture Sector Review (2012)

As a result of limited water resources, of the 17 million hectares available for irrigated agriculture, only 1.7 million are currently utilized for this purpose. Despite this, agriculture currently consumes 92% of all available surface waters in the country. Since agriculture is heavily dependent on irrigation, increasing temperature, a decrease in precipitation, and the probable reduction in surface water are all likely to potentially lead to an increase in aridity and accelerating desertification. Due to expected water scarcity, a decrease and degradation of natural grasslands is also anticipated, ultimately leading to a decline in sheep breeding production[35].

The Crops subsector: The focus of the sector is largely on state mandated crops such as cotton, wheat and sugar beet. Consequently, almost all public sector investments are directed at cotton and wheat, based on government policy of self-sufficiency in grains and maintaining the export potential for cotton products. This policy has greatly affected the structure of the agricultural sector and its potential for production, since thousands of hectares of land that were under orchards, horticulture and fodder crops have been diverted to production of winter wheat. In recent years, the Government has begun to recognize the need to diversify the agricultural sector and acknowledges the inefficiencies of enforcing cotton and wheat production in all regions of the country, however, this effort has been constrained by the increasing frequency of drought in agricultural producing regions, and the associated economic losses experienced by the state. The state has in recent years, allocated some land for crops other than the government mandated crops to be grown in each of the five provinces based on soil and climatic conditions in these regions. As a result of this, each province has been allocated land on a leasehold basis for growing maize, barley, lucerne and other forage crops, a practice aimed at promoting crop rotation and thus improving soil quality. The government is also beginning to invest in high efficiency irrigation technology for water intensive crops, to include (subsoil) drip irrigation systems, mobile sprinklers and wastewater drainage and recycling.

The Livestock subsector is dominated by the private sector, with more than 80% of all products produced by private farmers following the decommissioning of Soviet state livestock farms. Private rural households operate on a lease agreement, according to which the leaseholder provides feed and veterinary services and makes sure that the livestock is kept in good condition. Based on the lease agreement the leaseholder is allocated land for growing fodder crops and receives all the livestock products produced and half of the offspring during the lease period. This lease arrangement predominantly applies to the lease of cattle, whereas sheep and goat are mainly kept by the state association themselves due to relatively easier husbandry and production conditions. Despite a lack of state investment, livestock management has managed to develop a certain degree of efficiency and productivity, and this subsector now provides a good model for further private sector development within the agricultural sector.

A special attention in the context of climate change should be paid to the vulnerability of natural pastures. The natural pastures have a large diversity of vegetation species and low-cost maintenance with a high nutritional value. However, the pastures are of low productivity and increasingly vulnerable to a sharp seasonal and annual variability. The natural pastures as a reserve base for forage and its nutritional value vary considerably throughout the year. From summer to winter the feed volumes of the pastures are decreasing by 2.0-2.5 times. Assessment of climate change and its impact on the grasslands have shown that productivity is likely to decline in the future. Despite a sufficient resistance of plants to drought and heat, it has been observed that when drought occurs over an extended period that there is a decline in grassland productivity. Soil drought caused by decrease in the water reserve in the soil up to 4 mm. An assessment of

[35]Second national communication of Turkmenistan to the UNFCCC

accumulated annual precipitation and moisture deficit show that climate change-induced grassland productivity may decline to 10–15% reflecting a moisture stock decrease in the soil in the 0-20 cm layer. The reduction in pasture productivity would likely result in decreased livestock productivity resulting in reduction in meat and wool production[36].

The Fruit and Vegetable subsector is the most independent of the agricultural sector in Turkmenistan with almost 100% of production is generated privately both by independent farmers and leaseholders. The total land area that is used for production of small-scale farming is negligible compared to the grain, cotton or livestock subsectors, but nevertheless it is highly productive and the most economically viable within the country´s agricultural sector. 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. Prices and availability fluctuate between seasons, reflecting an undeveloped processing sector and lack of appropriate technology, facilities and infrastructure for cool storage. Despite the emergence of some private sector activity, this remains a key area for development, and demand for locally sourced product in the markets remains strong.

At present, favorable climatic conditions of Turkmenistan enable it to grow cotton, cereals, vegetable, fruits, grapes, forage crops almost over all the territory of Turkmenistan, and subtropical crops such as olives, pomegranates, persimmons, etc., in the south-west. Projected climate change in Turkmenistan is expected to directly affect the following: (i) Irrigation water demand due to transpiration intensity; (ii) Irrigated land reclamation; (iii) Agricultural crop yields; and (iv) Growing period of plants. In order to determine climate change impact on key agricultural production indicators in the main agricultural regions of Turkmenistan, three natural climatic zones – the Kopetdag and Murgab, the downstream Amudarya and the middle-stream Amudarya were studied. The calculations have been made for major agricultural crops – cotton, wheat, lucerne, and vegetables taking into account their yield capacity. Data analysis showed that crop water demand is likely to increase by 2020 by 13%[37]. This is further compounded by the fact that Turkmenistan is a water-stressed country and has one of the harshest climates in the Central Asian region. The main causes of baseline water stress are: periodic low water flows in rivers, low efficiency of irrigation system, low performing irrigation techniques, limited effective water conservation mechanisms, and limited available water resources for the further economic development of irrigated agriculture.

One of the key underlying causes for baseline vulnerability of the agricultural sector in Turkmenistan is the inefficient water consumption due to outdated approaches to managing water, deteriorating irrigation infrastructure and subsidized water prices. The water subsidies make the current water system financially unsustainable, and dampen the private sector to invest in the absence of conducive financial mechanisms and economic instruments. As a result, incentives for efficient use of water are largely absent, thus large farmers use water inefficiently, and the quality of local service delivery for smaller farmers suffers. Despite inherent water scarcity, Turkmenistan has among the highest water consumption per capita in the world. However, the high-water consumption levels are largely related to the inefficient irrigation systems in the country, as opposed to high household consumption. Farmers in Turkmenistan are not well prepared for climate change, particularly in relation to the efficient use of water. They are often unaware of water saving options. The vulnerability of the water sector to climate change

[36] Second National Communication of Turkmenistan under UNFCCC, 2010

[37] Second National Communication of Turkmenistan under UNFCCC, 2010

processes directly affects water runoffs, alters rivers hydrographs, and reduces the overall quality of water. Thus, the intensive development of irrigated agriculture with the background decrease of water availability requires taking specific actions for sustainable and rational use of water resources.

To conclude, agriculture in Turkmenistan is extremely vulnerable to climate change, mainly connected to availability and quality of water and land resources. Given that agriculture is almost entirely based on irrigated agriculture practices, any reduction of the volume of available water resources would mainly take its toll on this sector. Effects could be the following: (i) less cultivable land as a result of less available water resources; (ii) increased demand for irrigation water (due to the increase of transpiration); (ii) declining quality of water resources as a result of growing salinity level; (iv) decreasing ameliorative conditions of irrigated lands; (v) decreasing agricultural crops productivity; and (vi) fluctuations in the vegetation periods for plants, etc.

Annex 6: Socio Economic Impacts of Climate Change and Analysis of Adaptation Options[38]

Climate impacts

Climate variability and change are likely to significantly impact the water, agriculture sectors in numerous ways with severe socio-economic consequences for Turkmenistan. Average temperature, number of extreme heat days and water availability are the key factors that are likely to determine agricultural productivity. Climate change will alter both of them and therefore the conditions for growing crops in Turkmenistan.

Table 4: Future impacts of climate change on agriculture

Climate-related root causes	Impacts
Increase in temperature and evaporation rate	Decrease in water supply; Changes in glacial fed river flows; Decrease in soil moisture; Increase in land degradation; Decrease in agricultural productivity; Increase in salination; Decrease in livestock productivity and pasture yield; Decrease in biodiversity[39];
Changing precipitation patterns	Increase in drought frequency; Increase in flood frequency; Decrease in agricultural productivity.
Extreme events a) Heat waves b) Prolonged droughts	Increase in heat waves resulting in: - Decrease in water supply and quality; - Decrease in crop and livestock productivity[40]; - Decrease in desert pasture productivity; Increase in number of prolonged droughts resulting in: - Decrease in water supply and quality; - Decrease in crop and livestock productivity; Decrease in vegetation cover resulting in an increase in land degradation and desertification.

[38] Based on the final report by the Adaptation Fund/UNDP project "Addressing climate change risks to farming systems in Turkmenistan at national and community level" (2012-2017)

[39] Loss of biodiversity is a cause of degradation of habitats due to deforestation, soil erosion and water pollution.

[40] Sheep breeding will be adversely affected by frequent heat waves and longer hot periods due to its dependence on the productivity of natural grasslands.

As can be seen above, reductions in agricultural productivity are expected. Soils in Turkmenistan are soft and sandy and a considerable amount of irrigation water is lost to infiltration into deep soil layers inaccessible to crop roots. Further drying of soils as a result of climate change impacts is likely to significantly affect the main cotton and grain cultivating areas[41], with adverse economic and food security consequences. Episodes of rainfall are predicted to become more sporadic, which will exacerbate the frequency and intensity of both flood and drought periods[42]. At present, agriculture and the agricultural practices adopted are adapted to specific latitudinal climatic zones. However, any shift in these zones as a result of climate change is likely to place pressure on existing practices and systems, which will consequently adversely impact on agricultural productivity[43].

International analysis indicates significant declines in wheat and cotton yields under higher temperatures and more variable precipitation. Recent work by the World Bank in Uzbekistan (World Bank 2013a) indicates that the direct temperature and precipitation effects of climate change will be a reduction in yields for most crops (although an increase in yields for grasslands). Direct effects on irrigated crops (including cotton, wheat, apples, tomatoes and potatoes by 1-13 percent by 2050 across all agro-ecological zones.

Elsewhere, Anwar et al (2007) found that median wheat yield may decrease by about 29% according to different global warming scenarios. When elevated atmospheric CO2 is considered, median wheat yield decreases 25% since CO2 reduces the severity of the warmer air temperatures and lower rainfall. These impacts can, however be offset to some extent by introducing different varieties and deploying better agricultural practices, such as stubble retention and reduced tillage.

Pastoralism is also likely to be adversely affected by climate variability and change. As a result of the predicted climate change-induced increase in temperature and decrease in rainfall, grassland productivity is expected to be reduced by 10-15% by 2050.[44] [45] Indeed, as a result of the increasing aridity in Turkmenistan, the yield of desert pastures has already decreased over the past decade. This is likely to have a considerable effect on sheep and goat productivity, unless adaptation measures centered on improving and protecting grassland productivity are implemented. Climate variability and change will also directly influence sheep productivity by causing an increase in average temperature. The predicted increase in annual average temperature and in the number of extremely hot days is expected to reduce wool production and livestock reproductive rates by 10-20% and 5-25%, respectively[46].

Increases in temperature will reduce yields and improve conditions for pests and diseases. Changes in precipitation patterns will lead to crop failures and diminished productivity. Some gains could be expected, depending on crops and regions, however, the overall impacts on

[41] Initial National Communication of Turkmenistan under the United Nations Framework Convention on Climate Change. Phase 2: Capacity building in priority areas of the economy in response to climate change. 2006.

[42] Turkmenistan Country Analysis. United Nations, 2008.

[43] Initial National Communication of Turkmenistan under the United Nations Framework Convention on Climate Change. Phase 2: Capacity building in priority areas of the economy in response to climate change. 2006.

[44] This is the prediction under the scenario of the UK89 GCM (Turkmenistan's Initial National Communication, 1998).

[45] Note recent work by the World Bank in Uzbekistan indicated a net benefit to the productivity of grasslands by 12-43% by 2050 under climate change scenarios

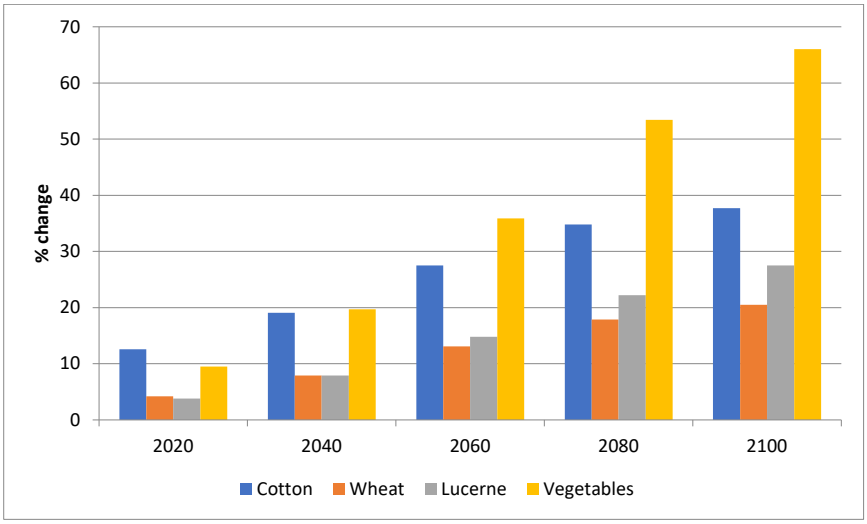
[46] Turkmenistan: Initial National Communication on Climate Change, 1998.

agriculture are expected to be negative. In the case of Turkmenistan most studies point to negative effects on cotton, wheat and other strategic crops.

Increased frequency of droughts and more aridity will result in more likelihood of poor harvests. Shortages in irrigation will also increase the degradation of valuable arable land in the form of intense salination, soil erosion, degradation and reduction of natural grasslands, decrease the productivity of pastures, and will lead to a less efficient livestock industry.

Of particular concern are the increase in water demand and the reduction in water availability which taken together, may result in a significant deficit of agricultural irrigation water. The higher evaporation rate predicted as a result of climate change is likely to increase the water requirements for irrigating crops by 30-40%, thereby aggravating existing water scarcity and irrigation concerns[47]. Increased water demand of up to 60% is expected for vegetables, a growing subsector. In the case of cotton and wheat, the two most important crops in the country, water demand is expected to increase by close to 20% and 10% per unit of area by 2040, respectively. By 2100 these figures will be close to 40% and 20%.

Figure 5. Expected water demand increases for A1F1 scenario for key crops.



Source: Second National Communication

Table 5. Water requirement of crops: changes in irrigation rates in m3/ha/year.

Period	Current irrigation rate	Projected irrigation rate	Difference
Vegetation	5,552	5,977	425
Non-vegetation	1,795	2,294	499

[47] Turkmenistan Country Analysis. United Nations, 2008.

TOTAL	7,347	8,271	924

Source: Second National Communication

On the supply side, river flows are expected to reduce drastically. An increase in the evaporation rates will also contribute to a significant reduction of water available for irrigation. According to Uzbekistan estimates, the flow of the Amy Darya will drop by 15%. Flow rates of other rivers are expected to decline at even faster rates (up to 30% reduction). Turkmenistan is anticipated to be heavily impacted by changes in the glacier systems in the Pamir Alai in the long term[48]. The average reduction in run off rates in terms of surface water collected in national storage and distribution systems is expected to be 10%, whereas during vegetation periods the reduction in run off rates will reach 30-40%.

With increasing demand as a result of higher temperatures and lower water availability, we estimate that by 2030 the total deficit could amount to 5.5 km3. This does not take into account planned increases in the land area under cultivation.

Table 6. Climate Change Water Impacts 2030-2040

Impact Description	Expected water losses
Decreased river flows including: Amu Darya -15% Murghab Tejen and Etrek rivers by 5-8%	2,400 million m3
Increased evaporation rates from reservoirs due to increased temperature	150 million m3
Increased irrigation demands of 13% due to increased temperature	3,000 million m3
TOTAL	5,500 million m3

Source: Author's calculations

These findings mirror similar studies in Uzbekistan, where the primary impact on agricultural yields resulted from shortage of irrigation water, rather than direct temperature or precipitation effects on crop growth (World Bank 2013a).

Prolonged exposure to extreme temperatures (35ºC in spring and 40ºC in summer) can have a significant negative effect on the productivity of agricultural sector. However, the Second National Communication of Turkmenistan indicates that neither the cumulative temperature effect nor the potential increase in extreme heat days are likely to impact significantly on agricultural productivity. Even under climate change scenarios, there is a probability of less than 1% of extreme heat days across all regions of Turkmenistan. Adjustments, such as earlier planting for winter wheat, may effectively compensate. The reduction in water availability is likely to be the major factor in reducing agricultural production.

[48] The First National Communication to UNFCCC, Turkmenistan, 1998

Adaptation options

Summary of technical options

This section sets out some of the key adaptation options for the water and agriculture sector identified in the early policy and strategy documents. Documents reviewed include Turkmenistan's UNFCCC First and Second National Communications, the Turkmenistan National Strategy for Climate Change and the UNDP Investment and Financial Flows for Climate Change report, among others. Some are related to water infrastructure while others address agricultural and land management practices. Examples identified in these strategies include

- Storage infrastructure
  - Construction of water reservoirs and water storage capacity;
- Off farm distribution networks
  - Reconstruction and lining of distribution to reduce losses;
  - Repair and development of the water drainage systems
- Water recovery and reuse
  - Saline drainage water
  - Ground water
  - Waste water
- On farm technologies
  - Introduction of more efficient irrigation techniques
  - Introduction of drought tolerant crops
- On farm land management
  - Improvement in on-farm efficiency
  - Introduction of agricultural optimization models
  - Reconstruction of irrigated lands (ILCR)
  - Reclaiming
- Pasture management
  - Planting of new forage plants (e.g. kanym, saxaul)
  - Introduction of grassland rotation techniques
- Economic incentives
  - Reform of economic relationship between the state and water consumers
  - Gradual introduction of water pricing
- Water management
  - Moving towards integrated water management (IWRM)
  - Introduction of Water User Associations (WUA)
  - Awareness raising on water efficiency
  - Introduction of water measurement

Each of the above-mentioned adaptation options is capable of "recovering", or "producing" a certain amount of water, or improving agricultural productivity in the face of a more hostile climatic baseline.

Water pricing – the role of economic instruments in water adaptation

Role of water pricing as an adaptation option

A key strategy to improve water efficiency relates to the economic pricing of water (or irrigation service fee – ISF). Water pricing is one of four integrated water management principles, known as the Dublin principles. This principle recognizes that all human beings have the basic right to

have access to clean water and sanitation at a reasonable price. However, considering it an economic good promotes efficient and equitable use, encourages conservation and protection of water resources. When water is collected from a source, it has a price as an economic and social good. In many instances failure to effectively manage water resources is associated with failure to recognize the economic value of water. Water pricing can encourage the introduction of more efficient water technologies, switching to more water efficient crop varieties, and more productive use of available land.

Current situation in Turkmenistan

The principle of water efficiency and water pricing are not new concepts in Turkmenistan. The Water Code sets out enabling legislation. Although water is provided free to the domestic sector, charges are applied for special uses (Article 110). Measures that support 'the rational use and protection of water' are supported (Article 34). The delivery of water to water users are carried out on a 'paid for' basis (Article 111).

Currently, water service charges depend on the crops to be irrigated, as reflected in the contract on the lease of land. For example, if the tenant will grow wheat the service of water delivery is 40 manats per hectare, for cotton 20.6 manat/ha, while for other crops (vegetables, potatoes, orchards, vineyards) the rate is from 120 to 180 manat/ha. Tariffs are differentiated on the basis of pumped irrigation vs. gratify fed systems.

In addition, 9% of a tenant's total income goes to the Fund of a peasant (Dayhan) Association. These funds are spent on infrastructure associated with the on-farm irrigation and collector-drainage networks based on local priorities as determined by the Board of the Dayhan Association.

Despite this, the current level and structure of tariffs for irrigation water in Turkmenistan do not fully reflect the intrinsic costs and value of the provision of water. As explained above, at present Turkmen farmers pay for irrigation water a percentage of their income from the crop, plus a nominal charge for the area of land. The cost of irrigation water provision is relatively low. In economic terms this acts as a small income tax. However, there is no connection between the actual cost of water delivery or the intrinsic value of the water and the tariff. In practice the Government pays for the bulk of cost of delivery of the water through the national budget and the farmers pay a percentage of their income to cover a proportion of the costs.

Water payment is made on the basis of norms per hectare (differentiated by crop type), rather than on the basis of actual volumes of water delivered. At the farm level, there is little or no measurement infrastructure that might serve as the basis for a proper volumetric system. In reality, farmers may receive more or less than the norm, but this will not feed through into the fee charged.

Since there is no correlation between the cost of the delivery and the actual payment by the farmer – there is no incentive to reduce water use. The payment for the water will not change, whether the farmer uses more than he needs or whether there are losses due to poor infrastructure maintenance. There is no incentive to save.

Options for tariff setting

The following represent the broad options for charging for the provision of irrigation water supply, based on international best practice:

- *By volume of water supplied (e.g. per 1000m3):* Volumetric methods are often used in countries with developed hydrometric networks, and where there is strong measurement

infrastructure. In some cases, they are based on irrigation time which equates to a flow rate and therefore volume. This can be

  - Fixed: Single tariff for the country as a whole in cases where the unit cost of operation and maintenance (O & M) are approximately equal for different irrigation systems or where there is no central mechanism for collection and redistribution of funds;

  - Differentiated: Different regions or crop types have different tariffs, taking into account differences in the cost of O&M for each irrigation system

  - Variable and increasing: Prices would reflect only on the volume of water consumed, with increasing unit costs by volume to discourage over use.

- *Per unit of area of irrigated land (price per hectare of irrigated area):* This kind of rate can be fixed or flexible, depending on the cost of services for each of the irrigation systems, and the composition of crops with different irrigation rates. Tariff by area is more often used in countries with underdeveloped hydrometric networks, or in areas traditionally dominated by monoculture (rice, melons, corn) where there is a good normative evidence base for volume requirements and delivery.

- *Combined rate:* This is a combination of the above, where there is a fixed fee (usually reflecting the irrigated area) plus a variable rate for water consumption.

In addition, differentiation may be used to reflect a range of attributes, including water quality, seasonality, crop type, soil fertility, gravity fed vs. pumped systems etc. There may be punitive charges for users who exceed certain pre-defined norms. In general, the complexity of water tariffs is usually a reflection of the level of economic development, and the sophistication of the monitoring infrastructure.

Regional best practice

Moving from the current tariff structure to a volumetric-based Irrigation Service Fee (ISF) system would encourage a reduction in water consumption by the agricultural sector. The move towards volumetric-based ISFs has taken place in other FSU countries. Details are provided below:

In the *Kyrgyz Republic*, most on-farm irrigation is managed by Water User Associations. The Department of Water Resources and Land Improvement at the Ministry of Agriculture and Land Improvement, through the RayVodKhozes, operate the off-farm system. The WUAs collect ISF from the users to cover the operating expenses of the WUAs as well as to pay (part) of the costs of the Government in operating the off-farm systems. In the Kyrgyz Republic there is no charge for the intrinsic use of the water but merely a contribution towards the actual costs of delivery, however whereas the overall costs of the WUAs are covered (they have to as the WUAs cannot really operate under a deficit) the operating costs of the off-farm-systems are not covered by the ISF and depend on Government subsidies, to the extent available.

The notion of volumetric ISFs was introduced in Kyrgyz Republic in the mid-1990s but the authorities did not immediately set charges or collect them. The reason for the introduction of the ISF in the 1990s was, as in many other countries in the FSU, the inability of the Government to pay for the upkeep of the irrigation system and the hope that the transfer of the on-farm irrigation system to WUAs would both improve maintenance of the on-farm systems and release the

Government from the need to pay for the on-farm-systems altogether and to collect ISF also for the off-farm systems.

In accordance with Article 7 of the Kyrgyz Water Code of 2005, the power to determine water charges[49] is vested in the Jogurku Kenesh, the Kyrgyz Parliament. The authors are unaware of a water charge for the Agency Managed Irrigation Systems (AMIS) having been set by Parliament and the charges are in fact determined by Government only. Reportedly, the 2010 average ISF rates was 6.65Tyyn/m^3. In practice the rates ranged from 2.8-9.28 Tynn/m^3 depending on regions[50].

In Tajikistan, in accordance with the Tajik water Code of 2000, payment for water is only due for Special Water Use whereas General Water Use is free of charge[51]. The Water Code defines [52] General Water Use as a use of water without applying constructions or technical devices that influence the condition of water and Special Water Use as a use of the water with the application of constructions or technical devices that influence the condition of water and may include in some cases also the use of water without devices but in a manner that negatively impacts the condition of the water.

In accordance with Article 31 of the Tajik Water Code fees are payable for Special Water Use[53] both for water use that is within the established limits, i.e. in accordance with the allocation, as well as for the overuse of water, i.e. exceeding the norm. Fees are also payable for various other uses of water. ISF is to be set by legislation, although the Consultant is unaware of a Parliamentary Act that sets the ISF rates.

ISFs are paid both directly to the District offices of the Ministry of Land Reclamation and Water Resources or through the WUAs where existing. The authors have no data as to the current ISF collection but are aware of the fact that the ISF does not cover the actual expenditures of the MLRWR in supplying the water.

In international terms, the costs associated with the provision of water can vary significantly. Volumetric rates range from between $1 USD per 1000 m3 (Colombia, Canada, Romania) to $290 USD (Israel). Area based tariffs range from $0.3 USD per hectare (Pakistan) to $538 USD in Tunisia and $800 USD in Malta during periods of low water availability. According to the FAO, the average tariff levels in 2004 were in the region of $20 USD per 1000m3 and $40-50 USD. The current rate in Kyrgyzstan and Tajikistan are approximately $0.75 and $2 USD per 1000 m3 (significantly lower than the world average).

A number of lessons can be learned

- The main objectives of the introduction of tariffs for agriculture water in most countries are to cover the costs of services for the supply of water and to encourage the introduction of more efficient technologies for water resources.
- On average, the level of payment for irrigation services must be at least 20 % of the net income before it begins to have a behavioral impact on water efficiency and use.

[49] The term "water charges" is not defined and could be interpreted either as an ISF or as payment for the intrinsic value of water. The authors believe that the term was intended to be an ISF.

[50] Data from Kyrgyz Republic Proposal for Funding for Agriculture Productivity and Nutrition Improvements under the Global Agriculture and Food Security Program (GAFSP), March 2012

[51] Tajik Water Code, 2000, Article 31

[52] Tajik Water Code, 2000, Article 23.

[53] Water Code, Article 31

- Where there is sufficiently robust monitoring infrastructure, the use of a combined rate (using a fixed component for infrastructure costs plus a variable volumetric component) is generally desirable.

Challenges and potential benefits of various options (incl. social protection)

The potential structure and application of water tariffs must take into account the ability and the willingness to pay for water services. Experience from other countries indicates that not all water users are able and willing to pay for the use of water. In Turkmenistan, where state orders form the mainstay of the agricultural system, a purely volumetric ISF "punishes" those farmers that require large quantities of water for the state ordered crops without providing them with an alternative crop choice that would enable them to reduce their ISF. There would therefore have to be some reform in the structure and pricing of state crops.

Recommended approach

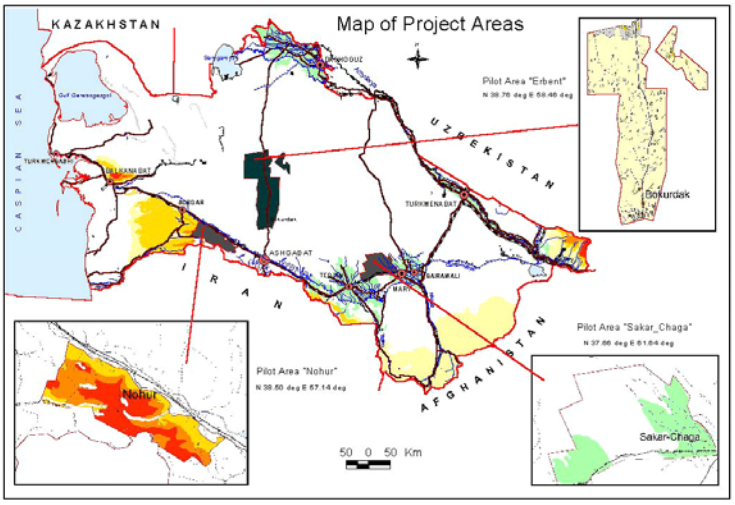
On the basis of the above analysis, the report recommends that Turkmenistan explore and develop a progressive approach to agriculture water pricing. This approach should seek to cover the costs associated with operating (and potentially developing) the water distribution system (and potentially the drainage system), encourage water saving through economic measures and be phased in such a way as to meet the social concerns set out above.

Further work on tariff reform will be undertaken as part of the project, with the authors recommending that the Government of Turkmenistan move towards a hybrid ISF system, where both area and volume are used to determine fees and where end users can benefit from reduction in water use. This process must be phased in slowly (reflecting the current system of state prices, land leasing and funding structures), and be accompanied by a wider process of reform of agricultural crop markets and pricing.

Community level adaptation technologies and practices

A climate risk assessment and investment appraisal undertaken under the project 'Addressing climate change risks to farming systems in Turkmenistan at national and community level' provides an indicative range of costs associated with community level adaptation measures.

Figure 6: Map of Project Area: Addressing Climate Change Risks to Farming Systems in Turkmenistan at National and Community Level.



Detailed assessments have been undertaken for three typical level agro-ecological communities (irrigated land, livestock and mountain agriculture) covering a total population of approximately 50,000 people.

As part of this study, analysis has been undertaken to scale up on farm project activities to a national level, based on relative population and geographic coverage.

Table 7: Community level adaptation measures scaled up to National Level

	Potential Area Under Cultivation (ha)	Potential population receiving benefits	Equivalent national investment costs
Drip Irrigation for vegetables	36,000	360,000	$90,000,000
Clearance of drainage canals	1,440,000	2,000,000	$430,000,000
New wells for desert pasture	3,000,000	20,000	$4,200,000
Efficient irrigation for wheat & cotton	1,440,000	2,000,000	$720,000,000
		TOTAL	**$1,244,000,000**

Source: UNDP, MoNP - Scale up of pilot project data to national level

It should be noted that these costs reflect on-farm and inter-farm costs, rather than the costs of regional or district level infrastructure, and as such do not provide a full picture of national costs. Nonetheless, the analysis provides an indicative estimate of $1.25 billion USD to upscale a typical set of on farm adaptation project practices to a national level.

Economic analysis of on-farm adaptation options

The following section sets out the cost benefit analysis of potential community level adaptation options. The analysis was undertaken as part of the earlier Adaptation Fund project to assess the impact of a range of typical adaptation measures in different types of agro-ecological zones. Adaptation options piloted in the project included the following:

Table 8: Types of adaptation measures by agro-ecological zone

Nohur Mountainous agriculture (fruit and vegetables)	**Karakum** Desert pasture (livestock)	**Sakar Chaga** Irrigated oasis (cotton and wheat)
✓ Water storage construction ✓ Creation and repair of dams ✓ Protection of springs ✓ Lining of water basins ✓ Introducing drip irrigation ✓ Drilling of wells ✓ Tree planting ✓ Composting techniques ✓ Planting of native species	✓ Construction of new wells ✓ Repairing existing wells ✓ Reconstruction of sardobs ✓ Cleaning of rain pits (Takir) ✓ Sand dune fixation ✓ Drip irrigation systems ✓ Planting of native species	✓ Installing hydraulic sluice ✓ Repairing water regulation ✓ Repair of drainage collectors ✓ Construction of new collector ✓ Recovery of previously used the wastelands ✓ Planning of irrigation land ✓ Laser levelling ✓ Introduction of drip irrigation ✓ Field boundary planting ✓ Nursery for native species

Source: Project investment plans

Cost benefit analysis was undertaken for several of the above measures with a view to assessing their economic returns and prioritizing their implementation. This approach provides a socio-economic basis for agricultural planners to prioritize investments where there are limited adaptation funds. The analysis indicates that all of the typical measures under implementation have strong benefit cost ratios and relatively quick payback periods. These benefits include rapid improvements in yields and productivity that can support the development of rural livelihoods under current climate baselines and in the absence of further climate change. This information can be used by policy makers to help prioritize investments within the national agriculture and water strategies, and to support on farm development activities.

The following sets out an initial ex-ante analysis for selected measures.

Table 9: Cost benefit analysis for selected community level adaptation measures

Measure	**Benefits assessed**	**Internal Rate of Return (IRR)**	**Benefit cost ratio (BCR)**	**Payback period (years)**

Construction of drip irrigation systems in Nohur (37 ha)	40-50% increase in fruit and vegetable yield/ha	19.4%	6.2:1	7
Construction of dams with water reservoirs in Nohur	Increase in water availability leading to expanded livestock cultivation	37.8%	6.5:1	5
Construction of 8 new wells for sheep pasture in Karakum	Increase in pasture availability supporting 200 head per well	80%	13.1:1	2
Repair of water regulation sluice gates	More effective use of water	30%	16.4:1	4
Reconstruction of the on-and inter-farm drainage collectors in Sakar Chaga	30% increase in cotton yield/ha	15.5%	1.65:1	7
Laser levelling and planning of cotton and wheat fields in Sakar Chaga (150 ha)	Reduction in water use and increase in productivity	24.7%	4.4:1	5

More detailed analysis of individual adaptation measures that might be prioritized under community level planning (Component 3) are set out below:

(i) Construction of drainage/water collector: Pilot area: oasis – irrigated territory of "Zakhmet" farmers' association, Sakarchage etrap of Mary velayat

The calculation was performed under the following conditions:

- cost of construction of the new collector with the length of 5km – 186.2 thousand manats; in addition, 20.3 thousand manats – the cost of performing topographical survey, total - 206.5 thousand manats;
- area, which will be impacted by the collector - 300 hectares;
- operating expenses - 5% of the cost (186.2 thousand manats × 0.05 = 9,3 thousand manats);
- at cotton cost of 1040 manats/ton and profitability of 30%, the prime cost will be 800 manats/ton, and revenue – 240 manats/ton;
- at cotton yield of 3 tons/ha, the value of income per 1 ha will amount to 720 manats;
- loss of crop at mid-saline lands is 30%; proceeding from this, the effect of the construction of collector is rated to 30% of the total revenue value;

720 Manats / ha × 300 ha × 0.30 = 64800 manats

Based on the above, the following assessment has been made:

The total amount of capital investments required for the implementation of the planned measures is 206.5 thousand manats.

Income related to the effect (30% of the value of total revenue) on the lands attributed to the planned collector (300 hectares) will be 64.8 thousand manats (in mildly saline lands the yield losses are up to 30%). In addition, by elimination of washings, more than 120 hectares of additional land can be put into cultivation. And the revenue from this area can be attributed to the effect of this activity (86.4 thousand manats).

The calculation showed, that the net present value (NPV) at a discount rate of 10% will be 228 thousand manats, Internal Rate of Return (IRR) - 15.49%, the ratio of discounted revenues to costs - 1.65 and the payback period of capital investment in the implementation of this activity will be 7 years, which leads to the conclusion about the economic feasibility of the project (table 3.1).

Assuming that 1 family possesses 1-3 hectares of land, 140÷420 families will benefit, and with the family coefficient of 5 700÷2,100 persons will benefit from the activity.

Table 10: Cost effectiveness of drainage collector construction

Indices	Unit of measure	YEARS											
		1	2	3	4	5	6	7	8	9	18	19	20
Capital investments, total	Th.manats	206,5	0	0	0	0	0	0	0	0	0	0	0
Collector construction	Th.manats	186,2	0	0	0	0	0	0	0	0	0	0	0
Topographic survey	Th.manats	20,3	0	0	0	0	0	0	0	0	0	0	0
Operating costs (5% of the construction cost)	Th.manats	0,0	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3
Total expenditures	Th.manats	413,0	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3	9,3
Revenue from agricultural production (30%)	Th.manats	-129,6	38,9	30,2	45,9	64,8	64,8	64,8	64,8	64,8	64,8	64,8	64,8
Revenue from saved water (120 ha)	Th.manats	-172,8	51,8	40,3	61,2	86,4	86,4	86,4	86,4	86,4	86,4	86,4	86,4
Net profit	Th.manats	-715,4	81,4	61,2	97,8	141,9	141,9	141,9	141,9	141,9	141,9	141,9	141,9
Discount factor	0,10	0,909	0,826	0,751	0,683	0,621	0,564	0,513	0,467	0,424	0,180	0,164	0,149
Discounted value of costs	Th.manats	375,5	7,7	7,0	6,4	5,8	5,3	4,8	4,3	3,9	1,7	1,5	1,4
Discounted profit value	Th.manats	-274,9	75,0	53,0	73,2	93,9	85,3	77,6	70,5	64,1	27,2	24,7	22,5

Discount rate, %	5	10	20	30
NPV (Net Present Value), thousand manats	791	288	-133	-277
IRR (Internal Rate of Return)	15,49%			
Ratio of discounted income to expenses	1,65			

(ii) Construction of water regulating structures: Pilot area: oasis – irrigated territory of "Zakhmet" Farmers association, Sakarchage district of Mary province.

The calculation was performed under the following conditions:

– cost of construction of water regulating facilities - 8900 manats;
– linked area - 180 hectares;
– operating expenses (annual repair of facility, cleaning, lubrication, etc.) - 5% of the price;
– crop yield - 3.0 t/ha;
– cost of 1 ton of cotton – 1040 manats/t;
– prime cost of 1 ton of cotton with profitability of 30% - 800 manats/ton.

Water savings will be about 10%, i.e. savings on water can additionally engage in agricultural use for at least 18 hectares.

Table 11: Cost effectiveness of construction of water regulating facilities

Indices	UOM	YEARS										
		1	2	3	4	5	6	7	8	18	19	20
Capital investments, total	th. manats	8,9	0	0	0	0	0	0	0	0	0	0
Operating costs (5% of the construction cost)	th. manats	0	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445	0,445
Total expences	th. manats	8,9	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4
Revenue from agricultural production (15%)	th. manats	-38,9	11,7	9,1	13,8	19,4	19,4	19,4	19,4	19,4	19,4	19,4
Revenue from water savings	th. manats	-25,9	7,8	6,0	9,2	13,0	13,0	13,0	13,0	13,0	13,0	13,0
Net profit	th. manats	-47,8	11,2	8,6	13,3	19,0	19,0	19,0	19,0	19,0	19,0	19,0
Discount factor	0,10	0,909	0,826	0,751	0,683	0,621	0,564	0,513	0,467	0,180	0,164	0,149
Discounted value of costs	th. manats	8,1	0,4	0,3	0,3	0,3	0,3	0,2	0,2	0,1	0,1	0,1
Discounted profit value	th. manats	-70,7	19,3	13,6	18,8	24,1	21,9	20,0	18,1	7,0	6,4	5,8

Discount rate, %	5	10	20	30
NPV (Net Present Value), thousand manats	152	83	23	0
IRR (Internal Rate of Return)	30,22%			
Ratio of discounted income to expenses	16,45			
Capital investments payback period, years	4			

These results show the high economic efficiency of the project. The calculation showed that the net present value (NPV) at a discount rate of 10% will be 83 thousand manats, Internal Rate of Return (IRR) - 30.22%, the ratio of discounted revenues to costs - 16.45, and the payback period of capital investments in the implementation of the activity will be 4 years, that leads to the conclusion about the economic feasibility of the project.

The projects of this kind are considered economically viable at a payback period of 8-10 years.

Besides, in relation to the similar projects it is advisable to estimate the number of people that will benefit from the project. Assuming that 1 tenant has from 1 to 3 hectares of land, and the total area of 180 hectares, 60÷180 families will be beneficiaries, and with the Family coefficient of 5, 300÷900 persons will benefit from the activity.

(iii) ***Laser land leveling: Pilot area:*** **oasis – irrigated territory of "Zahmet" farmers' association, Sakarchaga district of Mary province.**

The calculation was performed under the following conditions:

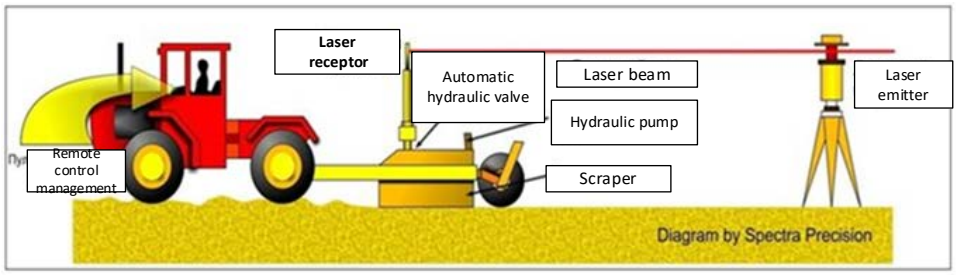
1. Field area – 10 hectares (cotton);
2. Cost of equipment - 8050 manats;
3. Other costs: work on rough planning, topographic survey of the field, etc. – in the calculation it is taken for 1000 manats;
4. Operating costs - 5% of the cost of equipment (9050 manats × 0.05 = 453 manats);
5. Extra income is the difference of income without project and with the project.
– without the project – existing income at 18 center/ha from 10 ha – 2,9 thousand manats;
– with the project – the income at 30 cent/ha from 10 ha – 7,2 thousand manats;
– difference – 4,3 thousand manats.
6. The amount of saved water (30%), additional area due to the saved water – 4,3 hectares;
7. Additional revenue due to the saved water - 3,1 thousand manats.

12: Cost-effectiveness of laser land leveling

Indices	UOM	YEAR										
		1	2	3	4	5	6	7	8	18	19	20
Capital investment, total	th.manats	9,1	0	0	0	0	0	0	0	0	0	0
Operational costs, (5% of construction costs)	th.manats	0	0,453	0,453	0,453	0,453	0,453	0,453	0,453	0,453	0,453	0,453
Total costs	th.manats	9,1	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Income from agricultural production	th.manats	0,0	0,0	1,2	2,6	4,3	4,3	4,3	4,3	4,3	4,3	4,3
Net profit	th.manats	-9,1	-0,5	0,7	2,2	3,9	3,9	3,9	3,9	3,9	3,9	3,9
Discount ratio	0,10	0,909	0,826	0,751	0,683	0,621	0,564	0,513	0,467	0,180	0,164	0,149
Discounedt value of costs	th.manats	8,2	0,4	0,3	0,3	0,3	0,3	0,2	0,2	0,1	0,1	0,1
Discounted value of profit	th.manats	0,0	0,0	1,7	3,6	5,4	4,9	4,4	4,0	1,6	1,4	1,3

Discount rate, %	5	10	20	30
NPV (Net Present Value), thous.manats	27,8	14,1	2,4	-1,7
IRR (Internal Rate of Return)	24,70%			
Ratio of discounted profit to expenses	4,41			
Capital investments payback period, years	5			

This result shows high economic efficiency of the project. The calculation showed that the net present value (NPV) at a discount rate of 10% will be 14,1 thousand manats, Internal Rate of Return (IRR) – 24.70%, the ratio of discounted revenues to costs – 4.41, and the payback period of capital investments in the implementation of this activity will be 6 years, that leads to the conclusion about the economic feasibility of the project (Table 3.3).



The projects of this kind are considered economically viable at a payback period of 8-10 years.

In addition, in relation to similar projects it is advisable to estimate the number of people that will benefit from the project. Assuming that 1 tenant possesses from 1 to 3 hectares, and the total area of 14.3 hectares, 14 families will receive benefit of 14 families; and with a Family coefficient of 5 - 24÷70 persons. The actual economic effectiveness of this adaptation measure is even higher due to the fact that the same equipment can be utilizes on the other areas in the same year and in the following years**.**

(iv) Drip Irrigation: Pilot area: mountainous area – "Konegumbez" site of "Yenish" Farmers Association, Baharly district of Ahal province.

The calculation was performed under the following terms:
1. The field area – 10 ha (gardens);
2. The cost of the drip irrigation system – 7160 manat/ha, while the total amount of costs is 71.6 thousand manats.

3. Operational costs - 5% of the total price, one time every 5 years (71.6 thousand manats × 0.05 = 3.6 thousand manats);
4. The price of fruits – 3000 manats/ton. At the profitability of 30%, the annual amount of income will be at least 9.7 thousand manats/ha.
5. The amount of saved water is 40%.

Table 13: Cost effectiveness of drip irrigation

Indices	Unit of measure	YEARS									
		1	2	3	4	5	6	7	8	19	20
Irrigated area	ha	10	10	10	10	10	10	10	10	10	10
Capital investments, total (construction of drip irrigation system)	th. manats	71.6									
Operating costs	th. manats						3.6				
Total costs	th. manats	71.6	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0
Income from agricultural production	th. manats	-193.8	-193.8	32.3	53.3	64.6	72.7	96.9	96.9	96.9	96.9
Additional income from saved water (40%)	th. manats	0.0	0.0	12.9	21.3	25.8	29.1	38.8	38.8	38.8	38.8
Net profit	th. manats	-265.4	-193.8	45.2	74.6	90.5	98.2	135.7	135.7	135.7	135.7
Discount factor	0.10	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.164	0.149
Discounted value of costs	th. manats	65.1	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0
Discounted profit value	th. manats	-176.2	-160.2	34.0	51.0	56.2	57.4	69.6	63.3	22.2	20.2

Discount rate, %	5	10	20	30
NPV (Net Present Value), thous.manats	815	357.2	-16	-136
IRR (Internal Rate of Return)	19.24%			
Ratio of discounted incomes to expenses	6.17			
Capital investments payback period, years	7			

This result shows high economic efficiency of the project. The calculation showed that the amount of the net present value (NPV) at a discount rate of 10% will be 357.2 thousand manats, Internal Rate of Return (IRR) – 19.24%, the ratio of discounted revenues to costs – 6.17, and the payback period of capital investments in the implementation of this activity will be 7 years, that leads to the conclusion about the economic feasibility of the project.

The projects of this kind are considered economically viable at a payback period of 8-10 years.

In addition, in relation to similar projects it is advisable to estimate the number of people that will benefit from the project. Due to the specifics of mountain territories, 1 leasee/farmer possesses from 0.08 to 0.09 hectares and the total area of 10 hectares. So, the beneficiaries will be 110÷125 families, and taking into account the Family coefficient (5) benefits will be received by 550÷625 people.

(v) Construction of water dams and reservoirs in mountainous regions

The calculation was performed under the following terms:

1. The additional number of sheep for 7 reservoirs – 700 heads;
2. The costs of the construction of dams and reservoirs – 67.371 thousand manats;
3. Every 5 years - 6% of the cost – operating expenses;
   67.371 thousand manats × 0.06 = 4.042 thousand manats
4. The price of 1 sheep is 400 manats/head, the prime cost is 120 manats/head;
5. Due to the fact that the reservoirs cannot be filled each year and are not used all year long (4-8 months), only 50% of the revenue is attributed to the effect.

The calculation showed that the amount of the net present value (NPV) at a discount rate of 10% will be 359 thousand manats, Internal Rate of Return (IRR) – 37.75%, the ratio of discounted revenues to costs – 6.48, and the payback period of capital investments in the implementation of this activity will be 5 years, that leads to the conclusion about the economic feasibility of the project (Table 3.5). Provided that there are 10 sheep per 1 family, 70 families will receive benefit, or 350 people (Family coefficient – 5).

Table 14: Cost effectiveness of construction of water dams and reservoirs

Indicators	UOM	YEAR											
		1	2	3	4	5	6	7	8	9	18	19	20
Capital Investments, total	th.manats	67.4											
Operational expenses	th.manats						4.04				4.04		
Total expenses	th.manats	67.4	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	4.0	0.0	0.0
Additional income	th.manats	0.0	0.0	9.8	14.0	28.0	42.0	56.0	70.0	84.0	98.0	98.0	98.0
Net profit	th.manats	-67.4	0.0	9.8	14.0	28.0	38.0	56.0	70.0	84.0	94.0	98.0	98.0
Discount factor	0.10	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.180	0.164	0.149
Discount value of costs	th.manats	61.2	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.7	0.0	0.0
Discount value of profit	th.manats	0.0	0.0	7.4	9.6	17.4	23.7	28.7	32.7	35.6	17.6	16.0	14.6

Discount rate, %	5	10	20	30
NPV (Net Present Value), in th. Manats	668	359	110	27
IRR (Internal Rate of Return)	37.75%			
Ratio of discounted incomes to expenses	6.48			
Capital investments payback period, years	5			

Extremely important is the fact that this adaptation measure will increase the flow of water in springs used by local population for drinking purposes (more than 5000 persons). Income from this is not defined in terms of value.

(vi) Construction of water storage in Desert regions (sardobas)

Estimation of economic efficiency of capital investments and feasibility of *sardoba* (dew mound) construction is performed using the method of comparative cost-benefit analysis. In this case, comparison of the costs for two options is made:

- *I option – construction of the 60 m³ capacity sardoba (underground reservoir);*
- *II option – delivery of the same amount of water by auto water carriers.*

The following should be considered for the I option:

– the service life of the facility (50 years). Provided *sardoba* operating for 50 years, the total volume of water will be 3000 m³;
– acquisition costs of building materials, tools, handling operations;
– the cost of transportation of materials and people to the construction site;
– annual operating costs (cleaning of dew mound, fencing repair, etc.)

The following should be considered for the II option:

– cost of delivery of the same volume of water, for example, from Yerbent to Bori. According to local residents' assessment, today water delivery by water carrier (8 m^3) costs 500 manats, therefore delivery of 60 m^3 of water to the village is estimated at 3750 manats.

The calculation shows that the total value of construction costs of *sardob*a and its operation during 50 years will amount to 47,56 thousand manats (including capital repair costs – one time every 10 years), whereas the delivery costs of water by trucks for the same period amount to 187,5 thousand manats (3,75 thousand manats × 50 years = 187,5 thousand manats). That is, the construction costs of *sardoba* are 4 times less than the cost to transport the same amount of water by trucks. On this basis, it is possible to make an unambiguous conclusion about the economic practicability of building dew mounds.

It should be noted that the construction of *sardoba* brings benefit to all residents of the village, as the water from the dew mound is delivered to them as needed, directly to the house.

In accordance with the norms, a person of average weight should drink 2 liters of clean water per day[54]. Hence, the work of the project on construction of 5 new *sardobas* and reconstruction of 4 existing dew mounds with the capacity of 60 m^3, implemented in 2015, will provide an annual demand for drinking water for about 1000 people.

Table 15: Cost effectiveness of construction of sardoba (dew mound) with capacity of 60 m^3

Indices	Unit of measure	YEARS						**Total for 50 years**
		1	2	3	4	49	50	
I option - construction of the 60 m^3 capacity dew mound (service life of *sardoba* is 50 years)								
Total expenditures	thous. manats	13.09	0.50	0.50	0.50	0.50	1.50	**47.56**
including construction materials and their delivery to the construction site	thous. manats	9.99	0	0	0	0	0	**9.99**
payment to workers	thous. manats	3.1	0	0	0	0	0	**3.10**
Annual operating expenditues (cleaning, fencing repair, etc) - 5%.	thous. manats	0	0.5	0.5	0.5	0.5	0.5	**24.48**
Costs of capital repair (once in 5 years - 10%)	thous. manats	0	0	0	0	0	1.0	**9.99**
II opion - delivery of the same amount of water by water tank trucks								
Cost of delivery of 8 м^3 of water from Yerbent to Bori is 500 manats. Transportation of 60 м^3 of water - 3,75 thousand manats	thous. manats	3.75	3.75	3.75	3.75	3.75	3.75	**187.50**

[54] http://www.watermap.ru/articles/sutochnaja-norma-vody-dlja-cheloveka

(vii) Construction of new wells for sheep watering in desert conditions

The calculation was performed under the following terms:

1. Additional number of sheep for 1 well – 250 heads;
2. Cost of the well construction – 30.0 thousand manats;
3. After each 5 years – 8% of the cost – repair and cleaning;
   30.0 thousand manats × 0.08 = 2.40 thousand manats
4. Price of 1 sheep – 400 manats/head;
5. Product prime cost – 30% of the price, or 120 manats/head.

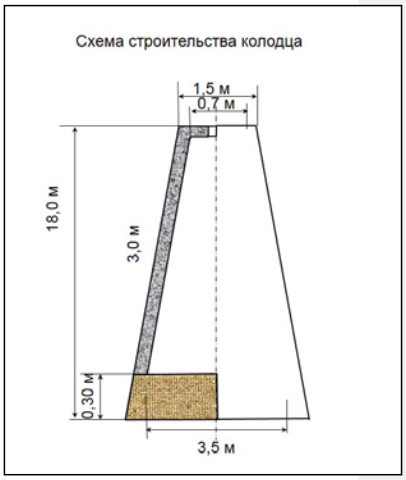
The calculation showed that the amount of the net present value (NPV) at a discount rate of 10% will be 363 thousand manats, Internal Rate of Return (IRR) – 79,92, the ratio of discounted revenues to costs – 13.11, and the payback period of capital investments in the implementation of this activity will be 2 years, that leads to the conclusion about the economic feasibility of the project (Table 3.7). Assuming that 25 families are using 1 well and will benefit – 10 sheep per family (Family coefficient - 5), or 125 people.

Taking into account the fact that 1 well serves for the area of about 7-10 thousand hectares of the pasture territory, construction of such wells can be done at the area of 2-3 million hectares – this is approximately 400 wells. In this case, 20,000 people will benefit, total costs will amount to 12 million manats (4.2 million USD). Importance of the implementation of this adaptation measure is even more enhanced by the fact that supplying additional area with water prevents further degradation of 2,5÷7,5 thousand hectares of pasture per 1 well.

Table 16: Cost effectiveness of building a well for sheep watering

Indices	Unit of measure	YEARS									
		1	2	3	4	5	6	7	8	19	20
Expenses, total	th. manats	30					2.4				
Additional income	th. manats	0.0	14.0	19.6	28.0	40.6	56.0	70.0	70.0	70.0	70.0
Net profit	th. manats	-30.0	14.0	19.6	28.0	40.6	53.6	70.0	70.0	70.0	70.0
Discount factor	0.10	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.164	0.149
Discounted value of costs	th. manats	27.3	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0
Discounted profit value	th. manats	0.0	11.6	14.7	19.1	25.2	31.6	35.9	32.7	11.4	10.4

Discount rate, %	5	10	20	30
NPV (Net Present Value), thous. manats	610	363	151	73
IRR (Internal Rate of Return)	79.92%			
Ratio of discounted incomes to expenses	13.11			
Capital investments payback period, years	2			



Conclusions and recommendations

This section sets out conclusions of the study and recommendations going forward.

The Agriculture sector has significant socio-economic importance

Agriculture remains a key strategic sector of the economy, employing approximately 50% of the workforce and contributing 10% of GDP (USD $3.8 billion). Livestock, wheat and cotton are the primary areas of economic sector activity. Agriculture is among the most climate sensitive sectors. The rural population in Turkmenistan is dependent upon agriculture for their livelihoods. Potential impacts will disproportionately affect poorer rural populations, and reduce potential growth and development patterns;

The extent of climate change impacts is expected to be significant

Climate change modelling indicates significant increases in temperature and reductions in rainfall. Temperatures are expected to increase by 2C by 2040 with precipitation declining across all agro-ecological zones after 2020. These trends will be accompanied by increased frequency and severity of climate induced disasters (drought, floods, and strong winds).

And agriculture will suffer, particularly due to lack of irrigation water

The agriculture sector will suffer a range of negative impacts as a result. In the short-medium term, direct impacts on agricultural yields resulting from changes in temperature and precipitation are likely be partially offset by increased CO_2 fertilization and longer growing seasons. However, more significant indirect impacts will occur as a result of reduced water availability within the irrigation network. Projected changes in climate are likely to result in reduced river flows, increased network distribution loses and higher evaporation rates. These factors are likely to

result in a water deficit of up to 5.5 km3 per annum by 2030-40. This is the equivalent of approximately 20% of current water use in the agriculture sector, resulting in a significant impact on yields. These findings are consistent with other recent studies in Central Asia (e.g. World Bank 2013a);

This has the potential to result in significant economic losses.

This water deficit has the potential to result in significant economic losses to the agriculture sector. In terms of productive land equivalent, this water deficit would result in a reduction of output over the period 2015-2030 equivalent to nearly 4 million tons of wheat and more than 3 million tons of cotton. In the absence of new policies and measures, the economic costs associated with such a decline could reach $2.5bn per annum by 2030 or a cumulative $20bn (discounted) for the period 2015-2030. These are the 'costs of inaction';

The costs of adaptation are large

The national level costs associated with adaptation to climate change are significant. National level estimates indicate that investments of $600m per annum by 2030 would be sufficient to reduce the water deficit. A number of on-farm adaptation activities are being supported by the project 'Addressing climate change risks to farming systems in Turkmenistan at national and community level'. These measures include drip irrigation, improvement of drainage systems and development of desert pasture wells. Up-scaling these activities to a national level would require investment of approximately $1.25bn and would deliver benefits to more than 2.3 million people.

But they are lower than the costs of inaction and adaptation delivers positive returns

At a national level, the costs of adaptation are significantly lower than the benefits envisaged in terms of economic losses (benefit cost ratio of 4:1). At a farm level, cost-benefit analysis of specific adaptation measures being undertaken across three agro-ecological zones indicates positive socio-economic returns, with some adaptation measures delivering high benefit cost ratios (>10:1) on the basis of water saving and yield improvements, with short payback periods of less than 5 years.

Mainstreaming adaptation in sector legislation will be important

The government of Turkmenistan has made good progress in setting out its climate change strategy and continues to build its research capacity through the development of the Third National Communication on Climate Change to the UNFCCC. Work is also on-going in the development of a National Adaptation Plan, led by the Ministry of Economic Development. As part of this process, it is recommended that the Government now focus on supporting the mainstreaming of climate change resilience and adaptation planning into the relevant sector policies and strategies as they are reviewed (e.g. Water Code, Dayhan Association Law) to ensure that the climate resilience strategies are operationalized in an effective manner. The Adaptation Fund financed project 'Addressing climate change risks to farming systems in Turkmenistan at national and community level' has made a set of recommendations to the Ministry of Water Economy in regard to the Water Code and will continue to support this reform process for other relevant legislation.

There are a range of opportunities to build adaptive capacity at the on-farm level

The Government of Turkmenistan should continue to build on farm capacity to strengthen the resilience of the agricultural network. This might include developing a more robust system of extension services (focusing on agronomic best practices, efficient irrigation techniques, land preparation and fertilizer use, drought resistant seed use and pest control). Consideration should also be given to the potential consolidation of Dayhan land into larger holdings to support more efficient investments in irrigation technology, and the encouragement of more flexible and

commercial approaches to agricultural production and crop choice. At an institutional level, potential adaptation approaches could include support for the development and identification of drought resistant seed varieties and livestock breeds.

The Government of Turkmenistan should continue to develop water infrastructure

The Government of Turkmenistan has a significant on-going programme of capital investment in water saving technologies and supply infrastructure to ensure the sustainability of the agricultural network. The main focus of these programmes at present is in large scale water storage, transport and drainage systems, although the strategy also indicates significant investment in efficient on-farm irrigation systems. The Government of Turkmenistan should review the scope and scale of these investments in the light of projected climate change to ensure that the availability of irrigation water is sufficient to address projected losses.

Water pricing will be central to improving end use efficiency

The lack of effective water pricing remains a significant challenge to improving end user water efficiency. Currently, there is limited use of volumetric measurement, with pricing based on norms derived from the area under cultivation. As such, there is no incentive by end users to improve the efficiency of their on-field irrigation techniques. We recommend that the Government of Turkmenistan investigate the potential to introduce a more robust system of water pricing. The process of developing more progressive tariff structures can be supported by the Adaptation Fund financed project 'Addressing climate change risks to farming systems in Turkmenistan at national and community level'.

Financing demands are large and it is important to leverage non-state investment

Under the current system of water management, the Government of Turkmenistan takes primary responsibility for financing water supply and drainage infrastructure (both on and off farm) in irrigated areas. The Government is also responsible for water infrastructure in desert pasture areas. Mountainous and piedmont areas are largely self-financing and operated by private farmers. The costs of financing a robust and efficiency agricultural water supply and drainage system for Turkmenistan over the next 10-15 years are significant (potentially up to USD $16 billion). While the Government of Turkmenistan will continue to cross-subsidize these investments from the national budget, opportunities should be explored to incentivize investments at the farm level by Dayhan Associations and individual small holders. This will require some reform of land tenure arrangements and state pricing of crops to create incentives to improve water efficiency.

Research and data and modelling capacity should be strengthened.

This assessment forms an initial view of the socio-economics of climate change in relation to water and agriculture. Going forward, we recommend that the Government of Turkmenistan seek to engage in more detailed modelling of its major agro-ecological zones potentially as part of preparations for the Third National Communication process. This could be done through local research institutions using national data and by applying a combination of climate, crop, water and economic models. These outputs would provide a higher resolution understanding of the potential impacts, economic costs and benefits of action. This process would help inform government investment policy in the sector.

(vii) Preliminary Cost Benefit Analysis associated with installing solar panels for water pumping in remote villages of the Karakum desert

The UNDP/GEF project “Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan” implemented jointly by UNDP, GEF and the Ministry of Agriculture and Water Resources of Turkmenistan have been piloting the use of renewable energy (solar panels) to replace diesel generators for water pumping in three villages of the Karakum Desert. To this end, it is planned to install solar panels that will generate energy to power the submersible pumps, which are used to pump water from wells (about 20 m deep). Also, the solar energy will be used for the operation of a desalination electrodialysis unit in one of the villages and low-power household appliances.

The analysis was based on the use of four electricity generators in three villages. According to experts, the approximate average annual cost for the production of electricity in three villages is almost 45,000 manat (almost USD 13,000, see table below). Since the generators are powered by diesel, it is not surprising that over 90% of the total cost is diesel and engine oil, which is necessary for the operation of a diesel generator for 5-6 hours a day. The remaining costs are the cost of the generators themselves and their current repairs. The service life of each generator is not more than 2 years. According to approximate estimates, the amount of installation of the solar panel system in these localities will be about $ 50,000. Thus, it can be calculated that **the payback of such a system will be less than 4 years, while the average service life of modern solar panels is at least 20 years.**

In addition to economic benefits, there are also **environmental benefits**. Oil and gas spills around wells and fuel storage areas are excluded. Smoke and odor on the work places of generators decrease. When the generators are turned off, the greenhouse gas emissions to the environment are zero. There are also **social and other benefits**. The elimination of fire danger, as well as noise from working generators, which is of great importance for the calm watering of animals. In addition, low-power household appliances (lighting, chargers, TV, satellite antenna, radio, electric kettle, etc.) can be powered from the uninterrupted solar system, which will allow residents of remote desert villages to enjoy the basic amenities available to date.

Table 17. Savings from replacement of diesel-powered water pumps with solar PV powere pumps in 3 villages (Turkmen manats)

Economic benefits due to the exclusion of diesel electric generators						
№	Item	Quantity	Unit	Cost (TMT)	Total cost per year (TMT)	Note
1	Diesel generators	4.00	piece	600.00	2,400.00	Solar panels will turn off 4 electric generators in 3 villages in the Karakum Desert
2	Fuel for operation of 4 generators	24,000.00	litre	1.50	36,000.00	about 300 days a year, shepherds have to use about 20 liters of diesel fuel per day every day to ensure the operation of submersible pumps and for household needs
3	Fuel delivery for 4 generators	4.00	tank (5 tons each)	800.00	3,200.00	delivery of diesel fuel from the nearest gas station to the village
4	Engine oil for operation of 4 generators	54.00	litre	30.00	1,620.00	the electric generator also needs engine oil for smooth operation
5	Maintenance of 4 generators	4.00	piece	400.00	1,600.00	it is often necessary to repair low-quality cheap electric generators all over the year
	TOTAL costs per year for 3 villages				**44,820.00**	

ANNEX 7: SOCIAL AND ENVIRONMENTAL SCREENING REPORT

Project Information

Project Information	
1. Project Title	Scaling climate resilience for farmers in Turkmenistan
2. Project Number	# 00097117
3. Location (Global/Region/Country)	Turkmenistan

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the Project mainstreams the human-rights based approach
The project will enhance the socio-economic rights of Turkmenistan's most climate change vulnerable population, by increasing water availability to rural farmers through climate resilient agricultural practices. That is, the project will increase climate resilience of 500,000 people in Turkmenistan's rural communities, representing the most vulnerable economic communities in Turkmenistan. Such farmers currently cannot effectively benefit from existing state support. They lack access to resources and know-how to invest in climate resilient practices and technologies, and in terms of how to manage water and land resources in an efficient way. Improved livelihood opportunities will facilitate the right to work and anticipated project impacts also expedite right to environmental protection and climate adaptation. In doing so, the project aims to promote the social and economic rights of beneficiaries, including the right to habitat and economic security, as reducing land degradation results in improved and more stable crop yields and incomes. The project also places emphasis on stakeholder engagement and capacity building at the local level, to ensure that solutions reflect specific needs and priorities, enhancing the project's social benefits. Equal consideration for the most vulnerable stakeholders, including testing ability-to-pay of the poorest beneficiaries in regards to policy measures such as water tariff setting, is ensured to mainstream human rights-based approach in the project. Strengthening land tenure rights, supporting the development of legal structures to facilitate collective planning and investment, and promoting the shift towards market-based pricing for water access, also mainstream the human-rights based approach.
Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment
Gender considerations will be fully mainstreamed into project implementation. The programme will provide opportunities for women to learn about climate resilience and integrate best practices into their operations, as well as to diversify their livelihoods in more

resilient ways. The project will ensure that there is gender balance in project activities (e.g. seminars, community level events) including access to project financial assistance. Gender considerations will be used in any community level vulnerability analysis linked to local infrastructure or demonstration plot development. The project will also use gender sensitive indicators (particularly around beneficiaries) to facilitate planning, implementation and monitoring.

The project will actively seek to engage women in all of its efforts regarding stakeholder engagement and agricultural extension. A process of community orientation and mobilization will be undertaken under the project by involving both genders with the intent of dissemination of the project information and objectives, and to seek to accurately identify the perceptions of the local communities and other stakeholders regarding existing water, and agriculture management practices. Farmer associations with livelihoods related to agriculture and livestock have at least 30 per cent female members who would actively attend the association's meetings and would be involved in various project initiatives. Efforts at social mobilization will ensure that female staff members will encourage greater participation of women from the farmer associations. Overall, the project will ensure that both men and women are able to participate meaningfully and equitably, have equitable access to Project resources, and receive comparable social and economic benefits.

Briefly describe in the space below how the Project mainstreams environmental sustainability

The core focus of the project is mainstreaming environmental sustainability by increasing the efficient use of water resources, and reducing and remedying land degradation. The project seeks to achieve such mainstreaming through several integrated activities, including the use of climate-resilient technologies in agriculture and testing through pilot plots, expanded investment, planning and regulatory support, capacity building, and national policy reform. Integrated, equitable and efficient use of water resources is the key environmental issue in Turkmenistan, with significant impacts on an array of environmental factors, including climate change resilience, land degradation and biodiversity. The project directly addresses this issue with the promotion of efficient irrigation systems, putting environmental sustainability and the integrated environmental benefits of water-use efficiency at the center of project design.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks? *Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to*	**QUESTION 3: What is the level of significance of the potential social and environmental risks?** *Note: Respond to Questions 4 and 5 below before proceeding to Question 6*	**QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?**

Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects.				
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Risk 1 Output 3.1 of the project proposes investments in efficient irrigation techniques (e.g. drip, sprinkler). There is a risk that the choice of irrigation technology, may lead to an increase in the use of surface water. **Relevant AF ESP principles:** • Pollution prevention and Resources Efficiency, • Compliance with the Law	I = 3 P = 2	Moderate	The significance of the potential environmental risks is moderate given that the focus of the project is increasing water use efficiency, but the overall use of both surface and groundwater should be monitored. Compliance with the national technical standards and regulatory requirements on water extraction will need to be ensured and monitored.	The design of demonstration projects featuring new water saving technologies will be based on careful hydrological studies in the chosen locations which would take into account the hydrographic parameters of the landscape, available water sources, their quantity and quality. Experienced local experts, drawing on international expertise as necessary, will carry out these engineering and hydrological studies. Irrigation technologies will also be monitored however for trends in water usage. In addition, Components 1-2 are aimed at supporting efficient water management practices and techniques to mitigate and minimize potential increase in water demand. Compliance with the national technical standards and regulations will be secured as indicated in the ESMF.
Risk 2 Governance issues, including "Elite capture" with the "plausible recurrent risk" of deviation and capture of the benefits accrued from the project by influential actors. **Relevant AF ESP principle:** • Access and Equity	I = 3 P = 2	Moderate	Criteria for beneficiary participation and selection need to be established. Access to the benefits delivered by the project (extension services and adaptation measures) need to be monitored.	The project supports farmers associations as a collective group, through a participatory planning process. Specific criteria and guidelines will ensure that infrastructure and land-use decisions at the local level are made through a collective decision-making process that would be facilitated by technical staff provided by the project. Regular monitoring and oversight provided by the project is intended to ensure that benefits are fairly well distributed to all participating households, including women, as well as through the project evaluation process. The project includes provisions/criteria for the selection and participation of the vulnerable populations.

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				supported by targeted outreach and promotion to poorer communities. The project also establishes annual project monitoring mechanism to verify that poorer and more vulnerable farmers have access and are participating in extension services training under Component 2.
Risk 3 There is some possibility the project could potentially restrict access to resources of marginalized individuals or vulnerable groups through the setting of tariffs for water supply services to water users. Also, managing the risk of water scarcity might require changing agricultural practices in a way that includes restricting or managing access to certain pasture lands, changing agricultural crops and practices that have potential to affect customary practices and/or resources. **Relevant AF ESP principle:** • Access and Equity • Marginalized and Vulnerable Groups	I = 2 P = 2	Low	Water tariffs, and water efficiency regulations, under the legislative reform component might have some potential for restrictions The project will pilot climate adaptation in already established farmer associations where the land is already allocated on the basis of long-term leases, so issues of customary rights or land tenure are unlikely to be triggered by the project	The potential structure and application of water tariffs must take into account the ability and the willingness to pay for water services. Experience from other countries indicates that not all water users are able and willing to pay for the use of water. The project will therefore explore and develop a progressive approach to agriculture water pricing. This approach will seek to cover the costs associated with operating (and potentially developing) the water distribution system (and potentially the drainage system), encourage water saving through economic measures and be phased in such a way as to meet the social concerns of affordability, particularly for the most vulnerable. The project approach is to use a participatory planning and decision-making process, that will ensure that any potential restrictions on the use of resources will not be imposed on the members, but defined through a collective decision-making process at the community level. Any decisions on restriction of access will not be make without identification of compensatory/alternative measures and practices that provides sufficient revenues and/or livelihoods that is equal to, or more than revenues being generated from existing practice.
Risk 4 As a result of climate change, significant decreases in water supply is expected: the average reduction in run off rates in terms of surface water collected in national storage and distribution systems	I = 4 P = 2	**Moderate**	Water scarcity poses significant risk to sustainability of Turkmenistan's agricultural sector and thus is also a	The project will help address this risk by directly supporting water saving technologies. It will create meaningful benefits even if conditions tend to make the root problems worse. Adaptation is an explicit objective of the project, and the activities of the project will have direct benefits in terms of climate change adaptation as well as mitigation. Regardless, assessment of water

is expected to be 10 percent, whereas during crop growing season the reduction in runoff rates will reach 30-40 percent. Water scarcity might have negative impact on the implementation of new technologies and demonstration projects. **Relevant AF ESP principles:** • Climate Change; • Lands and Soil Conservation)			concern for the proposed project.	availability and actual water use, will be an important task to make sure that proposed solutions have adequate and available resources base to operate. The project on-the-ground interventions are limited within the demonstration plots on the productive/converted agricultural land. The project activities will not modify existing types of land use and will not interfere with the biodiversity conservation areas.

	Medium		
	Select one (see SESP for guidance)		**Comments**
	Low Risk	☐	
	Moderate Risk	X	
	High Risk	☐	
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
	Check all that apply		**Comments**
	Principle 1: Human Rights	X	
	Principle 2: Gender Equality and Women's Empowerment	☐	
	1. Biodiversity Conservation and Natural Resource Management	X	
	2. Climate Change Mitigation and Adaptation	X	
	3. Community Health, Safety and Working Conditions	☐	
	4. Cultural Heritage	☐	
	5. Displacement and Resettlement	☐	

	6. Indigenous Peoples	☐	
	7. Pollution Prevention and Resource Efficiency	☐ X	

Final Sign Off

Signature	***Date***	***Description***
QA Assessor,Rovshen Nurmukhamedov Energy&Environment Programme Office, UNDP Turkmenistan		UNDP staff member responsible for the Project, typically a UNDP Programme Officer. Final signature confirms they have "checked" to ensure that the SESP is adequately conducted.
QA Approver, Elena Panova UNDP Resident Representative		UNDP senior manager, typically the UNDP Deputy Country Director (DCD), Country Director (CD), Deputy Resident Representative (DRR), or Resident Representative (RR). The QA Approver cannot also be the QA Assessor. Final signature confirms they have "cleared" the SESP prior to submittal to the PAC.
PAC Chair		UNDP chair of the PAC. In some cases, PAC Chair may also be the QA Approver. Final signature confirms that the SESP was considered as part of the project appraisal and considered in recommendations of the PAC.

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		
Principles 1: Human Rights		**Answer (Yes/No)**
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? [55]	No
3.	**Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?**	Yes
4.	**Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?**	Yes
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	No
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	No
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services?	No

Deleted: No

Deleted: No

[55] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

	For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes	
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	**Does the Project involve significant extraction, diversion or containment of surface or ground water?** ***For example, construction of dams, reservoirs, river basin developments, groundwater extraction***	**Yes**
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.*	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant[56] greenhouse gas emissions or may exacerbate climate change?	No
2.2	**Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?**	**Yes**
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	No
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No

[56] In regards to CO_2, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	No
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions?[57]	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? *If the answer to the screening question 6.3 is "yes" the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.*	No

[57] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	No
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol*	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	**Does the Project include activities that require significant consumption of raw materials, energy, and/or water?**	**Yes**

Annex 8.

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK:

SCALING CLIMATE RESILIENCE FOR FARMERS IN TURKMENISTAN

(1) Project description:

This project seeks to build resilience to climate change among the emerging class of small and medium private farmers in Turkmenistan. Over the past 60 years, intensive warming has been observed all over the country. Future climate scenarios project an increase in average annual temperature and in the number of extremely hot days, a reduction in annual average rainfall, an increase in average evaporation rates, an increase in the frequency and intensity of drought and flood spells, and a reduction in river flow rates. These climate changes are projected to result in reduced yields, improved conditions for pests and diseases, crop failures and diminished productivity. Shortages in irrigation will also increase the degradation of valuable arable land in the form of intense salinity, soil erosion, degradation and reduction of natural grasslands, decrease the productivity of pastures, and will lead to a less efficient livestock industry. Of particular concern are the increase in water demand and the reduction in water availability which taken together, may result in a significant deficit of agricultural irrigation water. The higher evaporation rate predicted as a result of climate change is likely to increase the water requirements for irrigating crops by 30-40%, thereby aggravating existing water scarcity and irrigation concerns. Increased water demand of up to 60% is expected for vegetables, a growing subsector.

In order to address these concerns, the project is comprised of the following activities:

Output 1.1. Climate resilience is mainstreamed into policies and regulations in agriculture, water and land management sectors; new regulatory incentives are communicated to farmers in an accessible way.
Output 1.2: Development of strategic concept to support resilience in non-state agriculture sector
Output 1.3: Capacity built for key government ministries and other relevant institutions to promote climate resilience in private sector agriculture.
Output 2.1: A public-private network of at least 50 extension service providers is trained to deliver climate risk management and adaptation information and advice to farmers
Output 2.2. 20,000 farming enterprises and entrepreneurs receive climate risk information and resilience advice through enhanced access to extension services, best practice guidance and improved climate information services.
Output 3.1: At least 1 MAEP research institute site developed providing access to best available technologies and practices for non-state order crops and supporting improved research links.
Output 3.2: At least 3 larger private sector farming enterprises invest in demonstration sites for specific technologies that form a basis for local learning and best practice dissemination.
Output 3.3: At least 3 resilient best practice sites developed by private farmer collectives or groups of small holder farmers through collective community planning and investment.

Deleted: MOAWR

(2) Potential social and environmental impacts and relevance to the Adaptation Fund ESP principles:

A description of the potential social and environmental impacts, both positive and negative, related to likely activities, sub-projects, policies, and/or regulations to be supported during project implementation, is provided in the Social and Environmental Screening Report (Part B).

The following four social and environmental risks has been identified:

Risk 1: Output 3.1 of the project proposes investments in efficient irrigation techniques (e.g. drip, sprinkler). There is a risk that the choice of irrigation technology, may lead to an increase in the use of surface water. Furthermore, any extraction of groundwater as an irrigation water source bears the risk of water depletion.

Risk 2: Governance issues, including "Elite capture" with the "plausible recurrent risk" of deviation and capture of the benefits accrued from the project by influential actors.

Risk 3: There is some possibility the project could potentially restrict access to resources of marginalized individuals or groups through the setting of tariffs for water supply services to water users. Also, managing the risk of water scarcity might require changing agricultural practices in a way that includes restricting or managing access to certain pasture lands, changing agricultural crops and practices that have potential to affect customary practices and/or resources.

Risk 4: As a result of climate change, significant decreases in water supply is expected: the average reduction in run off rates in terms of surface water collected in national storage and distribution systems is expected to be 10 percent, whereas during crop growing season the reduction in runoff rates will reach 30-40 percent. Water scarcity might have negative impact on the implementation of new technologies and demonstration projects.

The risk screening and identification has been conducted against the 15 AF ESP principles, which are also encompassed in the UNDP SESP. In particular, the following AF ESP principles were identified as relevant (with potential impact and risks) for which future assessment and management is required:

- Compliance with the law (with regard to the access to and extraction of surface and ground water resources)
- Access and equity (with regard to access to the benefits delivered by the project and potential restriction of access to water resources)
- Climate change (related to the vulnerability of the project outputs and communities to climate change)
- Pollution prevention and resource efficiency (with regard to the efficient use of water resources vs the risk of increased water extraction)
- Lands and soil conservation (with regard to the vulnerability of land and soil resources in the face of climate-driven aridification and water scarcity).

(3) Legal and institutional framework:

(a) The country's applicable policy framework (e.g. national laws and regulations) relating to relevant social and environmental issues; obligations of the country directly applicable to the project under relevant international treaties and agreements, is summarized below

Following are the main laws govern the protection of the environment in Turkmenistan.

Law/Code	Date	Key areas
On the Protection of Nature	11/12/1991	The basic law regulating environmental relations, defines the basic legal principles of environmental and natural resource management and environmental protection

Law/Code	Date	Key areas
"On Standardization and metrology	01/10/1993	Regulation of product requirements, providing security for people and the environment
On the protection and rational use of flora	12/28/1993	Regulates relations in the protection and use of natural vegetation.
On the state environmental Review	15/06/1995	Legal and regulatory framework to ensure environmental safety
On Air Protection	12/20/1996	The legal regulation of activity of state bodies, enterprises, institutions, organizations, public associations and citizens in the area of air protection
On the protection and rational use of fauna	12/06/1997	Regulates relations in the protection, use and reproduction of the animal world
Assessment of the environmental impact of planned economic and other activities in Turkmenistan. Home Civil Service "Turkmenstandartlary".	2001	Represents the Turkmen State Standard (TDS 579-2001) to implement the EIA for the development of design and project documentation.
Code of Turkmenistan "On Water	10/25/2004	Regulates water relations, rational use of water for the needs of the population and economy, as well as protect the rights of enterprises, institutions, organizations, enterprises and citizens "daikhan" in the field of water relations
Code of Turkmenistan "On Earth"	10/25/2004	Regulates land relations, rational use of land, protects the rights of enterprises, institutions, organizations, and citizens "daikhan" farms in the area of land relations
Forest Code Turkmenistan	06.04.2011	Regulates relations in the use and protection of forests, contains general provisions on the functions, membership of forests and forest funds and regulates the use and restoration of forest resources

Law/Code	Date	Key areas
On specially protected natural areas	31/04/2012	Legal, environmental, economic and organizational basis for the creation, management and protection of unique natural complexes, which are of national wealth and national property for the benefit of present and future generations.

Table 0-1: National laws of Turkmenistan for the protection of environment

Environmental Impact Assessment Legislation is especially relevant:

As of 2000, environmental impact assessment (EIA) has been part of the national legislation and quite a broad range of activities are subject to EIA.

The general procedure for the assessment of environmental impact using EIAs and SEEs includes the following main stages:

- Submission by a developer of a notice on the proposed type of activity to the Ministry of Nature Protection
- Preparation of the EIA documentation
- Organization of public participation procedures
- Review of EIA documentation by the Ministry of Nature Protection, preparation of the review document, and conclusion of the SEE.

National Programme on the Strategy of Economic, Political and Cultural Development of Turkmenistan until 2020

The National Programme on the Strategy of Economic, Political, and Cultural Development of Turkmenistan until 2020 and the National Environmental Action Plan until 2010 (from 2002), identify the following environmental priorities:

- Water resources
- Land resources
- Air pollution and depletion of the ozone layer
- Industrial pollution from the oil and gas and energy sectors
- Biodiversity conservation
- Protection of natural and cultural heritage
- Issues of degradation of environmental media in Turkmenistan's Aral Sea area.

Land Code of Turkmenistan

The land code of Turkmenistan differentiates several categories of land that are summarized in the following:

Categories of Land:

In accordance with the target purpose the land fund of Turkmenistan is divided into the following categories:

- Lands of agriculture purpose
- Lands of forestry fund
- Lands of water fund
- Lands of state reserve
- Lands of population settlements (cities, residential settlements, rural settlements)
- Lands of industries, transport, communication, energy, defense and other sectors)

- Lands of nature protection purpose, health care, recreational, historic and cultural purposes
- (Source: Land Code Chapter 2, Article 6)

Land acquisition procedure:

Official request from the Ministry of Energy (promoter of the project) to the governor (hakimlyk) including the master plan for the power plant and the surface required for the development.

Governor writes act and permission letter to promoter,

EPC Contractor finalizes design, MOE and IA submit final design to cabinet of ministers

Approval by cabinet of ministers

Applicable International Conventions and Agreements:

The country operates a specially created state commission to ensure compliance with obligations under the Conventions and the UN program on environment, including:

- The Convention on Biological Diversity (1996) - supports the conservation and sustainable management of biodiversity resources
- The United Nations Convention to Combat Desertification (1995) - the purpose of this Convention is to reduce human impact on ecosystems of the desert, the restoration of the biological productivity of degraded lands
- The Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer (1993) - aimed at protecting the ozone layer on a global scale
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1996) - establishes a strict control of transboundary movements of hazardous wastes and other wastes to protect human health and the environment
- The Aarhus Convention on public access to information on environmental issues (1999) - aimed at the development of human society to participate in the formulation and implementation of state environmental policies that promote social stability
- Framework Convention for the Protection of the Marine Environment of the Caspian Sea (2004) - defines the main directions of regulation of human impact on the ecosystem of the Caspian Sea, protection and restoration of the biological and other resources
- The Ramsar Convention on Wetlands (2009) - aimed at preserving ecosystems wetlands
- UN Framework Convention on Climate Change (1995) - aimed at stabilizing greenhouse gas concentrations
- Ashgabat Framework Convention for the Protection of the Environment for Sustainable Development in Central Asia (2006) - aimed at the integration and harmonization of efforts to manage natural resources.
- Interstate Coordination Water Management Commission (ICWC) regulating the water intake for Turkmenistan allocates 22.15 billion m^3 of water each year to the country.

(b) Applicable requirements under UNDP's SES include the completion of the Social and Environmental Screening Procedure. As a part of the procedure, a Social and Environmental Assessment Report has been completed which demonstrate how environmental sustainability, human rights and gender has been mainstreamed into project design, as well as indicates potential environmental and social risks according to project level safeguard standards.

(c) The project is also subject to the Environmental and Social Policy of the Adaptation Fund.

UNDP Country Office in Turkmenistan has practical experience with implementing/piloting of all technologies proposed for the AF project and listed under Component 3 in compliance with the national technical standards and regulations. The following process secures compliance with the corresponding standards and regulation:

(i) Upon identification of sub-projects/sites and prior to the investment the applicable national technical standards and regulations are defined and safeguards monitoring activities are defined and incorporated in the sub-project design;

(ii) Technical specifications/terms of references for the procurement and commissioning of technology installation include requirements for the sub-contractor to ensure compliance with all relevant national technical standards and regulations according to the national law. All the relevant national technical standards (including permits, licenses, etc. for construction, hydroengineering and other physical works) are specified in detail in UNDP tender documentation along with technical specifications of works required;

(iii) At the contracting phase UNDP verifies compliance of the sub-contractor with the national regulations (e.g. availability of appropriate licenses). Contracts are awarded to vendors, that possess full compliance with national technical standards for implementation of adaptation activities.

(iv) UNDP Country Office has an internal procedure for carrying out monitoring field visits and spot checks during the implementation of site activities by sub-contractors. The monitoring visit check lists include above all monitoring of compliance to technical standards;

(v) In case of high technical complexity of works and services, external experts (e.g. engineers) and/or national government staff are engaged for site monitoring.

(4) Procedures for screening, assessment and management:

As this project is supported by UNDP the project has been screened against UNDP's Social and Environmental Standards Procedure. The risk screening included review of the potential impacts and risks against the 15 Adaptation Fund ESP principles. The Social and Environmental Screening Template was prepared and the project deemed to be a moderate risk (Category B) project. Guidance on the impact assessment is provided in the Social and Environmental Screening Report, which provides the rationale for the project being classified as a moderate risk project. Given the limited scope of adverse impacts, further assessment is not required. However, during project implementation is there is an increase in the use of surface water, or any extraction of ground water, the ESMF, should be used as the basis of creating a site-specific Environmental and Social Management Plan (ESMP).

An impact risk assessment was undertaken using the UNDP Social and Environmental Screening Procedure to assess the probability (expected, highly likely, moderately likely, not likely) and the impact of the risk (critical, severe, moderate, minor, negligible). From this, a significance value was attributed to the potential impact (negligible, low, medium, high and extreme).

Score	Rating
5	Expected
4	Highly Likely
3	Moderately likely
2	Not Likely
1	Slight

Table 2 Rating of Probability of Risk

Score	Rating	Definition
5	Critical	Significant adverse impacts on human populations and/or environment. Adverse impacts high in magnitude and/or spatial extent (e.g. large geographic area, large number of people, transboundary impacts, cumulative impacts) and duration (e.g. long-term, permanent and/or irreversible); areas impacted include areas of high value and sensitivity (e.g. valuable ecosystems, critical habitats); adverse impacts to rights, lands, resources and territories of indigenous peoples; involve significant displacement or resettlement; generates significant quantities of greenhouse gas emissions; impacts may give rise to significant social conflict
4	Severe	Adverse impacts on people and/or environment of medium to large magnitude, spatial extent and duration more limited than critical (e.g. predictable, mostly temporary, reversible). The potential risk impacts of projects that may affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples are to be considered at a minimum potentially severe.
3	Moderate	Impacts of low magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures
2	Minor	Very limited impacts in terms of magnitude (e.g. small affected area, very low number of people affected) and duration (short), may be easily avoided, managed, mitigated
1	Negligible	Negligible or no adverse impacts on communities, individuals, and/or environment

Table 3 Rating of Impact of Risk

Green = Low, Yellow = Moderate, Red = High

Table 4 UNDP Risk matrix

When undertaking the risk assessment, all activities were assessed, including, hard/soft infrastructure. If further assessment is required due to project activities in the pilot demonstration plots under Component 3 of the project, specific measures for each relevant environmental and social component e.g. water; access and benefit sharing etc. should be discussed along with mitigation measures in the ESMP.

Screening of social and environmental issues and impacts and determining applicable social and environmental standards and requirements (including UNDP SES) and the appropriate types of social and environmental assessment needed to address identified impacts.

Process and responsibilities for screening and assessment of risks for activities or components that are not identified at the proposal stage to the level where adequate and comprehensive environmental and social risk assessment is possible.

Some activities under Component 3 cannot be fully defined in the proposal document: the types of adaptation technologies have been defined, but specific locations, owners and site-specific scope of measures will be defined during the project implementation. The following types of adaptation technologies/practices will be implemented under Component 3: water collection and micro-storage (tanks, pasture wells), efficient water delivery (metering, pipes, canal lining), efficient irrigation (sprinkling, drip), greenhouse technologies, renewable energy technologies (e.g. solar powered pumps and greenhouses), horticultural techniques to improve yield, effective soil preparation (e.g. laser levelling) and fertilizer use, drainage and desalination techniques (e.g. canal lining and maintenance). All these technologies have been piloted before by UNDP through past and on-going projects. None of these activities will be implemented in a large scale that could have detrimental environmental or social impacts. The scope of activities will be limited with demonstration plots with the training and education purposes. However, once the exact location/sites, “owners” and beneficiary communities for these measures will be defined, the project will carry out additional risk screening and assessments as necessary.

For these activities UNDP will carry out social and environmental risks screening, consultations, assessment and monitoring during the project implementation in accordance with the UNDP safeguards policy. The project will follow Adaptation Fund Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, UNDP safeguards policy and the national laws and standards. As outlines above and in the SESP (Annex 7) the project will follow a process for identifying environmental and social risks for the unidentified activities/sub-projects and, when needed, will develop commensurate environmental and social management elements that will complement and be integrated in the overall ESMP.

Prior to any on-site investment, the project will conduct:

(a) detailed screening/identification of risks and applicable principles (UNDP SESP screening will be updated and a screening against AF 15 principles will be conducted);

(b) Impact assessment (scope of ESIA in each case/sub-project will depend on the results of risk screening for specific site-based measures); and

(c) monitoring.

UNDP Country Office in Turkmenistan will be responsible for the implementation and monitoring of the relevant environment and social risk assessments in compliance with the national law, UNDP and AF policies.

UNDP SESP will be updated prior to the implementation of specific activities/investments at demonstration plots and at least annually. Compliance with the national laws and standards will be included in the technical specification/TORs for sub-contractors; contracts for the delivery of works and services under Components 2 and 3 will be awarded to vendors that possess full compliance with national technical standards for implementation of adaptation activities. UNDP Country Office will monitor compliance through regular field visits and spot checks. A M&E officer will be assigned at the UNDP Country Office to secure project compliance to the ESMF.

(5) Institutional arrangements and capacity building:

Clear definition of roles and responsibilities of project staff and associated agencies in implementation of project activities and application of social and environmental procedures (preparation of management plans, monitoring) is required as part of the ESMP. Where necessary, capacity building and technical assistance activities should be included to enable implementing agencies and involved institutions and stakeholders to implement the ESMP, including preparation, implementation and monitoring of specific social and environmental management plans/measures.

(6) Stakeholder engagement and information disclosure process:

Describe the procedure for ensuring consultation and stakeholder engagement during assessment, development of action plans, and monitoring of social and environmental impacts associated with specific project activities, including information disclosure requirements as part of the ESMP.

(7) Grievance redress mechanism:

During the construction and implementation phases of any project, a person or group of people can be adversely affected, directly or indirectly due to the project activities. The grievances that may arise can be related to social issues such as eligibility criteria and entitlements of selected beneficiaries, gender norm changes, access to project benefits by marginalized groups, disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances may also be related to environmental issues such as impacts on water quality, damage to infrastructure due to construction or transportation of raw material, noise, decrease in quality or quantity of private/ public surface/ ground or surface water resources during implementation of livelihoods assets or water provision, damage to home gardens and agricultural lands etc.

Should such a situation arise, there must be a mechanism through which affected parties can resolve such issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner. To achieve this objective, a grievance redress mechanism has been included in the ESMF for this project.

The project allows those that have a complaint and/or grievance to be able to communicate their concerns and/or grievances through an appropriate process. The Complaints Register and Grievance Redress Mechanism set out in this ESMF are to be used as part of the project and will provide an accessible, rapid, fair and effective response to concerned stakeholders, especially any vulnerable group who often lack access to formal legal regimes.

While recognizing that many complaints and/or grievances may be resolved immediately, the Complaints Register and Grievance Redress Mechanism set out in this ESMF encourages mutually acceptable resolution of issues as they arise. The Complaints Register and Grievance Redress Mechanism set out in this ESMF has been designed to:

a. Be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner

b. Allow simple and streamlined access to the Complaints Register and Grievance Redress Mechanism for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns

c. Provide clear and known procedures for each stage of the Grievance Redress Mechanism process, and provides clarity on the types of outcomes available to individuals and groups

d. Ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a concern, complaint and/or grievance

e. To provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint and/or grievance, the information that was used when assessing their complaint and/or grievance and information about the mechanisms that will be used to address it, and

f. Enable continuous learning and improvements to the Grievance Redress Mechanism. Through continued assessment, the knowledge generated through the process may reduce potential future complaints and grievances.

Eligibility criteria for the Grievance Redress Mechanism include:

g. Perceived negative economic, social or environmental impact on an individual and/or group, or concern about the potential to cause an impact

h. Clearly specified kind of impact that has occurred or has the potential to occur; and explanation of how the project caused or may cause such impact, and

i. Individual and/or group filing of a complaint and/or grievance is impacted, or at risk of being impacted; or the individual and/or group filing a complaint and/or grievance demonstrates that it has authority from an individual and or group that have been or may potentially be impacted on to represent their interest.

UNDP Grievance Mechanism

Guidance for Submitting a Request to the Social and Environmental Compliance Unit (SECU) and/or the Stakeholder Response Mechanism (SRM)

Purpose of this form

- **If you use this form, please put your answers in bold writing to distinguish text**
- **The use of this form is recommended, but not required. It can also serve as a guide when drafting a request.**

This form is intended to assist in:

(1) Submitting a request when you believe UNDP is not complying with its social or environmental policies or commitments and you are believe you are being harmed as a result. This request could initiate a 'compliance review', which is an independent investigation conducted by the Social and Environmental Compliance Unit (SECU), within UNDP's Office of Audit and Investigations, to determine if UNDP policies or commitments have been violated and to identify measures to address these violations. SECU would interact with you during the compliance

review to determine the facts of the situation. You would be kept informed about the results of the compliance review.

and/or

(2) Submitting a request for UNDP "Stakeholder Response" when you believe a UNDP project is having or may have an adverse social or environmental impact on you and you would like to initiate a process that brings together affected communities and other stakeholders (e.g., government representatives, UNDP, etc.) to jointly address your concerns. This Stakeholder Response process would be led by the UNDP Country Office or facilitated through UNDP headquarters. UNDP staff would communicate and interact with you as part of the response, both for fact-finding and for developing solutions. Other project stakeholders may also be involved if needed.

Please note that if you have not already made an effort to resolve your concern by communicating directly with the government representatives and UNDP staff responsible for this project, you should do so before making a request to UNDP's Stakeholder Response Mechanism.

Confidentiality

If you choose the Compliance Review process, you may keep your identity confidential (known only to the Compliance Review team). If you choose the Stakeholder Response Mechanism, you can choose to keep your identity confidential during the initial eligibility screening and assessment of your case. If your request is eligible and the assessment indicates that a response is appropriate, UNDP staff will discuss the proposed response with you, and will also discuss whether and how to maintain confidentiality of your identity.

Guidance

When submitting a request please provide as much information as possible. If you accidentally email an incomplete form, or have additional information you would like to provide, simply send a follow-up email explaining any changes.

Information about You

Are you:

1. A person affected by a UNDP-supported project?

Mark "X" next to the answer that applies to you: Yes: No:

2. An authorized representative of an affected person or group?

Mark "X" next to the answer that applies to you: Yes: No:

If you are an authorized representative, please provide the names of all the people whom you are representing, and documentation of their authorization for you to act on their behalf, by attaching one or more files to this form.

3. First name:
4. Last name:
5. Any other identifying information:
6. Mailing address:
7. Email address:
8. Telephone Number (with country code):
9. Your address/location:
10. Nearest city or town:

11. Any additional instructions on how to contact you:
12. Country:

What you are seeking from UNDP: Compliance Review and/or Stakeholder Response

You have four options:

- Submit a request for a Compliance Review;
- Submit a request for a Stakeholder Response;
- Submit a request for both a Compliance Review and a Stakeholder Response;
- State that you are unsure whether you would like Compliance Review or Stakeholder Response and that you desire both entities to review your case.

13. Are you concerned that UNDP's failure to meet a UNDP social and/or environmental policy or commitment is harming, or could harm, you or your community? Mark "X" next to the answer that applies to you: Yes: No:
14. Would you like your name(s) to remain confidential throughout the Compliance Review process?

Mark "X" next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

15. Would you like to work with other stakeholders, e.g., the government, UNDP, etc. to jointly resolve a concern about social or environmental impacts or risks you believe you are experiencing because of a UNDP project?

Mark "X" next to the answer that applies to you: Yes: No:

16. Would you like your name(s) to remain confidential during the initial assessment of your request for a response?

Mark "X" next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

17. Requests for Stakeholder Response will be handled through UNDP Country Offices unless you indicate that you would like your request to be handled through UNDP Headquarters. Would you like UNDP Headquarters to handle your request?

Mark "X" next to the answer that applies to you: Yes: No:

If you have indicated yes, please indicate why your request should be handled through UNDP Headquarters:

18. Are you seeking both Compliance Review and Stakeholder Response?

Mark "X" next to the answer that applies to you: Yes: No:

19. Are you unsure whether you would like to request a Compliance Review or a Stakeholder Response? Mark "X" next to the answer that applies to you: Yes: No:

Information about the UNDP Project you are concerned about, and the nature of your concern:

20. Which UNDP-supported project are you concerned about? (if known):
21. Project name (if known):

22. Please provide a short description of your concerns about the project. If you have concerns about UNDP's failure to comply with its social or environmental policies and commitments, and can identify these policies and commitments, please do (not required). Please describe, as well, the types of environmental and social impacts that may occur, or have occurred, as a result. If more space is required, please attach any documents. You may write in any language you choose

23. Have you discussed your concerns with the government representatives and UNDP staff responsible for this project? Non-governmental organizations?

Mark "X" next to the answer that applies to you: Yes: No:

If you answered yes, please provide the name(s) of those you have discussed your concerns with

Name of Officials You have Already Contacted Regarding this Issue:

First Name	Last Name	Title/Affiliation	Estimated Date of Contact	Response from the Individual

24. Are there other individuals or groups that are adversely affected by the project?

Mark "X" next to the answer that applies to you: Yes: No:

25. Please provide the names and/or description of other individuals or groups that support the request:

First Name	Last Name	Title/Affiliation	Contact Information

Please attach to your email any documents you wish to send to SECU and/or the SRM. If all of your attachments do not fit in one email, please feel free to send multiple emails.

Submission and Support

To submit your request, or if you need assistance please email: project.concerns@undp.org

Grievance Mechanism of the Adaptation Fund

Complaints regarding projects/programmes supported by the Fund can also be filed with the secretariat at the following address:

Adaptation Fund Board Secretariat Mail stop: MSN P-4-400 1818 H Street NW Washington DC

20433 USA Tel: 001-202-478-7347 afbsec@adaptation-fund.org

(9) Monitoring and evaluation arrangements:

Define the monitoring and evaluation arrangements in order to monitor the implementation of the ESMF and specific social and environmental management plans/measures, including the parameters to be measured and arrangements for stakeholder participation in such monitoring.

In addition to the project-level and national grievance redress mechanisms, complainants have the option to access UNDP's Accountability Mechanism, with both compliance and grievance functions. The Social and Environmental Compliance Unit investigates allegations that UNDP's Standards, screening procedure or other UNDP social and environmental commitments are not being implemented adequately, and that harm may result to people or the environment. The Social and Environmental Compliance Unit is housed in the Office of Audit and Investigations, and managed by a Lead Compliance Officer. A compliance review is available to any community or individual with concerns about the impacts of a UNDP programme or project. The Social and Environmental Compliance Unit is mandated to independently and impartially investigate valid requests from locally impacted people, and to report its findings and recommendations publicly.

The Stakeholder Response Mechanism offers locally affected people an opportunity to work with other stakeholders to resolve concerns about the social and environmental impacts of a UNDP project. Stakeholder Response Mechanism is intended to supplement the proactive stakeholder engagement that is required of UNDP and its Implementing Partners throughout the project cycle. Communities and individuals may request a Stakeholder Response Mechanism process when they have used standard channels for project management and quality assurance, and are not satisfied with the response (in this case the project level grievance redress mechanism). When a valid Stakeholder Response Mechanism request is submitted, UNDP focal points at country, regional and headquarters levels will work with concerned stakeholders and Implementing Partners to address and resolve the concerns. Visit www.undp.org/secu-srm for more details. The relevant form is attached at the end of the ESMF.

Annex 9.

Record of Stakeholder Consultations for Development of Project Proposal to Adaptation Fund

The preparation of the AF proposal "**Scaling climate resilience for farmers in Turkmenistan**" was carried out in consultation with stakeholders, drawing on the expertise of International and National experts, National government stakeholders, as well as a variety of other actors including state-level unions, private sector representative and community members in targeted project areas.

Two missions of the international consultant on climate change project development, Matthew Savage, took place to Turkmenistan with the participation of UNDP Regional Technical Advisor, and UNDP Environment Portfolio staff, Rovshen Nurmuhammedov (UNDP Programme Specialist) and Rahman Hanekov (Programme Management Officer) to meet with key stakeholders. A record of the stakeholder consultations, with dates and participants is provided below. During these missions there were intensive consultations with variety of stakeholders to get insights for project activities and outputs. During the second mission a visit was arranged to one of the agricultural regions of the country Mary Province, where in-depth consultations occurred with farmers and agri-entrepreneurs. Furthermore, research sites of agricultural research institutes were visited to see their potential and possibility upgrade their capacity in the framework of the future project.

In addition, in order to maximize synergies, share lessons learned and to avoid consultation fatigue with stakeholders involved in complementarity climate change resilience initiatives, the AF project idea was widely discussed on a local community level during numerous field visits to pilot sites of existing UNDP SCCF project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan" in Dashoguz and Lebap Provinces and UNDP/GEF project "Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan" in Ahal province.

Finally, in order to validate the technical aspects of the project design, hydrological experts undertook a mission to Turkmenistan to:

- Carry out field investigations to generate new data in support of the project;
- Identify and meet with project stakeholders to acquire site specific data;
- Acquire existing current and historical data from institutions;
- Identify gaps from local stakeholders in the information required to deliver the project.

Towards this purpose a series of workshops were hosted at the UNDP/Energy Efficiency and Renewable Energy for Sustainable Water Management project office, site meetings with stakeholders and site investigations in the catchment of the Layinsuw river and Kaakhka town.

Stakeholder Consultations during Mission to develop project proposal to Adaptation Fund
International Climate Change Project Development Specialist
And Regional Technical Specialist, UNDP-GEF
Ashgabat, Turkmenistan, December 04-07, 2017

Monday, December 04, 2017

10.00 – 12.00	Meeting with UNDP Environment Portfolio staff (Rovshen Nurmuhammedov, UNDP Programme Specialist, Rahman Hanekov, Programme Management Officer)
14.30 – 16.30	Meeting with representatives of the State Committee of Turkmenistan on Environment Protection and Land Resources and National Institute of Deserts, Flora and Fauna
17.00 – 18.00	Meeting with UNDP Management (Vitalie Vremis, UNDP Deputy Resident Representative in Turkmenistan)

Tuesday, December 05, 2017

09.00 – 10.30	Meeting with representatives of the Ministry of Agriculture and Water Economy
11.00 – 13.00	Meeting with project staff and local experts of the UNDP project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan"
14.30 – 16.30	Meeting with representatives of the Union of Industrialists and Entrepreneurs of Turkmenistan and Bank "Rysgal"
16.30 – 17.30	Meeting with GIZ Regional Project "Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia"

Wednesday, December 06, 2017

10.00 –11:00	Meeting with Kepbanov Y., Legal expert
11.00 –12.30	Meeting with project staff and local experts of the UNDP GEF project "Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan"
14.30 –16.00	Meeting with representatives of the National Committee for Hydrometeorology
16.30 – 17.30	Meeting with EuropeAid Project "Support to further sustainable agriculture and rural development in Turkmenistan - III Phase"

Thursday, December 07, 2017

16.00 – 18.00	Debriefing UNDP Management regarding the mission results (Elena Panova, UNDP Resident Representative in Turkmenistan and Vitalie Vremis, UNDP Deputy Resident Representative in Turkmenistan, Rovshen Nurmuhammedov, UNDP Programme Specialist)

Stakeholder Consultations during Mission of International Climate Change Project Development Specialist

Ashgabat, Turkmenistan April 16-20, 2018

Monday, April 16, 2018

10.30 – 11.00	Meeting with UNDP Environment Portfolio staff (Rovshen Nurmuhammedov, UNDP Programme Specialist, Rahman Hanekov, Programme Management Officer) and International Climate Change Project Development Specialist
11.00 – 12.00	Meeting with UNDP Management (Elena Panova, UNDP Resident Representative in Turkmenistan and Vitalie Vremis, UNDP Deputy Resident Representative in Turkmenistan, Rovshen Nurmuhammedov, UNDP Programme Specialist) and International Climate Change Project Development Specialist

Tuesday, April 17, 2018

09.30 – 10.30	Meeting with project staff and local experts of the UNDP project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan"
11.00 – 12.00	Meeting with representatives of the State Committee of Turkmenistan on Environment Protection and Land Resources
12.00 – 13.00	Meeting with representatives of the Ministry of Agriculture and Water Economy

15.00 – 17.00	Meeting with representatives of the Union of Industrialists and Entrepreneurs of Turkmenistan and Bank “Rysgal”

Wednesday, April 18, 2018 - Field visit to Mary Velayat

09.00 –10.00	Meeting with representative office of the Union of Industrialists and Entrepreneurs of Turkmenistan in Mary velayat
11.00 –13.00	Visit and meeting with representatives of the Iolotan research-production pilot center of the agricultural research institute
15.00 –16.00	Visit and meeting with representatives of the Mary research-production pilot center of the agricultural research institute (in Bayramali)

Thursday, April 19, 2018

09.30 –11:00	Meeting with representatives of the State commercial bank “Daihanbank”
11.00 –12.30	Meeting with representatives of the National Committee for Hydrometeorology
14.30 –16.30	Meeting with representatives of the Institute of Desert, Flora and Fauna

Friday, April 20, 2018

09.30 – 12.30	Meeting with project staff and local experts of the UNDP GEF project “Energy Efficiency and Renewable Energy for Sustainable Water Management in Turkmenistan” and visiting Geokdepe poligon
14.00 – 15.00	Debriefing UNDP Management regarding stakeholder consultation results (Elena Panova, UNDP Resident Representative in Turkmenistan and Vitalie Vremis, UNDP Deputy Resident Representative in Turkmenistan, Rovshen Nurmuhammedov, UNDP Programme Specialist)

Minutes of the Round table to discuss project proposal to Adaptation Fund Project Scaling climate resilience for farmers in Turkmenistan

Ashgabat, Turkmenistan April 16-20, 2018

Participants:

- State Committee for Environmental Protection and Land Resources of Turkmenistan (2 people)
- Ministry of agriculture and water resources (3 people)
- Parliament (Mejlis) of Turkmenistan
- Union of Entrepreneurs and Industrialist of Turkmenistan
- State Committee on hydrometeorology under Cabinet of Ministers of Turkmenistan (2 people)
- State Commercial Bank “Daikhanbank”
- Commercial Bank “Rysgal”
- Livestock Institute of the Academy of Sciences of Turkmenistan
- Turkmen State agricultural University named after S. Niyazov
- Turkmen agricultural Institute in Dashoguz city
- UNDP (6 people)

Agenda:

1. Presentation of the goals and objectives of the project proposal to the Adaptation Fund
2. Discussion of inputs/suggestions/remarks of representatives of ministries and departments to the project proposal
3. Discussion of the procedure and deadlines for submitting a project proposal to the Adaptation Fund

Summary of Discussion:

- UNDP presented the goals and objectives of the project proposal to the Adaptation Fund. Also, all 3 components of the project proposal developed as a result of consultations with national partners were described.

- Participating representatives of government agencies, after listening to the presentation, noted the feasibility and timeliness of this project. Recommendations from key stakeholders were as follows:
  - On the 2nd component, to maintain continuity in the ongoing UNDP project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan", and to include the issue of the introduction of international experience in curricula and scientific topics for agricultural institutions and research institutes of the country;
  - Along with the crop sector, include the development of the livestock sector;
  - Pay attention to the organizational structure of the extension services for the sustainability of the results of this project;
  - Demonstration plots in the velayats should be oriented towards the search and implementation of practical solutions to the Aral Sea basin problems;
  - Co-financing is not required.
- The participants of the meeting confirmed their willingness to cooperate and support the project at all levels if the project proposal was approved by the Adaptation Fund and also agreed that the main national partner and coordinating body should be the State Committee for Environmental Protection and Land Resources with the operational and administrative support of the UNDP office in Turkmenistan

Conclusions:

1. To recommend starting the procedure for submitting a project proposal to the Adaptation Fund after incorporating comments and suggestions from representatives of ministries and departments to the project proposal;
2. To recommend the appointment of the State Committee for Environmental Protection and Land Resources of Turkmenistan as the main national partner and coordinating body for this project proposal.

Minutes of the Round table to discuss project proposal to Adaptation Fund

Project Name: *Scaling climate resilience for farmers in Turkmenistan*

Date: July 4, 2018

Participants:

- State Committee for Environmental Protection and Land Resources of Turkmenistan (2 people)
- Ministry of agriculture and water resources (3 people)
- Parliament (Mejlis) of Turkmenistan
- Union of Entrepreneurs and Industrialist of Turkmenistan
- State Committee on hydrometeorology under Cabinet of Ministers of Turkmenistan (2 people)
- State Commercial Bank “Daikhanbank”
- Commercial Bank “Rysgal”

- Livestock Institute of the Academy of Sciences of Turkmenistan
- Turkmen State agricultural University named after S.Niyazov
- Turkmen agricultural Institute in Dashoguz city
- UNDP (6 people)

Agenda:

1. Presentation of the goals and objectives of the project proposal to the Adaptation Fund
2. Discussion of inputs/suggestions/remarks of representatives of ministries and departments to the project proposal
3. Discussion of the procedure and deadlines for submitting a project proposal to the Adaptation Fund

Discussion:

- UNDP presented the goals and objectives of the project proposal to the Adaptation Fund. Also, all 3 components of the project proposal developed as a result of consultations with national partners were described.

- Participating representatives of government agencies, after listening to the presentation, noted the feasibility and timeliness of this project. They recommended:

  - on the 2nd component, to maintain continuity in the ongoing UNDP project "Supporting climate resilient livelihoods in agricultural communities in drought-prone areas of Turkmenistan", and to include the issue of the introduction of international experience in curricula and scientific topics for agricultural institutions and research institutes of the country;
  - along with the crop sector, include the development of the livestock sector;
  - pay attention to the organizational structure of the extension services for the sustainability of the results of this project;
  - Demonstration plots in the velayats should be oriented towards the search and implementation of practical solutions to the Aral Sea basin problems;
  - co-financing is not required.
- The participants of the meeting confirmed their willingness to cooperate and support the project at all levels if the project proposal was approved by the Adaptation Fund and also agreed that the main national partner and coordinating body should be the State Committee for Environmental Protection and Land Resources with the operational and administrative support of the UNDP office in Turkmenistan

Conclusion:

1. To recommend starting the procedure for submitting a project proposal to the Adaptation Fund after incorporating comments and suggestions from representatives of ministries and departments to the project proposal;
2. To recommend the appointment of the State Committee for Environmental Protection and Land Resources of Turkmenistan as the main national partner and coordinating body for this project proposal.

Протокол круглого стола по обсуждению проектного предложения для подачи в Адаптационный Фонд

Название проекта: *Повышение устойчивости для частных фермеров в Туркменистане*

Дата: 4 июля 2018 года

Участвовали:

- Берди Бердиев, Государственный комитет Туркменистана по охране окружающей среды и земельным ресурсам
- Атамурадов Нуры, Государственный комитет Туркменистана по охране окружающей среды и земельным ресурсам
- Мамметгулов Керимназар, Министерство сельского и водного хозяйства Туркменистана
- Мередов Байрамдурды, Министерство сельского и водного хозяйства Туркменистана
- Пурлиев Мурзе, Министерство сельского и водного хозяйства Туркменистана
- Аширов Гурбангельды, Меджлис Туркменистана (комитет по окружающей среде)
- Шарипов Мекан, Союз Промышленников и Предпринимателей Туркменистана
- Оразмухаммедова Махым, Национальный Комитет по гидрометеорологии при Кабинете Министров Туркменистана
- Мухаммедова Марал, Национальный Комитет по гидрометеорологии при Кабинете Министров Туркменистана
- Чарыев Курбан, Государственный коммерческий банк «Дайханбанк»
- Гылычханов Гылычхан, АК Банк «Рысгал»
- Гурдов Гюйчмурад, Институт животноводства АН Туркменистана
- Аннамухамедов Сапармырат, Туркменский сельскохозяйственный университет им. С.А. Ниязова
- Курбанов Бабагельды, Туркменский сельскохозяйственный институт г.Дашогуз
- Виталий Времиш, Программа развития ООН
- Ровшен Нурмухамедов, Программа развития ООН
- Амангуль Овезбердыева, Менеджер проекта ПРООН «Поддержка климатически устойчивой экономической жизнедеятельности сельскохозяйственных

сообществ в засушливых регионах Туркменистана»

- Джумадурдыев Овездурды, специалист проекта
- Ханеков Рахман, ПРООН
- Сарыева Джемал, ПРООН

Повестка:

1. Представление целей и задач проектного предложения в Адаптационный Фонд
2. Обсуждение замечаний и предложений по проектному предложению представителей министерств и ведомств
3. Обсуждение процедуры и сроков подачи проектного предложения в Адаптационный Фонд

Обсуждение:

- ПРООН были представлены цели и задачи проектного предложения в Адаптационный Фонд. Также были описаны все 3 компонента проектного предложения, разработанные в результате консультаций с национальными партнерами.

- Участвующие представители государственных ведомств, выступав презентацию, отметили целесообразность и своевременность данного проекта. Они рекомендовали:

  - по 2му компоненту сохранить преемственность по реализуемому проекту ПРООН «Поддержка климатически устойчивой экономической жизнедеятельности сельскохозяйственных сообществ в засушливых регионах Туркменистана», а также включить вопрос о внедрении международного опыта в учебные программы и научные темы для с/х учебных заведений и НИИ страны;
  - наряду с сектором растениеводства, включить вопросы развития сектора животноводства;
  - обратить внимание на организационную структуру с/х консалтинговых услуг для устойчивости результатов данного проекта;
  - демонстрационные участки в велаятах должны быть ориентированы на поиск и реализацию практических решений проблем бассейна Аральского моря;
  - со-финансирование не требуется.

- Участники встречи подтвердили свою готовность сотрудничать и поддерживать деятельность проекта на всех уровнях в случае одобрения данного проектного предложения Адаптационным Фондом, а также согласились с тем, что главным национальном партнером и координирующим органом должен быть Государственный комитет Туркменистана по охране окружающей среды и земельным ресурсам при операционной и административной поддержке офиса ПРООН в Туркменистане.

Заключение:

1. Рекомендовать начать процедуру подачи проектного предложения в Адаптационный Фонд после внесения замечаний и предложений представителей министерств и ведомств в проектный документ;
2. Рекомендовать назначение Государственного комитета Туркменистана по охране окружающей среды и земельным ресурсам в качестве главного национального партнера и координирующего органа по данному проектному предложению.

Annex 10. Typical profile of Daikhan Associations

Vatan Daikhan Association, Lebap Province (Agriculture-oriented Daikhan)

Indicators:	2016
Total population	9864
Of which men	4861
Of which women	5003
Of which children	3677
Population at working age (women 16-55 years old, men 16-62 years old)	5331
Number of brigades in the daihan association	16
Number of tenants in the daikhan association	1650
including of women	55%
Number of daihan farms within a daihan association	3
Plant growing	
Total area of irrigated land, ha	
including wheat, ha	1968
tons	3295
cotton, ha	1540
tons	4774
rice, ha	250
tons	803
tomatoes, ha	9
tons	242
cabbage, ha	3
tons	60
cucumbers, ha	five

tons	166.5
carrot, ha	6
tons	116,6
onion, ha	five
tons	306
potato ha	17
tons	522,6
melon, watermelon / melon	thirty
tons	104.2
Barley ha	6
Gardens, ha	18
Forest belts, ha	12
Mulberry plantations, ha	86
Length of irrigation network, km	56
Length of the collector-drainage network, km	72
ANIMAL BREEDING	
Number of sheep, including in the private sector	6200
Number of cattle, in total, incl. in the private sector	5420
Assessment of land reclamation state:	
- area of moderately saline land, ha	971.3
- area of strongly saline land, ha	208
Technical equipment of daihan associations and farms, as well as farmers:	
- excavator	one
- wheeled tractors	25
Number of tenants (farmers) who received a loan	one

Livestock: Example Garagum Daikhan Asssociation, Dashaouz Province

Indicators:	2016 Data
Total population	924
Of which men	448
Of which women	476
Of which children	337
Population at working age (women 16-55 years old, men 16-62 years old)	557
Agriculture	
Total area of irrigated land, ha	99
other crops, ha	99
Livestock	
Total area of pastures, ha; thousand hectares	880,661
including area of flooded pastures, ha; thousand hectares	265,000
Number of wells, watering points	119
Total number of sheep	32024
Total number of camels	1713
Technical equipment of daihan associations and farms, as well as farmers:	
- wheat crusher	1
- water carrier	1
- car "Ural"	1
- baler	1
- Tractors "Class"	1

Annex 11. Letter of support from the Union of Industrialists and Entrepreneurs of Turkmenistan

TÜRKMENISTANYN
SENAGATÇYLAR WE
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«30» 11 2018 ý. № 01-12/10025

Постоянному Представителю
ПРООН в Туркменистане

Уважаемая госпожа Панова!

Союз Промышленников и предпринимателей Туркменистана рассмотрел проектное предложение ПРООН в Адаптационный Фонд «Повышение устойчивости фермеров Туркменистана к последствиям изменения климата» и отмечает важность реализации этого проекта, который приведет к содействию развития сельского хозяйства Туркменистана на новый качественный уровень и повышению устойчивости фермеров к последствиям изменения климата.

В этой связи, мы считаем выполнение вышеупомянутого проекта очень своевременным и актуальным.

Члены Союза, включая велаятские подразделения, будут играть одну из ключевых ролей в создании системы информационно-консультативных услуг для фермеров-предпринимателей. Показательные участки в каждом велаяте будут демонстрировать и практиковать инновационные методы и технологии, направленные на адаптацию сельскохозяйственной деятельности к условиям изменения климата.

Со своей стороны хотим подтвердить готовность Союза Промышленников и предпринимателей Туркменистана к сотрудничеству и поддержать реализацию проекта на всех уровнях, во всех регионах через свои велаятские подразделения в случае одобрения данного проектного предложения Адаптационным Фондом.

С уважением,
Председатель **А. Дадаев**

Unofficial translation

UNION OF INDUSTRIALISTS AND ENTREPRENEURS OF TURKMENISTAN

30.11.2018 **No 01-12/10025**

UNDP Resident Representative in Turkmenistan

Dear Ms Panova,

The Union of Industrialists and Entrepreneurs in Turkmenistan has considered the UNDP project proposal to the Adaptation Fund on 'Scaling Climate Resilience for Farmers in Turkmenistan' and highlights the importance of the implementation of the said project, that will lead to facilitating agricultural development in Turkmenistan at a new quality level and enhancing the resilience of Turkmenistan farmers to climate change consequences.

In this regard, we believe the implementation of the project will be timely and relevant.

The Union members, including velayats' subsidiaries will play one of the key roles in setting up the extension services for private farmers. Pilot areas in each velayat will show and apply hand-on innovation techniques and technologies aimed at the adaptation of agricultural activities to climate change impact.

From our side, we would like to confirm the readiness of the Union of Industrialists and Entrepreneurs in Turkmenistan to cooperate and support the implementation of the project at all levels, in all regions through our velayats' subsidiaries should this project proposal be adopted by the Adaptation Fund.

Yours sincerely,

A.Dadayev

Annex 12, Gender Action Plan

Project Outputs	Gender mainstreaming actions	Indicators and targets	Timeline	Responsibilities
	Component 1. Policy and institutional development to mainstream resilience			
Output 1.1. Climate resilience is mainstreamed into policies and regulations in agriculture, water and land management sectors; new regulatory incentives for farmers are in place	Review of the new policies and guidance documents by the gender advisor to identify gender gaps and mainstreaming opportunities Gender expertise will be engaged for the development of the new laws, regulations and guidance documents to ensure that gender considerations are taken into account in the design. Gender expert will provide inputs to the TORs and will screen all policy and guidance documents Gender sensitive considerations will be integrated into the design of new laws, regulations and associated explanatory materials relating to agricultural sector strategy development	Level of integration of gender concerns in the new policy and guidance documents Gender analysis and gender mainstreaming objectives are included in the new/updated laws or sub regulations, guidance notes and the Strategic Concept to support climate resilience among smallholder farmers.	Years 1-4	Project Management Unit (PMU), Gender Expert, short-term gender consultants, MAEP
Output 1.2. Capacity built for key government ministries and other relevant institutions to promote climate resilience in private sector agriculture	Capacity building activities will target both men and women Gender mainstreaming objectives will be reflected in the agenda of capacity building and training events	Ratio of women among institutional stakeholders engaged and trained At least 30% of national/regional	Years 1-4	PMU, Gender Expert

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		stakeholders trained are women		
	Component 2: Climate resilient extension services			
Output 2.1. A public-private network of extension service providers is trained to deliver climate risk management and adaptation information and advice to farmers	Gender expert provides inputs to training agendas A series of training workshops focussed on gender mainstreaming for extension workers, practitioners, UIE	Gender considerations are reflected in training materials and technical guidance to extension workers (review by gender advisor) Extension workers are trained on gender mainstreaming in climate change adaptation Number of women trained among the extension workers (at least 30%)	Year 1-5 (continuously)	PMU, Gender Expert
Output 2.2: More than 20,000 farming enterprises and entrepreneurs receive climate risk information and resilience advice through improved and accessible extension services, best practice guidance and improved climate information services.	Extension service providers will screen to ensure that at least 30% of those receiving support (either heads of enterprises or individual entrepreneurs) are women. PMU and Project Gender expert will monitor implementation of gender targets and reporting Gender expert will provide inputs to the outreach strategy of the project and extension centres to ensure that	Ratio of women among beneficiaries of extension support At least 30% of 20,000 private sector farmers who access information on climate resilient best practices and best available technologies are women	Year 2-5	PMU, Gender Expert, Extension workers

	extension services are reaching out men and women	At least 30% of 2000 private sector farmers who receive direct field training in climate resilient agriculture are women		
	Component 3: Regional demonstration plots and community level investment into adaptation technologies			
Output 3.1. At least 1 MAEP research institute site developed providing access to best available technologies and practices for non-state order crops and supporting improved research links	Achieve 30 percent representation of women-farmers in training courses Tailor information and awareness campaigns for the needs of men and women Taylor the outreach campaign to ensure equal reach out to male and female farmers	At least 30% of farmers visiting project demonstration sites for field training and to learn about best practices and technologies are women Women and men demonstrate positive feedback on the training materials and delivery methods (verified through training reports) Women comprise 30% of trainees	Year 2-5	PMU, Gender Expert, MAEP
Output 3.2. Private sector-led best practice demonstration facilities:	The siting of demonstration plots will be informed by the potential for access by vulnerable groups, including women. This will include both location as well as access arrangements. The access of vulnerable farmers, including women to these demonstration plots will be monitored on an annual basis through a formal review mechanism, with	At least 30% of farmers visiting project demonstration sites for field training and to learn about best practices and technologies are women Information tailored to the needs of men and women	Year 2-5	PMU, Gender Expert, extension workers, Union of Entrepreneurs, private farmers hosting the demonstration plots

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	corrective action undertaken where such access is not being prioritized. Gender balanced approach to selection of participating private sector partnerships (female led enterprises) Achieve 30 percent representation of women in training courses Tailor information and awareness campaigns for the needs of men and women	Private sector partners hosting demonstration plots include both men and women-led farming enterprises		
Output 3.3. Adaptation investments in community scale farmer-led cooperatives:	Conduct detailed gender assessments as part of socio-economic vulnerability assessments Gender expert will be engaged since the project Inception Phase to support selection of the pilot sites, detailed gender assessments and adaptation plans Make sure that women and vulnerable groups are adequately represented in the stakeholder consultations and design of adaptation investment plans Local NGOs with experience and track record in gender mainstreaming work at local level will be engaged in	Gender assessment conducted for each project location Ratio of women in stakeholder consultations and community adaptation planning work Community consultation groups with at least 30% representation of women At least 30% of those receiving field training and support will be women	Year 1-5	PMU, Gender Expert, extension workers

	the community based outreach and capacity building activities			
	Effective project management			
Governance	Ensure that project Steering Committee and other supervisory bodies are composed of at least 30% of women	30% percent of women in the project governance and supervisory bodies	Year 1-5	UNDP, PMU, Gender Expert
Capacity building and training	Training of staff members of the project on gender mainstreaming and social vulnerability approach	Staff members completed training in gender mainstreaming and social vulnerability approach	Year 1-5	UNDP Gender Focal Point, PMU, Gender Expert
M&E	Gender mainstreaming targets in the logical framework will be specified based on the detailed gender analysis and gender mainstreaming action plans for each site Gender-disaggregated data for evaluation purposes will be collected	Logframe gender targets updated based on detailed gender assessment. Reporting includes gender-disaggregated data.	Year 1	PMU, Gender Expert
Stakeholder consultations, access to information and participatory decision making	Secure participation of the project Gender Advisor in all project working groups. Ensure that women are adequately represented in all project stakeholder consultations and capacity building events. Ensure that women have equal access to grievance reporting mechanism.	Gender Advisor is a member of all working groups. Ratio of women in stakeholder consultations Community consultation groups with at least 30% representation of women	Years 1-5	UNDP, PMU, Gender Expert

Annex 13. Acronyms

ADB	Asian Development Bank
AF	Adaptation Fund
BCR	Benefit Cost Ratio
CO	Country Office
COP	Conference of the Parties
DRR	Disaster risk reduction
EBRD	European Bank for Reconstruction and Development
EECCA	Eastern Europe, the Caucasus and Central Asia
ESP	Environmental and Social Principles
EU	European Union
FAO	Food and Agriculture Organisation
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GoT	Government of Turkmenistan
Ha	Hectare
IRR	Internal Rate of Return
M&E	Monitoring and Evaluation
MAEP	Ministry of Agriculture and Environment Protection of Turkmenistan
MOAWR	Ministry of Agriculture and Water Resources
MTE	Mid-term evaluation
NAP	National Adaptation Plan
NCCS	National Climate Change Strategy
NDC	Nationally Determined Contribution
NEPAAM	National Economic Program of Action on Adaptation and Mitigation
NPD	National Project Director
OECD	Organisation for Economic Cooperation and Development
PA	Project Assistant
PAC	Project Appraisal Committee
PB	Project Board
PM	Project Manager
POPP	Programme and Operational Policies and Procedures
PPR	Project Performance Reports
PSC	Project Steering Committee

SCCF	Special Climate Change Fund
SES	Social and Environmental Standards
SME	Small and Medium Enterprise
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
SCEPLR	State Committee for Environmental Protection and Land Resources of Turkmenistan
VCA	Vulnerability and Capacity Assessment
WUG	Water User Group
WUA	Water Users Association
IMC	Inter-Ministerial Climate Change Council
UNECE	United Nations Economic Commission for Europe

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: FULL PROPOSAL

Country/Region: **Turkmenistan/ Central Asia**
Project Title: **Scaling Climate Resilience for Farmers in Turkmenistan**
Thematic Focal Area: **Agriculture**
Implementing Entity: **UNDP**
AF Project ID: **TKM/MIE/Agric/2018/1**
IE Project ID:

Requested Financing from Adaptation Fund (US Dollars): $7,000,040

Reviewer and contact person: **Dirk Lamberts**
Co-reviewer(s): **Saliha Dobardzic**
IE Contact Person: **Natalia Olofinskaya**

Review Criteria	Questions	Comments	Final review comments February 14, 2019	Responses
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes, Turkmenistan ratified the Kyoto Protocol on January 11, 1999.		
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes, it is a developing country particularly vulnerable to the adverse effects of climate change.		
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	No. The endorsement letter submitted was not signed by the Designated Authority on file. **CAR 1**: Please submit a Letter of Endorsement signed by the Designated Authority on file, or submit an official letter informing	**CAR1:** Addressed.	

		of the change in the Designated Authority.		
	2. Does the length of the proposal amount to no more than fifty pages for the project/programme concept, including its annexes; or One hundred pages for the fully-developed project document, and one hundred pages for its annexes?	Yes.		
	3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?	Overall yes. A significant proportion of the funding requested would be directed towards development of climate-resilient extension services, which is important and expected to benefit 20,000 small- and medium-sized non-state farming enterprises and entrepreneurs in adopting climate-smart agricultural practices. Criteria have now been included in the proposal for the selection of the vulnerable populations but the criteria are rather generic and do not explain how the poorest and most climate-vulnerable beneficiaries will be selected. The process of risk screening is not described and it is not clear how it will be an open, transparent consultative process.	**CR1:** Addressed	

		CR 1: Please elaborate the beneficiary selection criteria for Component 2 and describe the selection process.		
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes.		
	5. Is the project / programme cost effective?	Yes. The cost effectiveness of the unidentified sub-projects of Component 3 will be ascertained prior to investment. **CR 2**: Please describe the process that will be used (including timing, roles and responsibilities and decision-making criteria and uptake) to ascertain cost-effectiveness of the unidentified sub-projects of Component 3.	**CR 2:** Addressed	
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national	Yes, consistency with national development strategies is described on p. 41-43.		

	development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?			
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Mostly yes. It is not clear if or how this is also the case for the activities that are yet to be identified of Component 3. **CR 3**: Please clarify the process of complying with relevant national technical standards for the unidentified sub-projects of Component 3.	**CR 3:** The clarification provided in the response sheet to the initial review is adequate but is not reflected in the proposal. Project approval may be conditional upon updating the proposal accordingly. The text provided in the response sheet is the following: **"***UNDP Country Office in Turkmenistan has practical experience with implementing/piloting of all technologies proposed for the AF project and listed under Component 3 in compliance with the national technical standards and regulations. Annex 6 of the project proposal refers to the lessons and evidence from earlier UNDP implemented pilots. The following process secures compliance with the corresponding standards and regulation:*	**CR3:** Comment is addressed, text is added in the full proposal paragraph 149 and in the ESMF Annex 8.

			(i) Upon identification of sub-projects/sites and prior to the investment the applicable national technical standards and regulations are defined and safeguards monitoring activities are defined and incorporated in the sub-project design; *(ii) Technical specifications/terms of references for the procurement and commissioning of technology installation include requirements for the sub-contractor to ensure compliance with all relevant national technical standards and regulations according to the national law. All the relevant national technical standards (including permits, licenses, etc. for construction, hydroengineering and other physical works) are specified in detail in UNDP tender documentation along with technical specifications of works required;* *(iii) At the contracting phase UNDP verifies*	

			compliance of the sub-contractor with the national regulations (e.g. availability of appropriate licenses). Contracts are awarded to vendors, that possess full compliance with national technical standards for implementation of adaptation activities. (*iv) UNDP Country Office has an internal procedure for carrying out monitoring field visits and spot checks during the implementation of site activities by sub-contractors. The monitoring visit check lists include above all monitoring of compliance to technical standards;* *(v) In case of high technical complexity of works and services, external experts (e.g. engineers) and/or national government staff are engaged for site monitoring."*	
	8. Is there duplication of project / programme with other funding sources?	No. Information is provided on relevant existing projects, including information on how they are complementary and how duplication is avoided.		
	9. Does the project / programme have a	Yes. There is a clear way forward with the institutions involved to		

	learning and knowledge management component to capture and feedback lessons?	ensure that the investment in knowledge during the project is effectively managed. The IE is expected to provide continuing additional support as needed to those institutions to support knowledge uptake and management.		
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Mostly yes. **CR 4**: Please clarify the process of stakeholder consultation for the unidentified sub-projects of Component 3.	**CR 4:** Sufficiently addressed. Consultation of stakeholders is now implied in the selection process.	
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Probably yes. Please see also CR 2.		
	12. Is the project / program aligned with AF's results framework?	Yes.		
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes, and the sustainability of the project/programme outcomes has sufficiently been indicated and the financing and incentives mechanism described.		
	14. Does the project / programme provide an overview of	The overview table has been completed. The activities of Component 3 (and to some extent	**CR 5**: Sufficiently addressed. It is understood that the identification and	

	environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Component 2) have not been identified to the point where effective risks identification is possible. **CR 5**: Please clarify the process of complying with the Environmental and Social Policy (ESP) of the Adaptation Fund for the unidentified sub-projects of Component 3, identifying risks according to the 15 principles of the ESP, assessing impacts in a way commensurate to the risks, justifying the findings, and formulating mitigation or management measures accordingly to avoid or minimise negative environmental and social impacts. (Please refer to the relevant Guidance Document https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf).	implementation of necessary safeguard measures is part of the impact assessment for unidentified sub-projects.	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes.		

	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	The Implementing Entity Management fee is at 8.50% of the total budget before the fee.		
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes.		
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes.		
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	Compliance with the Gender Policy remains inadequately demonstrated in the proposal in two ways: 1. Gender targets and considerations are rather vague and several not-clearly defined terms are used (including "gender-sensitive", "gender-responsive", "engendering", "gender balanced"). Gender targets are set throughout the proposal at typically "at least 30% women". The proposal does not provide a justification for this target.	**CR 6:** Sufficiently addressed. Justification for the gender targets is provided in the response sheet as follows: "*Gender-related targets in the new proposal have been based a lot on the lessons from and experience of the earlier Adaptation Fund project in Turkmenistan that piloted and supported establishment of new Water User Groups (WUG) in rural communities engaging women in WUG*	

		CR 6: Please provide specificity and details to establish confidence that the gender considerations are fully mainstreamed throughout the project. 2. In addition, the proposal needs to demonstrate compliance with the AF Gender Policy in the unidentified activities of Component 3. **CR 7**: Please describe the process that will be used (including timing, roles and responsibilities and decision-making criteria and uptake) to ascertain Gender Policy compliance of the unidentified sub-projects of Component 3.	*management structures and in broader project consultations. Based on the previous experience, the targets proposed in the new projects are both ambitious and achievable, and will positively promote gender equality in Turkmenistan.*" A Gender Action Plan has been added to the proposal (Annex 12). The plan would benefit from being further and explicitly integrated in the overall project management arrangements. **CR7:** Addressed.	
	2. Are there measures for financial and project/programme risk management?	Yes.		

	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	The environmental and social screening report (Annex 7) and the ESMF (Annex 8) present risk identifications for the activities of the project in line with the IE requirements. While these may be adequate in terms of compliance with the ESP this is not demonstrated in the proposal. **CR 8**: Please clarify how the risks and impacts identification complies with the requirements of the AF ESP. **CR 9**: Please update the safeguards process of the ESMF to reflect the outcome of CR 5, and to expand to all activities for which comprehensive risks identification has not yet been done. Please clarify how the project will comply with the AF ESP, in addition to national requirements already included and how the safeguard arrangements will be updated as may be required during implementation.	**CR 8**: Not addressed. The response sheet states that "*The project risk screening and ESMF procedures are compliant with the UNDP safeguards policies, which have been in compliance/aligned with the AF ESP.*" The latter is a common misunderstanding and the information provided on risks identification and impacts assessment does not meet the requirements of the ESP, in particular with respect to risks identification according to the 15 AF ESP principles, and evidence-based justification of the risk identification and impact assessment findings. **CR 9**: Addressed, with the caveat contained in CR 8.	**CR8**: The risk screening and identification has been conducted against the 15 AF ESP principles. An updated section K. in the full proposal provides an overview of all 15 AF ESP principles with an evidence-based justification for the assessment of the level of potential impacts/risks. Those AF ESP principles against which potential impacts and risks have been identified are reflected in the UNDP SESP (Annex 7). Additional notes on compliance with the AF ESP principles have been added in SESP report (Annex 7) and in ESMF (Annex 8). In particular, the following AF ESP principles were identified as relevant (with potential impact and risks) for which future management is required: • Compliance with the law (with regard to the access to and extraction of surface and ground water resources) • Access and equity and Marginalized and

				Vulnerable Groups (with regard to access to the benefits delivered by the project and potential restriction of access to water resources) • Climate change (related to the vulnerability of the project outputs and communities to climate change) • Pollution prevention and resource efficiency (with regard to the efficient use of water resources vs the risk of increased water extraction) • Lands and soil conservation (with regard to the vulnerability of land and soil resources in the face of climate-driven aridification and water scarcity). Four potential identified risks related to these five AF ESP principles are formulated in the SESP (Annex 7) with the clear reference to the AF ESP. Additional notes are included in the ESMF and SESP related to risk screening and identification and risk management.

	4. Is a budget on the Implementing Entity Management Fee use included?	Yes, Annex 2.		
	5. Is an explanation and a breakdown of the execution costs included?	Yes, A breakdown of the execution cost is included on p. 76.		
	6. Is a detailed budget including budget notes included?	Yes.		
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	Yes.		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.		
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from	Yes, p. 71-73.		

	the Fund's results framework?			
	10. Is a disbursement schedule with time-bound milestones included?	Yes, p. 80.		
Technical Summary	The purpose of this project is to improve climate resilience among smaller private sector farmers through strengthening the enabling environment, expanding climate resilient extension services and creating demonstration sites to support communities across farming systems in Turkmenistan. The project is focused on agriculture, which, while contributing only 10% to the GDP, provides employment for around half of the population. Given its high sensitivity to climate change and variability, it is critical to boost the resilience especially of the most vulnerable in this population. The initial review resulted in a corrective action (CAR) and some clarification (CR) requests, mostly related to Component 3 of the proposal containing a number of potential activities that will be selected during project implementation, as follows: **CR 1**: Please elaborate the beneficiary selection criteria for Component 2 and describe the selection process. **CR 2**: Please describe the process that will be used (including timing, roles and responsibilities and decision-making criteria and uptake) to ascertain cost-effectiveness of the unidentified sub-projects of Component 3. **CR 3**: Please clarify the process of complying with relevant national technical standards for the unidentified sub-projects of Component 3. **CR 4**: Please clarify the process of stakeholder consultation for the unidentified sub-projects of Component 3. **CR 5**: Please clarify the process of complying with the Environmental and Social Policy (ESP) of the Adaptation Fund for the unidentified sub-projects of Component 3, identifying risks according to the 15 principles of the ESP, assessing impacts in a way commensurate to the risks, justifying the findings, and formulating mitigation or management measures accordingly to avoid or minimise negative environmental and social impacts.			

	CR 6: Please provide specificity and details to establish confidence that the gender considerations are fully mainstreamed throughout the project. **CR 7**: Please describe the process that will be used (including timing, roles and responsibilities and decision-making criteria and uptake) to ascertain Gender Policy compliance of the unidentified sub-projects of Component 3. **CR 8**: Please clarify how the risks and impacts identification complies with the requirements of the AF ESP. **CR 9**: Please update the safeguards process of the ESMF to reflect the outcome of CR 5, and to expand to all activities for which comprehensive risks identification has not yet been done. Please clarify how the project will comply with the AF ESP, in addition to national requirements already included and how the safeguard arrangements will be updated as may be required during implementation. The final technical review finds that most clarification requests (CR 1, 2, 4, 5, 6 and 7) have been addressed and that the required processes for activities of component 3 have largely been put in place. CAR 1 has not been addressed. CR 3 has been addressed in the response sheet but this still needs to be reflected in the proposal. CR 8 has not been addressed. CR 9 has been addressed but is substantively dependent on the outcome of CR 8.
Date:	14 February 2019

TÜRKMENISTANYŇ DAŞKY GURŞAWY GORAMAK WE ÝER SERIŞDELERI BARADAKY DÖWLET KOMITETI

744000, Aşgabat ş., Arçabil şaýoly, 92
Tel: 44-78-01; Faks: 44-78-68

STATE COMMITTEE ON ENVIRONMENT PROTECTION AND LAND RESOURCES OF TURKMENISTAN

744000, Ashgabat c., Archabil avenue, 92
Phone: 44-78-01; Fax: 44-78-68

« 31 » august 2018 ý. № 04-3945

To: Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: secretariat@adaptation-fund.org
Fax: 202 522 3240/5

Dear Sir/Madame,

By this letter I would like to confirm that the State Committee on Environmental Protection and Land Resources of Turkmenistan remains as the National Designated Authority (NDA) of Turkmenistan for The Adaptation Fund. I also appoint Mr. Berdi Berdiyev, Head of International Relations and Planning Department, as the Focal Point of Turkmenistan's NDA for The Adaptation Fund.

Berdi Berdiyev can be reached at mnptm.dcep@gmail.com, phone: (+933 12) 44-78-50, and fax: (+933 12) 44-78-55.

Thank you in advance and best regards,

Batyrmyrat Orazmyradov,

Chairman of the State Committee
on Environment Protection and Land Resources
of Turkmenistan

TÜRKMENISTANYŇ DAŞKY GURŞAWY GORAMAK WE ÝER SERIŞDELERI BARADAKY DÖWLET KOMITETI

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STATE COMMITTEE ON ENVIRONMENT PROTECTION AND LAND RESOURCES OF TURKMENISTAN

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☎ Phone: 44-78-01; Fax: 44-78-68

«31» august 2018 ý. № 04-3945a

To: Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: secretariat@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Project "Scaling Climate Resilience for Farmers in Turkmenistan".

In my capacity as designated authority for the Adaptation Fund in Turkmenistan, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Turkmenistan.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by United Nations Development Programme and executed by the State Committee on Environment Protection and Land Resources of Turkmenistan.

Sincerely,

Berdi Berdiyev

Head of International Programme Coordination Department

State Committee for Environmental Protection and Land Resources of Turkmenistan,
Designated Authority for the Adaptation Fund in Turkmenistan

TÜRKMENISTANYŇ OBA HOJALYK WE DAŞKY GURŞAWY GORAMAK MINISTRLIGI

744036, Aşgabat şäheri, Arçabil şaýoly, 92-nji jaýy
Telefon: (+993 12) 44-74-04, 44-76-05; Faks: 44-74-01

TURKMENISTAN MINISTRY OF AGRICULTURE AND ENVIRONMENTAL PROTECTION

92nd building, Archabil avenue, Ashgabat city, 744036
Telephone: (+99312) 44-74-04, 44-76-05; Fax: 44-74-01

"10" 04 2019 ý. № 01-1105/10

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Dear Sir/Madame,

I would like to inform you that the Ministry of Agriculture and Environment Protection of Turkmenistan was established on January 29, 2019, as a result of merge of the Ministry of Agriculture and Water Economy of Turkmenistan and the State Committee on Environment Protection and Land Resources of Turkmenistan and assumed the functions of these former state organizations beginning from above mentioned date. Therefore, the Ministry of Agriculture and Environment Protection of Turkmenistan acts as the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund.

In this regard, I appoint Mr. Berdi Berdiyev, the Head of the Department of Coordination of International Environment Cooperation and Projects as the Focal Point of Turkmenistan's NDA for the Adaptation Fund.

Mr. Berdi Berdiyev can be reached at mnptm.dcep@gmail.com, phone: (+993-12) 447850 and fax: (+993-12) 447855.

Thank you in advance and best regards,

Magtymguly Bayramdurdyyev

Minister of Agriculture and Environment
Protection of Turkmenistan

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"10" 04 2019 ý. № 01-1104/10

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Project "Scaling climate resilience for farmers in Turkmenistan"

We, the Head of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund and the Focal Point of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund, confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts and risks, posed by climate change in Turkmenistan.

Accordingly, we are pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by United Nations Development Programme and executed by the Ministry of Agriculture and Environment Protection of Turkmenistan.

Sincerely,

Magtymguly Bayramdurdyyev
Minister of Agriculture and Environment Protection of Turkmenistan
Head of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund

Berdi Berdiyev
Head of Department of Coordination of International Environment Cooperation and Projects,
Ministry of Agriculture and Environment Protection of Turkmenistan
Focal Point of the National Designated Authority (NDA) of Turkmenistan for the Adaptation Fund