



PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

Project/Programme Category:	Regular
Country/ies:	Iran
Title of Project/Programme:	Reducing vulnerability to climate change in the Lake Bakhtegan Basin. (UNDP PIMS 6190)
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	United Nations Development Programme
Executing Entity/ies:	Department of Environment (DoE)
Amount of Financing Requested:	US\$ 9,865,653(in U.S Dollars Equivalent)

PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

National context

1. According to Iran's Second National Communication to the UNFCCC *"Iran is highly vulnerable to the adverse impacts of climate change. It is a country with arid and semi-arid areas, limited water availability, low forest cover, liable to drought and desertification, prone to floods, high urban atmospheric pollution, fragile mountainous ecosystems.*
2. It is well documented that the west of Asia region has experienced climate changes, water shortages, and disruptions to agriculture and human settlement for millenia¹. The Middle East and North Africa (MENA) is the most water scarce region in the world. With combined effects of a predominantly arid climate, rapid population increases, increased demand for water, climate change, and transboundary water management issues, Iran, along with other MENA countries, is faced with a growing water crisis situation². The rapid growth in demand for water in Iran has led to severe depletion of available water with annual renewable water availability per capita projected to be at crisis level by 2021³. In a recent World Resources Institute study, Iran ranks 13th out of 33 countries identified as likely to face severe water stress by 2040⁴ under a Business as Usual scenario. In the mid-1960s with a population of 19 million water per capita was 7000 cubic metres per annum. By 2014, with a population of 70 million, this figure had reduced to less than 1900 cubic metres per annum, and with projected population increases is expected to be approximately 1400 cubic metres per annum by 2025⁵.
3. The Islamic Republic of Iran, with an area of 1,648,195 square kilometres, is mostly a mountainous and semi-arid land. The climate is mainly influenced by a sub-tropical high-pressure belt, with three climate types according to the Koppen climate classification; arid and semi-arid; temperate-mesothermal; continental-microclimate. Approximately 97 percent of the country is arid or semi-arid with an average annual rainfall of 240mm, less than a third of the world's average precipitation⁶. Annual rainfall in the inland dry deserts of Iran can be as low as only 10mm. Rainfall is very seasonal with only 10 percent of the annual rainfall occurring during the hot and dry seasons in the central, southern and eastern areas of the country⁷. Average annual rainfall over most of the country is about 200mm. Temperatures vary from -6°C to 21°C in January and 19-39°C in July⁸.

¹ Kaniewski, Daniel, Van Campo, Elise, Weiss, Harvey. 2012. Drought is a recurring challenge in the Middle East. PNAS 109 (10) 3862-3867

² World Bank. 2017. Beyond Scarcity: Water Security in the Middle East and North Africa.

³ Iran Second National Communication to the UNFCCC. 2010.

⁴ Luo, T., R. Young, P. Reig. 2015. "Aqueduct Projected Water Stress Country Rankings." Technical Note. Washington, D.C.: World Resources Institute. Available online at: www.wri.org/publication/aqueduct-projected-water-stresscountry-rankings

⁵ Garshasbi, Parviz. 2014. *Drought conditions and management strategies in Iran*. Report presented to UN Water Regional Workshop for Near East and North Africa Region on Capacity Development to support National Drought Management Policies, 17-20 November 2014.

⁶ Department of Environment. 2016. Islamic Republic of Iran Revised National Biodiversity Strategies and Action Plan (NBSAP2) 2016-2030.

⁷ Garshasbi, Parviz. 2014. *Drought conditions and management strategies in Iran*. Report presented to UN Water Regional Workshop for Near East and North Africa Region on Capacity Development to support National Drought Management Policies, 17-20 November 2014. http://www.ais.unwater.org/ais/pluginfile.php/605/mod_page/content/23/Iran.pdf

⁸ Iran Second National Communication to the UNFCCC. 2010.

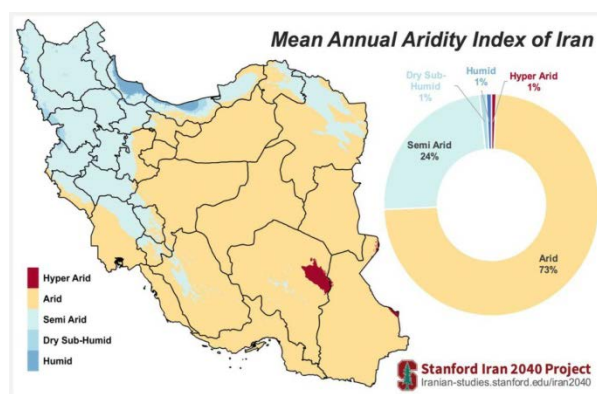


Figure 1: Mean annual aridity index for Iran

4. Mean annual temperatures have increased in Iran based on analysis of data from 1960-2010, with an increase in minimum temperatures over this period of approximately 2°C and an increase in maximum temperatures of approximately 1°C. Annual rainfall is already low throughout most of Iran and for the most part there have been no significant changes over the 1960-2010 period⁹. Projections to the 2015-30 period compared to 1982-2009 indicate average temperature increases of approximately 0.5°C, with variable and uncertain changes in precipitation. Projected temperature increases of up to 3-4°C by 2100 were identified in Iran's Second National Communication to the UNFCCC, with uncertain changes in precipitation. Continued temperature increases, combined with the already low rainfall throughout most of Iran, will increase the risk of drought over time. *"According to the long-term climate predictions, the provinces and areas south of the Zagros Mountains range will experience the greatest decline in snowfall. This will have important consequences on surface and underground water resources and thus the availability of water for irrigation in these areas."*¹⁰
5. With high summer temperatures and low summer rainfall, combined with low annual rainfall in most areas, the drought risk is very high. The severe drought experienced from 1999-2002 resulted in an estimated \$3.5 billion worth of damage, killed 800,000 head of livestock and dried up major inland reservoirs and lakes¹¹. Unlike other natural disasters, which have immediate and obvious impact, the impacts of drought are insidious. These impacts are experienced throughout the economy, society and environment with often long-lasting consequences. Based on an analysis of the economic impacts of climate change induced water scarcity the MENA region is expected to experience the greatest economic losses, estimated at 6-14 percent of GDP by 2050¹².
6. Iran's population has grown rapidly over the last sixty years, from approximately 19 million people in 1956 to approximately 80 million in 2016¹³. The increase has been notably greater in urban areas than rural. This difference reflects the rapid growth of urbanisation in Iran, with 73 percent of the population now living in urban areas compared to only 27 percent in 1950¹⁴. Within the context of the Iran government's policy of food self-sufficiency these changes in population and its distribution have had significant impacts. Among other factors the loss of arable land to increased urbanisation and the pressure to feed a rapidly growing population has placed enormous pressure on soil and water resources.
7. Iran is the second largest economy in the Middle East and North Africa (MENA) region with a Gross Domestic Product (GDP) in 2016/17 of 13,045 trillion Iranian Rials (USD377 billion)¹⁵. Iran's Human Development Index (HDI) value for 2013 was 0.749, which is in the 'high human development' category, positioning the country at 75 out of 187 countries and territories. Between 1980 and 2013, Iran's HDI value increased from 0.490 to 0.749, an increase of 52.9 percent. Life expectancy at birth increased by 19.9 years, mean years of schooling increased by 5.7 years and expected years of schooling increased by 6.5 years. Iran's Gross National Income (GNI) per capital increased from 5,065,499 Rials in 1996 to 7,465,317 Rials in 2012 (47.3% increase) using the base year 1997. Government investment in research increased from 0.4 percent of GDP in 2000 to 0.87 percent by 2009¹⁶. In 2011 Iran ranked first in scientific growth in the world and 17th in scientific production. The largest sector in Iran is the service sector, with agriculture ranking third behind industry, mining and manufacturing.

⁹Iran's Third National Communication to the UNFCCC. Chapter 4: Vulnerability and Adaptation Assessment, Climate Change Modelling. DRAFT.

¹⁰Iran Second National Communication to the UNFCCC. 2010.

¹¹http://www.un-spider.org/sites/default/files/Iran_booklet_final_web_012016.pdf

¹²World Bank. 2016. *High and Dry: Climate Change, Water, and the Economy*. Washington, DC: World Bank.

¹³Iran Census 2016

¹⁴Statistical Center of Iran

¹⁵International Monetary Fund. 2017. Islamic Republic of Iran: 2016 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for the Islamic Republic of Iran

¹⁶ Source: https://en.wikipedia.org/wiki/Economy_of_Iran

8. Of Iran's total land area of 165 million hectares about 37 million hectares are suitable agriculture, of which 20 million hectares are irrigated and 17 million hectares are dryland¹⁷. Of the total agricultural land area, currently 18.5 million hectares are devoted to field crop production and horticulture. Of this, 6.4 million hectares are under annual irrigated crops, 2 million hectares are under horticultural crops and about 6.2 million hectares are under annual dryland crops. The remaining 3.9 million hectares are fallow. Cereals (predominantly wheat, but including rice, barley and maize) are grown on 70 percent of cultivated land. Other crops include various fruits, nuts, vegetables, cotton, sugarcane, sugar beet and spices. The main development challenges faced by agriculture and the rural sector include: a harsh physical environment; constraints to food security and self-sufficiency in major staple crops; low productivity of the many small-holder farmers with issues including water shortages and outdated and inefficient irrigation systems; rural poverty; limitation and application of and access to modern technologies; adverse impacts on the natural environment.
9. A consequence of the increased demand for and use of freshwater, predominantly for irrigated agriculture, has been severe impacts on natural ecosystems. Iran has a high natural biodiversity with natural habitats supporting over 8200 plants species of which 20 percent are endemic; 535 bird species; 197 mammal species, 227 reptile species, 21 amphibian species and 160 freshwater fish species¹⁸. Iran's wetlands, covering 1.7 percent of the total land area, provide important habitat for many species. Half of this area, amounting to 1.4 million hectares, is made up of the 24 wetland sites designated as Wetlands of International Importance (Ramsar sites) in Iran¹⁹. From studied wetlands of the country by 2013, about one third of them are under pressure or in a critical condition²⁰. Extreme drought conditions have exacerbated the dramatic shrinking of inland water bodies in Iran, including the striking examples of Lake Urmia, the Hamoun Wetlands and Lake Bakhtegan which has affected the large number of communities around the ecosystems along with severe adverse impacts on biodiversity. While drought has played a significant role there has been a combination of factors that have led to this situation. The main causes are reduced precipitation, increasing temperatures, construction of dams in the past decades and diversion of surface water for farming which has also resulted in decreased recharge of groundwater²¹.
10. According to the National Biodiversity Strategies and Action Plan (NBSAP2) (page 18) *"Climate change, water shortages and the continuation of droughts are among the serious threats to biodiversity in the past and future that must be considered accurately. The location of Iran in the dry belt and building dams illogically has not been ineffective in causing water crises and desertification of large parts of the country especially in a land where its ancestors knew, from many years ago, that the most important enemy of the water in that land is the sun and learned to conduct the water into underground and roofed water storage tanks. For this reason, special attention must be paid to water management because it plays a significant role in biodiversity conservation."*
11. The importance of water management in Iran is reinforced through the recently published World Bank report on Water Security in the MENA²² which states that *"A fundamental development challenge for the region is to take the actions necessary to navigate sustainable pathways toward water security. Sustainable pathways would anticipate and manage the inevitable increases in water scarcity and water-related risks—against a backdrop of climate change, urbanization, growing fiscal constraints, and widespread fragility and conflict. Planning and action are needed to strengthen the resilience of economies and societies to protect them from water-related disasters."*
12. This project aims to bring these issues into focus, within the context of climate change, in the Bakhtegan Basin in Fars Province in southern Iran. The Bakhtegan Basin is the heart of Persian civilization with the ruins of the ancient cities of Pasargadae and Persepolis within its boundaries. The story of the Bakhtegan Basin is in many ways the story of Iran. It encompasses a long history of wise resource management, the more recent decades of environmental mismanagement, the social, environmental and economic costs that have arisen as a result, and the unfolding impacts of climate change.

The Bakhtegan Basin²³

13. The Bakhtegan Basin is located in the northeast of Fars Province in the south of Iran and is home to 854,093 people²⁴. It is one to the most important natural habitats in Iran covering an area of 2,724,592 hectares. 99.17 percent of the basin is in Fars province and minor parts are located in Yazd, Isfahan and Kohgiluyeh and Boyer-Ahmad. It is the heart of Persian civilization and culture, with the ruins of Persepolis and other important archaeological sites located within the basin. Persian

¹⁷Keshavarza et al, 2005. Water Allocation and Pricing in Agriculture of Iran, Water Conservation, Reuse, and Recycling: Proceedings of an Iranian-American Workshop, page: 153-172.

¹⁸Department of Environment. 2016. Islamic Republic of Iran Revised National Biodiversity Strategies and Action Plan (NBSAP2) 2016-2030.

¹⁹<http://www.ramsar.org/wetland/iran-islamic-republic-of>

²⁰Department of Environment. 2016. Islamic Republic of Iran Revised National Biodiversity Strategies and Action Plan (NBSAP2) 2016-2030.

²¹Nazemosadat, M.J. Amin, S., Kamgare-Haghighi, A.A., Khalili, D. 2000. Workshop on Drought-Related Issues in Fars Province, Iran: Critical Points and Resolutions. Drought Network News (1994-2001), p. 64.

²²World Bank. 2017. Beyond Scarcity: Water Security in the Middle East and North Africa.

²³Relevant summary information, including maps, from a comprehensive 2007 study on the natural environment and environmental challenges in the Bakhtegan Basin is provided in Annex 1

²⁴Iran Census 2016

civilization undoubtedly thrived there because of water. The hydrological system of the basin has sustained life for thousands of years. The basin's hydrological system is collapsing, resulting already in a situation that is an environmental, social and economic disaster. This is the result of the combined effects of a dismantling of longstanding traditional land management systems and practices, mismanagement of land and water resources over the last forty years and hotter and drier average conditions over the last decade. The situation is very serious and one which has huge implications for Iran if unaddressed.

Climate and climate change

14. The most important meteorological systems in the region are the Sudanese low pressure system, the low pressure of the Mediterranean, the cold north high pressure, the low thermal pressure of India and the low pressure of Saudia Arabia. Local climate data have been gathered and analysed from 43 meteorological stations. Average annual precipitation varies from 139.1mm recorded at Abadeh to 853.6mm recorded at Choubkhale. Precipitation is distributed unevenly through the year with 24.5 percent in autumn, 58.3 percent in winter, 16.8 percent in spring and 0.6 percent in summer. All stations follow a similar rainfall pattern with rainfall beginning in October, peaking in November and continuing in December. The annual precipitation volume in the study area was estimated at 87.9 billion cubic meters²⁵. Temperatures vary seasonally and with altitude throughout the Bakhtegan Basin. A lowest absolute minimum temperature of -28°C has been recorded at Kafter. Average minimum temperatures of 6.6°C, 11.5°C and 7.7°C have been observed at Abadeh, Doroodzan and Zarghan stations respectively with average maximum temperatures of 22.1°C, 23.9°C and 24.6°C recorded at the same sites. A daily maximum of 49°C has been recorded at Kafter station in July.
15. Iran's second national communication included an analysis of changes in runoff by 2100. Percentage changes in runoff by 2100 were calculated for 30 sub-basins using a number of different greenhouse gas emission scenarios. The Tashk-Bakhtegan and Maharloo sub-basin showed the greatest decrease in runoff, ranging from 13-15 percent across five of the six scenarios used. A separate study²⁶ on the relative effects of climate variability and human activities on runoff in the Bakhtegan Basin showed a trend of decreased annual runoff over the 40 year period from 1972-2011.
16. Climate change is already manifesting in the Bakhtegan Basin with evidence of increasing temperatures and below average rainfall over the last decade. The latter may only be a shorter-term variation, but is wholly consistent with what can be expected with climate change. The Bakhtegan Basin as a whole is a part of Fars Province that is classified as having extremely severe drought risk. In the past 40 years there have been four drought periods. These were: (1980/81 to 1985/86, 1987/88 to 1990/91, 1996/97 to 2002/03, 2007/08 to 2014/15 and continuing); The 2007/08 drought was particularly severe and the extended drier than average period since then is the worst in the last 40 years (Figure 3).
17. Various climate change assessments have been made in the basin. Recent analyses of drought in Fars Province have come to slightly different, but overall, the same conclusions. The first of these analyses, based on 2000-2008 data, showed that most of the province is vulnerable to drought²⁷, but with greatest susceptibility in northern and southern areas. The second study²⁸ concluded that the north and northwest experience the most severe droughts. However, overall, this study demonstrated that the whole province is exposed to moderate to severe drought conditions and recommended the need for effective planning and management of drought, with particular attention being paid to water resources management in order to avoid irrecoverable disasters.

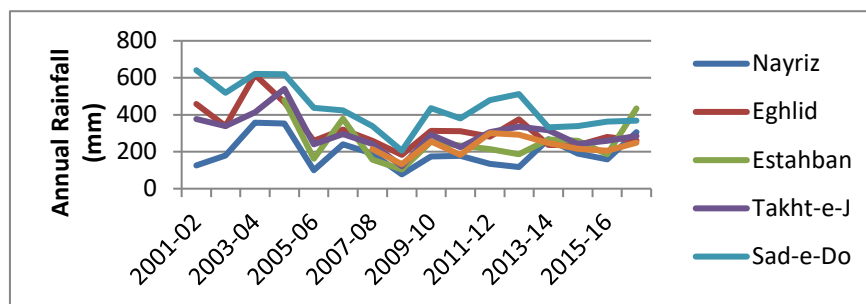


Figure 2: Annual rainfall changes in the Bakhtegan Basin showing a drier than average period since the 2007/08 drought

²⁵ Rooyan Consulting Co. 2007. *Studies on Environmental Challenges on Bakhtegan Lake*. in Persian

²⁶ Hamidreza Gharechaei, Alireza Moghaddam nia, Arash Malekian, Azadeh Ahmadi (2015) Separating the effects of climate variability and human activities on runoff in Bkhtegan Basin *Ecohydrology Journal*. 2, 445-454. (In Persian)

²⁷ Mahdi Erfanian, Nasrin Vafaei, Mehdi Rezaianzadeh. 2014. A New Method for Drought Risk Assessment by Integrating the TRMM Monthly Rainfall Data and the Terra/MODIS NDVI Data in Fars Province, Iran. *Physical Geography Research Quarterly*, 46 (1).

²⁸ Fatemeh Bagheri . 2016. Mapping Drought Hazard Using SPI index And GIS (A Case study: Fars province, Iran). *International Journal of Environment and Geoinformatics* 3 (1), 22-28

18. A recent analysis of the impacts of climate change on the Bakhtegan wetland²⁹ is somewhat inconclusive. Using 1998-2012 as a baseline period changes out to 2050 were determined using 28 different climate change scenarios. The results demonstrated that "The Bakhtegan wetland is predicted to have an area of 238–690 km² in 2050. All scenarios predicted a decrease of 17–69.5 % in the maximum area (i.e. the maximum extent identified from the baseline period) of the Bakhtegan wetland.
19. Another recent study³⁰ involved an assessment of the streamflows in the Kor River under historical and climate change conditions. Based on the results, hydrological behavior of the basin has significantly changed after 2006, such that despite of increases in a number of subsequent years, the streamflows have not increased. For this study, SWAT-FARS model were applied that simultaneously considers land use changes and climate variability of the basin. Furthermore, the status of basin's hydrological condition was projected for the period of 2020-2049 using the RCP climate change scenarios from the IPCC 5th Assessment Report and variety of the respected AOGCM models. The most important results are as follows:
20. It is expected that the annual river flows to the basin's main water bodies including Dorrodzan Dam, Mola Sadra Dam, Sivand Dam and Lake Tashk-Bakhtegan face up to 17%, 8%, 42% and 60% reduction, respectively.
21. Assessment of seasonal flows shows that maximum variations accrue during winters. This reduction can be up to 84% under RCP8.5 scenario. These changes are not much significant during spring. However, the autumn and summer streamflows may increase up to 43% under RCP2.6 as the most optimistic scenario. But due to the small share of these seasons in annual flows, they will not have much effect on compensating for the decline of the winter river flows.
22. As with all climate change impacts assessments the above results need to be treated with some caution due in particular to uncertainties associated with different GCM results, which increase greatly with downscaling to a local area such as the Bakhtegan Basin. Additionally they represent a somewhat fragmented and 'snapshot' assessment approach to what is a very complex interplay of issues arising from mismanagement of land and water resources, drought impacts and unfolding effects of climate change.
23. This complex interplay of issues was qualitatively examined through the Conservation of Iranian Wetlands project. As part of this project vulnerability scoping diagrams (VSDs) were developed for all Iranian Ramsar sites, including those in the Bakhtegan Basin. This involved a participatory process facilitated with managers, experts, specialists and local community representatives. A set of indices were predetermined for each of the three components of vulnerability: exposure, sensitivity and adaptive capacity. Each of these were scored by participants with results collated in the form of the VSDs. Key exposures are identified as: extraction of both surface and ground water, agricultural development, hydrological changes, precipitation changes, and failure to comply with environmental water rights. Key sensitivities are: wetland and groundwater levels, increasing cultivation, dealing with drought, and lack of water allocation. Adaptive capacity is lowest with some key biophysical and human/social indices, including: lack of management plan review, lack of knowledge among local people, stresses and pressures that are likely to arise with climate change, and lack of monitoring. Climate variability and change features strongly, but as already noted is occurring within a complex situation involving the need for local people to sustain their livelihoods in a situation of limited water resources. Key issues in the basin that are being affect by drought and climate change are discussed in the following sub-sections.

Aridification

24. A study³¹ mapping drought hazards using the Standardized Precipitation Index (SPI) and GIS in Fars province, based on data compiled by weather stations in the province provide an insight of the extent of the drought overtime since 1994 to date in the Bakhtegan basin.
25. The SPI used to measure drought has the following values associated to drought category classification:

²⁹ Sanjerehei, M.M and Rundel, P.W. 2017. The future of Iranian Wetlands under climate change. *Wetlands Ecology and Management*. 22: 257-273.

³⁰ Delaver M. and Morid S. (20016) Development of National Strategy for Adaptation to Climate Change in Iran Water Sector, Water Research Institute, Ministry of Energy (Iran)

³¹ Bagheri, Fatemeh. (2016). Mapping Drought Hazard Using SPI index And GIS (A Case study: Fars province, Iran). *International Journal of Environment and Geoinformatics*. 3. 22-28. 10.30897/ijgeo.304419.

Table 4. Annual Standardized Precipitation Index (SPI) $SPI = p_i - \bar{p} / sd$ Classification	
SPI value	Drought Category
≥ 2	Extremely Humid
1.5 to 1.99	Very Humid
1.0 to 1.49	Moderately Humid
0.5 to 0.99	Lightly Humid
-0.49 to 0.49	Normal
-0.99 to -0.5	Lightly drought
-1.0 to -1.49	Moderate drought
-1.5 to -1.99	Severe drought
≤ -2	Extreme drought

*: p_i : Annual precipitation in each station \bar{p} : Average precipitation in each station
 sd : Standard deviation of precipitation in each station

26. Based on data from 10 weather stations from 1994-2011 and from 7 stations from 2007-2011 in Fars province, the SPI index was calculated as follows:

Table 2. Annual Standardized Precipitation Index (SPI) for 10 station from 1994-2011

Station Name	Abadeh	Fasa	.....	Sadedorodzan	Zarghan
1994	0.33	0.32	.....	0.44	0.45
1995	0.42	0.84	.....	0.19	0.63
1996	-1.06	-0.79	.....	-0.11	-0.91
.....
2007	-0.85	-0.96	.....	-0.74	-0.04
2008	-1.16	-2.03	.....	-1.37	-1.58
2009	-0.21	-0.12	.....	-0.34	-0.56
2010	-0.28	-0.41	.....	-0.58	-0.91
2011	-3.46	-2.81	.....	-3.61	-3.15

Table 3. Annual Standardized Precipitation Index (SPI) for 7 stations from 2007-2011.

Station Name	Arsenjan	Izadkhast	.....	Neyriz	Noorabad
2007	0.12	0.0089	.....	0.27	0
2008	-0.57	-0.08	.....	-0.84	-0.39
.....
2011	-2.22	-2.33	.....	-2.14	-2.02

27. Based on the results above, drought maps from Fars province have been developed using ArcGIS coupled with drought index (SPI) that clearly demonstrate the extended severe to moderate drought that Fars province has been enduring for the past decade. It important to point out that the SPI only take into account climate and hydrological variables, therefore it's clear to affirm that drought is driven by climate factors.

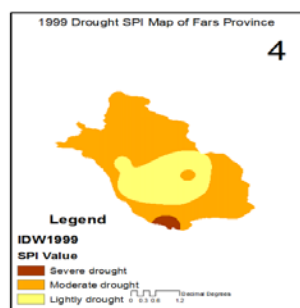


Fig 5. Hazard map of drought vulnerability in 1999.

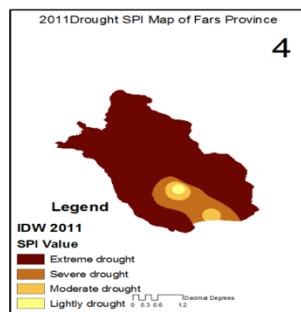


Fig 4. Hazard map of drought vulnerability in 2011

Climate zoning and future aridification trends

28. A study³² commissioned by the Ministry of Energy developed a climatic zoning for the Bakhtegan Basin using the Trewartha - Koppen classification method because of high precision in determining the boundaries of temperature and precipitation. The analysis used network data from CCAFS-Climate Data Center with five-minute spatial resolution under the A2, B2 and A1B scenarios of HadCM3 model for the base time period of 1982 to 2012 the projected periods 2030s, 2050s, and 2080s (More information about the analysis on Annex 2).
29. The observation of climate change was projected based on A2, B2 and A1B climate scenarios for the seven existing climate classes. The projected results are summarized in table and figure below based on A1B scenario which clearly show the aridification over time in the province.

³² Ministry of Energy. Macro-National Plan "Impact of Climate Change and Drought Management". Summary of Pilot Report of Lake Bakhtegan Basin (Detection of Climate Change and Drought Identification). Prepared by Shahid Beheshti University.

Table 1: comparing the spread changing of climate types in current period to the 2030s, 2050s and 2080s based on A1B scenario:

Climate Type	Current Period	Based on A1B scenario		
		2030s	2050s	2080s
Warm semi-arid	21.7	49.9	33.3	35.7
Cold semi-arid	8.3	31.7	17.7	11.3
Arid hot	-	1.9	40.4	49.4
Arid cold	-	-	8.0	3.1
Subtropical with dry summer	18.7	6.1	-	-
Hot dry moderate	8.5	6.1	-	-
Cold dry moderate	0.2	-	-	-
Arid-hot moderate with winter precipitation	12.5	-	-	-
Humid moderate	30	4.3	0.5	0.5

Figure 3: Comparing the spread changing of climate types in current period to the 2030s, 2050s and 2080s based on A1B scenario.

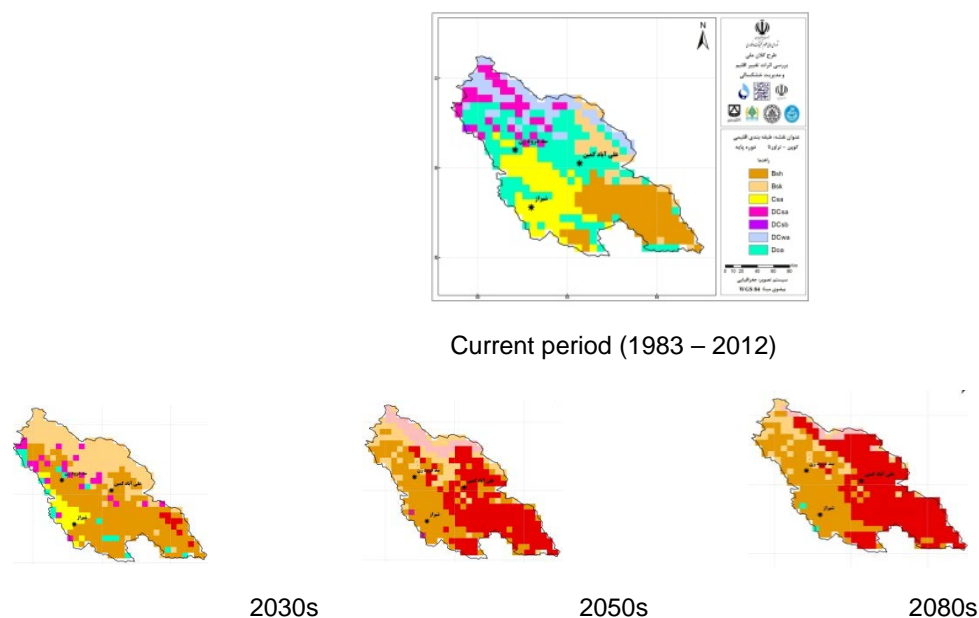


Table 2: Comparing land-use change in 1956 to 2006 (based on image processing and aerial photo analysis).

Land-Use	1956		2006		Change(ha)
	Area(ha)	Percentage	Area(ha)	Percentage	
Barren	31,128	1.142	37,348	1.37	+6,220
Rain-fed	247,125	9.070	59,424	2.18	-187,701
Irrigated	223,593	8.206	580,063	21.29	+356,470
Forest	744,631	27.330	742,023	27.23	-2,608
Lake	173,259	6.359	138,014	5.07	-35,245
Wetland	46,150	1.694	2,609	0.10	-43,541
Rangeland	1,225,466	44.978	1,083,445	39.77	-142,021
River bed	863	0.032	863	0.03	0
Saline land	31,138	1.143	74,616	2.74	+43,478
Residual	1,239	0.045	6,187	0.23	+4,948

Total	2,724,592	100	2,724,592	100	0
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The water situation

30. The combined area of Lakes Tashk and Bakhtegan makes them the second largest in the country (the largest being Lake Urmia). The area of Tashk and Bakhtegan lakes are 41,000 hectares and 85,000 hectares respectively, located at an altitude of 1525m above sea level. The maximum depth of Lake Bakhtegan is 3m and its average depth is 1.3m. The maximum depth of Lake Tashk is 1.3m and its average depth is between 0.3 and 0.5m. Both of the lakes are classified as saline wetlands.
31. The Bakhtegan Basin consists of three main sub-basins fed respectively by the Kor and Sivand rivers (Figure 4). These two rivers meet in Pol-e-Khan and then feed into the Tashk and Bakhtegan Lakes. The 10 year average volume of water entering Lake Bakhtegan is 784 million cubic meters, of which about 484 million cubic meters is supplied by the Kor-Sivand River and about 206 million cubic meters by temporary streams and the rest by precipitation. The 10 year average of water entering Tashk is estimated at 300 million cubic meters. About 47 million cubic meters is provided by Gomban spring, 218 million cubic meters by stream water, and the rest is provided by direct precipitation. Kamjan is fed by rainfall and Kor river flooding.

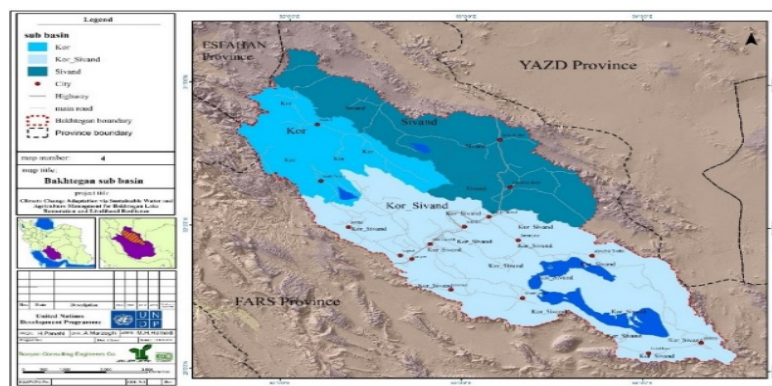
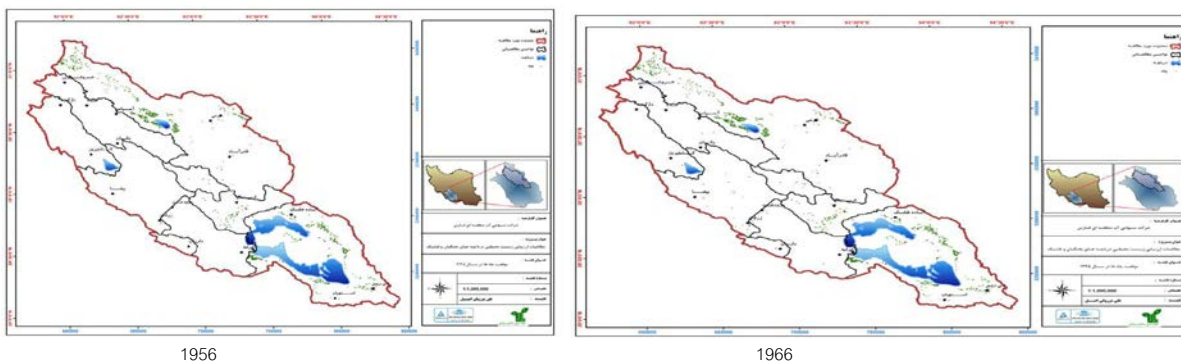
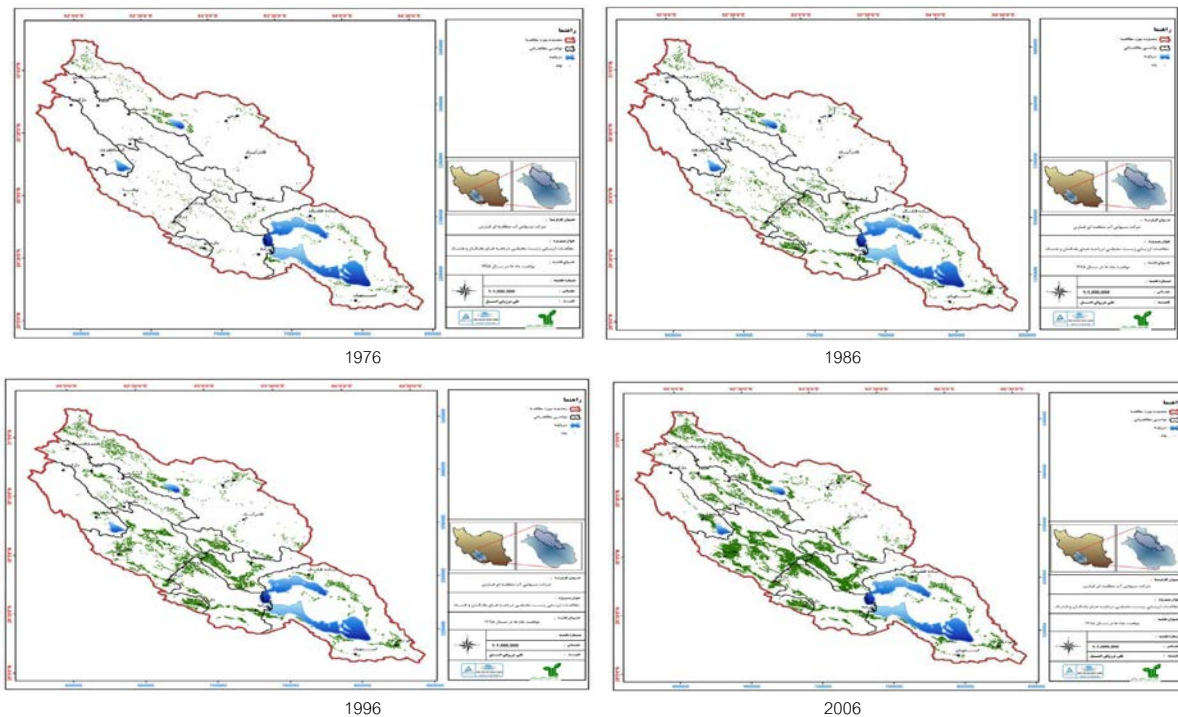


Figure 4: The three main sub-basins within the Bakhtegan Basin

32. Surface discharge of water had declined over the last decade, based on data from four selected gauges: Tang e Bolaghi, Khsrow shirin, Sad e droudzan and Pol e khan. There have been particularly dramatic declines in discharge as measured at Sad e droudzan and Pol e kan. Over the same period (2006-2016) there has been no apparent decline in ground water levels from nine plains monitoring sites in the basin (see Annex 2). However, this requires closer analysis, and over a longer time period, given the clear evidence of increasing numbers of wells (see Annex 1) and the anecdotal reports of increasing well depths and of saline water intrusion to wells around the lakes.

Number of wells in the Bakhtegan Basin from 1956 to 2006





33. Analysis of monitoring data from throughout the Bakhtegan Basin demonstrates that irrigated agriculture is the single biggest use of water³³. While the amount used for irrigation drops significantly in dry years the percentage use is much higher (nearly 70 percent based on a 10 year return period). The amount of water received by Lake Bakhtegan varies from 225 to 1567 MCM based on return period calculations. The average input rate In Tashkh - Bakhtegan Lakes, was 616 MCM and 672 MCM in the period from 1969-1984 to 1984-1996, respectively³⁴. Analysis of data from 1965 to 2006 showed an almost equal division between dry and wet years, with 23 and 20 years respectively. The total water yields released to Bakhtegan Lake varied from 360.5 MCM in the driest period to 966 MCM in the wettest period. The current situation is that there is no surface water feeding into the lake. Saline intrusion into bores around the lake also suggests that there is no net inflow of ground water.

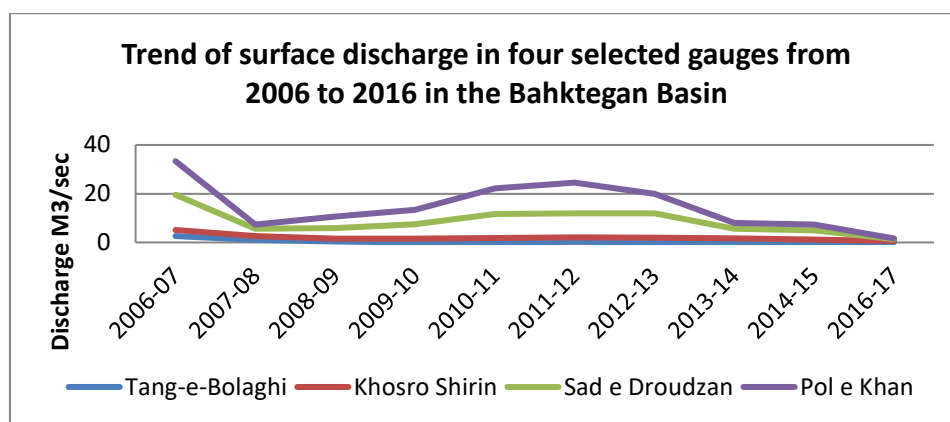


Figure 5: Changes in surface discharge in the Bakhtegan Basin from 2006 to 2016

³³Rooyan Consulting Co. 2007. *Studies on Environmental Challenges on Bakhtegan Lake*. in Farsi

³⁴Ibid

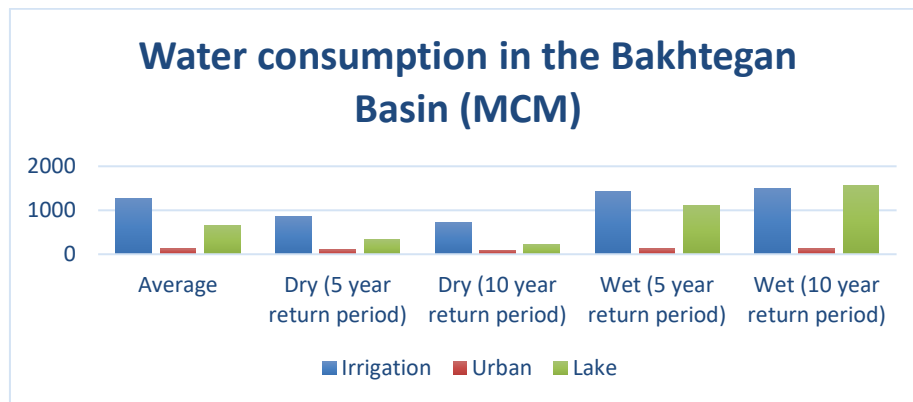


Figure 6: Water consumption in the Bakhtegan Basin based on return periods (recurrence intervals) derived from data for 1965-2006

34. Current water extraction and use, and the extent of irrigated agricultural land, is at unsustainable levels. At the same time there are bores, both legal and illegal, in the bed of the Kor river and throughout the middle and lower parts of the basin. Current agricultural land area is 482,898 ha with more than 30,000 wells spread throughout the basin but mainly concentrated in Marvdasht, which is the main arable farming area. Nearly a third of these wells are illegal and even legal wells are being over exploited. As surface water has reduced the number and depth of wells throughout the basin has increased. The average depth of wells is particularly high in Estahban County (Figure 7), which adjoins the lakes and wetland area. With increased reliance on ground water, which is becoming depleted in some areas, or is as at risk of depletion, the vulnerability of communities to drought and climate change has increased.

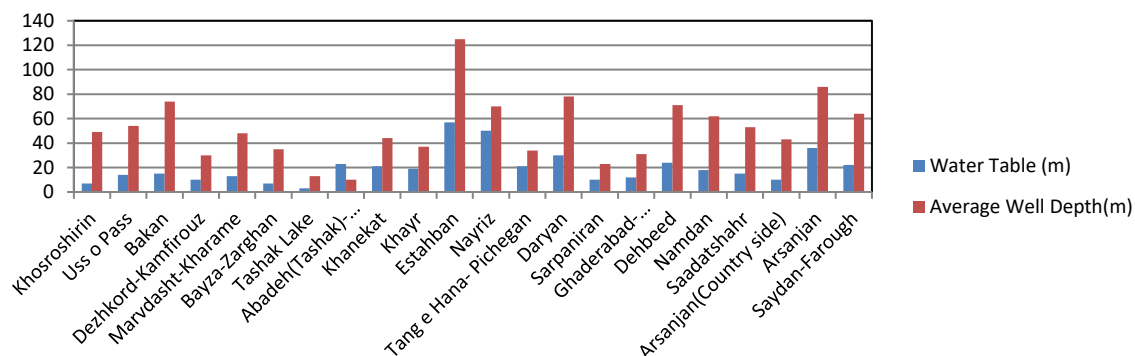


Figure 7: Comparison of average water table and well depths in the Bakhtegan Basin

35. Empirical findings reveal that Lake Bakhtegan lost almost 73 percent of its size from 1973-2013³⁵. Drier than average conditions since a severe drought in 2007 are seriously exacerbating this situation. With the current extended, multi-year, dry conditions the Kor river is no longer flowing in the middle and lower parts of the basin. The significant area of agricultural land in these areas is currently wholly dependent on ground water. Near to the lakes the lack of surface and ground water inflow combined with the high level of water extraction has led to severe loss of hydrostatic pressure and backflow of saline water into freshwater wells is now happening.
36. Government is aware of the current water crisis result from the drought and has included some policy instruments to address water mismanagement. First, under Article 35 of the 6th Five-Year Development Plan enacted in 2017 guidelines were included to promote efficient water management. In addition, the Ministry of Energy's Water Strategy endorsed in May 2013 have clear standard procedures related to the promotion of integrated management of water resources and re allocation of water rights (See Annex 3). More importantly MoE has recently announced its vision for the country's water resources, were "new dam projects, which are being designed or constructed, will be reassessed based on hydrological changes, environmental impacts and economic feasibility"³⁶.

³⁵ Arsanjani, T.J., Javidan, R., Nazemosadat, M.J., Arsanjani, J.J., Vaz, E. 2015. Spatiotemporal monitoring of Bakhtegan Lake's areal fluctuations and an exploration of its future status by applying a cellular automata model.

Computers & Geosciences. 78: 37-43. <https://doi.org/10.1016/j.cageo.2015.02.004>

³⁶ <https://financialtribune.com/articles/energy/75280/irans-new-energy-minister-vows-action-on-chronic-water-crisis>

Agriculture and water use in the Bakhtegan Basin

37. The current total area of irrigated agriculture³⁷ is about 580,000 hectares (21.2 percent of the Bakhtegan Basin area). About 35 percent of irrigated farmland is upstream of the Doroodzan and Sivand dams and about 48.5 percent of irrigated farmland is located below the dams. The first area, upstream of the dams includes the Marvdasht, Zarghan, Beyza, Karbal, Kharameh, Murghab and Daryan plains. The second area, below the dams, includes Aspas, Kamfirouz, Sadeh, Khosrow -o- Shirin, Bekan, Kafer, Nemdan, Khorrami and Ghader Abad. This middle elevation plains area has a much shorter history of agriculture than the upper plains area and has experienced rapid development in recent years. The remainder of irrigated farmland, 16.5 percent of the total area, is located in Arsanjan, Farooqh, Abadeh-Tashk, Estahban and Nayriz.
38. Arable land in the Bakhtegan Basin³⁸ is comprised of 79.8 percent cereal, 4.7 percent industrial and 2.4 percent forage crops, and 2.4 percent in horticulture. Orchards, beans, vegetables and fruits make up the remainder, occupying 3.7 percent, 3.2 percent and 0.8 percent, respectively. The most extensive crop area is cereal, mostly wheat, covering 53.9 to 96.7 percent of the land area in different locations. The area dedicated to other crops also varies, for example with orchards covering as much as 10.2 percent in some parts and 1.3 percent other areas. Water availability is one of the most important factors determining the extent of different crops. Cereals are the most commonly grown crops in water short areas. Where water is readily available highwater demanding crops such as rice are grown, in areas like the Kamfirouz plain. Thus, greater diversity and more intensive cropping patterns are found in the areas where agricultural water supply is not severely restricted.
39. Agricultural practices, in particular arable farming, in the basin have been geared to a situation of abundant water over the last forty years especially in upstream areas. Rice cultivation is still widely practiced with high and unsustainable use of water in upstream areas. Most arable farming in the basin involves continual cropping of cereal. There are no fallow periods, with bare soil visible to the horizon and soil erosion from wind now widespread. The continuous cropping has also led to higher inputs of fertilisers and pesticides to sustain production, with resultant negative effects on soil organic matter and soil structure. The impacts of prolonged drought since the severe drought in 2007/08 is very noticeable in fig production statistics presented above. While the planted area has increased by 1,000 hectares since 2007/08, from just under 22,500 hectares to just over 23,500 hectares, total production over the last decade has been at least half that of the years preceding the 2007/08 drought.

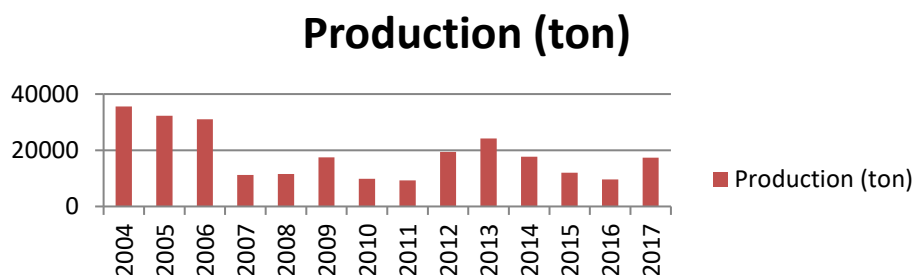


Figure 8: Changes in fig production in the Bakhtegan Basin

40. In the upper part of the basin, traditionally grazed by nomads and now a national protected area (water recharge zone), there has been encroachment into forest and rangeland areas for fruit production, river terraces are being used for rice cultivation. In recent years the local government closed 2000 wells in the upper part of the Kor river basin, but within a year the people had opened them all again. The children of these people are now returning to cultivate the land that is being exposed by the lower reservoir levels. Compensation, regulation and enforcement have therefore not been effective.
41. The local people are already being proactive in adapting autonomously through diversifying their agriculture and implementing alternative livelihoods. For example, some farmers are already switching to less water demanding crops such as safflower. In upper and lower parts of the basin some are attempting to diversify into higher value and lower water demanding crops such as pistachio and saffron. Alternative livelihoods being developed include activities such as mushroom cultivation and handicrafts. All of these initiatives present opportunities for enhancement to encourage people more widely to adapt to the changing conditions.

³⁷ Rooyan Consulting, 2007. *Studies on Environmental Challenges on Bakhtegan Lake*, in Persian.

³⁸ Ibid

Social impacts³⁹

42. The social costs of the drying of the Bakhtegan Basin are already manifesting with some parts of the basin more severely affected than others (see Table 2, Part II, Section A and Annex 3 for more detail). Conflicts over water are evident between different parts of the basin. Migration is an important issue. In parts of Kharameh, in the lower part of the basin, 100 percent of jobs have been destroyed leading to increased poverty and increased mental health issues.
43. While there has not been any detailed analysis of the socioeconomic consequences of drought at the household level in the Bakhtegan Basin, a recent study⁴⁰ made in Sabzevar County, Khorasan Razavi Province, in north-eastern Iran provides valuable insights. This study assessed villager responses to 29 economic variables and 28 social variables. The economic variables were grouped into seven main components covering the amount of production, quality of production, costs of natural resources (losses), production costs, costs of living, overall level of living, and investment. Similarly the social variables were grouped into seven main components covering quality of life, poverty or income, employment, psychological tensions, public safety, crime and delinquency, and social damage. Overall, the socioeconomic costs were significant and high and mirror those that have been qualitatively identified in the Bakhtegan Basin.

Biodiversity impacts

44. There are also significant biodiversity costs. Currently, the lakes are in critical condition. Bakhtegan and Kamjan are completely dry and about only 10-20 percent of the area of Tashk Lake, near Gomban spring, still has some water. The drying out of wetlands has had significant impacts on biodiversity. Lakes Tashk and Bakhtegan and the Kamjan wetlands are important places for the reproduction of birds such as Egrets, Dalmation Pelican and Greater Flamingo. 95 species of birds, most of them winter migratory birds, have been identified in these wetlands. Because of their significance they were listed as Ramsar sites in 1974. Due to their critical status in recent years they have been shifted to the Montreux List of the Convention. Biodiversity impacts are not just occurring in these former wetland areas, but throughout the basin. Brown bear numbers have been affected by wildfires resulting from the prolonged dry conditions. Lack of food has forced them to areas of human occupation where some have been shot. Continued encroachment of agriculture into forest and rangeland areas also has biodiversity impacts, and wider consequences in terms of soil and water conservation. Some specific biodiversity impacts that have been observed over the last decade are:
- The population of plains species have severely decreased due to resource conflicts and scarcity of water resources, e.g. Zebra and Chinkara;
 - Mountainous regions species are not severely affected, e.g., goats, which have been less affected by drought, but there are subsequent impacts from increased browsing pressure;
 - The population of wild birds has severely reduced in Bakhtegan and Tashk lakes with the majority now migrating to other areas.
 - A fairly good population of birds has been observed in Kamjan Lake.

The problem and the proposed solution

45. The situation in the Bakhtegan Basin is complex, involving the interplay of multi-decadal mismanagement of water, inappropriate land use, drought and climate change. As the heart of the Persian Empire, Fars Province has a very long history of water use for agriculture and other purposes. In an arid country such as Iran water has very high symbolic and utility value. This has been recognised throughout Iran's long history. However, the value of water and its balanced use has come under increasing pressure over the last four decades. It is clearly evident that the hydrological system of the Bakhtegan Basin is in a state of collapse, with no surface water currently flowing to the middle and lower parts of the basin and extraction of ground water that is far in excess of recharge rates. The evidence of this state of collapse is apparent with significant water shortages in lower parts of the basin, degraded agricultural environments, social upheaval and detrimental and potentially long-lasting impacts on the natural environment. There is now a serious threat of an irreversible situation that will lead to loss of livelihoods, environmental and human health and biodiversity. Without active intervention a worse case situation could develop where the basin becomes much less habitable leading to mass migration of people and permanent loss of natural ecosystems and the many plant and animal species they support.
46. With a long history of water dependence accompanied by times of prolonged drought, it would be a wise to assume that climate change will not be beneficial to the Bakhtegan Basin. Based on research in the basin using the Standardized Precipitation Index (SPI) to measure drought and extrapolating weather stations' data collected in the province, analysis

³⁹ The information presented here is based on a summary of the current situation in the Bakhtegan Basin provided by the local consultant team from Fars Province (see Annex 3). It is consistent with documented evidence from elsewhere in Iran.

⁴⁰ Darban-e Astane, A. R., & Azimpour, Gh. (2017). Evaluation of Farmers' Resilience Against Socioeconomic Consequences of Drought: A Case Study on Sabzevar, Iran. *Journal of Sustainable Rural Development*, 1(1), 27-38.

shows over time (2030s, 2050s and 2080s based on A1B scenario) that aridification of the Bakhtegan basin will become more severe with expected drier conditions in the area (See Annex 2).

47. The current development situation in the basin can be described as one of maladaptation with the past construction of the Doroodzan and Mulla Sadra dams. There are clearly strong underlying development issues and challenges that require major interventions. However, at the same time, there are very clear climate risk and climate change related vulnerabilities that are magnifying these issues however present a clear opportunity for this project.
48. Four key limitations and barriers have been identified which are affecting the ability of the Fars provincial government, natural ecosystems and Bakhtegan Basin communities to cope with drought and climate change:
 - Limited information and data about the impacts of drought and climate change to make more informed decisions at the provincial and local level;
 - Current water-intensive agricultural practices undermine the capacity of the hydrological system to cope with the effects of drought/climate change;
 - Locally proven water-saving agricultural practices lack financial resources to be promoted across the province/basin;
 - Current governance structure in the Bakhtegan Basin is not conducive to promote adaptation approaches at the regional and local levels.
49. Within this very complex and challenging situation the project has an aspirational goal to restore the Bakhtegan Wetland, which encompasses Lakes Bakhtegan and Tashk and the Kamjan Marshes towards achieving this long-term goal the proposed project will provide a foundation for building resilience to climate change in the basin through a holistic, integrated landscape management approach. To achieve this will require a completely different way of thinking and acting, with a shift in thinking from the current mind-set of high water dependency and use to the already new reality of a dryland environment with water scarcity. This can only be achieved through a process of participatory engagement with all parties aimed at shifting approaches to the development pathway in the Bakhtegan Basin. In particular, this requires project targeting and a governance mechanism that ensures full involvement of both the immediately affected vulnerable communities and those who are less vulnerable but are practising unsustainable water and land use and management practices to the detriment of all.
50. As participation of all stakeholders in the project was a key issue the proposal development process was designed through a participatory approach at different level. Establishing a technical committee consisting of main related government entities provided a very good opportunity for their engagement during the whole process. Other important aspect was local community participation in the process for which one of the active NGOs (consisting of local environmental activist and some university professors) in the basin was involved in the project to facilitate local community and local authority participation in proposal development. This local NGO was part of a team consisting of an international consultant and a national consultancy company to develop the proposal. The local team main objectives was to raise awareness about the project in the early stages of the process and they had more than 10 introductory meeting with villagers and local authorities all around the basin to inform them about the proposal development process and setting the stage for further participatory workshops in later stages. After joining national and international consultants at the field for a two-week assignment 3 district level workshops were held in the chosen pilots in both downstream and upstream of the basin. Kherame and Estahban are located downstream and Marvdasht is located upstream. In these participatory workshops, the stakeholder's points of view on their livelihood issues, the impacts of drought on their lives and the challenges that the authorities are facing in Bakhtegan basin management. At the same period the consulting team were visiting selected villages all around the basin to visit and discuss the project with local communities in their farm and villages. Consultation with the local communities/authorities was not limited to a two-month period and the local consultant (NGO) was in touch with both communities and local authorities during proposal development to fill the gaps through field visit at village level and meetings at provincial and district level. The summary report which was prepared by the NGO is in Annex 9 for further detail.

PROJECT / PROGRAMME OBJECTIVES:

51. The objective of the project is increase the resilience of communities and the natural environment of the Bakhtegan Basin to climate variability and change through integrated landscape management.

The project objective will be achieved by the following components:

 1. Knowledge of climate risk, climate change and the environmental situation is strengthened to support development of long-term climate resilience in the Bakhtegan Basin using a decision support system;
 2. The resilience of communities in the Bakhtegan Basin is strengthened through community empowerment and implementation of climate smart agriculture and alternative livelihoods;
 3. The resilience of the natural environment of the Bakhtegan Basin is strengthened through targeted interventions in key locations;

4. Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures.

TABLE 3: PROJECT / PROGRAMME COMPONENTS AND FINANCING:

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.	1.1 An integrated model for climate risk and climate change assessment supports medium and long term decision making. (\$179,962) 1.2 A land and water use planning framework is developed and implemented to support decision making. (\$347,645) 1.3 Community engagement, empowerment and ownership in decision making is supported through local community monitoring. (\$427,670) 1.4 A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making. (\$125,000)	A decision support system is in place and facilitates strengthened knowledge of climate risk and climate change towards the development of long-term resilience in the Bakhtegan Basin	1,130,527
2. The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods	2.1 Climate smart agriculture practices are adopted in target areas. (\$1,414,130) 2.2 Alternative livelihoods are adopted by women/women's cooperatives in target villages. (\$1,635,170)	Strengthened climate resilience of local communities enables them to sustain and enhance their livelihoods	3,220,300
3. The resilience of the natural environment of the Bakhtegan Basin is strengthened	3.1 A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks. (\$1,594,010) 3.2 Landscape rehabilitation to restore functionality of ecosystem services to increase climate resilience. (\$1,978,620)	Increased resilience of the natural environment through rehabilitation and conservation work reduces vulnerability of communities to the impacts of climate change	3,572,630
4. Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures	4.1 A comprehensive communications, education and capacity building programme on climate resilience is implemented. (\$311,020) 4.2 A Bakhtegan Basin Council is formed to facilitate the long-term sustainable and climate resilient management of the Bakhtegan Basin. (\$249,700)	Strengthened governance and decision-making capacity at local, regional and national level for implementing and sustaining relevant climate change adaptation measures	560,720
5. Project/Programme Execution cost			608,591
6. Total Project/Programme Cost			9,092,768
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			772,885
Amount of Financing Requested			9,865,653

PROJECTED CALENDAR:

Milestones	Expected Dates
Start of Project/Programme Implementation	June 2020
Mid-term Review (if planned)	Aug 2023
Project/Programme Closing	May 2025
Terminal Evaluation	March 2025

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project Components

52. There are four Components to the project:
1. Knowledge of climate risk, climate change and the environment strengthened
 2. Sustainable livelihoods supported
 3. A resilient natural environment sustained
 4. Capacity for improved governance and decision making strengthened

The relationship between these four components is illustrated in Figure 9 below. Component 1, focused on strengthening knowledge of climate risk, climate change and the environment to support better decision-making forms the foundation of the project. Components 2 and 3, focused on sustainable livelihoods and a resilient natural environment form the two pillars. Component 4, focused on strengthened capacity for improved governance, provides overarching support for improved decision making and actions towards the goal of a climate resilient Bakhtegan Basin. All four Components are inter-dependent. Outputs from Component 1, will directly contribute to improved governance and decision making at all levels through Component 4. Component 4 will then contribute to refinement and wider adoption of activities under Components 2 and 3. Components 2 and 3 are closely inter-related, with respective foci on Community Based Adaptation and Ecosystem Based Adaptation.

Project targeting

53. The biophysical targeting for the project is based on previous work in developing land use planning zones for the Bakhtegan Basin⁴¹. These zones conform to various features of homogeneity which include the following

- Common terrain, landscape and geomorphology characteristics
- Common climatic zones
- River morphology
- Land-use
- General ecosystem conditions

These have been matched with the administrative county boundaries (Figure 9) and also relate to identified hydrological units within the basin.

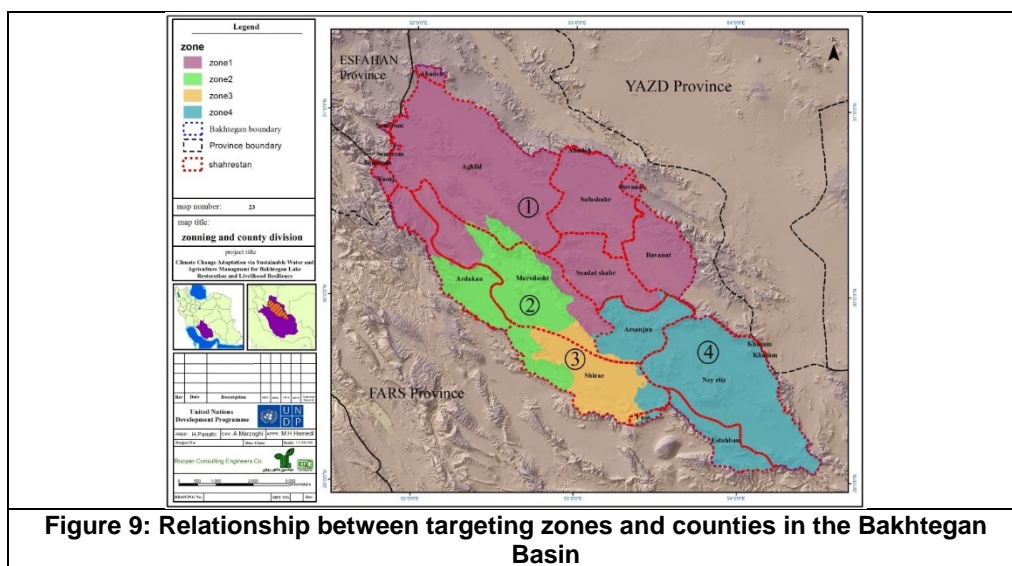


Figure 9: Relationship between targeting zones and counties in the Bakhtegan Basin

54. Zone 1 encompasses the Kor and Sivand sub-basins (see Figure 9) and includes the Eghlid, part of Marvdasht (referred to as Kor County), Safashahr, Bavanat and Saadatshahr. The Dozoodran, Mulla Sadra and Sivand dams are all located in Zone 1. This Zone is defined as a cold, semi-humid, mountainous ecosystem. It was previously all rangeland and forest, with seasonal grazing by nomads. Grazing rights were carefully managed to ensure protection of the land. This is now the only part of the Bakhtegan Basin with year round availability of surface water (although this is in decline) supplemented by water from wells (many of which are illegal). Irrigated agriculture, mainly for rice production, is widespread on river terraces with fruit production on converted rangeland areas and forests. In general the soils are poorer and crop yields lower than the traditional cropping areas of the basin. With declining water availability, yields are decreasing and people are increasingly struggling to survive.

⁴¹ Rooyan Consulting Co. 2007. *Studies on Environmental Challenges on Bakhtegan Lake*. in Farsi

55. Zone 2 encompasses the counties of Ardakan, most of Marvdasht and part of Shiraz. This area is the traditional arable farming area of the basin. With the construction of the Doroodzan dam upstream and the building of irrigation canals, irrigated agriculture expanded significantly in this zone over the last 40 years. The current situation involves continuous cropping of wheat, with rice and to a lesser degree barley production. As a result of the drier average conditions over the last decade there is currently no water flowing in the Kor river into this area and insufficient water from the Doroodzan dam for irrigation. The consequence is much greater dependence on ground water. Soil erosion is apparent, with dust clouds rising from the bare soil throughout this zone.
56. Zone 3 includes most of Shiraz County. Conditions are similar to Zone 2. It occupies the lowest part of the plains area with irrigated lands over clay soils. This zone is completely dependent on the water resources of the upper two zones and is increasingly dependent on groundwater. It has become a desert-like environment as a result of human mismanagement. This zone also includes areas developed for weekend retreats by wealthier residents from Shiraz. These people are all putting in unregulated water bores to provide domestic water and to irrigate their small olive groves, orchards and gardens.
57. Zone 4 encompasses the Tashk and Bakhtegan National Park, which includes Lakes Tashk and Bakhtegan. It includes the counties of Arsanjan, Neyriz and Estahban. In the past surface water was mainly obtained during floods. These areas have been severely affected by the lack of water flowing into the lakes. What was previously described as humid environment is now a dry, desert-like and very dusty environment, described by one elder villager⁴² as a 'living hell'. The worst drought effects and water tensions are being experienced in this Zone. Figs have traditionally been grown in this area, but crops are now suffering from the lack of water, large areas of arable land have been abandoned and there is increased migration of rural people to urban areas and associated social problems.
58. The environmental and socio-economic status of the four zones is summarized in Table 2 (more detail is provided in Annex 3). Reduced precipitation, increasing temperatures and increased evaporation and transpiration are common characteristics throughout the basin, although are being experienced with greater severity in some zones than others. Similarly the drying of the basin is widespread, even in Zone 1 which incorporates the upper reaches of the Kor and Sivand rivers. Biodiversity issues and conflicts are also widespread. The impacts, however, are strongest in Zones 1 and 4. This is reflected in the socio-economic issues, which are being experienced most strongly in Zones 1 and 4 and include increasing poverty, increasing mental health issues, increasing divorce rates and increasing crime rates in urban fringe areas.

Table 4: The environmental and socio-economic situation in the four zones aggravated by climate change.

Zone	Environmental issues	Socio-economic issues
1	<ul style="list-style-type: none"> Dried Kaftar wetland Reduced flow into the Mulla Sudra and Sivand dams Reduced biodiversity in upstream areas Increased conflicts between wildlife and residents of the catchment area 	<ul style="list-style-type: none"> Reduced income from aquaculture Reduced farmer and dairy farmers' income Increased unemployment Increased poverty
2	<ul style="list-style-type: none"> Doroodzan dam lake has become an alternative habitat for aquatic birds Increased water exploitation Conflicts between farmers and fruit growers 	<ul style="list-style-type: none"> Increased rice farms Villagers preference to cultivate rice and have fish ponds Conflict with downstream counties over water
3	<ul style="list-style-type: none"> Dried Kor river Destruction of the habitats of birds, pond turtles and aphanus fishes Decreased spring flows Conflicts between livestock farmers and leopards 	<ul style="list-style-type: none"> Conflict with upstream farmers in spring when water for irrigation is being shared Dried wells Migration to cities Increased unemployment rates Shift to safflower cultivation
4	<ul style="list-style-type: none"> Dried wetlands Severely reduced migratory bird numbers Destruction of hatching habitats Dried springs Increased conflicts between farmers and birds Wind erosion and increased dust storms 	<ul style="list-style-type: none"> Unemployment Increased migration A growing poverty trend Increased divorce and crime rates Decreased quality of farm crops and fruits such as fig

59. Drawing from the preceding information along with local consultations and experience a number of project villages and sites have been identified for Components 2 and 3 of the project. More detail on the selection process and summary information on the project villages and sites is provided in Annex 4. While not exclusively focused on Zones 1 and 4, the project has a strong emphasis on these areas. Collectively these two zones account for just under 46 percent of the total population of

⁴²From project development consultations 14-20 November 2017

854,093. The most vulnerable are the rural dwellers (villagers) whose livelihoods are highly dependent on the natural environment, principally to support their agricultural activities. The current population of villagers in Zone 1 is 111,775 spread across 264 villages; with 69,118 villagers in Zone 4 spread across 172 villages.

60. The project will ensure equitable distribution of benefits at different yet inter-connected levels, i.e., basin-level and household/individual levels, through a selection criteria prepared through a consultative process and elaborated in the table below to result in the most impactful interventions on the ground as and in full compliance with AF policies.

Table 5: Beneficiary selection criteria

Output	Distribution of benefits	Selection criteria	Comply with AF policies
1.1 An integrated model for climate risk and climate change assessment supports medium and long-term decision making.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakteghan basin anchored on climate change impacts on these zones, combined with socio-economic criteria of villages/households. This is fully described in the proposal under "Project targeting" sub-section (Paragraphs 53 – 59), with more detail provided in Annex 1 (climate change impacts), Annex 2 (Socio -economic conditions in 4 zones) and Annex 3 (Target of Beneficiaries).	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: Though this output is not expected to trigger any law (as it pertains to development of a model) the project will ensure its compliance with national laws. At proposal development stage, all relevant land and water management and environment protection laws and regulation including a) Law of Protection and Improvement of the Environment; b) Land and Coastal Law (Approved 20/07/1975); c) The law of water fair distribution (Approved 07/03/198); d) Regulations on rivers, anchors, mussels, marshes, natural ponds and water supply networks, irrigation and drainage (approved on 01/11/2000) and; e) The law on Wetland Management and Conservation were considered through DoE, MoE and MoJA intervention, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary.
1.2 A land and water use planning framework is developed and implemented to support decision making.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakteghan basin.	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national law and targeting the most vulnerable populations. Relevant laws, including those stated above, were considered and discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary.
1.3 Community engagement, empowerment and ownership in decision making is supported through local community monitoring.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakteghan basin.	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national law and targeting the most vulnerable populations. Relevant laws, including those stated above in output 1.1, were discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary.

1.4 A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakteghan basin.	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national laws, mentioned against output 1.1, and targeting the most vulnerable populations.
2.1 Climate smart agriculture practices are adopted in target areas.	Village / Household/ Individual level	In Annex 3 – “Targeting of Beneficiaries” there is a Summary of targeted villages by Outputs and Zones. The criteria for the selection of villages for Output 2.1 has been conducted on the basis of extensive consultations with the county authorities, communities, farmers, NGOs and CBOs. The following items were considered: 1. Farmers with successful experiences, such as low-water and drought resistant crops with high yields/income such as the villages that cultivate saffron, safflower and pistachio as an alternative for rice 2. Governmental extension services with successful research and development experiences in reducing water consumption for agricultural purposes. The provision of this services will focus to villages, farmers willing to implement sustainable agriculture projects. 3. Existence of potentials and demonstration effect of less water-intensive agriculture with same yields and less GHG emission, including the support of village officials and the presence of leading farmers in Zone1, 2, 3 and 4. 4. The location of the villages and their impact on the surrounding villages (outside Zone 1, 2, 3, and 4), aiming to promote a spillover effect. 5. Villages dependent to agriculture for their livelihood/income and most impacted by drought: mostly farmers (Zone 4 being the most affected, zone 2 are mostly rice farmers and in the other zones farmers have dry farms of wheat and barley).	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national law targeting the most vulnerable populations. Relevant laws, including those stated above in output 1.1, were discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary. If national Standards are not applied the following AF ESP principles will be at risk: 2, 3, 5,6, 9, 12, 13, 15
2.2 Alternative livelihoods are adopted by women/women’s cooperatives in target villages.	Village / Household/ Individual level	The project will use and tailor the GEF’s Iran Small Grants Programme (SGP) Eligibility Criteria for Grantees and Projects to assess target beneficiaries according to 5 main areas (refer to Annex 6 for more details): - Organization/individual carrying out the project/activity - Local vulnerability and resilience analysis - Adaptive capacity and resilience building - Compliance of the goal with targeted environmental areas - Benefits of the project Based on the selection criteria and the pre-selected livelihoods options, women and women’s groups will be selected and financially and technically supported to rolled out the preferred livelihood options.	GPAP: AF’s resource allocation in this output contributes directly to gender equality and supports the economic empowerment of women. Measure the outcomes and impacts of its activities on women and men’s resilience to climate change impacts and their ability and agency to address gender differentiated vulnerability ESP: This output will be in compliance with national law targeting the most vulnerable populations. Relevant laws, including those stated above in output 1.1, were discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary. If national Standards are not applied the following AF ESP principles will be at risk: 2, 3, 5,6, 9, 10, 12, 13

3.1 A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks.	Basin-level	23 target villages in Zone 1 and Zone 4 have been selected based on the current drought impacts and the likelihoods of reverse these adverse impacts. More information in Annex 3 – “Targeting of Beneficiaries”	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national law targeting the most vulnerable populations. Relevant laws, including those stated above in output 1.1, were discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary. If national Standards are not applied the following AF ESP principles will be at risk: 9, 10, 12, 15
3.2 Landscape rehabilitation to restore functionality of ecosystem services to increase climate resilience.	Basin-level	7 Critical ecosystems have been selected in Zone 1, 3 and 4 based on the current drought impacts and the likelihoods of reverse these adverse impacts. More information in Annex 3 – “Targeting of Beneficiaries”	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national law targeting the most vulnerable populations. Relevant laws, including those stated above in output 1.1, were discussed with the involvement of DoE, MoE and MoJA, the main authorities responsible for application of the above regulations in development projects. Thus, all project activities will comply with these national guidelines, where necessary. If national Standards are not applied the following AF ESP principles will be at risk: 9, 10, 12,
4.1 A comprehensive communications, education and capacity building programme on climate resilience is implemented.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakhtegan basin.	GPAP: Knowledge generation and communication towards the implementation of gender-responsive adaptation actions and to contribute to addressing existing knowledge and data gaps, the project will document the experiences and knowledge gained from the implementation of GAAP. ESP: This output will be in compliance with relevant national laws and will benefit the most vulnerable populations.
4.2 A Bakhtegan Basin Council is formed to facilitate the long-term sustainable and climate resilient management of the Bakhtegan Basin.	Basin-level	Land use planning zones (Zone 1, 2, 3 and 4) around the Bakhtegan basin.	GPAP: This output will provide women and men with an equal opportunity to build resilience, address their differentiated vulnerability, and increase their capability to adapt to climate change impacts. ESP: This output will be in compliance with national laws stated in output 1.1 and targeting the most vulnerable populations.

61. The project will ensure that all outputs foster equal participation and representation of women and men by following the management tools (GAAP, SESP, ESMF) developed for this project with the ultimate aim of impactful interventions on the ground in full compliance with AF policies. The criteria was developed based on several consultations with Government and communities that informed the structure of this project. In addition, a Gender Assessment and Action Plan (GAAP) has been developed which provides actions to be taken under each Output to foster the inclusion of women and women's groups to ensure that they participate in and benefit from the project (Please refer to Annex 8). GAAP's baseline and targets have been included in the logframe. An Environmental and Social Framework (ESMF) (Annex 10) will guide the implementation of the project activities to be in line with national laws and standards.
62. Small scale field activities, which will be site specific, are envisaged as an integral part of this project. Detailed design of such activities, ensuring that benefits are properly targeted, unacceptable environmental and social impacts are either designed out or properly managed, and that all sub-projects comply with AF principles, cannot take place until the project is underway. Such Unidentified Sub-Projects (USPs) represent some outputs of the project – the actual activities taking place on the ground under Components 2 and 3, while Components 1 and 4 are designed primarily to enable them to take place. As projects with a local focus, with local buy-in, and which rely on community support, local communities need to be involved in not just their design and implementation, but also in the process of identifying the projects themselves, and any adverse impacts that such proposals may entail. Such local stakeholder involvement is not something that can be done in

advance, but is done in parallel with the other component parts of the project, including the Information and Decision Support System, strengthened governance at local, regional and national levels, as also seen in Output 3.2. The involvement of communities and stakeholders is itself part of the project, empowering communities, women, and the poor and marginalised, enabling them to contribute to the work of which they will be the prime beneficiaries. The project seeks to provide the framework for such activities, designed and implemented by the communities concerned in a manner fully consistent with AF's ESP and gender policy requirements, to take place.

Component 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.

63. Component 1 focuses on enhanced management and processing of relevant , hydrological, land use and other identified data and information aimed at supporting decision making and actions that enhance the climate resilience of the Bakhtegan Basin. Results from the identified Outputs, and specific Activities, will be tailored to directly support land and water use planning decisions and actions within the Fars Provincial Government, through the planned Bakhtegan Basin Council (Output 4.2) and through local County governance structures as well as through direct engagement with and participation of communities. There are both technical and non-technical aspects to this Component which will require a multi-partner, integrated, approach to ensure effective implementation and dissemination. The Ministry of Energy (MOE), Ministry of Jihad Agriculture (MOJA) and Department of the Environment (DOE), which have responsibility for monitoring and management of water resources, will take a lead role in the climate and climate change assessments and water/land use planning for the Bakhtegan Basin. Local community monitoring will be facilitated by identified local NGOs, with linkages to the Fars Provincial Government, MOE, MOJA and DOE.
64. Component 1 will encompass the following: a) the customization and application of an integrated climate, climate risk and climate change assessment model which has been progressively developed over the last 24 years. This model (SimCLIM) was developed in its original form as a customized model for climate change impacts assessment in New Zealand and was further customized for applications in Bangladesh and the Pacific Islands. Since 2002 the software has been redesigned into an open architecture platform and has been used extensively throughout the world in multiple applications. This model will be customized for application in the Bakhtegan Basin and will be used for integrated assessment of climate risk and climate change impacts on land and water resources. Simulations and assessments will be made using output from a full suite of GCM and RCM patterns and to cover the full range of IPCC AR5 representative concentration pathways (RCPs); b) development and implementation of a participatory and integrated approach to water and land use planning (WLUP) in the Bakhtegan Basin. This work will be guided by current water and land use planning, and will generate outputs that will further inform both planning and governance of water and land resources (through Component 4). It will involve comprehensive analysis of available data and information on land and water resources in the basin aimed at guiding and informing the wise and sustainable use of land and water resources; c) the development and implementation of a local community monitoring programme. Participating communities in the four Zones will be actively engaged in identifying indicators for monitoring changes in both vulnerability and resilience in their local environment, social situation and economy. This will include monitoring of changes in water use with participating farmers. The focus is to build knowledge, understanding and ownership of the severe situation that many households are now facing throughout the basin, while also building more effective information and communication bridges between local communities and local, provincial and national decision makes; d) education, capacity building and communications. This will include education and capacity building of all stakeholders but in particular focusing on training of trainers (i.e. training of facilitators) and building awareness and capacity of participating households, farmers and communities. This will be supported by a communications programme aimed at wide dissemination of results from Component 1 throughout the Bakhtegan Basin. There will be a strong focus on linking outputs from this Component to support enhanced governance structures and mechanisms under Component 4 aimed at improved decision making and actions which will be implemented through Components 2 and 3.
65. Under Component 1 results will be generated from the climate risk and climate change assessments, water and land use planning and local community monitoring aimed at directly building more climate smart and resilient use of land and water resources by 254560 families in more than 722 target communities and indirectly to the entire population of the Bakhtegan Basin (854,093 people, according to the 2016 census).
66. During the project formulation phase the needs for the Outputs presented in Component 1 were identified through consultations nationally with MOE, MOJA and DOE, provincially with the Fars Provincial Government, and locally with county governors, local representatives of government agencies and local community and NGO representatives. The results of these consultations are summarized in Section H with a report on provincial and local consultations provided in Annex 7. The capacity for in-depth climate risk and climate change assessments, particularly relating to water resources management and decision making, is a direct response to a high priority need identified by the MOE.
67. During project implementation a comprehensive participatory approach will be taken to ensure that outputs from this Component are both directly addressing identified needs and leading to enhanced decision making and actions in relation to climate resilience. Output 1.3 has been specifically designed to empower communities through greater community understanding, engagement and ownership. The participatory approach is further supported and strengthened through Output 1.4 which will support a strong emphasis on education, capacity building and communications.
68. A consistent and comprehensive analysis of climate risk and climate change impacts in the Bakhtegan Basin will greatly assist with informed decision making, planning and action towards building climate resilience. The targeting of specific outputs to participating communities, families and farmers will foster 'champions of change' in the basin, while the

widespread sharing of information throughout the basin will foster greater understanding of shared issues and challenges, as well as positive solutions. The partnership through this Component of three participating government ministries, of national, provincial and local stakeholders, and of communities representing the four different Zones and associated issues will greatly foster and enhance understanding of the water and land use and associated climate change crisis that must be addressed collectively for the benefit of all life in the Bakhtegan Basin.

69. Component 1 results will be disseminated to all national, provincial and local stakeholders through the information portal system (TIPS) which is described under Output 1.4. In particular this system will provide relevant information to support all Outputs and Activities in Component 4.
70. As the foundation for the project it is intended that all Outputs from Component 1 will be timed for completion during the first two years to ensure maximum input and support for Components 2, 3 and 4. Outputs 1.1 and 1.2 will be completed within the first two years of the project. The local community monitoring through Output 1.3 will be on-going throughout the project. All results from these three Outputs will be fed into Output 1.4. Under supervision of the project board, the project team will coordinate with MoE as the lead agency for managing hydrological systems and data to roll out the technical assessments. All relevant agencies will work in partnership with provincial and local governments and authorities and participating communities to implement all non-technical activities. The enhancement of existing governance mechanisms (under Component 4), together with the agreed project management structure (refer to Part III, Section A) will be used to guide this work, as will the Outputs from Component 1 be used to guide and support improved governance. In summary, it is expected that Components 1 and 4 will be mutually supportive and will be developed together in an iterative manner.
71. Component 1 will produce data and analysis aimed at supporting participatory decision-making mechanisms in Component 4. For example, decisions relating to water allocation for each type of land use in different parts of the basin will guide best practices for agriculture and water resources management which support wetlands restoration. Decisions relating to the crop pattern in each part of the basin will inform Component 2 (primarily CSA systems) and Component 3 (watershed management measures and landscape rehabilitation), with the latter further supporting the chosen land use practices.
72. Under Component 1, customized climate change scenarios for the Bakhtegan basin will be generated and analyzed by national and provincial government to inform decision-making in the basin. Within the project the focus will be to support decision-making relating to project activities relating to land and water management, but the intention is that the climate change information generated will be mainstreamed into all decision making over time (including budgeting processes, etc.). By modeling various scenarios of change in temperature and rainfall and water yield as a result, corresponding policies for different regions will be determined. Currently reliable and up to date long-term scenarios are lacking to feed into adaptation decision-making.

Component 1 consists of the following Outputs and Activities:

Output 1.1 – *An integrated model for climate risk and climate change assessment supports medium and long term decision making.*

73. A customised version of SimCLIM will be developed for the Bakhtegan Basin incorporating monthly time series data for seven climate variables, daily time series of available climate data and GCM patterns from 40 models which are linked with the IPCC AR5 representative concentration pathways (RCPs). Output from SimCLIM. This will be linked to the Soil, Water Assessment Tool (SWAT) as part of a comprehensive climate change impact and risk assessment in the basin aimed at complementing and enhancing activities in Output 2.1. Assessments will focus on the basin as a whole as well as the three sub-basins (the Kor, Sivand, and Kor-Sivand. Analyses will incorporate different scenarios of water extraction, from surface and ground water, to support clearer understanding and decision-making in relation to the water resources situation in the basin and how it will be impacted by climate change. The different scenarios of water extraction will encompass the current situation based on available monitoring data, and different land use scenarios, aimed at determining as clearly as possible the sustainable level of surface and ground water use under both present and future climate change conditions.
74. The modelling work with SimCLIM will build on past analyses conducted in the Bakhtegan Basin. Importantly it will provide a coherent and consistent set of analyses and results that will be directly targeted at supporting greater understanding and decision making in relation to surface and ground water resources, and different land use options. This will be a clear progression from previous analyses which have involved discrete studies by various researchers using different models, assumptions and scenarios.
75. This output is crucial to developing a clear and comprehensive understanding of how climate change is already impacting, and will continue to impact, on the currently very fragile situation in the Bakhtegan Basin. In combination with the results from Output 1.2 this will provide a much stronger basis for enhanced decision-making, awareness raising and action towards increasing the climate resilience of the environment, society and economy of the basin.

Activities under Output 1.1 include:

- SimCLIM will be customized for the Bakhtegan Basin. This requires data development applying the latest CMIP5 statistically and dynamically downscaled information for the seven variables of minimum, mean and maximum temperature, precipitation, relative humidity, solar radiation and wind. All of these can be generated for monthly patterns and used with SimCLIM to assess baseline and future scenarios of change across all the available Representative Concentration Pathways (RCPs). These GCM and RCM patterns will be at 1 km resolution and applied to the shape file that defines the Basin. Additionally historical time series data for the Basin will be provided by the Ministry of Energy and Iranian Meteorological Organization for inclusion to enable extreme event analysis. All climate scenarios developed will be

consistent of a full suite application of current Global Climate Model (GCM) and Regional Climate Model (RCM) results combined with AR5 Representative Concentration Pathways (RCP) in the Bakhtegan Basin.

- Training in the data applied and SimCLIM will be undertaken to facilitate assessments of climate change and climate risk for the Bakhtegan Basin. Such training over a two week period will not only clearly articulate the underlying principles in the development of climate data for basin-wide application but will also encourage better understanding of IPCC guidelines for the application of climate models in decision making. Topics for inclusion include risk analysis using a scenario approach and threshold analysis and integration of climate model outputs for planning and decision making and community outreach.
- Application of SimCLIM will focus on comprehensive modelling of climate change and climate risk in the Bakhtegan Basin, with a specific focus on surface and ground water resources under current and future climate conditions.

Output 1.2 – A water and land use planning (WLUP) framework is developed and implemented to support decision making.

76. There are many challenges that the rural areas in the Bakhtegan Basin are currently facing. This includes: achieving food security; mitigating and adapting to climate change; protecting biodiversity; supporting economic growth; protecting people from natural disasters; preventing and settling land and water demand conflicts; and encouraging local people and communities to alternative livelihoods. An integrated approach to water and land use planning (WLUP) is one of the tools that can help to address these challenges as it focuses on making best use of available information and data to support informed decision making on the future use of land and water resources with participation of all relevant stakeholders.
77. The main objective of this Output is to develop and implement a land-use planning framework that is based on a fully integrated approach to addressing water resources limitations in the Bakhtegan Basin aimed at building resilience to climate variability and change. This framework can be used to guide land use decisions that protect and enhance natural resources and biodiversity by limiting agricultural expansion, protect and enhance the fragile water resources, and constrain the further conversion of forests and rangelands to arable land while also guiding reconversion of arable land to forests and rangelands. WLUP can also be used to identify areas suitable for carbon sequestration, for example through afforestation or for the introduction of agro-forestry. Examples include the transformation of high water demanding rice monocultures into rice/wheat/saffron systems, and establishment of agro-forestry plantations in which the carbon in biomass and soil litter can be multiplied through the cultivation of plantation shade trees.
78. The results of this Output will be combined with the results from Output 1.1 and integrated into the Decision Support System in Output 1.4 to provide a much stronger basis for enhanced decision-making, awareness raising and action towards increasing the climate resilience of the environment, society and economy of the basin.

Activities under Output 1.2 include:

- Public participation – All stakeholders, representing communities, authorities and industry, will be involved through participatory workshops in the planning and design of the parameters for this Output; in further workshops to agree on recommendations and revisions as the work progresses; and in determining final recommendations for implementation from this Output. Project will organize consultative participatory workshops for rural women to provide feedback into this process.
- Development of an integrated WLUP framework for the Bakhtegan Basin. This framework will consist of the following specific activities and steps, which will be undertaken at both the basin level and also for each of the identified land use planning Zones :
 - Analysis of existing land-use and policies by using remote sensed data and GIS analysis that includes the present condition of various land-uses including forest, rangeland, irrigated cultivation, rain-fed cultivation, residual area (urban and rural) that prevail under existing national and provincial policies (e.g. allowable or disallowable arable land expansion).
 - Analysis of existing water resources (surface and sub-surface) and systems including information and data from registered and unregistered wells, registered and unregistered river water diversions, updated well pumpage information and records, updated river diversion records. All data will be obtained from available hydrometric gauge stations, and planned waste water and desalinization projects.
 - Analysis of data from existing water uses from both surface and ground water including agriculture, domestic uses and industrial uses (including mining, factories, hydroelectric power plants).
 - Projections of future water supply and demands based on the results of the future climate projections that will be formulated in Output 1.1 using the SimCLIM model coupled with the SWAT hydrological model. WLUP will be introduced at the Bakhtegan Basin and land use planning Zone levels to identify measures to reduce vulnerability and build resilience to climate change. This will enable identification, discussion and decision-making on specific risks and interventions that are related to the unique characteristics and circumstances of each of the four Zones.
 - Identification, review and assessment (including costing) of water and land resource options that include: changes and refinements to conventional water system infrastructure; alternative water resource measures (e.g. desalinization and use of recycled water); supply side and demand side options. The supply side will be evaluated under three climate change scenarios: projection under the optimistic climate change scenario, i.e. RCP 2.6; projection under the pessimistic climate change scenario, RCP 8.5; projection under a mid-range scenario. The demand side will be defined based on: different land use scenarios ranging from high water use to no water use and including retirement and reconversion of arable lands to rangelands or forest; population growth scenarios. This will help address the current situation where

there are no limitations on water use and policy makers are not following any plan towards water resources management based on the water availability limitations in uplands and climate change vulnerabilities.

Output 1.3 – Community engagement, empowerment and ownership in decision making is supported through local community monitoring

79. A fundamental issue within communities in the Bakhtegan Basin is a lack of in-depth awareness and ownership of the seriousness of climate change impacts. The levels of awareness and ownership vary in the four different Zones identified for targeting. For example, it is clearly evident to people in Zone 4 that there is no surface water available and that they have saline water in their wells. They are aware that they are now living in a dryland environment, but they are not fully aware of all of the causes, the most importantly the role of climate change. On the other hand, people in Zone 1 have access to water but their production is still suffering due to factors such as high soil erosion rates. There is also a lot of blame being apportioned with people and communities becoming territorial as a result, particularly where they have water. This gap results from a lack of sharing of issues that people are experiencing in different Zones. At the same time people have no means to monitor improvements in their situations and environment and for sharing their success stories with others.
80. To address this situation this Output will focus on empowering communities to take ownership through developing, in a participatory manner, with targeted communities, a system for monitoring changes in both vulnerability and resilience and sharing this information between communities and with both county and provincial authorities. This local community monitoring will be accompanied by education and capacity building under Output 1.4. Examples of indicators for vulnerability and resilience monitoring include: biodiversity status, water situation, soil quality, household income, crop productivity, crop health, crop pattern, animal health. Specific indicators will be developed in partnership with the targeted communities, using as much as possible a simple ranking (e.g. on a scale of 1 to 5) for reporting on their status. The number of indicators and frequency of reporting to be determined with participating communities and families. Responses to indicators will be verified with quarterly site visits and facilitated sessions. Information will be collated into a form that will be available for communications, education and sharing with communities and authorities throughout the basin.
81. This Output will provide the basis for awareness building and ownership of issues and building resilience in response to identified vulnerabilities. It will also provide valuable information on the status of different communities that will be shared throughout the basin with the goal of informing people widely of the challenges that are being faced and what is being implemented to address them. It will also help the fine tuning and targeting of resilience building interventions for different communities. This local community monitoring will complement and add further insight to results from existing monitoring activities, in particular the monitoring of water resources and climate.

Activities under Output 1.3 include:

- Participatory engagement with targeted communities, farmers and households to identify and agree on a set of vulnerability and resilience indicators (encompassing environmental, social and economic) which will be used for local community monitoring. Project will facilitate presence of Rural Women's Trust Funds representatives in public consultation meetings.
- Development of a participatory monitoring system to facilitate tracking changes on the agreed indicators by targeted communities and households.
- Installation of a water monitoring system with participating farmers from Output 2.1 to measure and quantify water reductions from the introduction of climate smart practices.
- Quarterly site visits to all participating communities to verify and review information provided and discussed in the participatory monitoring system.
- In conjunction with Output 1.4, development and dissemination of information based on the local community monitoring, which will be fed back to communities and others through Output 4.1.

Output 1.4 – A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making

82. The focus of Output 1.4 is on data and information management for improved decision making. This is focused on streamlining all relevant data and information generated through the project through a customized GIS platform and development of an information portal system (TIPS). This will then provide input to guide all Outputs under Component 4. Advances in data acquisition through remote sensing, data utilization through geographic information systems (GIS), and data sharing through the internet have provided watershed managers access to more information for management decisions. In the future, applications incorporating hydrologic simulation models, GIS, and decision support systems will be deployed through the internet. In addition to challenges in making complex modeling technology available to diverse audiences, new information technology issues, such as interoperability, internet access, and security, are introduced when GIS, simulation models, and decision support systems are integrated in an internet environment. This project will review current use of information technology in watershed management decision making and develop a discussion of issues created when developing internet based, integrated watershed management decision support systems. A prototype spatial decision support system (TIPS) for rangeland, forest, cultivation areas management will be developed around web services, which are components that communicate using text based messages, thus eliminating proprietary protocols. This new framework will provide an extensible, accessible, and interoperable approach for decision support in the Bakhtegan Basin. The information generated will be used by policy and decision makers in Fars Province, through the mechanism of the Bakhtegan Basin Council (Output 4.3).

83. Data and information management will be linked strongly to both the education and capacity building and communications elements of Output 4.3. In particular, but not exclusively, this element will focus on effective management and use of data and information that is either generated from, or underpins, other Outputs. The key is to ensure that all data and information are brought together in a form that is accessible to all project stakeholders, from individual householders and farmers through to national level policy makers. In essence this will take the form of an internet based decision support system, as outlined above, to ensure effective decision making and actions of relevance to climate resilience.

Activities under Output 1.4 include:

- Data and information management for decision support will focus on the development of a GIS platform that integrates all relevant data and information layers generated for and through the project.
- Establishment of the information/data portal system (TIPS) to facilitate completion to disseminate the needs all the stakeholders based on the national, provincial and local scales.

Component 2: The resilience of communities in the Bakhtegan Basin is strengthened through implementation of climate smart agriculture and alternative livelihoods

84. Component 2 focuses on the development and implementation of climate smart agriculture and alternative livelihood practices which are aimed towards achieving significant reductions in the demand for, and pressure on, land and water resources in the Bakhtegan Basin. It is designed to address some of the core vulnerabilities that are increasingly being exacerbated by climate variability and extremes, in particular drought associated with climate change. Core vulnerabilities are arising from the unsustainable rates of extraction and overuse of both surface and ground water resources, combined with over-extensification and over-intensification of agriculture. The severe drought in 2007/08 intensified the effects of these practices and this has continued with the sustained period of drier than normal conditions since then. The consequences of this are severe in an already arid environment. While this Component cannot address all of the underlying issues throughout the basin, it will provide support for more climate smart and climate resilient agricultural practices and alternative livelihoods which will lead to significant reductions in vulnerability to drought and climate change by participating farmers, households and communities.
85. The project will strengthen and add value to existing agriculture initiatives within the Bakhtegan Basin. This includes supporting the Fars provincial government strategy to change cropping patterns and practices. Changes already occurring include: shifting arable land to alternative crops such as almond, fig, rose-flower (mostly using for cosmetics and some food industries), pistachio and medicinal herbs. Additionally farmers are already making changes such as: increasing the area of saffron cultivation (estimated to be increasing by about 100 ha annually); shifting to lower water demanding crops such as safflower (increasing by about 500 ha annually in Shiraz, Marvdasht and Kharameh Counties); increased cultivation of barley and introduction of less water demanding wheat varieties. Other current agricultural initiatives include organic certification of farms and processing facilities. However, it needs to be clarified to what extent these organically certified farms are receiving sufficient economic incentives to sustain their organic status and whether they are achieving significant reductions in water use. Crops currently covered include dates, figs, pomegranate, saffron and medicinal herbs.
86. Similarly the project will extend existing alternative livelihood practices within the Bakhtegan Basin aimed at diversifying household incomes away from dependence on land based, water dependent activities. Current alternative livelihood practices that will be extended include sewing, mushroom production, carpet weaving, vegetable production, processed food products (e.g. pomegranate sauce, tomato paste, fig products, grape juice, raisins, pickles), bread making, chicken and turkey breeding, bee keeping and sheep husbandry. A specific mechanism for supporting women is the Rural Women's Trust Fund, which will be supported and enhanced through the project.
87. Component 2 will therefore encompass the following: a) climate smart agriculture which will include a participatory planning process, market research, research on new crops and cropping systems that are suited for a dryland environment which can provide more income with less land and significant reductions in water use, extension of both existing initiatives and of the results from the research into new crops and cropping systems and widespread dissemination of results; b) alternative livelihoods which will also involve a participatory process, market research, education and training, certification, marketing and widespread dissemination of results. All activities and practices will be targeted to the specific needs of participating farmers, households and communities within the context of the limitations and challenges of each of the four Zones. In all cases a Community Based Adaptation approach will be used, which will be complementary to the Ecosystem Based Adaptation approach of Component 3.
88. Direct beneficiaries of sustainable livelihood practices will include 766 households, with 900 women receiving support from the Rural Women's Trust Fund, in ten villages with two from Zone 1, two from Zone 2, one from Zone 3 and five from Zone 4 (see Annex 4 for details). Targeting of villages for both Outputs in Component 2 has been developed to address the range of agricultural issues (e.g. from overuse of water to lack of water) and focusing in particular on identified vulnerable communities for alternative livelihood practices. Indirect beneficiaries of the project will be the entire population of the Bakhtegan Basin through communication of project results and outcomes, which will be facilitated through Output 4.1.
89. During the project formulation phase the needs for the Outputs presented in Component 2 were identified through consultations nationally with MOE, MOJA and DOE, provincially with the Fars Provincial Government, and locally with county governors, local representatives of government agencies and local community and NGO representatives. The results of these consultations are summarized in Section H with a report on provincial and local consultations provided in Annex 7. Reference was also made to existing successful initiatives in Iran, including the Lake Urmia project (see Section F).

90. Component 2 has been designed with the recognition that participation, empowerment and ownership building are the keys to success. This component along with component 3 will also provide a practical platform for implementing decision made in components 1 and 4. Project results won't be sustained if people are simply told what to do. Therefore both Outputs 2.1 and 2.2 will begin with a participatory planning process and will involve continual engagement with and feedback from farmers, women, households and their communities for the duration of the project. This process will ensure that all direct beneficiaries will own both the problems and the solutions.
91. The main outcomes of Component 2 will be successful introduction and extension of climate smart agriculture and alternative livelihoods that decrease vulnerability to drought and climate change in the Bakhtegan Basin in line with decision made by newly governance mechanisms established in the basin to address climate change. This component reduces pressure on scarce land and water resources, providing viable and sustainable sources of income, and reducing pressure towards migration from rural areas. By building climate resilience within the context of what is now a dryland environment the project will raise understanding and awareness of the underlying situation and associated effects of drought and climate change and provide solutions that will be of long-term benefit to the basin if adopted widely and wisely.
92. The two Outputs in this Component will be spread throughout the lifetime of the project. The Fars provincial government, through the Bakhtegan Basin Council, together with provincial and local staff of MOJA, MOE and DOE, and local county governors will have collective responsibility for implementation of Component 2 in line with decision made through mechanisms established in outcome 1 and 4.

Component 2 consists of the following Outputs and Activities:

Output 2.1 – Climate smart agriculture practices are adopted in target areas

93. Development and implementation of climate smart agriculture in the Bakhtegan Basin forms one of the most substantial components of this project, which aims to provide a practical platform to change traditional approaches of local related authorities, local companies and cooperatives and local communities and farmers to sustainable agriculture (SA) practices. In this regard, SA techniques are developed based on participatory approaches, bringing together farmers, agriculture authorities, agriculture research centres and professional facilitators aiming at water saving at farm level to help meet part of the ecosystem and lake water rights without compromising farmers' net income.
94. Agriculture is both the single major source of the situation that now exists in the basin and must be an integral part of the solution. The solution involves putting into practice many of the elements of the project, in particular drawing on results of the assessments in Component 1 and guided by the governance arrangements in Component 4. It will involve a clear action focus towards drastically reducing water consumption and shifting the mind sets of farmers and other related stakeholders towards what must now be treated as a dryland environment. Experience shows that this cannot be achieved by trying to tell farmers what they must do, for example by trying to shut down illegal wells. It can only be achieved by engaging with farmers fully in an action focused, participatory process. This will involve bringing together farmers, agriculture research centres and professional facilitators aimed at implementing identified climate smart practices that reduce water consumption without compromising farmers' net income.
95. Any adaptation measure won't be successful without a sense of ownership among people in the basin through a participatory approach which support and advocates a sustainable change in their daily livelihood. For this reason, local community engagement is one of the major objectives of the project. The above-mentioned process led to engagement of government, private sector, NGOs and the local farmers. Significant improvement of inter-sectoral collaboration can be seen to the point where different stakeholders are participating in planning and decision making on a regular basis. Besides, a bottom-up planning and implementation of SA techniques is carried out by farmers in collaboration with local companies.
96. In addition, local companies and cooperatives play a key role in the project with regular and continued presence in the field and accompany with local farmers and providing a collaborative platform toward joint planning and implementation among key stakeholders in line with sustainable agriculture, applying smart agriculture technics and aiming to achieve results. The necessity of involving communities and other third parties in the planning process for on-the-ground and site-specific activities, means that only provisional assessment of generic types of impacts can be made at this stage of project development, without further investigation on a site-by-site, and community-by-community basis. This is further explained in Sections B and J below, and in the ESMF (Annex 10)
97. There are a number of critical elements to this Output which are aimed at building on other relevant projects elsewhere in Iran and within the basin. This includes market research, including for organically certified products, research at the MOJA research station in Marvdasht on new crops and cropping systems suited to a dryland environment, participatory extension and engagement with farmers and communications drawing on existing and new research. These different elements need to consider the variation in conditions and agricultural activities throughout the basin, while at the same time considering the need for a coherent, integrated, approach for the whole basin. It will therefore draw strongly on results from the Output 1.2, which will guide and inform the limitations and opportunities relating to sustainable land and water use in each of the four Zones.
98. Considering the fact that water efficiency in most part of the basin is less than 30% and based on the current situation in the four different Zones, and subject to the results of Output 1.2 which will further guide this Output, the following is an overview of the activities in each Zone. Zone 1 encompasses the Kor and Sivand sub-basins, and was traditionally a rangeland area with seasonal grazing by nomads and rural people. There is now heavy use of water here, including significant amounts for rice cultivation on river terraces. The focus will therefore be on achieving significant reductions in water use drawing on available research from the MOJA research station in Marvdasht, while also encouraging

diversification towards lower water-demanding and higher value crops and cropping systems and alternative livelihoods (Output 2.2). In Zones 2 and 3, where there is the highest concentration of water dependent arable farming, the focus will similarly be towards achieving significant reductions in water use and other sustainable agriculture practices and encouraging all water users to diversify based on revised water allocation plans, produced through Output 1.2 for the Bakhtegan Basin. In Zone 4, which is the most critical zone in terms of the lack of water, the focus will be towards enhancing already existing shifts towards higher value, less water demanding, crops and cropping practices.

99. Local cooperatives/local technical companies with technical expertise on climate smart agriculture, technologies and participatory approaches will be contracted for each target village in a competitive process. Selected companies are obliged to be in each village full time and responsible to develop and implement a participatory plan which is agreed by local community to apply smart agriculture systems for the village.
100. Each contracted company is responsible to fully drive the whole process in each village under supervision of local related authorities (MoJA and DoE) which include trust building in the village, public awareness activities on climate change and climate smart agriculture, developing a participatory smart agriculture plan, participatory selection of target farms, gathering data and develop an action plan for each farm which will be agreed by the farmer owner.
101. The process of introducing SA techniques to the farmers include i) Development of Participatory Action Plan engaging Farmers, Facilitators, Agriculture Researchers and, ii) Implementation of water management techniques, emphasizing on water saving at farm level iii) Implementation of soil fertility techniques, iv) emphasizing on application of biological fertilizers rather than chemical fertilizers; v) Implementation of crop protection techniques, emphasizing on application of biological pesticides rather than chemical pesticides and pollutants; vi) Supply and installation of monitoring equipment and measuring instruments to enhance water consumption management
102. Applying new CSA techniques and technologies at the farm level will be supported by MoJA and contracted cooperative/company based on agreed action plan for the farm but there is an emphasis on techniques which could be applied and advocated by the farmers themselves. The new technologies includes but not limited to improvement of irrigation systems through better flow management (irrigation with constant flow, dual flow, decreasing flow, surge flow, blocked furrows), Improvement of soil conservation at farm level (land levelling, no/minimum tillage, contour ploughing, terrace farming, runoff control, wind breaks, Cover crops/crop rotation, soil-conservation farming, salinity management, soil fertility management); introduction of new type of seeds, pesticide and fertilizer at farm level. All farm level techniques/technologies will be discussed with farmers after initial monitoring of the farm and as possible solution to response climate change effect on their usual practices. Joint action plan will be developed based on possible solutions for farm and farmers will be supported to apply the action plan during the cultivation season.
103. This Output is provisionally targeted at 4,425 farmers and fruit and nut growers in 15 villages. (Target villages and selection criteria are described in Annex 3), It is expected that 21,910 hectares of cropping land will be converted to climate smart agriculture systems and 1,726 hectares of horticultural land will be converted to climate smart agriculture systems. The introduction of CSA systems will be undertaken on current agricultural land, and will be focused on environmental enhancement together with economic and social improvement. By the second year of the project at least 20% of target farms/orchards will be covered and at least 80% will be covered in the beginning of the last year of the project. It needs to be noted that all farm level activities will also be directly linked to other initiatives in other components like sustainable alternative livelihood activities and value chain which will be promoted and supported by local NGOs and CBOs (Output 2.2). All farmers in the provisionally-selected villages are targeted beneficiaries in the implementation phase. However, marginalized farmers with low income or most affected by drought and climate change along with women groups are priority and will be encouraged to participate in applying climate smart agriculture (CSA) in their farms and hence will benefit from CSA practices and trainings. This will be considered as an important indicator in initial consultation processes, and trust building meetings/visits in each village which will be held by extension offices and local technical cooperatives, with support from the project team. It should be noted that this will be an evolving process in which it is envisaged that more farmers within the village as well as neighbouring villages and communities will be engaged in the CSA gradually after witnessing the results and benefits in the primary cultivation seasons.

Activities under Output 2.1 include:

- **Market Research:** Market research, including value chain analyses, on alternative crops and cropping systems that are suited to a dryland environment under changing climate conditions. This will include market research on the potential for high value, export focused, organically certified crops. The focus on organically certified crops (focused mainly on fruit and nuts) for export is intended to identify as clearly as possible the potential for alternatives to rice production that will give farmers a strong economic incentive to change. Additionally, it will include an emphasis on processing opportunities for added value products that are aimed at high end markets. One example is cold-pressed safflower oil aimed at international health food markets. Simply focusing on local markets in Iran is unlikely to be sufficient to provide enough of an economic incentive for farmers to change. This market research will also encompass exploration of the potential to develop a unique branding of all produce from the Bakhtegan Basin, aimed at gaining international recognition of, and support for, the need to restore, revive and sustain its unique character as the heart of Persian civilisation.
- Based on the results of the market research, development of a unique brand for the Bakhtegan Basin. Associated with this working groups will be established in each Zone, involving farmers and industry (i.e. food processors) aimed at working

together to identifying and implementing new opportunities for high added value products, such as the previously mentioned example of cold pressed safflower oil.

- **Applied Research Programme in the Bakhtegan Basin:** Development and implementation of a new applied research programme at the MOJA research station in Marvdasht. This will draw experiences and lessons learned from the Lake Urmia project, FAO guidance on Climate Smart Agriculture, and the results of the market research on alternative crops, cropping systems and added value processing opportunities. The research programme will be focused only on new crops and techniques suited for a dryland environment that are likely to result in strong environmental, social and economic benefits. It will encompass low-cost more water efficient practices, introduction of fallow crops and periods, soil conservation practices including contour ploughing and use of shelter trees around fields (ideally using nitrogen fixing species) to reduce wind erosion of soil and to provide mulch material, use of biological pesticides and fertilizers. Subject to outcomes of the market research this will also include the design of farming systems that are capable of earning greater income from less land and with substantially reduced water inputs.
- **Development of Climate Smart Agriculture (CSA) Plans**

Based on the consultations and the research carried out by the MOJA research station in Marvdasht, the process of introducing sustainable agriculture techniques to the farmers include i) Development of Participatory Action Plan engaging Farmers, Facilitators, Agriculture Researchers and, ii) Implementation of water management techniques, emphasizing on water saving at farm level iii) Implementation of soil fertility techniques, iv) emphasizing on application of biological fertilizers rather than chemical fertilizers; v) Implementation of crop protection techniques, emphasizing on application of biological pesticides rather than chemical pesticides and pollutants; vi) Supply and installation of monitoring equipment and measuring instruments to enhance water consumption management. The new technologies include, but not limited to, improvement of irrigation systems through better flow management (irrigation with constant flow, dual flow, decreasing flow, surge flow, blocked furrows), Improvement of soil conservation at farm level (land levelling, no/minimum tillage, contour ploughing, terrace farming, runoff control, wind breaks, Cover crops/crop rotation, soil-conservation farming, salinity management, soil fertility management); introduction of new type of seeds, pesticide and fertilizer at farm level. All farm level techniques/technologies will be discussed with farmers after initial monitoring of the farm and as possible solution to respond to climate change impacts on their agricultural practices. Joint action plan will be developed and farmers will be supported to apply the action plan during the cultivation season. These plans will be targeted at 4,425 farmers and fruit & nut growers in 15 villages. (Target villages and selection criteria is described in Annex 3), covering 21,910 ha of arable land and 1,726 ha of horticultural land.

As indicated above, while the majority of the aspects of the subprojects have been, identified so far, the identification of appropriate technologies for each individual village and farm requires further stakeholder consultation which will be done during the project implementation phase. A social and environmental screening process has been developed to make sure AF's 15 principles are addressed for selected farmlands.

- **Implementation of Climate Smart Agriculture Plans**

Implementation of the CSA plans will involve a structured process of engagement with targeted farmers including:

- Training and capacity development practices for companies, authorities experts and farmers
- Extension support during the growing season for implementation of the agreed action plan for each farm, provided by MOJA Marvdasht Research Station and selected cooperatives/companies. This will involve the initial trialling of new technologies and cropping systems at the agreed sites in each targeted village and at Marvdasht research station, rapid extension of further trialling with identified leading, and innovative, farmers, and then widespread extension to all targeted farmers.
- The new technologies includes but not limited to improvement of irrigation systems through better flow management (irrigation with constant flow, dual flow, decreasing flow, surge flow, blocked furrows), Improvement of soil conservation at farm level (land levelling, no/minimum tillage, contour ploughing, terrace farming, runoff control, wind breaks, Cover crops/crop rotation, soil-conservation farming, salinity management, soil fertility management); introduction of new type of seeds, pesticide and fertilizer at farm level
- Support for agricultural inputs, including but not limited to seeds, seedlings and biologically friendly inputs
- Support for organic certification where required
- Monitoring the results
- Documentation and sharing lessons learned

- **Widespread Communication and Education**

A comprehensive extension, communication and education programme to disseminate results and information as widely as possible throughout the Bakhtegan Basin (Output 4.1).

Output 2.2 – Alternative livelihoods are adopted by women/women's cooperatives in target villages.

103. Support and establishment of water-friendly alternative livelihoods with an especial focus on women and youth involvement forms a crucial part of this project. This activity is aimed at significantly decreasing the dependency of local communities on water resources while providing new job opportunities. It is complementary to the climate smart agriculture focus of Output 2.1. Many households and villages within Zones 1 and 4 are no longer able to sustain themselves economically due to the sustained effects of drier than normal conditions over the last decade and depleted water resources. This situation will continue to worsen with climate change. There has already been land abandonment within these four zones due to drought, low rainfall, lack of available water and/or low crop yields, and migration of families to urban fringe areas

with associated social issues such as increased divorce rates. Communities in Zone 4, in the immediate and wider environments of Lakes Bakhtegan and Tashk are the most severely affected and will be the primary focus for activities under Output 2.2.

104. The current situation is one where individual households are already practicing alternative livelihoods. The emphasis of Output 2.2 is therefore to build on and enhance these existing initiatives. The identified aim is to support the shift away from water dependent agriculture, which is already been enforced through lack of available water in some situations, increase the climate resilience of communities and stem the flow of people to urban fringe areas. Such initiatives decrease the local communities' dependence on wetland resources, while making rural people aware of their role in restoration and management of wetlands (through Component 3) and increases the level of social responsibility.
105. Key determinants of the success of alternative livelihoods include marketability of products generated, both nationally and internationally, and the capacity of individuals to successfully adopt and sustain alternative livelihood practices and sell their products. At present the production and sale of alternative livelihood products is being done in an ad hoc manner, with both the need and opportunity for a much more structured approach in terms of market identification and targeting, and vocational training.
106. The existing Rural Women's Trust Fund is an important mechanism for supporting the development of alternative livelihood practices. However, during the project consultations the project design team heard of mixed results with this fund. It is therefore very important to review results achieved from this fund and apply lessons learned to ensure its success through the project.
107. Based on the identification of market opportunities and vocational needs, participatory workshops will be undertaken in targeted villages. These workshops will be aimed at identifying opportunities and capacities for livelihood diversification, agreeing on specific alternative livelihood options for each participating village, based on the market research, and the development of alternative livelihood plans.
109. Subject to the above review and implementation of lessons learned from the review of the Rural Women's Trust Fund the project will support NGOs to establish up to 9 women's cooperatives (depending on whether they already exist or not, see below). The 9 cooperatives will cover all 9 target villages of this output and will respect current ways and norms of organization in the target area. By having one cooperative per village, it would be logistically easier to organize trainings and meetings with trainers and facilitators. Fars province is one of the pioneers in the country for large women's cooperatives. Of more than 300 women's cooperatives established throughout Iran 135 are in the Bakhtegan basin). These existing cooperatives have established women focused micro credit funds and the project will cooperate jointly with MOJA to support existing capacities in line with the project's goal. These cooperatives have already supported several alternative livelihood practices in the agriculture sector and the project will work as much as possible to build on these initiatives within the context of the climate change adaptation focus of the project.
110. Through the Rural Women's Trust Fund the project will target at least 900 women to implement alternative livelihoods by receiving small-grants support. Based on the Gender Assessment and Action Plan (GAAP) [Annex 8], it was identified that targeted villages currently have different capacities for adopting and sustaining alternative livelihoods. It was further identified that provision of financial support to the most vulnerable population in the target area, focused in particular on women, is needed to implement livelihoods to reduce the pressure on scarce water resources while creating alternative income generating opportunities for generation of income. Another important element distilled from the GAAP is that it is not only necessary to consider the needs of men and women but also their potential capacity in dealing with economic, social and ecological vulnerabilities as individuals and as a community in the context of drought. The provision of small grants will increase women's agency and control over resources that ultimately are aimed at their economic empowerment.
111. Relevant alternative livelihoods practices were identified based on the participatory consultative process among sub-national, NGOs and local communities in target area in Fars province (See Table 6 below). This pre-selected set of livelihoods will be subject to review and refinement based on the market research activity discussed above and validated during the GAAP. Based on good practices from similar alternative livelihoods in relevant projects, a joint participatory analysis will be conducted with the target communities to support participatory development strategies for empowerment of marginalized communities. After an initial agreement, a proposal including a business plan will be developed for each livelihood option, identified in Table 6, before the implementation phase. To the extent possible, the proposal will promote efficient utilization of locally available resources. The business plan will ensure that mechanisms are in place for sufficient economic returns through market-based research and value chain development. Local NGOs with technical expertise will be involved in supporting the development of such proposals and business plans, to ensure participation of the most marginalised communities, especially women.

Table 6: Pre-selected livelihoods

Livelihood	Prospective Village	Required Investment	Description ⁴³
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⁴³ Project will build on economies of scale to maximize budget

Sewing & Tailoring	<ul style="list-style-type: none"> - Emamzadeesmail - Kordeshul - Ali abad - Doroodzan - Bandeamir - Kamajan, Jamishi - Jazin, Khanekat - Shargh Abad 	Around \$700 per beneficiary	Sewing supplies and accessories (sewing machines, fabric, patterns, etc.), training/workshops, post production support / links to markets Skills training, promotion of economies of scale (sewing machines with different features, fabric by the bulk)
Carpet weaving	Same villages as above	Around \$ 600 per beneficiary	Weaving supplies (knitting machine /carpet weaving Loom, wool, cotton, natural coloring plants, combs, scissors, spindles, spinning wheels, etc) traditional and new methods, colors, patterns and weaving techniques workshops, post production support / links to markets
Dried fruit/herbs/vegetables processing	Same villages as above	Around \$ 500 per beneficiary	Inputs (non-water intensive commodities), Solar drying machine, Packaging inputs, training/workshops, post production support / links to markets
Traditional aviculture	Same villages as above	Around \$600 per beneficiary	Inputs (birds livestock /poultry, animal feed), Materials (fencing, water containers) Packaging inputs (egg cages), training /workshops, post production support / links to markets
Jewelry	Same villages as above	Around \$800 per beneficiary	Inputs, jewelry machinery and accessories, Packaging inputs, training/workshops, post production support / links to markets

112. Implementation of identified alternative livelihood practices will be supported by local NGOs. Selected local NGOs will work closely with the communities to analyse possible sustainable alternative livelihood opportunities at village level based on the market research, develop and agree on a joint plan with local communities, provide assistance to roll out prioritized alternative livelihoods, provide vocational training, support development of processing and packaging skills, assist with linking identified product to markets, monitor implementation, lead participatory evaluation of the livelihoods and help synthesize lessons learned and other knowledge for policy inputs. The National Steering Committee will oversee the development of the portfolio of community-based alternative livelihoods, ensuring its alignment with AF requirements and that lessons learned are discussed and evaluated. Information collected from project M&E will be centralized in a database and shared with communities, organizations and government institutions for policy and program discussions.
113. These alternative livelihoods will be implemented based on the experiences and best practices generated by the UNDP all around the country in past 30 years including GEF large scale projects and Iran Small Grants Programme (SGP). The AF project will build upon the project National Steering Committee (NSC) comprised by DoE and UNDP and other key institutions such as MoJA, MoE, others. The NSC is responsible for the review, selection and approval of small-scale projects and for ensuring their technical and substantive quality. The AF project will build upon existing delivery modality to direct grants to approved community projects. AF grants will be channelled directly to selected NGOs, community-based organizations (CBOs) and local cooperatives and the maximum grant amount per project will be US\$50,000. To assess eligibility of CBOs and NGOs (grantees) proposals, the National Steering Committee will base its decisions using SGP's Eligibility Criteria for Grantees and Projects (Annex 6). DoE, as a member of the Project Board will lead this process and will provide inputs as part of the strategic directions approved by national steering committee. A fundamental part of the proposals' screening process will be the technical elements, where a special focus will be put at supporting those proposals which contribute to increase the adaptive capacity and resilience to climate change impacts in the basin. The technical criteria will assess high adaptation benefit; degree of reliance on water inputs vs. water efficiency; potential for employment (agriculture and non-agriculture sectors); number of direct female beneficiaries; potential to contribute to landscape regeneration and integrity of the basin ecosystem; among others. The UNDP will provide financial oversight on grants allocation
114. The small-scale nature of the envisaged alternative livelihoods are highly unlikely to require an Environmental Impact Assessment (EIA) based on the nature, purpose and possible effects on the environment. The National Steering Committee will assess, using the screening process described in the ESMF, whether any proposal would legally require carrying out an EIA, to showcase if the environmental and community benefits outweigh the negative effects. As previously stated, the AF project includes technical and budget provisions in compliance with the AF ESP, the first Principle of which is compliance with national law, including adherence to all national and local standards on environmental and social impacts
115. In addition, the project team with the guidance of the Steering Committee, will ensure that each community is assisted by qualified technical personnel from government extension agencies and/or NGOs to ensure that all environmental, social and technical issues that may arise are squarely addressed. This will be important to guarantee that project activities are in full compliance with AF requirements, do not lead to maladaptation or other undesirable consequences, i.e. that activities aggravate inequality, cause negative environmental or social impacts.

Selection of Beneficiaries:

116. The project team in consultation with other government entities and local stakeholders and NGOs and CBOs has identified criteria to be used to identify and prioritize community beneficiaries for the development of proposed activities. The criteria are consistent with the rationale of the AF project which aims to increase not only ecosystem resilience but also economic, social and territorial climate-related resilience within targeted communities. The criteria for the selection of villages is based on the following items: 1. Farmers with successful experiences, such as low-water and drought resistant crops with high yields/income such as the villages that cultivate saffron, safflower and pistachio as an alternative for rice. 2. Governmental extension services with successful research and development experiences in reducing water consumption for agricultural purposes. The provision of this services will focus to villages, farmers willing to implement sustainable agriculture projects. 3. Existence of potentials and demonstration effect of less water-intensive agriculture with same yields and less GHG emission, including the support of village officials and the presence of leading farmers in Zone 1, 2, 3 and 4. 4. The location of the villages and their impact on the surrounding villages (outside Zone 1, 2, 3, and 4), aiming to promote a spillover effect. 5. Villages dependent on agriculture for their livelihood/income and most impacted by drought: mostly farmers (Zone 4 being the most affected, zone 2 are mostly rice farmers and in the other zones farmers have dry farms of wheat and barley). The rationale of selection of these communities is included in Annex 3 'Targeting of Beneficiaries'.

The main beneficiaries of the project will be the 9 villages from Zones 1, 2, 3 and 4 as below:

Zone 1	Zone 2	Zone 3	Zone 4
<ul style="list-style-type: none"> •Emamzade Esmail •Kordshul 	<ul style="list-style-type: none"> •Aliabad •Doroodzan 	<ul style="list-style-type: none"> •Bande amir 	<ul style="list-style-type: none"> •Kamjan •Jamishi, •Jazin •Khane kat , •Shargh abad

117. The feasibility of the proposed interventions was assessed with local, regional and national stakeholders and beneficiaries as part of the consultation process, relying on their experience implementing related initiatives in the region (See Annex 7, Report on Consultations in the Bakhtegan Basin).

Activities under Output 2.2 include:

- **Market Planning & Research, Vocational Training Support:** An international and national consultant will be contracted to undertake relevant market planning and research aimed at refining the pre-identified list of alternative livelihood practices. Additionally, they will provide vocational training support to NGOs.
 - **Lessons Learned from the Rural Women's Trust Fund:** A national consultant will be contracted to assess lessons learned from the Rural Women's Trust Fund throughout Iran and particularly within the Bakhtegan Basin and provide recommendations for its refinement to ensure its success within the project and for the future.
 - **Participatory workshops:** Participatory workshops will be facilitated in the 9 target villages aimed at supporting/establishing local women's cooperatives, refining identified alternative livelihood practices based on the market planning and research, and developing alternative livelihood plans.
 - **Implementation of Alternative Livelihood Plans:** Local executive partners (NGOs/Local cooperatives) will be selected to support community members with a particular focus on women and women's cooperatives. They will:
 - Facilitate establishment of local cooperatives or strengthen existing cooperation mechanisms to sustain new initiatives in the community and giving further opportunity to other community members to join.
 - Facilitate establishment of sustainable alternative livelihoods based on agreed plans and the refined list of livelihoods options (e.g.. sewing, carpet weaving, dried fruit processing, traditional aviculture, and jewelry etc).
 - Provide vocational training support for all participating household members including women/women's cooperatives. Some villages already have existing capacity which can be drawn on through development of a 'training of trainers' and mentoring approach within each village.
118. Some livelihood related activities under Output 2.2 which are site-specific activities with a physical footprint, have not been fully defined during the proposal stage as they require screening, stakeholder consultation and buy-in from local communities as well as the development of business plans. These are considered Unidentified Sub Projects, and are to be developed during the implementation stage, based on the list of livelihood options provided in Table 6.

Component 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened

119. Component 3 focuses on implementation of a range of soil and water conservation measures in rangelands and forests; and the rehabilitation and conservation of national parks and protected areas. The natural environment of the Bakhtegan Basin has been significantly modified and put under severe stress over the last four decades. These stresses are now being exacerbated by the prolonged dry period since 2007, with climate change an increasing influence. While it is not realistic to believe that this project can fully restore the natural environment of the basin, it can implement measures to increase the resilience of what must now be treated as a dryland environment.
120. The resilience of the natural environment of the Bakhtegan Basin will be strengthened through the following two Outputs: a) soil and water conservation in rangelands and forest areas which will involve implementation of collaborative adaptive rangeland management which fostering science-management partnerships and data-driven rangeland management through a participatory, multistakeholder approach. While targeting goals have been set the specific target sites for implementation of different measures will be identified based on the results of Output 1.2 and through a participatory

engagement and decision-making process. Measures introduced will build on past successful work of this kind within the Bakhtegan Basin and in other Provinces; b) rehabilitation and conservation of national parks and protected areas will also involve implementation of specific measures at project target sites, to be undertaken as an essential part to recover and maintain overall functional integrity of the landscape. In particular this Output will draw on approaches, results and lessons learned from the Conservation of Iranian Wetlands project and Central Zagros Mountains project⁴⁴.

121. Component 3 will be implemented in Zones 1 and 4. Zone 1 forms the principal catchment area of the Bakhtegan Basin, while Zone 4 encompasses the Tashk and Bakhtegan National Park. Output 3.1 will be implemented in eight most vulnerable areas related to 14 and 13 direct and indirect vulnerable villages, respectively, with 21,380 directly vulnerable rural people, while Output 3.2 will be implemented in seven communities with 8,794 people. All Component 3 activities will be implemented in tandem with relevant activities from Component 2, with a particular focus on integrated approaches that combine climate smart agriculture and alternative livelihood activities with community engagement and participation in building the resilience of their natural environment.
122. The need for Component 3 was identified through national level consultations with MOE, MOJA and DOE. All three agencies place a high priority on rehabilitation and conservation of the natural environment of the Bakhtegan Basin. They recognize that the natural environment plays a fundamental role in the provision of ecosystem services which have widespread environmental, social and economic benefits if managed wisely and will play a key role of better adaptation to climate change. Given the current situation in the basin there is a recognition that a significant effort is required to strengthen the climate resilience to the now prevailing dryland conditions. Consultations with provincial and local stakeholders (Section H) confirmed the importance of this Component as an integral part of the project. It has also been indicated by stakeholders that improvement of natural environment situation in the basin is also a strong sign of better adaptation of basin and local community with new situation.
123. As with Components 1 and 2 a participatory planning and engagement process will be developed and implemented through both Objectives for Component 3, which will be sustained for the duration of the project.
124. The main outcomes from this Component will be enhancement of the natural environment of those areas that are targeted by this project, with wider benefits to the water catchments where they are located. Additionally, there will be greater awareness and ownership by participating communities of the need to continue protecting the natural environment within the wider environs of their villages. Component 3 will provide new opportunities to the local community for being part of the conservation measures while benefiting from ecosystem services.
125. As work progresses with implementation of specific activities within Component 3 there will be regular communication of results through the various mechanisms identified in Output 1.4
126. As one of the two main pillars of the project Component 3 will involve a significant amount of work which will be staged through the entire life of the project. Technical leads for Outputs 3.1 and 3.2 will be MOJA-FRWO and DOE respectively, working in partnership with the Fars Provincial Government, through the Bakhtegan Basin Council (Output 4.2) and with local officers from participating County governments.
127. Component 3 consists of the following Outputs and Activities:

Output 3.1 – *A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks*

128. Under the changing climatic conditions of the Bakhtegan Basin vital, and scarce, water and soil resources have experienced measurable quantitative changes in recent years. Natural resources in the basin are now suffering directly from the impacts of climate change, along with associated environmental, social and economic pressures on the natural environment (e.g., deforestation, over extraction of water; population growth and urban expansion, increasing demand for food production). The only realistic solution is to implement an integrated watershed management approach which involves practices including rehabilitation of vegetation cover in forests and rangelands and protecting natural resources. By implementing such practices widely over time this will help facilitate a much needed situation of wise resource management. For long term success, it is essential to not simply see rehabilitation activities as the solitary and final task. An integrated and participatory approach is required to ensure sustainable management. This approach involves a two-way process involving sharing technical and scientific considerations with local people and listening to and incorporating their needs, knowledge and experiences into planning, policymaking and implementation of agreed solutions. Without such an approach, land degradation and desertification will continue unabated, aggravated by climate change, with continuing long-term environmental, social and economic costs.
129. The objectives for this Output are to 1) prioritize desired ecosystem services for better adaptation to climate change; 2) determine objectives with stakeholders; 3) set stocking rates, criteria for livestock movement among pastures, and vegetation treatments to reduce adverse impacts on rangeland; 4) support implementation of agreed physical and non-physical interventions in selected rangeland areas 5) select and implement monitoring techniques that would inform decision making.
130. This Output will build on the success of other relevant projects elsewhere in Iran and within the basin. These projects have involved successful implementation of watershed management practices using participatory approaches in East and West Azerbaijan, Khuzestan, Golestan, Kordistan, Markazi, Isfahan, Booshehr, Sistan and Baloochestan, Hormozgan, Fars,

⁴⁴Conservation and Sustainable Development Program of Central Zagros Mountains

Yazd, Kermanshah, south Khorasan and elsewhere. They have been funded through national budgets under MOJA and through international projects in partnership with MOJA involving FAO, GEF, UNDP and JICA. Specifically, this Output will involve engagement with rural communities from the Chahmahaki, Temshouli, and Tang-e-hana villages in Bakhtegan1 county and Koushk and JahanAbad villages in Bakhtegan 2 county (Zone 4), Bakian, Palangari, Khaniman, Hajiabad, Moradkhani, Chamriz and Chamchenar villages in Marvdasht and Kamfirouz (Zone 1), Dochahi and Nayris in Nayriz (Zone 4), Zino village in Estahban (Zone 4), Bolaghi village in Pasargad (Zone1) and Charghalat and Kenare villages in Arsanjan (Zone 1), to implement physical solutions and management practices to reduce soil erosion and increase the vegetation cover in forest and rangeland areas of the Bakhtegan Basin.

131. Based on the current situation in the four different Zones, the defined activities will be focused principally in Zones 1 and 4. Zone 1 encompasses the Kor and Sivand sub-basins, and was traditionally a rangeland and forest area with seasonal grazing by nomads and rural people. A major issue now is the encroachment of agricultural activities into the rangelands and forest areas. Zone 4 encompasses the land surrounding the Bakhtegan-Tashk lakes which are now severely affected by soil salinization and desertification. The focus in Zone 4 will therefore be on achieving significant risk reductions terms of in soil erosion, drought control in rangelands and forest areas and combating desertification. Project work in Zone 4 will have a strong emphasis on combating desertification using best management activities aimed at achieving significant reductions in surface water runoff, increasing recharge to the aquifers and increasing vegetative cover.
132. An Integrated Watershed Management (IWM) plan will be developed and promoted in the basin as a suitable strategy for improving sustainable productivity and sustainable protection of the landscape. The Forest, Rangeland and Watershed Organization (FRWO) has developed IWM for small- and large-scale basins at national level and in small-scale basins in Fars province and will guide this process during implementation. IWM is a new approach which replaces outdated conservative/exploitation methodologies which were completely sectoral and did not lead to sustainable management of forests and rangelands. The new approach emphasizes the need to go beyond conservation technologies focused on engaging with diverse stakeholders to include multiple crop-livestock interventions that support and diversify livelihood opportunities for the most vulnerable and create synergies between targeted technologies, policies and institutions to improve productivity, resource use sustainability and market access.
133. The IWM plan will be developed and implemented through participatory workshops, capacity building, a range of targeted activities aimed at environmental enhancement, and monitoring and evaluation. One of main purposes of watershed management in drought-prone areas is to improve livelihood security by mitigating the negative effects of climatic variability while protecting or enhancing the flow of essential ecosystem services. This requires a diversity of measures and practices including rainwater harvesting involving terracing and construction of traditional water ponds, rangeland rehabilitation, protection of and revegetation of forests, herbal medicines harvesting, and revegetation to combat desertification.
134. The promotion and installation of traditional water ponds to harvest rainwater is particularly valuable both for domestic supply and to enhance crop, livestock and other forms of agriculture. Water pond technologies are simple to install and operate. Target communities will be trained to implement and operate these ponds, and construction materials are usually readily available. Rainwater harvesting is convenient because it provides water at the point of use and the local beneficiary has full control of their own system. Use of rainwater harvesting technology promotes self-sufficiency and has minimal environmental impact. Construction, operation and maintenance are not labor-intensive. Water collected is of acceptable quality for agricultural purposes. Other benefits include increasing soil moisture levels and increasing the groundwater table via artificial recharge. Rainwater harvesting and its application to achieving higher crop yields can encourage farmers to diversify their enterprises, such as increasing production, upgrading their choice of crop, purchasing larger livestock animals or investing in crop improvement inputs such as irrigation infrastructure, fertilizers and pest management.
135. Another important intervention to be supported is terracing practices⁴⁵ for slope management. A terrace is a levelled surface used in farming to cultivate sloping, hilly or mountainous terrain. They can be used on relatively flat land in cases where soil and climate conditions are conducive to erosion. Terraced fields are effective for growing a wide range of crops, shrubs and trees. Terraces have four main functions: Improve the natural conditions for agricultural production; Decrease the rate of erosion; Increase soil moisture; and Generate positive environmental benefits.
136. The most expensive component of terrace construction is labor which will depend on average local daily wages. The time required to construct a slow-forming terrace will depend on available manpower, the type of soil and the time of year. The basic tools required (such as picks and shovels) usually belong to the farmer and can be used at no extra cost. Once built, annual maintenance costs are minimal. Research indicates that two people can build 7m² of wall in one day. Assuming a common size terrace wall of dimensions 1.8m high and 50m long, two people could restore an entire terrace in two weeks, or build an entirely new one in a slightly longer period of time. (The initial estimated for investment is about \$415/ha with \$75/ha per annum for maintenance.)
137. This output will include the construction of small-scale works that in principle will not require an Environmental Impact Assessment (EIA) based on their nature. As previously stated, the AF project includes technical and budget provisions in compliance with UNDP requirements, including adherence to all national and local standards on environmental and social

⁴⁵ Slow-forming terraces can be built where the land is marginally to steeply inclined and where the soil is sufficiently deep to create a drag effect. This leads to the formation of steps as sediment accumulates due to high density rainfall and natural gravity. Level ditches are traced and excavated along the contour line of a slope and then an embankment of earth, stones or plants is constructed at regular intervals. Eroded soil accumulates in these buffer strips every year and terraces slowly form.

impacts, to request and carry out EIAs if any of the activities would require. (More information on EIAs see Annex 10 Environmental and Social Management Framework)

Activities under Output 3.1 include:

- **Development of an Integrated Watershed Management Plan:** A national consulting company will be contracted to develop an Integrated Watershed Management (IWM) plan. This plan will encompass preliminary identification and agreement on watershed management practices for the target communities. DoE will ensure that IWM plan complies with national law and does not have negative impacts on ecosystem while FRWO has internal monitoring mechanisms on safeguards. The plan will be finalised through participatory workshops with identified target communities.
- **Capacity Building and Training:** Capacity building and training will be provided to all the stakeholders to participate in planning, implementing and monitoring of the relevant activities for ecosystem protection. Training workshops will integrate the science and technology know-how of the authorities with the knowledge and experiences of local people to rehabilitate and protect the Zagros forest and the rangelands in Bakhtegan basin.
- **Implementation of Integrated Watershed Management Plan:** Implementation of the IWM Plan will be guided and supported by DoE and FRWO in a participatory manner involving training of facilitators, engagement with local people, participation of researchers, local authorities and other relevant stakeholders. Implementation of integrated watershed management adaptation activities by local people, with support from MOJA, will involve a range of physical options and interventions. An integrated, multi-faceted, approach will provide the necessary conditions to support conservation of the soil and water resources of the Bakhtegan Basin and increase climate resilience. Specific budgeted activities include:
 - a. Design and construction of water harvesting ponds and terracing in targeted areas of the basin
 - b. Artificial recharge of depleted aquifer, through rainfall trapping and pitting, in target sub-basins where groundwater level is low
 - c. Cultivation of medicinal plants in degraded rangelands of about 300 ha in the vulnerable Zagros mountains
 - d. Afforestation and revegetation in 400 ha of degraded areas in Zone 4 to combat desertification
- **Extension, communication and education:** A comprehensive extension, communication and education programme (through Output 1.4) to disseminate results and information as widely as possible throughout the Bakhtegan Basin, with a focus on role of rural women and the youth.

Output 3.2 – Landscape rehabilitation to restore functionality of ecosystem services to increase climate resilience.

138. The Bakhtegan Basin includes three general types of ecosystem which can be defined by their water status: aquatic, semi-aquatic and dryland. While many of the aquatic and semi-aquatic ecosystems are now mostly dry, these general types will be used to establish project activities aimed at enhancing the natural environment of the basin and building greater resilience to climate change.
139. Aquatic and semi-aquatic ecosystems in the basin include the Kor and Sivand rivers and their tributaries, Lakes Bakhtegan and Tashk and the Kamjan Marshes (abbreviated to Bakhtegan Wetland). The three lakes, their delta and spring-fed marshes are designated as Wetlands of International Importance by the Ramsar Convention on Wetlands. They are located in Zone 4 and are also referred to as the Neyriz Lakes and Kamjan Marshes covering an area of 1080 km². The Bakhtegan-Taskh National Park is within this area, which also encompasses a wildlife protected area. Semi-aquatic ecosystems are those in the basin that can be seasonally wet and are used as habitat by migratory birds and also by farmers with water buffalo. This includes the Margoun waterfall protected area in Zone 3 which is located in western part of Bakhtegan Basin. Dryland ecosystems are divided between National Parks and Protected Areas, which are managed by DOE, and rangelands and forest areas which fall under the Forests, Range and Watershed Management Organisation (FRWO) of Iran. The main dryland area that falls under DOE is the Bamou National Park in Zone 3, which occupies an area of 486.78 km². Additional dryland areas are: Tang-e-Bostanak protected area in Zone 2 which is located in the northwestern part of the basin; Basiran hunting prohibited area in Zone 1 in the north and KouhSiah-Arsanjan hunting prohibited area in Zone 4.
140. All three ecosystem types have been disrupted by the combined effects of mismanagement of water resources, intensification and extensification of agriculture and the extended dry period that has been experienced since 2007, with serious impacts on and threats to ecosystems. The drought resulting in the drying of water sources used by wildlife for drinking, including springs and some small water ponds, which has been sustained since then along with serious depletion of food supplies.
141. Wetland systems are vulnerable to changes in quantity and quality of their water supply, and it is expected that climate change will have a pronounced effect on wetlands through alterations in hydrological regimes with great global variability. Wetland habitat responses to climate change and the implications for restoration will be realized differently on a regional and mega-watershed level, making it important to recognize that specific restoration and management plans will require examination by habitat.
142. The Kamjan Marshes previously covered about 10,000 hectares of permanent and seasonal aquatic habitat. Drainage began in 1967, principally for rice cultivation. There has subsequently been some rehabilitation work done with drainage systems from surrounding arable land being conducted into the wetland. A negative consequence of this has been the transfer of agro-chemicals into the wetland environment. There are pressures and tensions in the environs of Bamou National Park, the Bakhtegan National Park and wildlife protected area, the Margoun waterfall protected area, the Tang-e-Bostanak protected area, the Basiran hunting prohibited area and KouhSiah-e-Arsanjan hunting prohibited area between

surrounding farmers and DOE rangers. Drier conditions due to the impact of climate change, have also increased the risk of wildfires and also reduce water and food availability for wildlife who then encroach into settled areas.

143. This project will benefit from experiences distilled from two GEF projects implemented in Iran: Conservation of Iranian wetlands project and Conservation of Zagros mountains landscape. The common feature of the two project is the participatory platform provided for effective participation of stakeholders relating to both forest/rangeland and wetlands ecosystems. From a technical perspective the experience from the wetland project will be used for aquatic ecosystems and the Zagros project experience will be used for upper basin land, forest and rangeland ecosystems. Inputs from both are essential to a truly integrated, holistic, approach to land and water resource management throughout the basin.
144. The project will build on past efforts in the Kamjan Marshes, Bamou and Bakhtegan National Parks, Margoun waterfall and Tang-e-Bostank protected areas and both Basiran and KouhSiahArsanjan hunting prohibited area with a strong emphasis on participatory engagement between the DOE other related authorities and local communities. Such an approach is essential to recover and maintain ecosystems services in the basin that will enhance climate resilience not only of the communities relying on these services but to the natural environment itself. The Conservation of Iranian Wetlands project (DoE/UNDP joint project) has already supported development of the "Bakhtegan Wetland Basin Integrated Management Plan" through a participatory approach in which main governmental, private sector and local community were involved. The plan has been recently approved at provincial level. All the activities to be undertaken in the protected areas will be done in compliance with the relevant national laws and in close consultation with the DoE, the agency responsible for protection of protected areas. Some of the identified activities under this output have not been detailed out intentionally during the proposal preparation phase, as the DoE emphasizes that working in multidimensional and complicated ecosystems like wetlands needs an adaptive management due to the inherent uncertainties that complicate natural resources management efforts, and offers a strategy for filling information gaps during project implementation. This approach will be useful in addressing environmental problems characterized by incomplete understanding and dynamic systems like wetlands within a protected area framework. The activities will be subject to full screening to AF Principles, and treated as Unidentified Sub Projects. Please refer to ESMF in Annex 10

Activities under Output 3.2 provisionally include: Approx. 30,000 ha of the Kamjam, Tashk and Bakhtegan target areas will be rehabilitated with participation of the local communities, especially women and youth, to develop the Bakhtegan Wetland Basin Integrated Management Plan, through the following activities:

- A study of Bakhtegan Wetland water rights will be conducted provisional upon initial agreement among main stakeholders and in a consultative process in the wetlands located in Zone 4 (Kamjan, Tashk, Bakhtegan). This study will contribute to improved hydrological regime of degraded wetland that is critical for flood attenuation. Water rights in the wetlands will be calculated and considered within the water allocation of the basin. At least 50 percent of the Bakhtegan wetland water rights will be realized at the end of the project. This will be done by calculating, monitoring and executing national protocols and guidelines for water rights allocation. This activity is linked with outcome 1 and 4 and realization of wetlands water right will be result of decision made and implemented through governance mechanisms. Output 2.1 and 2.2 aim to provide a practical platform for better use of water and realization of water right in downstream.
- Rehabilitation of at least 30% of Bakhtegan through the following activities:
 - a. Establishing and supporting mechanisms to secure flow of saved water in the basin to realize the river and wetlands ecosystem water right
 - b. River ecosystem re-naturalization in key areas to ensure water flow to the wetland
 - c. Restoring existing small-scale drainage/channels linked to wetlands to increase water inflow to the wetland;
 - d. Water treatment in drainage/channels linked to wetlands to improve the quality of inlet water;
 - e. Development of a Climate Resilient Wetland Rehabilitation Action Plan
- **Monitoring impacts of climate change on biodiversity in targeted basin protected areas:** To strengthen understanding of the impacts of climate change on ecosystems and habitat loss, the project will set up a Bakhtegan Basin Protected Areas Monitoring System covering at least 70% of the total targeted PAs through the following:
 - a. setting up a framework of biodiversity indicators to monitor the changes in habitats resulting from climate change, in the targeted protected areas and national parks (Kamjan Marshes, Bamou and Bakhtegan National Parks, Margoun waterfall and Tang-e-Bostank protected areas and both Basiran and KouhSiahArsanjan hunting protected area). These indicators will provide information and data of the effect of drought/ climate change on key fauna and flora species which could include: annual mammal census, mid-winter bird census, spring animal breeding monitoring, wildlife disease monitoring, springs and watering place monitoring, landscape monitoring in hunting prohibited areas (depth, quality and biological parameters). The monitoring system will be established building upon the work of the rangers in the target areas, equipped with monitoring equipment, that will gather data and biological parameters.
 - b. The data will be analyzed by DoE provincial staff. Based on the main results of time series of data and information reviewed and analyzed, DoE will share messages and policy advice to related Ministries' local offices to take necessary action to address impacts of drought/climate change on protected areas.
- **Ecosystem rehabilitation to reduce climate change impacts:** Ecosystem based adaptation activities to reduce climate change impacts on selected protected areas will be implemented in the Bakhtegan Basin (Bamou and Bakhtegan National Parks) to mitigate human-wildlife conflicts, control of wildlife disease, etc., involving:
 - a. Construction and reconstruction of 20 artificial watering small ponds/troughs to reduce the impact of drought on wildlife

- b. Rehabilitation of the wildlife habitats in the dryland ecosystem national parks through afforestation activities in Bakhtegan and Bamous National Parks
- c. Biological stabilization of margins of the wetland area by at least 50% by planting of native species (that cannot be restored in the short term) to control the sand and dust storm sources

As elaborated above, most of output 3.2 have clear identified activities and processes. However, working in complex ecosystems like wetlands comes with inherent uncertainties and require adaptive management that offers a strategy for filling information gaps during project implementation. This output is also closely connected with other outputs. For example, planning for realizing wetland water rights is linked to decisions made in component 1 and 4. Hence, sub-activities under output 3.2 need flexibility to adapt with results from other outputs and hence cannot be defined during the project preparation phase. All unidentified sub-projects will be screened against the AF's 15 principles as elaborated in the ESMF in Annex 10.

Component 4: Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures

- 145. Iran is yet to develop an official national climate change action plan. So far the country has envisioned climate change within the broader objective of achieving sustainable development. This vision was incorporated into the 2025 Vision of Iran, the Fifth Five-Year National Development Plan, as well as in other macro policies and sectoral plans. The 2025 Vision of Iran introduces a number of key objectives in areas such as culture, politics, economy, defence, education and environment. The document notes Iran should be a developed country that ranks as number one in the region by 2025. The Sixth Five-Year National Development Plan (SYDP) covering 2016 to 2020 mandates all relevant ministries to develop and implement programmes leading to reduction of GHGs and to manage the adverse impacts of climate change over water resources, agriculture and forestry, human health, biodiversity and coastal zones. The sixth FYDP is currently under development.
- 146. The National Rules of Procedure for Implementation of the UNFCCC and the Kyoto Protocol were approved in 2009, and revised in 2012. These National Rules of Procedure provide a path for implementation of climate strategies and the climate action plan, which mandates all ministries and organisations to incorporate climate change considerations in drawing up their development plans. The National Climate Change Committee (NCCC) is responsible for implementation of climate strategies and action plans. It comprises the deputy ministers of the most relevant ministries, under the responsibility of the Department of Environment. The Committee is organised into sectorial working groups, as well as an inter-sector layer, which ensures that the policies and projects promote climate change adaptation and mitigation across areas, as well as across regional and provincial spheres.
- 147. Within the above context there is currently a fragmented approach to land and water resource planning at national level, with no explicit consideration of climate change. There is therefore a need to carry out water management from a more integrated and less segmented focus, in which all the disciplines that rely on water in one form or another meet and are represented, with climate change fully considered and accounted for. Neither water resource plans nor land use plans currently give sufficient attention to territorial needs due to the absence of specific mechanisms in the current water resource planning process. This situation directly affects the instruments for territorial planning in areas such as the Bakhtegan Basin. At the local level, within the Bakhtegan Basin, this fragmented, sectoral, approach is therefore perpetuated. This situation arises from and results in the competitive compartmentalization between management administrations for water, agriculture and the environment. The need, in a twenty first century context with climate change, is therefore to shift from the current situation of fragmentation and artificial division to one of interdependence and cooperation. This can be achieved in this project through an integrated, multi-administration, approach to land use planning and water resource management. An important mechanism for facilitating this is a basin wide council, the Bakhtegan Basin Council, which is responsible for coordinating effective planning and timely decision making across all relevant sectors.
- 148. The above represents a refinement of traditional 'top down' decision making structures and while an essential ingredient for more effective and timely planning and decision making the important role of households and communities cannot be ignored. For this project to truly be successful, not just within its lifetime but to be of enduring benefit for the whole of the Bakhtegan Basin, it is essential that there is strong involvement and empowerment of local people from throughout the basin.
- 149. A key gap that has to be addressed to ensure that this Component delivers as effectively as possible in support of the remainder of the project, is the widespread need for education, capacity building and communications. This is required at local community level all the way through to senior decision makers at Fars Provincial Government level. This therefore forms the first Output of Component 4.
- 150. Adaptive management will be overseen by the Governance body of the project – Project board / Steering committee – As this committee consists of government bodies and UNDP it will ensure that adaptive management is in line with government, AF and UNDP policies and regulations. The strategy is to use the reporting milestones (PPRs, MTR, monitoring missions) to assess progress and suggest any required changes to the Project board for approval.

Component 4 consists of the following Outputs and Activities:

Output 4.1: A comprehensive communications, education and capacity building programme on climate resilience is implemented

- 151. Output 4.1 will draw directly from data and information collated under the GIS platform and disseminated through TIPS (Output 1.4) as a basis for supporting Outputs 4.2 and 4.3 and the project as a whole. The two key elements of Output 4.1 are: education and capacity building; and communications. These two elements have been brought together within this Output to form an essential part of Component 4 that are integral to all three other Components. While targeted and

tailored for different audiences, the two key elements to this Output serve a common purpose of ensuring that all stakeholders throughout the basin develop a much deeper understanding of the issues and challenges they are facing and the solutions that are required and are empowered to take action. They are therefore designed to ensure that the project doesn't simply support a set of discrete activities that have a finite life and thus no enduring benefit beyond the project.

152. Education and capacity building will be targeted at participating farmers, households and communities as well as participating local government authorities. This will specifically include education and capacity building that is conducted in a fully participatory manner aimed at both understanding more clearly the problems and what is required to develop and implement solutions. The focus on the problems will be on both the underlying conditions and situation throughout the Bakhtegan Basin and the already changing climate conditions, and likely future climate change and associated climate risks and impacts. The focus on the solutions will be on developing a clear understanding of what is required to build environmental, social and economic resilience throughout the basin.
153. Documenting lessons learned and developing learning objectives and indicators will be an important part of a comprehensive communications, education and capacity building programme under output 4.1. This programme will be developed in a way that addresses the learning needs within project life cycle as well as documenting project achievements and lessons learned for further scaling up after the project has been completed.
154. Communications will involve the use of multi-media platforms, including social media, to ensure that data and information relating to the project, and results generated through the project, are communicated widely throughout the Bakhtegan Basin.

Activities under Output 4.1 include:

155. Education and capacity building will involve development of resource materials based on information shared through TIPS (refer to Output 1.4 for details), training of facilitators, and facilitation of participatory workshops with all identified target groups and participating authorities. As the project progresses further workshops will be facilitated, together with farm and other field site visits, to share results more widely.
156. Organize a series of raising awareness workshops for women farmers on sustainable agriculture, cultivation of resistant species, participatory IWM approaches, links between health, food security and water use, good practices of women's engagement in IWM;
157. Communications will include the use of video to share stories within the basin and more widely, publication and dissemination of training materials, brochures and posters, sms messaging, television programmes and communication through the arts (e.g. poetry and painting).

Bakhtegan Basin Council is formed to facilitate the long-term sustainable and climate resilient management of the Basin

158. The proposed governance structure for the project and beyond is based on the existing management plan for the Bakhtegan-Tashk Lakes and Kamjan Marshes that has already been prepared by the DoE of Fars province and UNDP of Iran to combat drought. The intention to build on this existing mechanism represents a focus on ensuring participation of all relevant stakeholders to address the consequences of water and land resource mismanagement and adapt to the unfolding negative impacts of climate change in the Bakhtegan Basin. This includes working to ensure maximum participation from local people and authorities to support a bottom up approach management mechanis

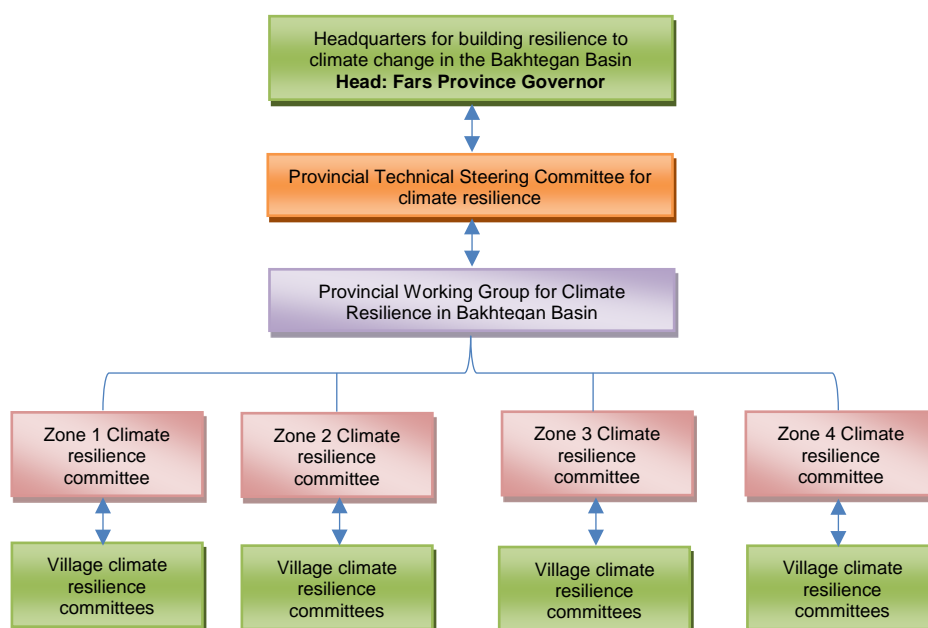


Figure 10: The proposed governance structure for the Bakhtegan Basin

159. The proposed governance structure is shown in Figure 10. At the highest level in Fars Province the Fars provincial governor, as the highest local official, will oversee the project's goal of building resilience to climate change in the Bakhtegan Basin. The Director General of the DOE in Fars Province will serve as the secretary. Head of all related provincial agencies are member of this structure align with province planning council as the highest decision taking mechanism at provincial level. Ministry of foreign affair is a member of project board and could be invited to these meeting accordingly Under this provincial leadership there will be a working group that is headed by the Director General of the DOE from Fars province. The Provincial Working Group will be made up of county level representatives from Marvdasht, Arsanjan, Neyriz, Kherame, Estahban and Pasargad counties. From each county it will include the local governor, head of DOE, head of water and sewage system (MoE), MOJA and head of the natural resources office. Local NGOs and women's cooperatives will also be represented. Most importantly, a mechanism will be established for direct community input and engagement to ensure that decisions being made are workable and fully owned at the community level. It is noteworthy that no new management structure will be built to prevent any duplication in duties and responsibilities but existing legal mechanisms will be modified or strengthened for better climate change adaptation and embedding it within national budgeting and planning mechanism.

Activities under Output 4.2 include:

160. Establishment of a Bakhtegan Basin Council under existing Fars Province structures. This activity will build on existing Fars provincial structures and also the existing management plan for the Bakhtegan Wetland that has already been defined by the DoE of Fars province and UNDP of Iran. The functions of this existing taskforce will be extended to incorporate adaptation to climate change in the Bakhtegan Basin. This will require some capacity building of provincial officials, to be undertaken through Output 4.1, to increase their awareness of climate change within the context of the current land and water crisis in the basin and what is required to build resilience, with a specific focus on the project Components, Outputs and Activities.
161. Guided by recommendations from the National and Provincial Councils and responding to identified needs from local communities, the Bakhtegan Basin Council will take account of the following national, provincial and local realities:
162. Commission a thorough review of existing national/province frameworks and policies relating to climate change adaptation and land and water resources planning and management. This review will focus on identifying key gaps and needs, particularly in relation to the efficiency and effectiveness of current governance mechanisms from national level all the way through to local farmers.
163. Drawing on the results of the above review to establish an integrated water and land management system that incorporates considerations of climate change and natural elements of the total water cycle alongside the realities of human resource use. This will involve the use of a "national spatial strategy plan" approach based on natural water basins, which will be trialed in the Bakhtegan Basin. It will require a fully participatory approach among all stakeholders in the Bakhtegan Basin. To be effective this process must work from the ground up, as well as being informed by climate change and natural resource issues and constraints and the national policy and planning context. Outcomes from this will guide and inform the provincial environmental working group under the Environmental High Council of Iran at the highest national scale.
164. Alignment with relevant national plans and policies based on the resistance economy⁴⁶ and food and water security in Bakhtegan Basin within a climate change adaptation context;
165. Addressing the need for people to sustain their livelihoods within the context of the land and water crisis and associated impacts of drought and climate change within the Bakhtegan Basin and in a manner that supports environmental, social and economic resilience throughout the basin;
166. Addressing the necessity to protect and rehabilitate water, land and other natural resources for future generations.

B. Economic, Social and Environmental Benefit

167. The Bakhtegan Basin is one of the most drought prone agricultural areas of Iran. The worst droughts in recent decades occurred in 1999 to 2002 and then 2007. Subsequently there has been a decade of drier than average conditions. This period has been preceded by at least four decades of land and water resource mismanagement with the result that the hydrological system of the basin is collapsing. Farmers and their communities are struggling to come to terms with a situation where they are now living in what must be treated as a dryland environment which is increasingly being impacted by climate change.
168. The project has been designed to address the climate change issues that are now apparent with the intention that a pathway will be established towards resolution of the much larger underlying developmental issues. The latter includes, in particular, the drying of the Bakhtegan Wetland. It is a massive undertaking to try and restore this highly significant protected area and it is not even certain that this can be achieved given the current lack of surface and ground water recharge and the very high rates and increasing depth of ground water extraction. The project is therefore focused clearly on what can be realistically achieved within the context of the current dry land environment and with a range of communities throughout the basin, focused in particular on those who are most vulnerable.

⁴⁶The "Resistance Economy" is a concept declared originally by the Supreme Leader of Iran in his August 2012 speech to promote economic self-reliance, a strategy that would defeat the US-led efforts against Iran via economic and trade sanctions. https://en.wikipedia.org/wiki/Resistive_economy

Socioeconomic benefits

169. This project is recognised as being of national importance and it is expected that it will provide a model for other parts of Iran, building on the work of other relevant projects such as the Lake Urmia and Zagros Mountains projects. The Bakhtegan Basin, as the home of Persian Civilisation, is of high significance nationally. The symbolic and utility value of water is strongly embedded in Persian culture and therefore this project, through its location, will be of very high symbolic value to the whole of Iran. In particular it provides a unique opportunity to remind and re-educate as many Iranians as possible about the fragile nature of their environment, the impacts of climate change and the importance of using water and land resources wisely. Effective communication of the Bakhtegan Basin story, by helping foster mind-set changes throughout Iran, will therefore have widespread social and economic benefits.
170. Within the Bakhtegan Basin the current population of 854,093 people will benefit directly through increased awareness of the issues throughout the basin, the respective roles of resource mismanagement and climate change, and the solutions that are required. The results from Component 1 will be of particular importance in this regard. Output 1.1 will provide specific information on drought risk and the potential impact of climate change. This information will be applied within the context of a comprehensive review and revision of water and land use planning through Output 1.2. Additionally, local community monitoring through Output 1.3 will both enhance knowledge and awareness of participating communities and provide better community based information to enable more informed decision making. All of the data and information generated by these three outputs will be integrated and fed through an online information portal, which will provide a mechanism for its widespread dissemination and application throughout the Bakhtegan Basin.
171. The introduction of climate smart agricultural practices (Output 2.1) will be of direct benefit to 4425 farmers from 15 villages, covering 23,636 ha of land and be of indirect benefit to all 374795 rural people throughout the Bakhtegan Basin. Climate smart agriculture will be carefully targeted and tailored to address the different issues and needs that are evident in the four different zones of the basin. There will be a strong focus on the most vulnerable communities and households within Zones 1 and 4, which are both experiencing the worst effects of the current extended dry conditions. Zone 4 in particular is severely affected and there will be a strong focus in this zone. Some farmers are already taking action in terms of shifting to alternative crops such as safflower and expanding cultivation of others such as saffron. However, such activities are occurring in the absence of a basin wide coordinated response that is focused on added-value production systems that are more climate resilient. Output 2.1 will address this situation, firstly by supporting market research on the economic value of alternative crops and associated cropping practices. This is an essential component to the project, to ensure that there are strong economic incentives for farmers to both reduce the amount of land under cultivation and significantly reduce the amount of water that is being used. At the same time there will be a focus on developing a unique Bakhtegan Basin brand, which is targeted at discerning national and international markets for high value products that have environmental integrity. This market research will then be supported by action-focused research which specifically targets those crops and cropping systems that have genuine economic potential. Participating farmers will benefit directly from this research, with the expectation that there will be widespread adoption by other farmers once the benefits become evident.
172. The provision of support for alternative livelihood practices (Output 2.2) will directly benefit 11750 people in 10 villages, with a strong emphasis on the most vulnerable communities and households in Zones 1 and 4. Some villages and households have already been proactive in developing alternative livelihood practices and the project will focus on building on these existing initiatives. One example is mushroom growing, with the development of household level production systems. At present all of the mushrooms being produced are sold in the local market in Shiraz city and there is an informal view that there is scope for more. However, this requires proper market research to determine the real scope for expansion along with support for marketing and selling. A similar approach will be taken for all alternative livelihood options. As much as possible these options will focus not just on providing supplementary income to households, but on strong alternative incomes streams that are not highly dependent on land and water resources.
173. Environmental protection and enhancement in the Bakhtegan Basin is a huge undertaking within the context of the combined effects of the development context and climate change. This is particularly so when seeking to address the effects of drought and extended dry periods, which are both insidious and widespread. The direct social and economic benefits of all activities under Component 3 will therefore be localised to those communities that are associated with project activities, but it is expected that there will be indirect benefits to the whole Bakhtegan Basin. An important dimension to this will be the opportunity for developing success stories of environmental protection and enhancement which can be associated with the Bakhtegan Basin branding of value added agricultural products under Output 2.1.
174. Decision makers at all levels, including households and local through to national government authorities, will benefit through Component 4 from increased awareness of climate change within the context of the development situation and through strengthened governance structures for decision making. Increased awareness will be achieved through multiple approaches and platforms involving education, capacity building and communications. Increased awareness, coupled with strengthened governance structures, will ensure that timely and effective decisions are made to improve the social and economic situation in the Bakhtegan Basin.

Environmental benefits

175. The unique challenge of this project is to establish a pathway towards the aspirational goal of restoring the Bakhtegan Wetland in a manner that is achievable within the timeframe and budget of the project and sustainable beyond its lifetime. The whole project has been designed in this manner, taking account of the fact that the basin is now a dryland environment. By adopting a climate resilience emphasis within this context the intention is to shift people towards

livelihood practices that are beneficial both to the environment and to their communities. This is a very complex and challenging undertaking. Fortunately there is growing awareness of the issues and challenges and a willingness to take action. However, as is often the case, the awareness and willingness to act is currently strongest with those who are the worst affected. A big part of the challenge therefore is to also engage with those who are currently less affected and less willing to take action, to foster an understanding that they are all part of the same environment and that their collective actions can either be to the detriment or benefit of all.

176. The first step towards environmental enhancement is to develop greater awareness of the environmental issues and associated effects of climate change throughout the Bakhtegan Basin. This will be achieved through the combined work generated from Components 1 and 4 of the project. Firstly, people need to recognise that there is a problem. This will be supported through the local community monitoring (Output 1.3). Secondly, they need to understand the problem. This will be supported through all education, capacity building and communication activities through Output 4.1 which is based on data and information provided through Output 1.4. Thirdly, they need to own the problem and take action. This will be supported through all activities under Components 2 and 3.
177. The direct environmental benefits of climate smart agriculture will be enhanced management of 10000 hectares of agricultural land, involving at least 30 percent reductions in water use on all participating farms and introduction of more sustainable land management practices. This will result in decreased extraction of ground water, reduced demand on surface water resources, increased soil organic matter, reduced wind erosion and increased biological diversity in agricultural systems. The successful introduction of alternative livelihoods to 570 households in 10 villages will reduce dependence on agricultural production and therefore reduce demands for both land and water resources. This is particularly important in Zones 1 and 4 where there is encroachment into rangelands and protection areas, issues with saline water intrusion into groundwater (Zone 4 in the vicinity of the Bakhtegan Wetland), and over extraction of surface water (Zone 1) and increasing depth of ground water extraction (Zone 4).
178. Component 3 is directly focused on environmental protection, enhancement and conservation in selected areas of the Bakhtegan Basin. Under Output 3.1 this will involve participatory engagement with communities aimed at identifying and implementing specific measures that are designed to enhance the environment in the vicinity of their communities. These measures will involve a range of physical options and interventions including constructing various embankment dams (small earth dams) and check dams, groundwater artificial recharge projects, re-vegetation of rangelands and forest areas, contouring and strip cropping. Output 3.2 will focus on restoration and conservation work in protected areas and National Parks, focusing in particular on the Bakhtegan Wetland.
179. A crucial element to ensure environmental benefits are fully realised through the project is the development of awareness, knowledge and ownership of both the problems and solutions. This need to happen from the community level, and at all levels of governance within the Bakhtegan Basin. All activities under Component 4 are designed to ensure that such results are realised both throughout the lifetime of the project and beyond.
180. In a general perspective the approximate 900,000 people who are living in the basin, whose daily lives are increasingly impacted by the effects of climate change and drought, will benefit from implementation of a successful AF project in the long-term with having a better life condition through climate change adaptive governance mechanisms. In component 1 and 4 the project will provide a practical platform for all decision makers to work cooperatively through a climate resilience lens and for communities to adopt new climate resilient approaches which provide both local and basin-wide benefits. This outcome will provide a shorter impact on one livelihood of communities which will be targeted under decision made based on the scenario development tools. In component 2 In the short term and under output 2.1, 4425 people in vulnerable target communities will benefit from CSA project activities in pilot sites including more than 1500 female beneficiaries while under output 2.2 more than 900 women from identified target communities will be involved in sustainable alternative livelihood practices. The communities in selected catchment areas are direct beneficiaries of output 3.1 and communities in villages around the lake will benefit directly from output 3.2. these benefits are Social as they will have their opportunity to stay in their homeland as they are not losing their livelihood while there is economic benefit for them as previous experiences show that the amount of yield will be increased in most cases and there are environmental benefit as new approaches are completely environmental friendly specially in terms of fertilizer and pest management and in a long term can effect ecosystem and lake restoration. Under outcome 3 all resident of the basin will be benefited through restored/adapted ecosystem while local community in the rangeland, forests and around the lake have a short term social benefit through hope and opportunities provided to them to stay in their home land.

Gender Equality

181. The project was developed through various consultations in the target area, where the comments, feedback and needs from women were specifically identified in the workshops and reflected in the proposed interventions. The inclusion of output 2.2, is a clear indication of this approach as it will target and support women and women-headed households who are seeking to develop alternative livelihood practices (i.e. sewing, carpet weaving, dried fruit processing, traditional aviculture, and dairy products, etc.) with small-grants.
182. In addition, it is expected that throughout the project, women will play a vital role as part of the project management unit and as beneficiaries of the project to receive productive inputs (seeds, seedlings, etc.), to be active participants in meetings and workshop, by providing small grants to implement alternative livelihoods, and engage working in protected areas as rangers to gather biological data.

183. The project will promote the agency of women in the light that climate change impact differently men and women. For monitoring, disaggregated and measurable data related to empowerment of women has been incorporated. The gender disaggregated data is as follows:

Table 7: Gender disaggregated data of direct and indirect beneficiaries of AF project

Indicator	Direct beneficiary	Indirect beneficiary	Men	Women
Number of villages (disaggregated by households) in the Bakhtegan Basin with increased resilience to climate variability and change.		The entire population of Bakhtegan basin 854,093 people Indirect benefits to the entire population of the Bakhtegan Basin through communications and awareness raising	469,751	384,341
	At basin level and it target villages at least 900 women will be involved thorough alternative livelihood practices and more than 1500 will be involved in smart agriculture activities.			2,400
	At least 2700 youth will be benefitted from project activities by being involved in local technical cooperatives, smart agriculture and alternative livelihood projects.		1,620	1,040
1.3 Number of households and farmers regularly participating and using the community monitoring system.	40 villages, involving 13,011 households (Which 5,200 of them are Women) and 12,821 farmers (which 3,900 are women)		16,732	9,100
2.1 Number of farmers with climate smart agriculture practice	4,425 farmers and gardeners (1,325 women) from the 15 target villages will be practicing climate smart agriculture		3,100	1,325
4.1 Number of key beneficiaries and decision makers aware and trained by the project on wetland ecosystem services and climate change- related drought (disaggregated by gender).		The entire population of Bakhtegan basin 854,093 people Indirect benefits to the entire population of the Bakhtegan Basin through communications and awareness raising		
	At least 200 government expert/staff trained on climate change impacts and adaptation strategies (at least 100 women).		100	100

184. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.

Environmental and Social Risk Management

185. The project has been developed in accordance with the AF ESP. The project elements have been screened against the 15 principles that form the basis of the AF ESP. The details of the screening, potential risk and proposed high level mitigations are contained in the ESMF (Annex 10). UNDP will not support activities that do not comply with national law and obligations under international law, whichever is the higher standard.
186. A high-level pre-screening against the 15 principles determined that the project is of Moderate risk. This is based upon formulated projects, and for projects which are not fully formulated at this time, the generic impacts of projects of this type. It is important to note that full details of all components cannot be known until communities and other stakeholders have been consulted. Where this is the case, then the activities that have yet to be fully described are considered to be unidentified sub-projects (USPs). During implementation of the project, USPs will be defined and then screened to ensure that they comply with the AF ESP. The process for screening is described below in Section 3 of the ESMF.
187. An EMSF, a management tool used to assist in minimising the impact to the environment and society and reach a set of environmental and social objectives, has been prepared and included as an annex. The ESMF is aligned with the AF's ESP and principles and gender plan. It identifies relevant legislation, multi-lateral agreements, steps for screening

activities, potential environmental and social impacts, recommended mitigation measures, and proposed monitoring schedules.

188. To ensure the environmental and social objectives of the projects are met, the EMSF will be used by the project implementers to structure and control the environmental management safeguards that are required to avoid or mitigate adverse effects on the environment. The EMSF will be updated from time to time by the implementing Project Management Unit (PMU)/contractor in consultation with the UNDP staff and GoI to incorporate changes in the detailed design phase of the projects.
189. The project will include a complaints and grievance redress process. The project complaints and grievance process has been designed to be problem-solving mechanism with voluntary good-faith efforts. The Grievance Redress Mechanism is not a substitute for the legal process. 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.
190. 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
191. Main result and activities under each component have been elaborated in below table regarding the link with CC effect and risk management

Table 8: Climate Change effect and risk management

Outcome #	Main delivery/activity	Description in line with CC adaptation and Risk Management
1	<ul style="list-style-type: none"> to acquire technology and a practical methodology for MoE to generate climate change scenarios nation-wide and for the Bakhtegan Basin a climate risk-informed Water and Land Use Planning framework will be developed 	<ul style="list-style-type: none"> These are the tools will inform governance mechanisms to support linking CC effect to medium- and long-term decision-making processes both at national and local level and will provide an enhanced tool for further plans and programs in line with evolving risks of climate change
2	<ul style="list-style-type: none"> climate smart agriculture systems will be introduced and practiced among affected local community Introduction and support alternative livelihoods to move away from water-intensive agriculture practices 	<ul style="list-style-type: none"> Climate smart agriculture increase the resilience of the agricultural systems and livelihoods to climate change – in particular the rising temperatures, reduced rainfall, and droughts. As the agriculture section is the main user of water in the basin (more than 80%) Low water efficiency (less than 30%) in the agriculture sector provides a key entry point for adaptation involving implementation of low cost techniques/technologies by a large number of farmers. The process of introducing SA techniques to the farmers include i) Development of Participatory Action Plan engaging Farmers, Facilitators, Agriculture Researchers and, ii) Implementation of water management techniques, emphasizing on water saving at farm level iii) Implementation of soil fertility techniques, iv) emphasizing on application of biological fertilizers rather than chemical fertilizers; v) Implementation of crop protection techniques, emphasizing on application of biological pesticides rather than chemical pesticides and pollutants; vi) Supply and installation of monitoring equipment and measuring instruments to enhance water consumption management Sustainable Alternative livelihood practices increase the resilience of local community for effect of CC on their livelihood through shifting to water independent livelihood. All the above CSA and sustainable alternative livelihood practices are environmentally friendly practices in small scale which are discussed by local community and verified by related authorities (mainly DoE) to prevent any maladaptation activities. This outcome is in line with decision made in outcome 1 and 4 to support fast track actions and ensure sustainability in the future
3	<ul style="list-style-type: none"> to establish climate risk-informed Integrated Watershed Management framework 	<ul style="list-style-type: none"> Integrated Watershed Management will support to improve management of water at watershed scale under conditions of increasing evapotranspiration and reduced rainfall. It also helps increasing resilience of communities in the rangelands for CC affects.

	<ul style="list-style-type: none"> ecosystem-based adaptation through restoration of the functionality of ecosystem services 	<ul style="list-style-type: none"> Restoration of the functionality of ecosystem services is increasing resilience of both local communities around the lake and biodiversity against the affect of a drying lake.
4	<ul style="list-style-type: none"> enhancing the capacities of the relevant stakeholders in improved, climate-risk informed water management and governance 	This is critical to not only sustain the investments made across the other project components but to ensure that long-term planning and governance to advance water security and agricultural resilience takes into account evolving climate risks. While the government is pursuing investments and policies to develop resources and capacities, currently the additional risks and impacts of climate change are not taken into account

C. Cost-effectiveness

192. As a predominantly arid country that is highly dependent on its agriculture the cost of drought in Iran is very high. The estimated cost of the prolonged drought from 1999-2002 was US\$3.5 billion. This situation is likely to worsen rather than improve based on a number of key factors unless proactive measures are taken. These include: rapid population growth; a strong focus on agricultural production within Iran; deforestation and land degradation; over-exploitation of surface and ground water resources and climate change. The most cost-effective solution to address this situation within the context of climate change adaptation is to adopt an integrated landscape management approach which includes strong participatory engagement with affected communities. This project is therefore focused on an integrated, participatory, approach to climate change adaptation in the Bakhtegan Basin as a successful model for other regions of Iran.
193. The situation in the Bakhtegan Basin, as with other regions of Iran, involves a complex of interacting factors with climate change having an increasing influence. Historically, as a result of the agrarian reforms of 1961-1972, there was a destruction of social capital in farming communities. Subsequently there has been a strong focus on increasing agricultural production with little attention, until more recently, to the need for farmer education and the need to address the growing environmental costs. Iranian farmers on the whole have limited understanding of markets and the environment and lack the capacity to produce food in a sustainable and climate smart manner. Physical constraints to agriculture include “*water scarcity, drought, soil erosion, fertility decline, plant pests and diseases, natural disasters, variable temperatures, dispersed farm plots, unstable markets and arbitrary price policies, and lack of access to credit, innovations and inputs.*”⁴⁷ Many of these factors are increasing, with climate change exacerbating an already fragile situation. Although not quantified in the Bakhtegan Basin the combined cost of the above factors is very high. The current situation is one of positive feedback where continued environmental degradation, lowered production, reduced water availability, and high social costs are resulting in increasing pressure on the natural environment leading to further environmental degradation and increased vulnerability of households and communities.
194. While there has not been any detailed analysis of the socioeconomic consequences of drought at the household level in the Bakhtegan Basin, a recent study⁴⁸ made in Sabzevar County, Khorasan Razavi Province, in north-eastern Iran provides valuable insights. This study assessed villager responses to 29 economic variables and 28 social variables. The economic variables were grouped into seven main components covering the amount of production, quality of production, costs of natural resources (losses), production costs, costs of living, overall level of living, and investment. Similarly the social variables were grouped into seven main components covering quality of life, poverty or income, employment, psychological tensions, public safety, crime and delinquency, and social damage. Overall, the socioeconomic costs were significant and high and mirror those that have been qualitatively identified in the Bakhtegan Basin for each of the four Zones.
195. Doing nothing is clearly not an option. At the same time the complexity of issues makes it clear that there are no simple solutions, with the need for “*sustainable strategies in natural resources management (NRM) and agricultural and rural development at multiple levels.*”⁴⁹ This requires an approach that recognises the continued importance of agriculture to Iran, the resource constraints on agriculture, the underlying development issues, the increasing role of climate change and the importance of engaging rural people in both understanding the problems and being an integral part of the process of identifying and implementing solutions. Such an approach has been adopted through the Lake Urmia project (see Section F) and has proven to be highly successful.
196. As already explained in previous Sections and in the opening paragraph of this section the realistic and most cost-effective approach for this project is to focus on what is achievable within a climate change adaptation context. While the restoration of the Bakhtegan Wetland is an important aspirational goal, a more achievable goal is to build on existing initiatives and successes with the Bakhtegan Basin aimed at building resilience to the dryland environment that now exists.
197. At an operational level the cost-effectiveness of the project is reflected in the following ways:
- A governance body is proposed at the local level which will be supported by three government ministries (DOE, MOE and MOJA) at national and provincial level with required technical expertise;

⁴⁷Karamidehkordi, Esmail, 2010. A Country Report: Challenges Facing Iranian Agriculture and Natural Resource Management in the Twenty-First Century. *Human Ecology*, 38: 295-303

⁴⁸Darban-e Astane, A. R., &Azimpour, Gh. (2017). Evaluation of Farmers' Resilience Against Socioeconomic Consequences of Drought: A Case Study on Sabzevar, Iran. *Journal of Sustainable Rural Development*, 1(1), 27-38.

⁴⁹Karamidehkordi, Esmail, 2010. A Country Report: Challenges Facing Iranian Agriculture and Natural Resource Management in the Twenty-First Century. *Human Ecology*, 38: 295-303

- b. The project is building on past and on-going projects with proven track records, including past and existing initiatives within the Bakhtegan Basin;
 - c. The PMU will be based on the target area which will reduce costs and increase efficiencies.
198. Additionally, the generation of a comprehensive drought and climate change risk analysis, the development and implementation of targeted solutions through a participatory community planning process, and lessons learned will result in more informed public policy at both national and provincial level. This will result in more timely, integrated and effective responses to drought and climate change that also take account of the underlying development issues that are impacting strongly on local communities.
199. All elements of the project have been brought together in an integrated manner within the context that has been outlined above. Without exception every Output within the project is designed to build on existing tools, methods, mechanisms and initiatives. It is therefore strongly focused towards adding value, rather than building things from scratch. This is evident in each specific Output as follows:

Table 9: Proposed interventions and Alternative options / cost-effectiveness.

Output	Alternative	Cost – effectiveness
<p>1.1 An integrated model for climate risk and climate change assessment supports medium and long term decision making</p> <p>This output entails the customization of SIMclim software to develop climate change scenarios.</p>	<p>Option 1: Commission climate change scenarios to national /international consultancy companies any time these are required.</p> <p>Option 2: Supporting Business as Usual practices in Iran which involves disparate development and application of climate change scenarios for different parts of the country by separate consultancy firms or universities.</p>	<p>Output 1.1 is focused on the customisation and application of an existing, well-proven, tool for integrated analysis of the impacts of climate change in the Bakhtegan Basin. An important element of this Output is to build the capacity to readily replicate such work throughout Iran by Government staff.</p> <p>Option1: The alternative option is highly reliant on an external consultant that is 1) high in costs in the long term with climate change scenarios that can be quickly outdated, and 2) not building capacity at Government staff level in Iran.</p> <p>Option2: There is no consistency in the scenarios used, some are out of date and in some cases, there is selective use of scenarios. Because of the disparate, and uncoordinated nature of this approach, the results generated are confined to research papers and are not usually used for decision making processes.</p>
<p>1.2 A land and water use planning framework is developed and implemented to support decision making.</p> <p>The LWUP framework envisions: -Analysis of existing land-use and policies by using remote sensed data and GIS analysis -Analysis of existing water resources (surface and sub-surface).</p>	<p>Option 1: Commission separately all analysis as per each Ministry's mandate (MoE, MoJA, or DoE) and focus only in this specific mandate (i.e. energy, agriculture or environment) when developing policies towards water management in Fars province.</p> <p>Option 2: Budget for a foreign consulting company to develop a comprehensive land and water planning framework.</p>	<p>Output 1.2 is aimed at conducting an in-depth review and revision of water and land planning resources in the Bakhtegan Basin to develop a framework that combines the current status of water (surface, sub-surface, groundwater), current uses and extrapolating to expected climate change impacts. This will inform policy-making decisions at the provincial and district level. This will be the first attempt to have MoJA, MoE and DoE developing an integrated framework aimed at better management of water resources in Fars province in the context of drought.</p> <p>Option 1: One alternative option is to keep a siloed approach with each ministry moving ahead with their own mandates and agendas when in reality the current drought needs to be analyzed and addressed from diverse angles with a comprehensive framework that links the current status of water, water use and climate scenarios.</p> <p>Option 2: The basin could benefit from the input of a completely un-biased group of technical experts, with no affiliation to the goals of any particular ministry. However, there are two major short-comings to this approach: i) it would cost significantly more to bring in foreign expertise; ii) it would not foster the collaborative process that has already begun between the three participating government ministries and the development of in-country capacity and skills that is essential for long-term ownership of the problem and solutions.</p>
<p>1.3 Community engagement, empowerment and ownership in decision making is supported through local community monitoring.</p> <p>The project will develop a participatory monitoring system to facilitate tracking changes on agreed indicators by targeted</p>	<p>Option 1: Establishment of set of indicators at relevant ministries to be monitored, reported, analyzed, disseminated and used in policy-making.</p> <p>Option 2: Outsource the monitoring system of set of indicators to a research institute and/or university.</p>	<p>Output 1.3 is focused on engaging local communities and CBOs directly in monitoring their local environment as a cost-effective means of data and information gathering as well as building local ownership and increasing awareness among communities from both the upstream and the downstream areas of the basin where the perception of water resources (and the scarcity of these) is vastly different.</p> <p>Option 1: This option lacks two important elements: 1) the process to raise awareness from the consumer/end-user standpoint about the real impacts of the drought in the entire basin as an interconnected system (zones in the upstream don't realize the harsh impacts on the drought, while zones downstream are suffering already the impacts of the drought), 2) the ownership of the process, as the land and water resources are the main source of livelihoods in the basin.</p> <p>Option 2: This alternative is unviable as Ministries will not be able to formally delegate their mandate to monitor indicators on environment, energy and agriculture to another entity.</p>

communities and households.		
1.4 A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making	<p>Option 1: To have each participating Ministry (DoE, MoE and MoJA) using different data and information systems.</p> <p>Option 2: Outsource the data/information management to a national company/consultancy</p>	<p>Output 1.4 is designed to ensure that all data and information generated through the project is readily available and accessible for timely use in education, capacity building, communications and decision making at all levels.</p> <p>Option 1: This option is not cost-effective as it would entail 3 different systems to capture data and information and that will only focus on information related to each Ministry's mandate (i.e. energy, agriculture or environment) prompting on-going silos in policy-making efforts.</p> <p>Option 2: The information to be generated and compiled during the project lifetime will be sensitive as will be used for public-policy purposes during and after the project. Based on the nature of the information, if the information management system is outsourced it will increase higher costs (during and after project closure) to maintain the system running and will increase the risk of limiting ownership of DoE, MoJA and DoE to use information not monitored internally.</p>
2.1 Climate smart agriculture practices are adopted in target areas	<p>Option 1: Move away entirely from water-intense agriculture practices in the basin.</p> <p>Option 2: Support a past initiative in the country involving high tech irrigation systems to reduce water consumption in the agriculture sector.</p>	<p>Output 2.1 is focused strongly on encouraging farmers away from agricultural production systems that have high water demands and are leading to continued degradation of both land and water resources. Based on market research it is strongly focused towards added-value and environmentally friendly production systems that are climate smart and linked to markets.</p> <p>Option 1: The alternative option is unviable as it will be 1) too costly – economically and socially - to move away entirely from agriculture-based livelihoods to other sectors, 2) given that rice is intrinsically related to the Iranian diet with a strong national market, and 3) that farmers have passed their knowledge on traditional rice production generation by generation and new skills would require a high investment plus social acceptance.</p> <p>Option2; This approach was tested and supported by the government for several years but without sufficient technical support and financial support from the government the high-tech technologies could not be implemented as a sole solution to the problem.</p>
2.2 Alternative livelihoods are adopted by women/women's cooperatives in target villages	<p>Option1: Promotion of alternative livelihoods through micro-credits in the basin.</p> <p>Option 2: Involving the private sector with large investment to introduce new job opportunities</p>	<p>Output 2.2 is focused on providing strong support for alternative livelihoods, with a strong focus on women and women-led households, which are aimed at reducing negative impacts on the environment and increasing household income as well as providing strong economic benefits that in the long-term will provide them will means to join the micro-credit market.</p> <p>Option 1: This option could potentially support beneficiaries to move away from water-intense agriculture livelihoods, however the micro-credit banks will not be able to reach the most vulnerable group: extreme poor woman, as most of them lack collaterals and creditworthiness to access any micro-credit as explained in the GAAP.</p> <p>Option 2: This approach was supported by the government for a while but wasn't successful for two main reasons: i) the sense of ownership was not strong among local communities, ii) addressing ecosystem vulnerability is not a priority focus for large businesses and the risk of investment was high.</p>
3.1 A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks	<p>Option1: Move away from agricultural land to conservation of area / protected area status.</p> <p>Option 2: Supporting a dedicated engineering approach for adaptation to climate change impacts.</p>	<p>Output 3.1 will develop and implement an Integrated Water Management (IWM) framework along with the installation of traditional water ponds to harvest rainwater both for domestic supply and to enhance crop, livestock and other forms of agriculture. In addition, terracing practices will be promoted to prevent erosion of soils while retaining rainfall/soil moisture in agricultural landscapes.</p> <p>Option 1: IWM is a new approach to be replaced by older solely conservative /exploitation methodologies which were completely sectoral and did not lead to sustainable management of forests and rangelands. The new approach emphasizes the need to go beyond conservation technologies engaging with diverse stakeholders to include multiple crop-livestock interventions that support and diversify livelihood opportunities for the most vulnerable and create synergies between targeted technologies, policies and institutions to improve productivity, resource use sustainability and market access.</p> <p>Option 2: This was the usual practice in the past and is still supported by some relevant authorities because of fast and tangible results. However, such approaches do not consider the long term and wider impacts but rather aim to solve the immediate problem and the immediate needs of communities... In essence it has led to maladaptive outcomes.</p>

3.2 Landscape rehabilitation to restore functionality of ecosystem services to increase climate resilience.	<p>Option 1: Creation of more Protected Areas (PAs) in the Bakhtegan Basin ensuring connectivity among PAs systems to avoid encroachment and to ensure native flora and fauna protection.</p> <p>Option 2: Focusing on only endangered species</p>	<p>Output 3.2 aims at the rehabilitation and establishment of an ecosystem monitoring system within all targeted protected areas to provide information and data of the effect of drought/ climate change on key fauna and flora species. In addition, the project will support the rehabilitation of selected wetland areas and biological stabilization of margins of the wetland area by planting of native species.</p> <p>Option 1: The alternative option will involve 1) more donor and/or government funding to establish and maintain the new PAs to avoid encroachment, 2) relocation of all communities living in the new established PAs, 3) development and funding of compensation mechanisms for the relocation of communities, 4) social unrest if communities are not willing to move.</p> <p>Option 2: This is a narrow, short-term, approach which does not protect natural ecosystems and species from the long term impacts of climate change.</p>
4.1 A comprehensive communications, education and capacity building programme on climate resilience is implemented	<p>Option1; Each participating Ministry develop their communication, education and capacity building programme around their mandates (i.e. energy, agriculture or environment) to reach their core audiences in the basin.</p> <p>Option 2; Focusing only on local community public awareness activities</p>	<p>Output 4.1 is aimed at ensuring everyone in the Bakhtegan Basin is informed about the issues and challenges being faced and solutions that are required and being implemented. An essential component to this Output is to build a sense of shared ownership throughout the basin.</p> <p>Option This option lacks the comprehensiveness of explaining and addressing the impacts of droughts from different angles and keeps promoting the work in silos for each participating Ministry.</p> <p>Option 2: Public awareness activities among local community are good but do not consider the ownership building that arises from capacity development and training for both local communities and government experts. Because it lacks this participatory element it ownership of issues is not developed and sustained among local communities.</p>
4.2 A Bakhtegan Basin Council is formed under an existing platform to facilitate the long-term sustainable and climate resilient management of the Bakhtegan Basin	<p>Option 1: To strengthen the current governance bodies around the Bakhtegan basin at the district level under the leadership of the Fars Governor to support water management-related efforts.</p> <p>Option 2: Create a new provincial governmental body covering the Bakhtegan basin</p>	<p>Outputs 4.2 is designed to ensure informed, timely and effective decision making at all levels by establishing a platform under an existing governance structure to focus solely on the basin.</p> <p>Option 1: The Bahtegan basin overlaps with many district's political boundaries in the Fars province and currently policy making efforts (and impacts of the drought in the basin) vary depending on the district. The alternative option is still a business as usual approach where the basin is not seen as an interconnected system and policies/initiatives fall short of addressing the issue in a comprehensive manner.</p> <p>Option 2: This alternative could involve creating a new government body that will require pollical and financial back-up to be formally created and the process will require few years to get approval an provincial and national level.</p>

200. The project is strongly focused on implementing cost-effective solutions that are of direct and immediate benefit with 85% percent of the budget allocated towards the implementation of actions aimed directly at improving the resilience of the natural environment and increasing the social and economic well-being of people and communities in the Bakhtegan Basin, particularly those that are most vulnerable.

201. The market assessment and value chain analysis to be conducted in the project will include a criterion for determining the cost-effectiveness of some of the USPs. This will include, but not be limited to, proximity of markets, availability of local materials, skill sets, etc, For eg., processing of fried fruits/vegetables will be undertaken in locations close to where they are produced/planted, or where local skills are available.

D. National and Sub-National Priorities

202. Vision 2025. The 20-Year National Vision of the Islamic Republic of Iran for the dawn of the Solar Calendar Year 1404 [2025 C.E.] has been defined as the “Vision 2025 document”. Its Article 43 address issues of sustainable development and the necessity of environmental protection in the development process of the country in relation to environmental and land administration.

203. Sixth Development Plan. On 19 March 2017, the “Law on the Sixth Five-Year Economic, Cultural, and Social Development Plan for 1396-1400 (2016–2021)” (the “Sixth Development Plan”) was approved by the Iranian Parliament. The development plan sets out the goals and objectives to be achieved by the country over the next five years. The plan addresses relevant water and environmental issues, which were identified as specific issues of strategic importance when the plan was submitted by the government to the parliament. Articles 45 to 47 address water-related issues such as the need for increased productivity, integrated water resources management, water needs, and determining suitable cultivation patterns to increase productivity and reduce water use. Also, Article 48 in the environmental section identifies the need for implementation of a program for the next five years aimed at protection, restoration and management of wetlands, with the participation of other executive agencies and with emphasis on wetlands that are registered under the Ramsar Convention. These above articles cover the core focus of this project, which are specifically addressed through Components 2 and 3.

204. National Strategic Plan on Climate Change. The first draft of the National Strategic Plan on Climate Change was launched in May, 2017. This plan includes strategies to both address the need to reduce greenhouse gas (GHG) emissions and to adapt to the impacts of climate change. Strategies of direct relevance to this project are summarized as follows:
- Food security and agriculture identifies the follows strategies: establish and improve climate smart agriculture to combat the negative impacts of climate change; develop plans, with climate change considerations fully integrated, for agriculture, horticulture, animal husbandry and fisheries.
 - Natural resources and biodiversity strategies include: climate based regional and rural development; integrating climate change considerations into the management structure for natural resources and biodiversity; empowering financial supporting systems.
 - Water resources strategies include: Strengthening the sectoral and multi-sectoral management and institutions for cooperation on water management; awareness raising related to climate change and water; sustainability of water demand and supply based within a climate change adaptation context.
205. Iran's Intended Nationally Determined Contribution (INDC). The Vulnerability and Adaptation section of Iran's INDC identifies the following key climate change vulnerabilities, which are aligned with the main issues identified in the Bakhtegan Basin:
- Reduction of the levels of agricultural production;
 - Sharp drops in surface runoff and underground water storage;
 - Increase of mean temperature with its consequences (heat exhaustion and spread of some diseases);
 - Increased hot-spots of dust and sand storms (with high health and industrial adverse impacts);
 - Extreme vulnerability of biodiversity and natural resources are some of the direct and indirect extreme impacts of climate change.
206. Iran's second National Biodiversity Strategy and Action Plan (NBSAP2, 2016-2030). The vision for Iran's second National Biodiversity Strategy and Action Plan (NBSAP2) 2016-2030 has four strategic goals, 24 national targets and 99 actions. The four strategic goals are:
- Strategic Goal 1:** Mainstreaming biodiversity across government and society and promoting awareness and public participation to achieve sustainable development goals;
- Strategic Goal 2:** Integrated biodiversity monitoring, assessment and reporting;
- Strategic Goal 3:** Reducing pressures on biodiversity and promoting sustainable use of natural resources;
- Strategic Goal 4:** Integrated conservation of biodiversity.
- The proposed project is aligned with all of these. The NBSAP2 recognises that as a result of excessive unsustainable development and population growth Iran is now facing serious environmental challenges including water shortages, desertification, habitat destruction, drying of wetlands, soil erosion and pollution. It further recognises that serious threats to biodiversity are arising from the combined effects of climate change, water shortages and the continuation of droughts.
207. Long-term Development Strategies for Iran's Water Resources. The following are relevant strategies from those approved in the Cabinet Council meeting dated October 19, 2003.
- National water management must be based on supply and demand management, integrated consideration of the water cycle, principles of sustainable development and land use planning in national and joint basins, and to realize integrated water resources management, various economic, social, infrastructural and service sectors must be coordinated with the water sector.
 - The utilization of Iran's water resources in each basin must be planned in such a way that the volume of the utilized underground water does not exceed the present utilized volume considering their tolerance. Therefore, structural and nonstructural actions must be taken to meet people's new demands to the extent that the utilized share of surface water resources increases from the present 46 percent to 55 percent within the coming 20 years and meets the minimum need of the natural environment.
 - The water consumption pattern in Iran must be reformed in such a way that the agricultural water consumption share will be reduced from the present 92 percent to 87 percent within the coming 20 years while doubling water use efficiency of 1 kg/m³ and allocating to more economically valuable crops. New water allocation priorities will be drinking and hygiene, industry and service, and horticulture and agriculture respectively.
208. The UN Development Assistance Framework for Iran (2017-2021). The proposed project aligns with the following Outcome areas identified in the United Nations Development Assistance Framework (UNDAF) for Iran (2017-2021): 1.1, Integrated natural resource management; 1.2 Low carbon economy and climate change; 3.1 Inclusive growth, poverty eradication and social welfare; 3.2 Food security, sustainable agriculture and improved nutrition.
209. The Country Programming Framework (CPF) 2012-2016 for Iran's Agriculture Sector. The Country Programming Framework (CPF) 2012-2016 for Iran's Agriculture Sector. Developed by the FAO, focuses on three main Strategic Priority Areas (SPAs):
1. Pro-poor enhancement of productivity for better food security, nutrition and livelihood of vulnerable groups in rural and urban areas;
 2. Enhanced sustainable management and development of natural resources, climate change mitigation and adaptation to its impact, and disaster risk management; and
 3. Strengthened governance and enhanced knowledge management of agricultural and rural development, food security and food safety.

210. National Action Plan to Combat Desertification and Mitigate the Effects of Drought 2005. Iran as a signatory to the United Nations Convention to Combat Desertification (UNCCD) produced its National Action Plan to Combat Desertification and Mitigate the Effects of Drought in 2005. The plan identifies the need for a well-coordinated and integrated approach with a strong focus on engagement with and participation of local communities aimed at the sustainable management of Iran's natural resources. Based on this premise the plan framework consists of four pivots:
1. Identification and control of the factors contributing to desertification;
 2. Support for the sustainable use and management of natural resources through conservation and reclamation;
 3. Promotion of sustainable livelihoods in affected areas through job creation, income generation and the improvement of socioeconomic standards;
 4. Strengthening the role of rural communities in terms of decision-making, planning, designing, implementation, monitoring and evaluation.
211. Strategic Plan of Ramsar Convention for 2016-2024. The Contracting Parties approved the Fourth Ramsar Strategic Plan for 2016-2024 at COP12. The Plan lays out a new vision under the Convention mission, four overall goals and 19 specific targets which are designed to support the efforts of Parties, partners and other stakeholders in preventing, stopping and reversing the global decline of wetlands.

E. Technical Viability

The project conforms with the following national laws:

212. The project is compliant with the legislation, technical/implementation system under the Technical and Implementation System Bureau⁵⁰ (TISB), and associated national standards, under the Institute of Standards & Industrial Research of Iran (ISIRI)⁵¹, the Water Industrial Standard⁵² (WIS) and will seek to strengthen these by mainstreaming climate change adaptation guidelines as per the Third National Communication of climate change and the National Climate Change Policy for Iran.
213. There are various relevant laws and regulations for protection and improvement of the environment; Land and Coastal; water fair distribution; Regulations on rivers, anchors, mussels, marshes, natural ponds and water supply networks, irrigation and drainage and the general environmental policy under the supreme leader's announcement.
214. Law of protection and improvement of the environment; One the most important existing laws is "The law of protection and improvement of the environment" which was approved in June, 18, 1974 and updated November, 19, 1992. Based on Article 16, the Iranian Department of Environment (DOE) is the main government agency responsible for environmental protection and is the legal officer (authority) to manage the country's' wetlands and their properties. The article also says, DOE does not have the right to transfer the utilization rights of wetlands to other authorities/organizations. This article also emphasizes that if the management and development of the wetlands requires the cutting the trees the Forest, Range and Watershed Management Organization (FRWMO) of Iran has to act.
215. Land and Coastal Law (Approved 20/07/1975); Under this law, lands that appear or are created as a result of lowering water level on the banks of water bodies including the sea, lakes, islands etc. are under government jurisdiction.
216. The law of water fair distribution (Approved 07/03/198); According to Article 45 of the Constitution of the Islamic Republic of Iran, the waters of the seas, natural rivers, streams, valleys and every natural water path, including surface and ground water, floods, sewage and drainage, lakes, natural ponds, and springs are common property under the governance of the Islamic Republic. The protection, monitoring and harvesting of all above water resources are delegated to the government to ensure they are used according to the public interest. Furthermore, any water contamination is prohibited, and responsibility for preventing the pollution of water resources is delegated to the DOE.
217. Regulations on rivers, anchors, mussels, marshes, natural ponds and water supply networks, irrigation and drainage (approved on 01/11/2000); According to this regulation, the river or stream bank border is determined with the Ministry of Energy or regional water companies in each location with regard to the hydrometric data and water tail footprint of and maximum flood with a 25-year return period. The regulations consist of 15 articles.
218. General Environmental Policy, Supreme Leader's Announcement November 17, 2015. This announcement includes 15 articles that covered various issues such as requirements for integrated natural resources management and focused on issues such as environmental monitoring and protection. An important point in this notice is the attention to climate change as an emerging pillar and its emphasis on the need to manage these changes and the resulting effects. Some of the important and relevant provisions of this announcement are as follows:
- Comprehensive, coordinated and systematic management of vital resources (such as air, water, soil and biodiversity) should be arranged based on the potential and sustainability of the habitat, especially by increasing the legal and structural capacities and capabilities associated using the participatory approach;
 - Establishing an integrated national environmental system;
 - Correction of living conditions in order to enable the community to enjoy a healthy environment and respect for intergenerational justice and rights;

⁵⁰ <http://isiri.gov.ir/portal/home/7331765/ISIRI-Portal>

⁵¹ <http://sama.mporg.ir/sites/publish/SitePages/Home.aspx>

⁵² <http://www.waterstandard.wrm.ir/>

- Preventing of the spread of all types of illicit pollution and the crippling of environmental degradation and the effective and deterrent punishment of polluters and environmental degraders and their obligation to compensate for damages;
 - Continuous monitoring and control air, water, soil, noise, waves and destructive rays, pollutants sources and climate change. This process requires an obligation to comply the monitoring process based on environmental standards and indicators as well as land development/ planning programs.
 - Providing an ecologic atlas of the country –covering conservation, restoration, rehabilitation and development of renewable natural resources, i.e. sea, lake, river, dams reservoirs, wetland, groundwater aquifer, forest, soil, rangeland and biodiversity, especially wildlife.
219. The basic idea of establishing ISIRI emerged upon the approval of "The Law of Weights and Measures" in 1925. Following the approval of the bill to establish ISIRI in 1960, the Institute became operational within the framework of the specified functions and responsibilities and joined the International Organization for Standardization (ISO) in the same year. In 2011, ISIRI status was set under the direct supervision of the President of the Islamic Republic of Iran as it has already been under the supervision of Minister of Industry, Mines and Commerce.
220. The TISB, under the Plan and Budget Organization (PBO), is the main national body for setting the executive criteria and methodology in Iran. The assigned missions for TISB are formulation and notification of technical and regulatory criteria, including legal and contractual conditions, the principles of remuneration, the relationship between private agents, technical and general specifications, etc. The development and dissemination of technical standards in various fields of the water and electricity industry was considered in order to improve the quality of technical activities and to adapt the advanced technology. In late 1981, following the negotiations between the MOE and the Plan and Budget Organization, there was agreement to establish the water industrial standards. There are more than 300 standards, criteria, guidelines and Terms of References (ToRs) related to water resources management, Environmental Impact Assessment (EIA), watershed management activities etc.
221. The following are references, standards, ToRs and guidelines that govern the implementation of climate change adaptation measure in the Bakhtegan Basin.

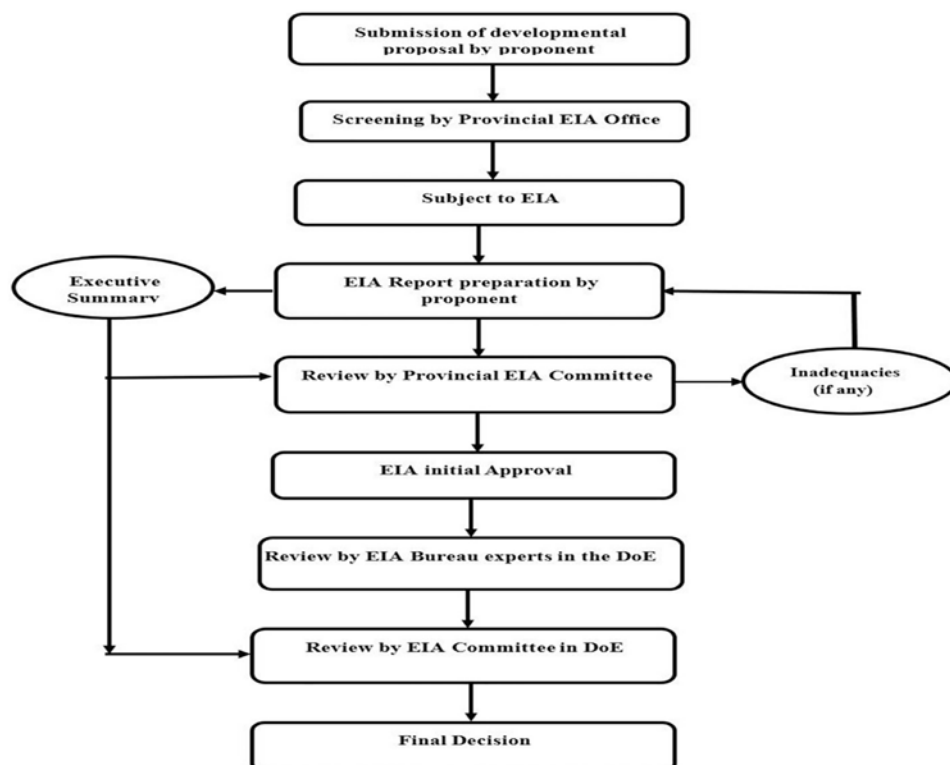
Table 10: references, standards, ToRs and guidelines

References/Standards/ToRs/Guidelines	Issued by & Date	Subject
Guideline to harvest the river bed material	WIS (2011)	Water and Environmental
Guideline for Environmental Impact Assessment (EIA) on River Engineering projects	WIS (1998)	Water and Environmental
Guideline for Environmental Impact Assessment (EIA) on water and sewage projects	WIS (1999)	Water and Environmental
Guideline for studying the big dam's reservoirs	WIS (2011)	Water and Environmental
Guideline for monitoring surface water	WIS (2009)	Water and Environmental
Guideline for monitoring sub-surface water	WIS (2012)	Water and Environmental
Environmental criteria for reusing recycle and sewage water	WIS (2011)	Water and Environmental
Fundamental of environmental issues to design artificial recharge projects	WIS (2010)	Water and Environmental
Term of References for Soil and Watershed Management studies	WIS (1994 & 1996)	Water Resources Management
Term of References for Sub-surface water studies	WIS (2001)	Water Resources Management
Guideline for water sampling	WIS (1999)	Water Resources Management
Term of References for Water Artificial Recharge studies	WIS (2001)	Water Resources Management
Guideline for agricultural wells rehabilitation and restoration	WIS (2002)	Water Resources Management
Applied guideline for using GIS & RS in Hydrology studies in various Iranian water basins	WIS (2013)	Water Resources Management
Guideline to calculate Probable Maximum Flood (PMF)	WIS (2013)	Water Resources Management
A Revision on the Current Studies of EIA,SEA and the Proposed Adaptive Needs	CZM ⁵³ (2015)	Environment Impact Assessment
The Guideline of Sustainable Agriculture	CZMP (2015)	Sustainable Agriculture
The Guideline on Sustainable Tourism	CZMP (2015)	Sustainable Tourism
The Guideline on Sustainable Use of Forests	CZMP (2015)	Sustainable Use of Forests
The Guideline on Sustainable Use of Rangelands	CZMP (2014)	Sustainable Use of Rangelands

⁵³ These guidelines have resulted from the Central Zagros Mountain Project (CZMP)

The Guideline on Sustainable Use of Water Resources	CZMP (2014)	Sustainable Use of Water Resources
The Guideline on the Effluent Management in the Rural Areas	CZMP (2013)	Effluent Management in the Rural Areas
The Guideline on the Solid Waste Management of the Rural Area	CZMP (2013)	Solid Waste Management in the Rural Area
The Guideline on Sustainable Aquaculture	CZMP (2013)	Sustainable Aquaculture

222. The Environmental and Social Management Framework (ESMF) lists the various pieces of legislation that would apply (refer section 2.1 of ESMF) and states: “*The Department of Environment (DoE) is the main government body in Iran responsible for assessing environmental impacts. The Department operates under the Environmental Protection and Enhancement Act (1972, as amended in 1991). Under Article 6 of the Guidelines on Environmental Impact Assessment (1997), the implementing bodies of major development projects should prepare an EIA report covering the points required by the DoE and related by-laws. Article 7 states that reports on EIA shall cover both the construction period and the operation period. All project activities will be assessed for risk and the DoE consulted regarding the need for SEA or EIA, which will be undertaken if required.*” The EIA process is shown in the below diagram



In addition, based on article 50 of the Iran constitution, the Department of Environment is the body that has primary responsibility to ensure that all major development activities in the country are in line with protection of the environment. Based on the Environment Protection Law, DoE is responsible for monitoring of all development projects. If any damage to the environment is identified through a project, DoE is responsible for negotiating rehabilitation work with the relevant authority and if necessary, has the authority to stop the project. As per decision made by Environment high council and cabinet in June 2011, 53 types of projects require EIA reports and confirmation of DOE for further implementation. These 53 projects fall under 7 main categories, including 1) Rails, Roads and Airports 2) Power plants 3) Petrochemical, Refineries 4) oil and gas pipe lines 4) Mine and industries 5) Large dams and water infrastructures 6) Large service providing projects 7) Agro-Industry Units. The proposed activities under the AF project do not fall under any of the above 7 categories and hence are not envisaged as requiring EIA. Nevertheless, screening of USPs against AF Principles has not yet taken place and cannot be pre-empted. While at this stage we not envisage that any USP will require a full EIA/ESIA, as further screening of all USPs is to take place as part of project implementation, it cannot be ruled out. Procedures for screening against AF requirements, in a manner commensurate with a project's magnitude and likely impacts, are detailed in Annex 10.

223. While DoE is the main implementing partner of this project at national level, provincial DoE offices are still responsible for monitoring any possible effects of project activities on the natural environment. At the same time for any major development activities there are EIA mechanisms in the country. Additionally, DoE, MoE and MoJA will be part of the Steering Committee which will ensure compliance of project activities with national standards from early stages of the project and throughout implementation. Every related ministry also has a legal and standard office. The project document has already been shared with them during the formulation process and their participation will be ensured during the implementation phase. There are mechanisms in place within DoE by which an agency submits a full description of project with related detail and it will be reviewed

by a committee for further approval/modification or rejection. Though the EIA process is under the supervision of the Deputy for Human Environment of DoE, decisions related to EIA are not made by the department singlehandedly, but by a national level committee consisting of related authorities, university and research center representatives. The above process and structure will prevent any conflict of interest in the process and decisions related to EIA.

224. In the above context all on-the-ground project activities are at a very small scale with consideration of environment/ecosystem conservation and will not have to go through the above process, but will be monitored closely by DoE. Further, every project activity will be implemented under the monitoring and supervision of the relevant authority who is also a member of the project steering committee. The project office will receive approvals from the relevant ministry/authority for contracts and payments related to activities under their respective areas of responsibility to ensure they are in compliance with the relevant guidelines and are monitored

Output 2.1:

225. Activities under output 2.1 are small scale projects at farm level which do not require EIA official processes based on consultation made with DoE during project formulation, but representative of DoE will be working jointly with MOJA to develop action plan for activities under output 2.1 and based on experience from LU project one final signatory for final payments for this output will be DoE to ensure their participation and regular monitoring. All project activities under output 2.1 will be implemented in coordination with Ministry of Agriculture-Jahad (MOJA) who is the main body responsible for monitoring agriculture related guidelines (WIS (2012), CZMP (2015), CZMP (2013) in close coordination with DoE. Ministry of Energy (MoE) will be also involved in the sections related to water savings and improved water management at farm/village level (WIS (2009), WIS (2012), WIS (1999), CZMP (2014)). PMU will, in parallel, monitor for continual AF ESP compliance.

Output 2.2:

226. The small-scale nature of the alternative livelihoods in principle will not require an Environmental Impact Assessment (EIA) based on their nature, purpose and possible effects on the environment. The National Steering Committee will assess if a proposal would require an EIA, to showcase if the environmental and community benefits outweigh the negative effects, to be subsequently approved or rejected. As previously stated, the AF project includes technical and budget provisions in compliance with UNDP requirements, including adherence to all national and local standards on environmental and social impacts, to request and carry out EIAs if any of the activities would require. (More information on EIAs in Annex 10). Activities under output 2.2 will be implemented through the MOJA and DoE and monitoring against related guidelines (CZMP (2015), CZMP (2015), CZMP (2013), CZMP (2013)) will be conducted by them, in close coordination with the PMU during the implementation phase.

Output 3.1

227. This output will include the construction of small-scale works that in principle will not require an Environmental Impact Assessment (EIA) based on their nature. As previously stated, the AF project includes technical and budget provisions in compliance with UNDP requirements, including adherence to all national and local standards on environmental and social impacts, to request and carry out EIAs if any of the activities would require. (More information on EIAs see Annex 10 Environmental and Social Management Framework). Activities under output 3.1 fall under the responsibility of Forest, Rangeland and Watershed Organization (FRWO) under MoJA who will ensure compliance with related guidelines (WIS (2010), WIS (1994 & 1996), CZMP (2015), CZMP (2014)) in implementation of activities. In parallel, PMU will monitor for on-going AF ES compliance.

Output 3.2

228. As most part of activities under this output will be in protected areas, all output 3.2 activities are fully developed through close consultation with different related offices in DoE to make sure that project activities are aligned with their standards, current ongoing projects and management plans in place and support activities which are related to adaptation with drought and climate change in the protected areas. Activities under output 3.2 will be supervised by the DoE as they are considered part of adaptation and rehabilitation activities for Bakhtegan protected areas. The law for wetland management and conservation and the law related to protected areas will apply. As with all project activities, PMU will also monitor for AF ESP compliance.

229. An Environmental and Social Management Framework (ESMF - Annex 10) has been prepared to address potential social and environmental risks and impacts and to ensure compliance with applicable regulations and standards. The ESMF outlines procedures for screening, assessment, and development of measures to manage potential social and environmental risks and impacts during project implementation.

F. Chances of Duplication

230. The proposed project is designed to complement, build on, and learn from existing and past initiatives in Iran, rather than overlap. At present, there are few projects underway in the Bakhtegan Basin. However, climate change is not a central focus of these initiatives, though some of the interventions may have indirect climate benefits. Of the projects currently being implemented in the country, there are complementarities and linkages with the Lake Urmia project and scope for scaling up and replicating the Women's Trust Fund project.

231. Conservation of Iranian Wetlands Project - Phase II (Scale-up): The ongoing second phase of the Conservation of Iranian Wetlands Project (CIWP) builds on the results and achievements of the initial Wetlands Project launched in 2005 and funded by

the Global Environment Facility. The second phase expands the project throughout the country. The goal is to enhance the sustainability of Iran's wetland protected areas and conserve its globally-significant biodiversity. It will do so by establishing ecosystem-based wetland management plans and inter-sectoral coordination structures for 15 important Iranian wetlands. A grant of US\$3 million has been provided by the Government of Japan to UNDP, contributing to the revival of one of these important wetlands, Urmia Lake, from its current critical situation. The project specifically addresses the restoration of the lake through modeling local community participation, promotion of sustainable agriculture and effective reduction of water consumption. The project engages with local communities and farmers using sustainable agriculture techniques. This approach is expected to contribute to an increase of inflow to the lake as well as to the protection of the biodiversity in the area.

232. The Integrated Management Plan of Lake Urmia Basin developed under CIWP specifically addresses the restoration of Lake Urmia mainly through effective reduction of water/agricultural chemical input consumption at farm level by engaging local community and farmers applying sustainable agriculture techniques. It is expected that this approach would lead to increase of inflow to the lake as well as protect the biodiversity, focusing on the island habitat of two main IUCN red list species. At the same time, there would also be direct biodiversity protection by implementing a water harvesting project in one of the key wildlife island habitats.

233. The above initiatives are of particular relevance to Output 2.1 on Climate Smart Agriculture of the proposed project with a focus on participatory engagement with farmers. Key lessons and observations from these initiatives that have contributed to Output 2 of the proposed project are:

- Chances of success are high when farmers, agriculture research centres and professional facilitators collectively work together to implement identified climate smart practices that reduce water consumption without compromising farmers' net income.
- Local companies and cooperatives play a key role in the project with regular and continued presence in the field by accompanying local farmers and providing a collaborative platform for joint planning and implementation among key stakeholders in line with sustainable agriculture, applying smart agriculture techniques and aiming to achieve results. Key results of the project include : i) a participatory action plan with involvement of farmers, facilitators, and agriculture researchers and MoJA extension offices; ii) water management techniques, emphasizing on water saving at farm level implemented iii) soil fertility techniques implemented; iv) application of biological fertilizers rather than chemical fertilizers emphasized; v) crop protection techniques, emphasizing on application of biological pesticides rather than chemical pesticides and pollutants
- The strong ownership demonstrated by farmers in Lake Urmia is evident as the framers now lead the farmer to farmer exchanges on knowledge and information.

234. This strong ownership and participatory demonstrated in the above initiatives are being replicated in the proposed project. To further build on these learnings, the new activities proposed are market research, exploring the potential of organic agriculture and certification, and an applied research programme that draws on the market research, relevant practices from Lake Urmia, in line with FAO guidance on Climate Smart Agriculture.

235. In addition, there are complementarities and potential for crossflow of information and sharing of experiences and learnings with the CIWP as both projects are implemented in joint cooperation between UNDP and DoE. As in the CIWP, the proposed project will be implemented under the supervision of DoE under the same National Project Director. This will provide opportunities for coordination between the two projects and if possible, the proposed project will use the platform created by the CIWP project for AF project implementation.

236. The Women's Trust Fund project supported by MoJA is one of the pioneer women micro credit fund projects at the country level which supports more than 150 women's groups all around the Fars province with 65 of them in Bakhtegan basin. Due to interventions under the WTF initiative, the women are now better informed and in well-organised groups. The proposed project will build on this existing structure, instead of duplicating the effort, to help accelerate the project implementation.

237. The micro credit funds set up under the WTF mainly supports sustainable alternative livelihoods that are linked to agriculture activities that are less dependent on water, a new approach taken by MOJA at the national and provincial level. This is also another critical learning that is being incorporated into the proposed project under output 2.2 where women under the WTF project will share their experiences with other beneficiaries on reducing water consumption by shifting focus on less water intensive agriculture.

238. An important institutional level outcome of the ongoing and past initiatives is the strengthening and establishment of inter-sectoral coordination and cooperation mechanisms at the provincial and local levels to facilitate sustainable rural development. The governance mechanisms of the proposed project has built on and will enrich these existing institutional mechanisms by integrating climate change considerations.

Table 11: The following is a tabulated summary of relevant projects

Project Title	Main Objective	Geographic Area	Status	Adaptation Approach	Potential Synergies and Coordination Mechanisms
Conservation of Iranian Wetlands Project - Phase II (Scale-up)	Enhancement of the effectiveness and sustainability of Iran's system of wetland protected areas as a tool for conserving globally significant biodiversity	Across Iran	Ongoing	Ecosystem approach in wetlands management	Inter-sectoral coordination structures for 12 (9 new wetlands + 3 demonstration sites) important Iranian wetlands, Put in place strong wetlands ecosystem management legislative platform and inter-sectoral administrative structures at national level, supporting implementation of the "Ecosystem Approach" in important Iranian wetlands and share CIWP and other wetlands management initiatives, knowledge and lessons learnt with the neighbouring countries
Contribution to Lake Urmia Restoration via local community participation in sustainable agriculture and biodiversity conservation	Wise use of land and water Resources Including agriculture water saving, urgent biodiversity conservation and awareness rising.	Urmia	Ongoing	Climate change mitigation and adaptation, water management	Participatory decision making and planning at national, provincial and local level will enhanced bottom up and inter sectoral collaboration during the project
Participatory Management of Natural Resources and Sustainable Rural Development in line with Carbon Sequestration in Desertified Areas	Rehabilitate the desertified areas and rangelands, while also seeking capacity building for communities who will carry out the activities to achieve this rehabilitation and conservation.	North Khorasan (two sites), South Khorasan, Yazd and Golestan provinces	Closed	Climate change adaptation	Inter-sectoral coordination and cooperation mechanisms established and strengthened at the provincial and local levels to facilitate sustainable rural development
MENARID - Institutional Strengthening and Coherence for Integrated Natural Resource Management	Removal of barriers to Integrated Natural Resources Management (INRM) by developing and strengthening institutional knowledge, capacity and coordination, and by demonstrating and up-scaling successful sustainable land and water management practices	Kermanshah; Sistan and Baluchistan; Tehran; Yazd; North Khorasan; Semnan; Karoon watershed	Closed	Climate change adaptation and mitigation	Inter-sectoral coordination and cooperation mechanisms established and strengthened at the provincial and local levels to facilitate sustainable rural development
Monitoring water use efficiency in Qazvin through City Prosperity Initiative	The Greener Cities Partnership (GCP) is to develop a list of recommended indicators that shall be added to the extended	Qazvin Province Qazvin city	Ongoing	Climate Change adaptation and SDG	The new indicators tackle the issues of water quality, water usage efficiency, more specifically reducing the use of potable water for non-drinking purposes, wastewater management, public transport and

	City Prosperity Initiative (CPI) framework to enhance the quality and depth of monitoring in the city. The Qazvin Pilot will be the first global project on Urban Environmental Indicators Monitoring, with the aim to collect long-term data and analyse these for more sustainable policies and results.				preservation of natural heritage. The data will be made available based on inter-sectoral coordination by various local and regional stakeholders e.g., National Statistics Organization and academic institutions, as appropriate.
Study on Integrated Water Resources Management for Sefidrud River Basin (Iran and JICA)	Under the circumstances, the study was started with the objectives to formulate a Master Plan for water resources management in Sefidrud river basin and to transfer technology on the integrated water resources management to the counterpart personnel.	Sefidrud Basin, Kordestan, Zanjan and East Azerbaijan, Ardabil, Qazvin and Gilan provinces	Closed	Climate Change Adaptation and Integrated Water Resources Management	In the study, conflict management is employed to coordinate the water conflict. As a part of the management, workshops were held in 7 provinces which are Zanjan, Kordestan, East Azarbaijan, Qazvin, Ardabil, Tehran and Gilan.
Project on Establishment of Participatory Water Management System in Golestan Province (Iran & JICA)	JICA development study "the Study of Improvement of Irrigation, Drainage and Agricultural Development for Gorgan Plain, in Golestan Province. The project was aimed at capacity building of the staff in JAO of Golestan Province as well as strengthening of structure in JAO of Golestan Province for extension of the model.	Golestan Province	Closed	Climate Change Adaptation & Sustainable Agriculture	In this project, "Participatory Water Management System" was to be promoted in Tazeh Abad irrigation area, one of 40 irrigation areas in Golestan Province.

G. Learning and Knowledge Management

239. Dissemination of all relevant data, information, knowledge and lessons learned through the project is addressed explicitly in the project design. Under Component 1, relevant data and information that is generated through the project will be collated within a customised GIS platform for the Bakhtegan Basin. Project Management Unit with support from local government staff and national/local NGOs/CBOs part of the project will gather and report delivery and impacts of investment on a quarterly basis in a pre-defined format. These data and information will then be made available through the planned information portal system (TIPS). The TIPS will be the principle mechanism by which data and information are provided as input to Component 4.
240. Component 4 is focused towards enhanced governance and decision making in relation to climate resilience in the Bakhtegan Basin. This will be supported, through Output 4.1, by a comprehensive focus on education, capacity building and communications. Data and information generated through Component 1 and made available through TIPS will provide primary input for Output 4.1. Additional knowledge and information will be integrated to address specific education, capacity building and communication needs. This will include, for example, relevant background summary information on the science of climate change, likely impacts in Iran, and implications for the Bakhtegan Basin. This will be combined with results generated from the climate change analysis under Output 1.1. Additional information of relevance to Components 2 and 3 will also be provided for use in education and capacity building activities. This will include materials relating to climate smart agriculture practices, results of market research, water resource management, alternative livelihood practices, marketing of value added products, and natural resources management.
241. Education and capacity building will be implemented with decision makers at multiple levels and will involve on-going activities for the duration of the project. This will involve dedicated sessions with local and regional government authorities and with local communities. There will be a strong emphasis on education and capacity building with local communities. This will focus on two principal dimensions. Firstly, the focus will be on building ownership of the issues and challenges that are being faced. This will involve activities both within communities in the four different Zones as well as between communities across the four Zones. The intention is to build a widespread sense of shared ownership throughout the Bakhtegan Basin. Secondly, the focus will shift to active participation in developing and implementing solutions. This will involve a strong 'learning by doing' emphasis, through both Components 2 and 3. Regular community meetings will be conducted to discuss and review lessons that are being learned, with continual feedback and refinement of approaches and methods. Furthermore this process will serve the purpose of engaging people more widely, beyond the initial target beneficiaries, in the project and its results.
242. The communications part of Output 4.1 will be focused on wide dissemination of results and lessons learned from the project. This will involve the use of multiple media platforms, including video, TV, social media and publications. The intention will be to educate and inform all people living in the Bakhtegan Basin and to also reach as many people as possible nationally.
243. The KM and media outreach strategy goals of the project are:
- To inspire, inform and engage with local communities affected by this project;
 - To motivate other surrounding zones/district/provinces facing similar challenges by transforming this project into a role model for effective water management in the context of drought, ensuring relevant knowledge generated is easily accessible and can be replicated and scaled up;
 - To support the information and internal communication needs of all our stakeholders while promoting the government's reputation in promoting climate smart agriculture and alternative livelihoods with the communities.
244. Key KM strategies and the sustainability measures are as follows:

Visibility material and SOPs: All visibility material and Standard Operation Procedure for public communications must adhere to the AF, UNDP and Gov guidelines. For that effect, specific branding guidelines and public communication focal points will be included in the communication strategy document, including examples for printed Materials (banners, billboards, etc.,)

Sustainability Measures: During the project lifetime, the knowledge management strategy outcomes will be anchored under the Project Management Unit, housed at DoE and will be linked with training and public awareness office of related ministries (e.g. DoE, MoJA, MoE). Based on previous experiences with similar UNDP projects in Iran, all KM related activities will be implemented jointly with related government offices and these new practices will be part of their usual practice and will be included in internal curriculum or new supported activity. After project closure, it is expected that all key related authorities and NGOs involved in the process will maintain this based on its mandate and initiatives that are relevant and of interest to stakeholders.

AF Project website: A central management platform for sharing and disseminating the body of knowledge and lessons learned generated and build a Community of Practice that contributes to the scalability and replication across other provinces. All communication activities undertaken should be reflected on the website. The website and associated social media will be handed over to the Department of Environment at the project closure stage and measures will be put in place to ensure sustainability and continuation of these platforms and that the same quality and standards are maintained. Based on previous experiences of joint projects with line ministries and entities, the concerned education and public

relation offices responsible for KM products and updating website, will be involved in the project activities from the initial stages. Project KM products will be reflected both in project and ministry website and in training modules. The handing over process will be done gradually with the Department of Environment (DoE). The project will have a specific section in the DoE website with agreed process for its maintenance. Based on best practices of other development projects, in the final year of project, a data bank of knowledge products will be developed and shared among all stakeholders and published in DoE and other related ministries' website.

Some of the key areas to cover are:

- Education (i.e.): Why is Bakhtegan basin important, historical drought, how can I help, what plants and animals live there, loss of biodiversity, training and mentoring
- Knowledge management (i.e.): Success stories, publications, photo & video database, press releases, interview with experts etc
- Vertical Themes (i.e.): Gender and youth, Climate Smart Agriculture, Alternative livelihoods, Endemic wildlife, Partnerships etc
- Media: Communication/advocacy initiatives, media packs, Social media news feed, Facebook and twitter partners (@AFIran), photos and video catalogue.

Target Audience: The website contents will be available to the public while specific thematic subjects will be categorized for technical experts, communication experts, local communities, academia etc.

Sustainability Measures: The website and social media channels will be hosted by DoE with a dedicated focal point in the communication office, in coordination with communication focal points of the stakeholder organizations. Towards the end of the project, the website and associated social media will be handed over to Implementing Agency.

- i) **Photovoice exercise:** This is a process by which people can identify, represent, and enhance their community through photographic means by entrusting cameras to people that act as recorders, and potential catalysts for social action and change in the riverside communities. It can also be used for documenting positive adaptation changes along basin communities. For example, as a participatory photography stories in partnership with the schools or women's cooperatives to empower community youth groups to portrait their views and issues related to drought.

Target Audience: Local Communities, NGOs in Bakhtegan basin

Sustainability Measures: This process will be led and hosted by the local NGOs and CBOs with support from project during implementation phase and will be completely handed over towards the end of the project.

- ii) **Reports and publications:** An integral part of the knowledge management strategy to replicate, scale and generate lessons learned.

Target Audience: The reports and publications of the project will be disseminated and advocated among different target groups such as local communities, NGOs and governmental organizations, academia in parallel with holding thematic workshops

Sustainability Measures: the soft copies of produced reports and publications will be made available on the project website, which will be hosted by the implementing partner after the project closure.

- iii) **Social Media:** This distribution channel can be very effective to inform communities, cross link to UNDP website and keep a log of the works to tell the project's story annually, after completion of the project and to support project evaluation.

Target Audience: Public in general, with thematic content produced for youth, farmers, local communities, teachers etc.

Sustainability Measures: During the project implementation and once the Communication, Education, Participation and Awareness (CEPA) action plan is produced, the Social Media channels of the project will be handed over to a suitable owner such as research centers or NGOs.

- iv) **Traditional Media:** Local newspapers, TV and radio broadcast, to reach the affected communities and establish media connections to receive the maximum media attention for our press releases, news stories, special events, press kit, interview with experts etc. A General approach in using media will be close cooperation with the communication bureaus of stakeholder organizations, in line with their mandates.

Target Audience: Public in general, with thematic content produced for youth, farmers, local communities, teachers etc.

Sustainability Measures: The communication bureaus of stakeholder organizations will be the main host to the Traditional Media, to continue advocacy on the results of the project.

H. Stakeholder Consultation and Participation

245. During the project preparation consultations were conducted with stakeholders at national, provincial and local levels. The consultation process involved meetings, workshops and informal discussions with local communities. The bulk of these consultations were conducted during an 11 day mission to Iran and the Bakhtegan Basin with a team that involved an international consultant, national consultants, local consultants from Fars Province, a UNDP Bangkok technical support person, UNDP Iran and representatives from participating government ministries. Additional consultations with communities were conducted by the local consultant team.

246. At national level the emphasis was on clarifying expectations of the participating government ministries and the national technical committee (NTC) for the project, identifying needs from their perspective, reporting back to them at the conclusion of the mission and receiving their feedback. At provincial level a meeting was held with provincial government staff and representatives. The focus of this meeting was to inform them about the planned project and to receive their feedback on key issues and needs with the Bakhtegan Basin. At local level, three participatory workshops were held with local governors, local government representatives of the three principal central government ministries, NGOs and others.
247. The three participating government ministries are the Department of Environment (DOE), Ministry of Jihad Agriculture (MOJA) and Ministry of Energy (MOE). All three ministries have previously worked on separate ideas and plans for an Adaptation Fund proposal. However, they subsequently came together and agreed that a combined, cross-sectoral, approach would be much more powerful and effective. Such an approach, involving several government ministries, is a new initiative in Iran and challenges the compartmentalised and silo-based thinking that prevails. They had held their own meetings and internal discussions prior to the project planning mission focused on initial scoping for the project. During the planning mission each of these participating ministries were consulted jointly, through the NTC, and separately.
248. The silo-based approach to climate change has been addressed since the outset by establishing a National Technical Committee in Iran to guide the proposal development process. The committee is comprised of senior representatives from DoE, MoJA, MoE and MoFA, who are determined to collaboratively implement this project building on their collective expertise. They will work jointly and in close coordination, as the drought in the Bakhtegan basin has multi- sectoral impacts. National representatives from these Ministries will be part of the Steering Committee/ Project Board. Most of the components will be implemented jointly (as stated in the organigram) and performance will be reported back at Project Board. As mentioned in Component 4 of the project, existing intersectoral mechanisms within the province and at district level will be used with enhanced responsibilities for the basin to practice collaboration among stakeholders. These enhanced mechanisms will have enough opportunity to practice and refine their new role during the project life cycle.
249. Following the national level consultations in Tehran the project team travelled to Shiraz, the capital of Fars Province. In Shiraz they held an initial meeting with staff from the provincial DOE and the local consultant team. A briefing on the situation in the Bakhtegan Basin was provided in this meeting, data and information needs were discussed and plans for site visits and local consultations were presented and discussed.
250. The meeting with the Fars Provincial government was chaired by the Acting Deputy of the Governor General of Fars Province. This meeting involved a briefing on the project and what was required to develop an AF proposal, presentations from provincial representatives, and identification of issues and needs from provincial government staff representing environment, water and agriculture.
251. Three local consultation workshops were held within the Bakhtegan Basin along with visits to potential project sites and villages. A report on outputs from these consultations is presented in Annex 7. These workshops were held in the towns of Kharama, Estahban (both in Zone 4) and Marvdasht (Zone 2). The latter, while located in Zone 2 included representation from the upper part of the basin (within Zone 1). In each workshop there was an introductory presentation on the project followed by an overview from the local governor, and then a facilitated process with participants to identify issues and needs.
252. The needs of women were specifically identified in the workshops. This included an extended discussion in the Estahban workshop on the Rural Women's Trust Fund, which is a mechanism for support women who are seeking to develop alternative livelihood practices. One of the main foci of this fund is gender equity, with the goal of empowering women. This discussion highlighted the fact that this fund has had successes and failures and that the project needs to learn from these lessons to ensure that it works effectively.
253. In the upper part of the basin, above Doroodzan Dam, the project team were also hosted for a day by the governor of Kamfirouz district (within Marvdasht County). Despite the relative abundance of water in this part of the basin, many households are suffering due to the poor soils and low yields. Visits to several local alternative livelihood initiatives were undertaken, including to a local women's cooperative that has been established to make jewellery for sale in Shiraz city and elsewhere.
254. Further consultations were held by the local consultants to identify locations and villages for implementing Components 2 and 3 of the project. This involved consultation with county authorities, farmers, NGOs and also drew on field experiences of the local consultants.
255. Table 12: summary of the stakeholders consulted and contributions they made to the project design.

Organisation consulted	Role/Responsibility	Issues addressed	Project components
National Technical Committee (NTC)	Cross-departmental committee overseeing development of the AF proposal on behalf of the Iranian Government Provided conceptual and technical guidance an input to the project development process	Identified the Bakhtegan Basin as the project location Project scope and management arrangements Feedback and comments on the project proposal	Components 1, 2, 3 and 4
Department of Environment	Responsible for natural resources management, with a particular project focus on protected wetland areas	Provided technical input into the formulation of Component 3	Components 1, 2, 3 and 4
Ministry of Energy	Responsible for water resources management	Developed a pre-proposal that guided the formulation of Component 1	Components 1, 2, 3 and 4
Ministry of Jihad Agriculture	Responsible for agriculture and food security	Provided technical input into the formulation of Component 2	Components 1, 2, 3 and 4
United Nations Development Programme	Provided technical and administrative support during the proposal preparation, organised the project development mission to Iran and the Bakhtegan Basin	Input to project formulation and design Contributions and support to the National Technical Committee Project management and institutional arrangements	Components 1, 2, 3 and 4
Fars Provincial Government	Responsible for the management of land and water resources in the Bakhtegan Basin Provided an overview of the situation in the basin Assisted in gathering requested data for the national consultants from stakeholders	Identification of issues and needs within the Bakhtegan Basin Information on existing activities and initiatives	Components 2, 3 and 4
Kharama County Government and community representatives	Responsible for local decision making in relation to land and water resources management Coordination between different County authorities and assistedwith the workshops	Provided information of the issues being experienced in Kharama County, actions that are already being taken and what additional support is required	Components 2 and 3
Estahban County Government and community representatives	Responsible for local decision making in relation to land and water resources management Coordination between different County authorities and assistedwith the workshops	Provided information of the issues being experienced in Estahban County, actions that are already being taken and what additional support is required	Components 2 and 3
Marvdasht County Government and community representatives	Responsible for local decision making in relation to land and water resources management Coordination between different County authorities and assistedwith the workshops	Provided information of the issues being experienced in Marvdasht County, actions that are already being taken and what additional support is required	Components 2 and 3
Non-Governmental Organizations	Participation in consultative workshops	Provided information of the issues being experienced, existing livelihoods and alternative ones	Components 2 and 3

I. Funding Justification

Component 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.

Baseline (without the AF investment)

256. Many Iranian institutions, including the Ministry of Energy and the Iranian Meteorological Organisation, currently have access to historical data sets for relevant climate and hydrological parameters. Similarly there is a strong capacity within Iran to undertake drought risk assessments. This is confirmed with a predominantly web based search identifying at least 20 published papers from within Iran focused on drought analyses, with and without consideration of climate change. At least two of these have included drought assessments in the Bakhtegan Basin. While a lot of relevant work has been done nationally there is a lack of consistency with modelling approaches including selection of GCM scenarios, use of outdated emissions scenarios by some and application of different drought models. Within this context there has been no systematic climate change risk assessment of each province in Iran. In summary, current analyses are fragmented, inconsistent and incomplete.
257. Iran's draft third National Communication to the UNFCCC includes a country-scale climate change analysis. This analysis uses results from 15 Global Climate Models (GCMs) in combination with emissions scenarios (referred to as the SRES scenarios) that were used the IPCC third and fourth assessment reports. These SRES scenarios have now been superseded by the Representative Concentration Pathways (RCPs) scenarios which were used in the IPCC fifth assessment report. The draft third National Communication analysis also uses the now outdated Standardised Precipitation Index (SPI) for drought analysis, which has been superseded by the Standardised Precipitation Evapotranspiration Index (SPEI). Results are presented for temperature and rainfall changes only, projected to 2030, with no in-depth analysis of drought risk nationally and provincially and how it might change with climate change. Nor is consideration given to potential impacts on available water resources.
258. A comprehensive report on land and water resources was published in 2007⁵⁴, with relevant summary material presented in Annex 1. While very valuable this information needs to be updated and revised to account for the significant changes that have occurred over the last decade. The Ministry of Energy has a current national strategic water plan which provides general guidance but no specific detail on the amount of water available for agriculture and other uses in the Bakhtegan Basin.
259. There is no coordinated community based monitoring of vulnerability and resilience. Evidence of the impacts of the 2007 drought and extended dry period since on communities and their local environments is predominantly anecdotal. For example, the information presented in Table 3 on the socioeconomic and environmental situation in the four Zones is principally based on local knowledge. Local people are aware of the situation in their locale but more widely throughout the basin there is a lack of understanding of the issues and their causes. The result of this is apportionment of blame and growing disharmony between communities in different parts of the basin.
260. Overall, the current situation is one that lacks clear and consistent application of climate change impact and vulnerability assessment methodologies at all levels, including national, provincial, county and local community. Within the Bakhtegan Basin there is a strong base of climate and hydrological data, but a lack of up to date socioeconomic and environmental data. There is also a lack of coherence in terms of the collation and dissemination of available data and information, between different government agencies and between the different levels of decision making (national to local and vice versa).

Additionality (with the AF investment)

261. Component 1 is designed to provide a coherent structure and consistent approach for assessing climate change impacts and vulnerabilities, as a basis for identifying and implementing solutions aimed at building climate resilience in the Bakhtegan Basin. This will also be of wider benefit throughout Iran. As a first step the capacity for consistent, and rapid, assessments with all currently available GCM results (from at least 40 models) and the current IPCC emissions scenarios (Representative Concentration Pathways) will be developed. This will then be implemented in association with a comprehensive updating of water and land use planning within the Bakhtegan Basin, to ensure that climate change impacts and vulnerabilities are fully integrated. Greater understanding of vulnerabilities, within and between communities and with decision makers at all levels of administration, will be facilitated through development and implementation of a structured approach to local community monitoring. Finally, platforms for collation, storage and dissemination of results will be established by building on current GIS capacity and through the development of an online information portal system. This will ensure that all stakeholders will have ready access to the same data and information, in support of the goal of more effective, efficient and timely decision making which takes full account of climate change.

Component 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods.

Baseline (without the AF investment)

⁵⁴Rooyan Consulting. 2007. *Studies on Environmental Challenges on Bakhtegan Lake*, in Persian.

262. Farmers within the Bakhtegan Basin are currently facing different circumstances, as summarised in the opening paragraphs of Section A. Within this context different measures are being adopted, mostly involving autonomous adaptations. In Zone 1 there is a situation of declining rice yields on the river terraces as a result of declining surface and ground water (extraction of the latter is mostly illegal) and also due to poor soil quality. There is also on-going encroachment into rangeland and forested areas for fruit production and other activities. Some attempts are being made to grow higher value crops such as saffron and pistachio, but there is limited knowledge and experience with growing these crops. Zones 2 and 3, in particular Zone 2, encompass the principal (and historical) agricultural area of the Bakhtegan Basin. The prolonged dry period over the last decade is leading to deeper and deeper wells and also an increase in the number of illegal wells. Continuous cropping is also resulting in soil degradation and wind erosion. Some farmers are switching to less water demanding crops such as safflower. Zone 4 is the worst affected by the activities in Zones 2 and 3, with local conflicts arising relating to water. This is the traditional fig growing area of the Bakhtegan Basin but fig production has declined significantly due to the lack of rain, impacts of saline water around the margins of the lakes and as a result of wind borne salt particles. There are also villages around the lakes that have traditionally relied on water buffalo and other activities that are associated with a wetland environment. Overall, many farmers in Zone 4 in particular are suffering and most have limited capacity to explore, develop and implement alternatives.
263. On the positive side there are some added value initiatives that provide scope for further development. In particular there is currently some organically certified production in the Bakhtegan Basin, covering dates, figs, pomegranate, saffron and medicinal herbs. However, there is a general lack of market research and basin wide coordination. Additionally it is presently not clear to what extent these added value practices fit within the criteria of what might be defined as 'climate smart'. While organic practices such as mulching, increasing agro-biodiversity, crop rotations with fallow periods, a focus on build soil biology and use of biological friendly products, are aligned with climate smart agriculture this does not mean that all organically certified farms can automatically be considered to be climate smart.
264. In Zones 1 and 4 in particular some villages, and some households in villages, are already self-organising in terms of adopting alternative livelihood practices. This includes mushroom production, dairy production, beekeeping, food processing (tomato paste and pomegranate sauce), tailoring and embroidery, carpet weaving, processing and packaging of produce. Data are available on the number of households currently engaged in different alternative livelihood activities and have been provided for the villages identified for inclusion in this project (Annex 4). The extension of these practices to other households and villages is limited by a number of factors including: access to appropriate knowledge and skills; access to finance; and relevant market information and marketing expertise and capacity.
265. The Rural Women's Trust Fund provides an existing mechanism for women to access financial support to initiate alternative livelihood activities. This fund is currently more active in some counties and villages than others. There are also anecdotal reports of both success and failures with the fund.
266. In summary, the current situation involves differing impacts on communities in the different Zones in the basin. Some farmers and households are already adapting autonomously to the changed conditions. However, there is no clear emphasis on the development and implementation of climate smart agriculture practices and there is no overall coordination of efforts to introduce alternative livelihood practices, in particular to the most vulnerable.

Additionality (with the AF investment)

267. Component 2 is focused firstly on establishing a clear climate change context for the introduction and implementation of relevant adaptation measures aimed at strengthening the resilience of livelihood practices in the Bakhtegan Basin. This context will be provided through Component 1 and further supported through Component 4. Within this context a systematic approach will be adopted, which is aimed at building on and adding value to existing initiatives. The primary focus of Output 2.1 will be the introduction of economically viable climate smart agricultural practices which are aimed at reducing demand for water and also the amount of land that is under cultivation. Essentially its core focus will be on behaviour change, to be fostered through a strongly participatory process that is focused on building ownership and learning by doing. While farmers and their current agriculture practices have rightly been identified as part of the problem it is also essential to recognise that they need to be an integral part of the solution. The primary focus of Output 2.2 will be on extending and adding value to existing alternative livelihood initiatives and practices by the provision of small-grants with a target on women entrepreneurs and women-headed households. This will include a strong emphasis on supporting those in the most vulnerable communities, particularly in Zones 1 and 4.
268. Lessons learned from the Rural Women's Trust Fund will inform the provision of small-grants to women to implement alternative livelihoods, that otherwise won't be able to be implemented and will not be able to promote off-farm livelihoods maintaining the dependence on water-intense agriculture practices.

Component 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened.

Baseline (without the AF investment)

269. The situation with the natural environment in the Bakhtegan Basin is highly complex with no simple solutions. There are multiple issues arising from the decline in surface and water resources, particularly in the lower parts of the basin, and the increasing encroachment of people into national parks, protected areas, forests and rangelands. This situation has arisen as the results of decades of mismanagement following, firstly, the land reforms that were implemented in Iran in the 1960s

and subsequently with further development decisions. This situation has been exacerbated by a prolonged drier than average period since the last serious drought in 2007.

270. The above situation, including the restoration of the Bakhtegan Wetland in alignment with the national priority focus on wetland restoration, cannot be easily resolved. Government agencies and communities are focused instead on what is achievable within their human and financial resource capabilities. Soil and water conservation work undertaken in the Bakhtegan Basin during the last 18 years has included revegetation of 106,700 hectares of land, exclusion of livestock from 65,000 hectares, construction of 22 embankments and 1712 masonry check dams and 61 groundwater artificial recharge projects. Work in protected areas and national parks has involved a combination of efforts from local communities and DoE. Restoration work in the Kamjan Marshes was initiated by the local community and has subsequently been supported by the DOE. Runoff was flowing in drains which were constructed 35 years ago to drain Kamjan for agricultural purposes. Local people blocked these drains to conduct water to the Kamjan Marsh. These drainage systems also reached to Tashk Lake. One on-going issue in this area is the nutrient and agro-chemical loading of the runoff. Other important work includes that undertaken through the Central Zagros Mountains (CZM) project. In the Bakhtegan Basin this involved a number of activities which are summarised in Section F.
271. One of the biggest issues for communities to come to terms with in the Bakhtegan Basin is that what was previously a moist, humid environment is increasingly becoming an arid, dryland environment. The focus on the natural environment therefore needs to be on the design and implementation of measures that enhances resilience of the rangelands, forests, wetlands, protected areas and national parks within the context of these changed conditions. As much as possible this needs to include restoration and protection of wetland habitats in local areas to support migratory birds and other wildlife.

Additionality (with the AF investment)

272. Component 3 is focused on implementing realistic and achievable measures to protect, enhance, and build the resilience of the natural environment within the context of the prevailing dryland environment. AF resources will be used construct small-scale works such as check-dams, contouring, strip-cropping that are intended to achieving significant reductions in soil erosion, drought control in rangelands and forest areas and combating desertification. In addition, rehabilitation and monitoring of forest rangelands, protected areas, national parks and wetlands will strengthen the necessary conditions to support conservation of the soil and water resources in the Bakhtegan Basin. Rehabilitation activities will be implemented with local community participation. On the same regard, AF resources will be used to develop and implemented a climate resilience action plan for the key species in target protected areas to monitoring results and conserve biodiversity in the context of severe drought.
273. Importantly, it is recognised that such work needs to involve active engagement with and participation of local communities. As much as possible this work will be aligned with communities who are also engaged with through Component 2 of the project, to ensure a fully integrated approach to resilience building which addresses environmental, social and economic issues.

Component 4: Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures.

Baseline (without the AF investment)

274. There is a current lack of clear understanding and integration of climate change considerations to guide decision making at all levels in the Bakhtegan Basin. Additionally the current situation involves a combination of government agencies operating in their individual silos and, in general, a top down approach to decision making. The latter is not exclusively the situation. For example in Arsanjan County (Zone 4) the local government authority has worked in a participatory manner with communities to stop rice cultivation and bring an end to the burning of stubble. Those local authorities who are working more proactively with their communities tend to be those are in more of a crisis situation. There is also an atmosphere of blame, increasing mistrust, and also people wanting to retain what they believe is their unrestrained right to have access to water. In the words of the Arsanjan Deputy of Local Government, *“you can’t stop people, you can only advise them”*. There is no existing governance structure specifically for the Bakhtegan Basin.

Additionality (with the AF investment)

275. Component 4 will provide, firstly and very importantly, a comprehensive and inclusive approach to education and informing as many people as possible in the Bakhtegan Basin about the current situation, its causes, and the increasing role of climate change. The latter will involve the provision of a clear, but concise, understanding of the science of climate change, what is already happening as a consequence, what it means for the basin in the future, and what can and needs to be done to build resilience. This will occur through multiple approaches and platforms, and will include education and capacity building of local communities, local authorities and provincial government. This improved knowledge and understanding of issues, challenges and solutions will be supported by strengthened governance structures and mechanisms, which build on existing governance structures. This strengthening of governance will have a very strong focus on inter-agency cooperation and strong engagement with and participation of local communities.

J. Sustainability of the project/programme outcomes

Institutional sustainability

276. Establishment of a functional governance structure is crucial for the long-term sustainability of interventions beyond the project lifetime. Under Output 4.2, the Bakhtegan Basin Council will be established to facilitate the long-term sustainability and climate resilient management of the Bakhtegan Basin, with clear mechanisms for strong community participation in decision making. This Council will be built on the existing management structure of the Bakhtegan Wetland defined by the DoE of Fars province and UNDP in Iran. The existing structure will be modified or strengthened to incorporate adaptation to climate change in the Bakhtegan Basin and mainstreamed into the national budgeting and planning mechanism. The intention to build on this existing mechanism represents a focus on ensuring participation of all relevant stakeholders to address the consequences of water and land resource mismanagement and adapt to the unfolding negative impacts of climate change in the Bakhtegan Basin.
277. The Council will aim to achieve livelihood sustenance within the context of the land and water crisis and associated impacts of drought and climate change within the Bakhtegan Basin. The Council will commission review of existing national/province frameworks and policies in the context of adaptation to climate change and land and water resources planning and management, efficiency and effectiveness of current governance mechanisms from national level all the way through to local farmers; establish an integrated water and land management system that incorporates considerations of climate change; demonstrate a pilot in the Bakhtegan Basin on use of a “national spatial strategy plan” approach based on natural water basins to guide and inform the provincial environmental working group under the Environmental High Council of Iran at the highest national scale. The proposed governance structure for Bakhtegan Basin is elaborated in Figure 10, para 156.
278. Since climate change is a relatively new subject for many of the provincial officials, capacity building measures will be undertaken through Output 4.1, to increase their awareness of climate change within the context of the current land and water crisis in the basin and what is required to build resilience. The project will also provide an opportunity for government and communities to jointly incorporate climate change impacts into a Water and Land Use Planning framework to guide land use decisions to protect and enhance natural resources and biodiversity in the context of drought and socio-economic stresses, which will guarantee the institutional support of project actions and results after the project is completed.

Technical sustainability

279. The key to ensuring technical sustainability of project outcomes is effective education and capacity building, and on-going positive relationships between technical staff from government agencies and local communities. This has been taken into account for all technical aspects of the project design. Under Component 1 a fundamental technical dimension to the project is the development and implementation of a capacity for consistent and up to date climate change and climate risk assessments. This work will build on the strong existing technical capacity that already exists within Iran for conducting such assessments. It will be achieved through customization of a widely used climate change scenario generator and risk assessment tool for Iran as a whole and specifically for the Bakhtegan Basin. Customization of this software tool will be accompanied by capacity building in relation to its application at national and provincial level. On-going applications will be supported and enhanced through the joining of an international community of scientists and technical staff who are engaged in applications of the same software. Other technical aspects of Component 1, in particular the development of a decision support system, will build on existing capacity and expertise with GIS as well as drawing on existing capabilities for the development of the information portal system (TIPS).
280. Components 2 and 3 will also require strong technical support and input. Engagement with, and increased ownership of, communities will be fundamental to ensuring that these efforts are sustained beyond the project. Of particular importance under Output 2.1 will be the research programme to be developed and implemented at the Marvdasht research station. To ensure its on-going success this work is focused on building on existing capacity within the research station. Importantly, the emphasis in the project design has been on an action research approach which is aimed at building ownership with farmers and rapid dissemination of results as widely as possible. With such an approach the technical capacity for new innovations is not simply held by scientific experts, but is held, owned and shared by a community of farmers with on-going feedback to scientists. Under Output 2.2 the technical dimensions of alternative livelihoods will be supported and sustained by local community experts, with additional input through specific education and training activities. Some villages already have strong technical capacity in certain areas, such as weaving for example, with sharing of technical skills through inter-generational learning and existing community structures. The project will build on these existing capacities as much as possible. Under Component 3 there is strong existing technical capacity amongst MOE, DOE and MOJA staff within the province and locally. As with Component 2, the key to long-term sustainability is the building of ownership, which requires firstly the development of strong working relationships between technical staff and local community members.

Environmental sustainability

281. The current crisis in the Bakhtegan Basin is first and foremost an environmental crisis. This situation has been clearly presented in this proposal and is the main underlying driver for the whole project design. The environmental issues in the basin are large, widespread and complex. This project cannot address them all and it cannot undo the progressive, and rapid, changes that have arisen since the 1960s that have resulted in the drying of the Bakhtegan Wetland and is now threatening the whole hydrological system of the basin.
282. The project has therefore been carefully designed to encompass what can be realistically achieved and sustained within a climate change adaptation context. Specifically, it is deliberately focused on the current dryland environment that is now prevailing. The rationale for this approach is that even if there is a climate shift in coming years towards wetter than average

conditions which ease the situation, there will have been a significant raising of awareness and implementation of actions that are designed to conserve water and protect and enhance the environment. These actions will be supported by the strengthened institutional and technical capabilities which have been summarised above.

Social sustainability

283. Communities within the Bakhtegan Basin, particularly in the rural areas, have strong social networks and support systems. However, the unfolding land and water crisis has had serious social impacts which have been summarized in Table 3. The loss of rural livelihoods, in particular through lack of water, environmental degradation and declining production, has directly resulted in migration to urban areas, loss of self-esteem, increased divorce rates, increased drug use and addition and increased crime. These, and other issues, are not unique to the Bakhtegan Basin and have been documented and studied in more depth elsewhere in Iran. Drought is a particularly insidious phenomenon that can have long-lasting impacts on individuals and communities.
284. Despite these challenges there is evidence of the strong social networks and support systems at work in the basin to address the crisis situation. This is apparent through the concerns and proactive work already being undertaken by a number of county governors and their administrations which were shared during project design consultations. It is evident in local examples of communities and individuals who are already adapting autonomously to the changed conditions. It is also evident in the increasing focus of government agency staff at provincial and local level on working together with communities to develop and implement solutions.
285. The project is designed to build on and enhance these existing social structures and initiatives and therefore has a strong foundation to work from to ensure the social sustainability of project outcomes. This will be achieved in two key ways. Firstly, the strong focus on education and capacity building in a participatory manner which builds long-term ownership will directly strengthen the social sustainability of participating individuals and communities. Secondly, the communication of project results widely to all people throughout the Bakhtegan Basin combined with an emphasis on sharing stories and fostering constructive dialogue between communities in different parts of the basin will provide enduring social benefits to the whole population.

Financial sustainability

286. Many of the environmental and social issues within the Bakhtegan Basin have arisen from the basic need of people to make a living from the land. With the removal of traditional land management systems and practices in the 1960s, accompanied by the absence of any education of farmers, a situation of unrestrained development has occurred. This has been exacerbated by subsequent government policies that have been narrowly focused on production with no consideration of the environmental and social costs. This is exemplified by the strong emphasis on rice production, which has been supported by high economic returns to farmers. The consequences of this narrow focus on production at all costs are now evident. An important part of the challenge now is to identify new initiatives that are environmentally and socially beneficial and provide strong economic incentives to change.
287. It is a reality that people are much less likely to sustain initiatives and activities when they experience direct economic benefits. Component 2, therefore, is strongly focused on improving the economic well-being of project beneficiaries, while at the same time enhancing and protecting the environment and improving social well-being. This forms one of the two key pillars of the project and is of fundamental importance to its enduring success. For the implementation of the Climate Smart Agriculture Systems, which are designed to reduce demands of land and water and at the same time increase farmer incomes, will be linked to the market research to identify potential national/international markets that will provide clear economic benefits to farmers after project closure. These activities will be guided and supported by MoJA's extension services.
288. In regards of the alternative livelihoods activities, based on results from the GAAP, the project will support the most vulnerable women and women's cooperatives with small-grants and skills training on the pre-selected alternative livelihoods identified to implement livelihoods to move away from water-intense agriculture. The financial sustainability strategy considered for this output is for these women and women's cooperatives to increase their collateral and creditworthiness, so they can access the micro-credit market, hence the interest to have the Rural Women Trust Fund and other women-oriented business initiatives being part of the project.
289. In addition, for the implementation of alternative livelihoods for women/women's cooperatives, DoE will seek to formalize support with diverse organizations during the 3rd year of implementation (through a LoA/ MoU) to keep links the AF-supported cooperatives with women-oriented organizations and financial institutions to maintain and expand their livelihoods. Among the institutions that DoE will reach to, it's expected to discuss formalization of support from Employment Department of Ministry of Cooperatives, Labor, and Social Welfare (MOCLSW), Center for Women Entrepreneurs and Traders of Fars Province, Professional Association Iranian of Women Entrepreneurs (AIWE), Dastadast Social Enterprise, among others. In addition, DoE will have special decision with Agriculture Bank of Iran and other micro-lending institutions working in Fars Province to discuss special borrowing services and credit lines for catered for these cooperatives (preferred borrowing services/incentives to differed payment timeframes, etc.)
290. For activities under component 3 that are targeted at achieving significant reductions in soil erosion, drought control in forest, rangelands, protected areas, national parks and wetlands, sustainability is associated with the capacity of local communities

and of local and regional authorities to influence collective decisions regarding the implementation of policies and activities to address climate change impacts which are embedded in the project's approach.

291. The construction of water ponds to harvest rainwater both for domestic supply and to enhance crop, livestock and other forms of agriculture and terracing (Out 3.1) will be fully financed by the project with paid labour from beneficiaries. The Forest, Rangeland and Watershed Organization (FRWO) will guide and support this output and it's expected for FRWO to provide O&M expenses of the ponds and terracing jointly with beneficiaries' support.
292. Regarding the financial sustainability strategy for the rehabilitation, conservation and monitoring of these sites, the DoE will incorporate in its general operation budget all associated costs related to the involvement managing, rehabilitating, and monitoring strengthened forest, rangelands, protected areas, national parks and wetlands.
293. Lessons learnt from Lake Urmia restoration project that involved MOJA, DoE and MOE, where new methodologies were adopted under a joint initiative with tangible results at the end, increased the sense of government ownership and recognition of such projects as best practices. This approach also led to changes in their planning and budgeting system to consider these successful practices in their annual budgeting system and national implementing projects. Now, the government of Iran is supporting Sustainable agriculture practices in more than 500 villages while the LU restoration project budget could support only 130 villages. The above practice would also be used for the AF project. With increasing sense of government ownership, the result of AF project will be sustained through governmental planning and budgeting system. As already discussed with the government partner of the project the new approaches and activities will be supported through national financial schemes under the national/provincial development programme of each responsible organization. Some of these national/provincial programmes already exist but need modification. In other cases, new programmes will be proposed to the Planning and Budgeting organization based on project best practices and lessons learned which will ensure both financial and technical support of project achievements in later stages

K. Overview of the environmental and social impacts and risks identified and relevant to the project / programme.

294. The project has been reviewed at a high level, against the 15 environmental and social principals that are the basis of the AF ESP, as well as with UNDP's Social and Environmental Screening Procedure (both provided in the ESMF in Annex 10). The screening and preliminary analysis found that certain project activities could generate a number of limited adverse social and environmental impacts. The screening resulted in an overall social and environmental risk categorization of "Moderate." The ESMF is designed to avoid, and where avoidance is not possible, mitigate and manage these limited potential impacts.
295. As previously stated, proposed USP cannot undergo a full screening until they are fully formulated during project implementation. USPs occur in Output 2.2, Output 3.1, and Output 3.2. A summary of the risks and mitigation measures identified to date, in line with the ESP of the Adaptation Fund is provided in the table below. A more detailed output level table is provided in Annex 10: ESMF Table 2: *Assessment against AF 15 ESP* in line with the ESP.

296. Table 13: Risks and mitigation measures for known activities in line with the ESP of the Adaptation Fund

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks –further assessment and management required for compliance
<i>Compliance with the Law</i>	X	Low/no risk: The project will be compliant with all relevant national laws and regulations. Legal register will be used to track/ensure compliance.
<i>Access and Equity</i>	X	Low/no risk: The project will ensure equitable access to project benefits by all community member. An inclusive SEP will be implemented.
<i>Marginalized and Vulnerable Groups</i>		Low/no risk: to ensure consultation and involvement of such groups an inclusive SEP and GAP will be implemented.
<i>Human Rights</i>	X	Low/no risk: This project affirms the rights of all people and does not violate any pillar of human rights. The project will adhere to national and international human rights standards, policies, rules and regulation
<i>Gender Equity and Women's Empowerment</i>	X	Moderate: Project will not maintain or exacerbate gender inequality or the consequences of gender inequality. A Gender Assessment and Action Plan has been prepared. Gender will be mainstreamed in all project components
<i>Core Labour Rights</i>	X	Low/no risk: The project will adhere to core labour rights during implementation

<i>Indigenous Peoples</i>	X	No risk: No indigenous peoples within project area
<i>Involuntary Resettlement</i>	X	Low/no risk: no involuntary resettlement is proposed as part of project. WLUPs will be developed in consultation and with agreement of communities.
<i>Protection of Natural Habitats</i>	X	Low: Activities will enhance protection of natural areas through improved water and land management planning, improved farming practices on existing farms and capacity building to increase community awareness of values of natural habitats.
<i>Conservation of Biological Diversity</i>	X	Low: Improved water and land management knowledge and practices, including CSA, will reduce pressure on habitats. Application of ESMF
<i>Climate Change</i>	X	Low/no risk: The project will not generate any significant emissions of greenhouse gases and will not contribute to climate change in any other way. All project components and activities contribute to increasing local capacities to sustainably face climate change in the long-term and climate variability in the short and medium terms.
<i>Pollution Prevention and Resource Efficiency</i>	X	Low/no risk: The project will not release pollutants. Energy efficiency, minimization of material resource use, and minimization of the production of wastes will be embedded in project design.
<i>Public Health</i>	X	Moderate: The project design will ensure that public health is not adversely affected. Capacity building will include good OHS practices
<i>Physical and Cultural Heritage</i>		Low risk: Consultations and engagement with stakeholders and communities will ensure that any physical cultural heritage present on the project site is identified and potential negative impacts are avoided through project design
<i>Lands and Soil Conservation</i>		Moderate: Project includes farming activities, which by its nature has impacts on soil. The project will promote conservation of soil and land resources and introduce WLUPs. Project will develop ESCPs to manage erosion risks.

*There are no groups officially classified as 'marginalised or minority'. The project considers marginalised groups as the villagers living in the downstream part of the basin close to the Bakhtegan Wetland whose livelihoods (from agriculture related activities) are severely affected by climate change/drought, making daily life in the villages more difficult, or has forced them to migrate to large nearby cities as slums dwellers which again brings in new social implications.

297. The above risk assessment considers the known aspects of the project activities, some activities are still not fully defined and therefore considered undefined sub-projects (USPs) by AF. To ensure continued compliance with the AF ESP, the USPs will require further assessment once full details are known. The ESMF identifies the process and timing of screening of USPs. The process of screening USPs is provided in detail in Annex 10:ESMF

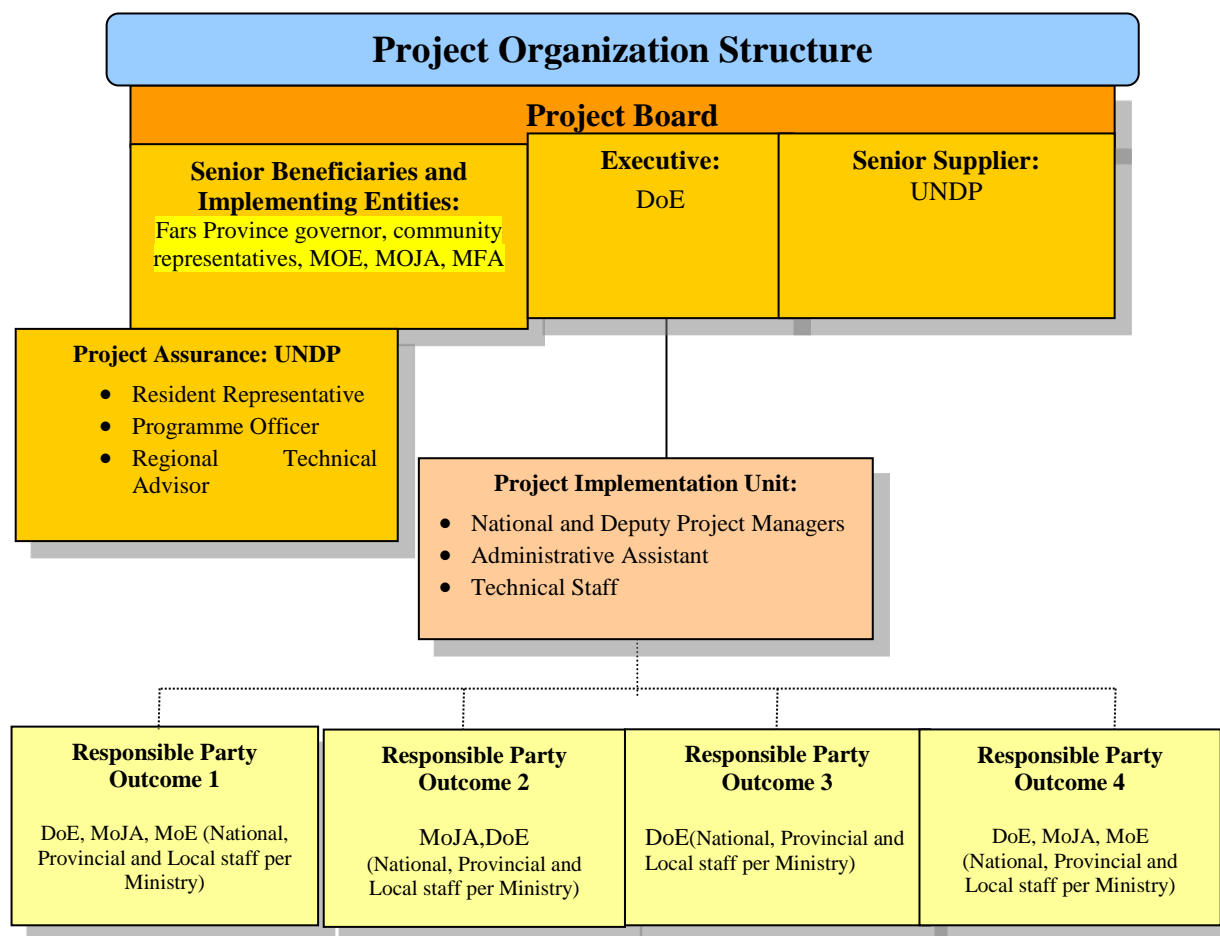
PART III: IMPLEMENTATION ARRANGEMENTS

A. Adequacy of Project Management Arrangements

298. The Government of the Islamic Republic of Iran will execute the project with the support of the UNDP under the National Implementation Modality (NIM). The Department of the Environment (DOE) will be the Executing Entity responsible for ensuring that the objectives and components of the project are delivered, and that resources are allocated and disbursed in an efficient and effective manner. The DOE will have the technical and administrative responsibility for applying AF inputs in order to reach the expected Outcomes/Outputs as defined in this project document. The DOE will be responsible for the timely delivery of project inputs and outputs, and in this context, for the coordination of all other responsible parties, including other government agencies, regional and local government authorities.
299. As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key general management 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: programme formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of programme staff and consultants; general oversight and monitoring, including participation in programme 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. In this context, UNDP will provide support to the Project Coordinator of the programme to maximize its reach and impact as well as the quality of its products. Moreover, it will be

responsible for administering resources in accordance with the specific objectives defined in the Programme Document, and in keeping with its key principles of transparency, competitiveness, efficiency and economy. The financial management and accountability for the resources allocated, as well as other activities related to the execution of Programme activities, will be undertaken under the supervision of the UNDP Country Office, UNDP Regional Hub and UNDP HQ, in line with the 3-tiered quality assurance function of UNDP. UNDP will undertake the internal monitoring of the Programme and of evaluation activities, taking into account from the outset local capacities for administering the programme, capacity limitations and requirements, as well as the effectiveness and efficiency of communications between ministries and other institutions that are relevant to the programme⁵⁵.

300. Implementation of the project will be carried out under the general guidance of a **Project Board (or Project Steering Committee)** that is responsible for making management decisions for the project in particular when guidance is required by the Project Manager. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual WorkPlan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans based on AF budget guidance.
301. In order to ensure UNDP's ultimate accountability for the project results, Project Board decisions will be made in accordance to standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the final decision shall rest with UNDP.



⁵⁵ As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of programme execution modalities determined on country demand, the specificities of an intervention, and country context. Under the national execution modality proposed to be used for this programme, 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 responsible and accountable for budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and programme personnel; financial and progress reporting; and monitoring and evaluation. As stated above, however, UNDP retains ultimate accountability for the effective implementation of the programme.

302. Potential members of the Project Board are reviewed and recommended for approval during the PAC meeting. Representatives of other stakeholders can be included in the Board as appropriate. The Project Board will be composed of designated senior-level (national and provincial) representatives from Ministry of Energy (MOE), Ministry of Agriculture-Jahad (MOJA), Ministry of Foreign Affairs (MFA), Department of Environment (DOE) and Fars Province governor (representative) and community representative(s). Other related authorities could be added to this committee with confirmation of other members or being invited to the meeting accordingly. The establishment of a Bakhtegan Basin Council under existing Fars Province structures will provide long-term sustainability. The council will be comprised by committees from each target zone (Zone 1 to 4) that will form a "Provincial Working Group for Climate Resilience in Bakhtegan Basin" headed and housed at Fars Province Governor. The council will provide recommendations to the Project Board related to implementation of the outputs from Component 2, 3 and 4. It's expected that after project closure the Council will take over the Project Board's functions to the extent possible with financial support from Fars Province Governor. A complete list of PB members and their designated alternates will be provided in the inception workshop report. The project board will be the highest governance body for the project planning and result while the council is a governmental body which will lead adaptation activities and project in the basin and will manage all sectoral planning and budgeting according to new approached to adapt with climate change effects. By having the Governor in the project board, a strong link will be established between the board and the council, as the latter is chaired by Governor at provincial level. Most part of project activities will be implemented under the responsibility of MOE, MOJA and DoE on soil and water management along with environment protection and they have a strong role in supporting project implementation as board members. Provincial Governor office as another board member has the main coordination role of government authorities, ensure smooth implementation of project activities and allocation of budget in a long-term period. Community representatives also have a crucial role in project board both being involved in decision making processes and also further implementation of project activities at local level. While all main agencies (MOJA, DOE, MOE, MFA and Governor offices) are members of the steering committee and have a role in high level decision making under the project, each has a responsibility regarding specific sections of project. The Ministry of Agriculture-Jahad (MOJA) has the main role of implementing activities under output 2.1 which relates to promotion of climate smart agriculture and will be the lead agency to implement project activities in coordination with its provincial and local offices. MOJA also has an important role in output 2.2 as most of alternative livelihoods will be in relation to their area of authority. Ministry of Energy (MoE) will be the main responsible authority for activities under output 1.1, 1.2 and 1.4 and also involved in output 2.1 in the sections related to water savings and improved water management at farm/village level. Forest, Rangeland and Watershed Organization (FRWO) under MoJA is the main responsible authority for output 3.1. DoE as the main executing entity, and chairperson to the board, has the overall coordination role among different agencies while monitoring project activities in all project outputs and project central office will be based in DoE. Activities under output 3.2 are considered as part of adaptation and rehabilitation activities of DoE for Bakhtegan protected areas and it will be done under their responsibility. As MFA is AF focal point in Iran and this project will be implemented through UNDP as an international agency, MFA has to be present in steering committee meetings and will be a key partner in monitoring project results, validate reports for further submission.

303. **Project Manager:** The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Implementing Partner within the constraints laid down by the Board. The Project Manager'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. The Project Manager or Coordinator will prepare a Work Plan to incorporate the activities and results of the project to be delivered. The Plan will define the timeframe for implementation of each activity and the parties responsible for their implementation. The First Work Plan will be finalized and incorporated into the Project Document within 30 days of its signature.

304. **Project Support:** The Project Support role provides project administration, management and technical support to the Project Manager as required by the needs of the individual project or Project Manager.

305. **Project assurance:** UNDP Iran 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 Iran 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 Officer to support the Project Board to objectively and independently oversee and monitor the project.

306. **UNDP Direct Project Services as requested by Government:** Upon request from the Executing Entity, UNDP can provide Direct Project Services (DPS) according to its specific policies and convenience. In this case, the Executing Entity will sign a Letter of Agreement specifying the services to be provided and their costs. These are services that cannot be handled by the Executing Entity's existing mechanisms (especially timely and efficient procurement of goods or services) and are to be provided by the UNDP Country Offices to ensure the successful delivery of programmes, and mainly include:

- Payments, disbursements and other financial transactions

- Recruitment of staff, project personnel, and consultants
- Procurement of services and equipment, including disposal
- Organization of training activities, conferences, and workshops, including fellowships
- Travel authorization, visa requests, ticketing, and travel arrangements
- Shipment, custom clearance, vehicle registration, and accreditation

From a practical point of view UNDP Iran provides a neutral platform for implementation of multi-stakeholder projects. UNDP role in previous experiences to support services and provide an implementation arrangement that is inclusive and ensures participation of all stakeholders and helped government to practice new approaches in an enabling environment. Based on this, 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 carry out such activities directly. The costs of these services will be part of the project management costs of the executing entity identified in the project budget. UNDP and the government of Iran recognize that these services are not mandatory and will only be provided in full compliance with the UNDP recovery of direct costs policies. The DPS will be charged annually using the UNDP Universal Price List.

B. Table 14: Measures for financial and project risk management

No.	Type	Risk Description	Level	Mitigation strategy
1	Institutional	Decision-making processes at the national and local levels are slow.	Low	-Project Implementation Unit will operate directly in the project area to promote decision-makers' involvement in the project and keep authorities and decision-makers informed about the development and achievements of the project. - Permanent political and technical support will be provided to the project and its stakeholders by the agencies of the Government that are involved in the project (MoE, DoE, MoJA), as well as coordination of actions with the project team and regional and local stakeholders.
2	Institutional	Coordinated efforts with DoE, MoE and MoJA in Tehran and in Fars Province might create delays during project implementations.	Medium	-Project Board (Steering Committee) will be structured to have representatives from national ministries and their counterparts from Fars Province to foster coordination. -Foster participation of national and provincial policy and decision-makers in workshops during the project preparation phase and consultation through various meetings and communications about the project's strategy, components, and expected outcomes. -Active participation of national and provincial policy and decision-makers in key moments during the life of the project (approval, inception, implementation, and mid-term and final evaluations).
3	Operational	There might be resistance from some stakeholders in adopting the proposed measures in target area.	Low	A Bakhtegan Basin Council will be established where community members, community leaders, civil authorities and other stakeholders will discuss locally important issues related to climate change and adaptation and interventions to be implemented in the Basin increasing the ownership and acceptance of interventions.
4	Financial	Delays in executing funding at the provincial level.	Low	-Project activities have been designed and paced to ensure a reasonable chance of completion after the timeframe of the project. -UNDP and MoE/MoJA/DoE will provide permanent support for the mobilization of funds, contracting, monitoring, and financial reporting. -UNDP will provide specific technical assistance and management support to each agency based on the results of such assessments.
5	Financial	Gov of Iran is not able to leverage sufficient financial resources for the sustainability of project actions.	Medium	-The project will strengthen the institutional basis for accessing public and private sources of climate change finance in the future to attract additional sources of funding. -UNDP will provide support to the Gol in securing and mobilizing climate change-related financing.

6	Political	Continued anthropogenic degradation in the Bakhtegan Basin, as a result of deforestation and conventional irrigation practices.	Medium	-Project activities will be aligned to national and provincial initiatives currently addressing deforestation and water-intensive irrigation practices. -Project coordinator will work closely with provincial staff from MoE, DoE and MoJA to take advantage of environmental and land use instruments in place to assure that the objectives sought in the AF proposal are not undermined. -Specific activities were designed to directly and indirectly address anthropogenic degradation while generating food security and generation of income in target communities.
7	Political	Pressures and tensions in the surroundings of national parks	Medium	-Project activities will be aligned to restore degraded lands in Protected Areas and outside and setting up a monitoring system with DoE. -Project Coordinator will work closely with provincial staff from DoE to monitor pressures on natural parks to make sure that the AF project objectives are met.
8	Political	Social upheaval related to water management	Low	-Project activities are aim at increase awareness about the impact of drought in the Bakhtegan basin as an interconnected system and the need to reduce inefficient use of water. -Project will set up a Bakhtegan Basin Council for all relevant stakeholders to seat at the table and discuss jointly efficient water management initiatives.
9	Political	Illegal wells digging and overexploitation of legal wells	Medium	-Project activities are aim at increase awareness about the impact of drought in the Bakhtegan basin as an interconnected system and the need to reduce inefficient use of water. - Project coordinator will work closely with provincial staff from MoE, DoE and MoJA to develop strategies to better enforce legal framework around illegal wells and over exploitation of legal wells.

A comprehensive risk management strategy will be a core component of project management activities. This is in line with UNDP's stringent risk management approach which is corporate policy. The respective UNDP CO provides support to the project team and executing agency for constant and consistent risk monitoring, and the results are tracked and reported in UNDP's internal risk monitoring system. Risks will be entered into the UNDP's Atlas (project management system) and will be systematically monitored as part of the M&E process by UNDP staff carrying out their oversight related tasks. The results are also reported in the yearly evaluation undertaken for each project.

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

307. As noted in previous sections in this document, the project falls under the B category as assessed by 15 criteria and principles established by the Adaptation Fund. Risk mitigation and management measures are described under Section J, and in the Environmental and Social Management Framework attached to this proposal.
308. The ESMF outlines monitoring arrangements for implementation of environmental and social risk management, as well as procedures for addressing stakeholder concerns regarding the project's social and environmental performance.
309. DoE will be responsible for the implementation of the ESMF through the PMU. Environmental and social risks will be assessed for each sub-activity by the DoE and UNDP prior to any works being undertaken. The EMSF identifies potential risks to the environment and social matters from the projects and outlines strategies for managing those risks and minimising undesirable environmental and social impacts. Further, the EMSF provides a Grievance Redress Mechanism for those that may be impacted by the projects that do not consider their views have been heard.
310. The PMU will ensure timely remedial actions are taken where necessary.

Administration of the ESMF

311. The DoE will be the implementing agency and will be responsible for the implementation and compliance with the ESMF via the collaborating partners and contractors. The ESMF will be part of any tender documentation. The DoE will be responsible for the revision or updates of the ESMF. Site supervisors will be responsible for any daily/weekly environmental inspections at implementation sites. The DoE will cross check these inspections by undertaking monthly audits. The DoE or its delegate will maintain and keep all administrative and environmental records which would include a log of complaints together with records of any measures taken to mitigate the cause of the complaints.

Environmental procedures, site and activity-specific work plans/instructions

312. Environmental procedures provide a written method describing how the management objectives for a particular environmental element are to be obtained. They contain the necessary detail to be site or activity-specific and are required to be

followed for all construction works. Site and activity-specific work plans and instructions are to be issued and will follow the previously successful work undertaking similar projects.

Environmental incident reporting

313. Any incidents, including non-conformances to the procedures of the EMSF are to be recorded using an Incident Record and the details entered into a register. For any incident that causes or has the potential to cause material or serious environmental harm, the site supervisor shall notify the Project Manager as soon as possible. The delivery organisation/contractor must cease work until remediation has been completed as per the approval of DoE.

Daily and weekly environmental inspection checklists

314. A daily environmental checklist is to be completed at each work site by the relevant field officer and maintained within a register. A weekly environmental checklist is to be completed and will include reference to any issues identified in the daily checklists completed by the site supervisor. The completed checklist is to be forwarded to DoE for review and follow-up if any issues are identified.

Corrective Actions

315. Any non-conformances to the EMSF are to be noted in weekly environmental inspections and logged into the register. Depending on the severity of the non-conformance, the field officer may specify a corrective action on the weekly site inspection report. The progress of all corrective actions will be tracked using the register. Any non-conformances and the issue of corrective actions are to be advised to DoE.

Procedures to Address Environmental and Social Impacts and Risks

316. The ESMF was developed to ensure due diligence, to avoid causing harm or exacerbating risks or impacts. This section describes the procedures in place to determine: (i) the categorization of the project activity based on potential adverse environmental and social impacts of project activities, and (ii) how potential impacts will be addressed through the selection of appropriate mitigation and management plans.

317. The broad physical investments are known, however, there are implementation details and final detailed designs that will be identified during project implementation. To ensure that detailed design and implementation plans do not change risk ratings and to better define the nature and scale of potential impacts and the mitigation measures required in the subsequent ESMPs, secondary screening should be undertaken (this can be done at the appropriate level eg task by task or by atoll or by sub-activity).

Environmental Safeguard Screening Procedures

318. This section sets out a process for screening sub-activities and associated elements during project implementation. Any sub-activity and associated elements developed during the Project should be evaluated according to the screening process described below to determine the potential risk of associated environmental and social impacts, and associated mitigation options. The process consists of the following steps:

Step1: at the time of preparing Terms of Reference for each sub-activity or associated element (TA or services delivery component), each sub-activity or associated element shall be screened against the 15 AF ESPs and categorized, with a decision made to proceed or modify the proposal and identify relevant safeguards instruments.

Step 2: Preparation of required safeguards instruments including stakeholder consultations as necessary

Step 3: Review of prepared safeguards instruments as per Iran and AF safeguards policies; additional stakeholder consultations as deemed necessary.

Step 4: Submit prepared safeguards instruments to UNDP. Disclosure of approved instruments locally and on UNDP's website.

Step 5: Implementation – monitoring, reporting and remedial measures as per approved ESMP etc. Ongoing consultations and community engagement.

D. Monitoring and Evaluation arrangements in compliance with the ESP and the Gender Policy of the Adaptation Fund, including budgeted M&E plan.

319. The project will be monitored through the following M&E activities. The M&E budget is provided in the table below.

Project start:

320. A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

321. The Inception Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.

- b) Based on the project results framework, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
- c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
- d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
- e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

322. The following will be undertaken on a quarterly basis:

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Note that for UNDP AF projects, all financial risks associated with financial instruments such as revolving funds, microfinance schemes, or capitalization of ESCOs are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).
- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

323. The project is required to submit a Project Performance Report (PPR) to the donor on an annual basis, one year after the start of project implementation (date of inception workshop) and the last such report should be submitted six months after project completion

The PPR completed template should be submitted to the secretariat in English and that all financial figures provided in the template should be in US dollars (USD). There are 8 sections in the template, as follows:

1. Overview
2. Financial information
3. Procurement data
4. Risk assessment
5. Ratings
6. Project indicators
7. Lessons learned
8. Adaptation Fund results tracker

Periodic Monitoring through site visits:

324. UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no later than one month after the visit to the project team and Project Board members.

Mid-term of project cycle

325. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; it 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. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-EEG. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the [UNDP Evaluation Office Evaluation Resource Center \(ERC\)](#).

End of Project:

326. An independent Final Terminal Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and AF guidelines. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-EEG.

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

328. During the last three months, the project team will prepare the Project Final Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Audit

329. The audit would be performed under the UNDP financial regulations and rules applicable to audit policies on UNDP projects.

Learning and knowledge sharing:

330. Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.
331. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.
332. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Communications and visibility requirements:

333. The AF logo should appear on all relevant publications of the Project, included within other logos, project equipment and other acquisitions with AF funds. Any citation in publications regarding projects funded by the AF should give recognition to the AF. The logos of the implementing agencies and enforcement agencies will also appear on all publications. Full compliance is required with UNDP's Branding Guidelines. These can be accessed at <http://intra.undp.org/coa/branding.shtml>, and specific guidelines on UNDP logo use can be accessed at: <http://intra.undp.org/branding/useOfLogo.html>.
334. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Table 15: M&E, responsible parties, budget and timeframe

Type of M&E activity	Responsible Parties	Budget US\$	Time frame	Source of fund
Inception Workshop and Report	<ul style="list-style-type: none"> Project Manager UNDP CO, UNDP CCA 	Indicative cost: 10,000	Within first two months of project start up	Project budget
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> UNDP CCA RTA/Project Manager 	None	Start, mid and end of project (during evaluation cycle) and annually when required.	N/A
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> Oversight by Project Manager Project team 	None. To be determined as part of the Annual Work Plan's preparation.	Annually prior to the annual report and in accordance with the definition of annual work plans	None
Annual reports (PPR)	<ul style="list-style-type: none"> Project manager and team UNDP CO UNDP RTA UNDP EEG 	None	Annually, after inception workshop	None
Periodic status/ progress reports	<ul style="list-style-type: none"> Project manager and team 	None	Quarterly	None
Final External Evaluation (cost for Internationals and local consultants) including Project Final report	<ul style="list-style-type: none"> Project manager and team, UNDP CO UNDP RCU External Consultants (i.e. evaluation team) 	Indicative cost: 60,000	At least three months before the end of project implementation	Project budget
Audit	<ul style="list-style-type: none"> UNDP CO Project manager and team 	Indicative cost per year: 3,000 (a total of 15,000 for project)	Yearly	Project budget
TOTAL indicative COST		US\$ 85,000		

E. Strategic Result Framework

	Indicators	Baseline	End of project targets	Means of verification	Risks and assumptions
Objective of the Project To increase the resilience of communities and the natural environment of the Bakhtegan basin to climate variability and change through integrated watershed management	Number of villages (disaggregated by households) in the Bakhtegan Basin with increased resilience to climate variability and change. Number of direct and indirect beneficiaries (disaggregated by women and youth) [Adaptation Core Indicator]	The Bakhtegan Basin is within one of the most drought prone areas of Iran. The entire population of 854,093 people is increasingly exposed to the impacts of a 10-year extended dry period. Water resources are becoming increasingly limited and social and environmental costs are already evident. Lake Bakhtegan is almost dry and it affected daily livelihood of local communities living around the basin.	Direct project beneficiaries at village level: - 15 villages adopting climate smart agriculture practices - 9 villages adopting alternative livelihoods - 6 villages with ecosystem conservation in forest and rangeland areas - 7 national park, protected areas and hunting prohibited areas with rehabilitation work Direct beneficiaries: 4,425 farmers and gardeners (1,325 women) from the 15 target villages will be practicing climate smart agriculture. 900 women will benefit from alternative livelihood practices Indirect beneficiaries: The entire population of Bakhtegan basin 854,093 people (384,341 women) At least 2700 youth will be benefitted from project activities by being involved in local technical cooperatives, smart agriculture and alternative livelihood projects. Indirect benefits to the entire population of the Bakhtegan Basin through communications and awareness raising	- Field reports - Climate-related databases - Project reports: annual reports; mid-term and final evaluations	The project is focused on addressing the impacts of drought and a decade of drier than average conditions, not the underlying issues associated with the mismanagement of water resources since the 1960s. Decision makers at all levels in the Bakhtegan Basin are willing to work together to ensure that climate change considerations are fully integrated into all planning decisions. Participating communities are willing to adopt and sustain the climate change adaptation measures introduced to them.
Outcome 1 A data and information	1.1 Number of climate change scenarios developed to assess	Published analyses of climate change in Bakhtegan Basin but no coherent study for the whole	At least 3 Climate change scenarios for the Bakhtegan basin will be developed based	A published report and generated results	Climate change impact and vulnerability

management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin	climate risks and climate change impacts in target area.	basin using up to date climate change scenarios	on the tailored SimCLIM software. (Scenarios will be developed: 1) projection under the optimistic climate change scenario, i.e. RCP 2.6; 2) projection under the pessimistic climate change scenario, RCP 8.5; 3) projection under a mid-range scenario.)	integrated into the GIS and the Information Portal System (TIPS) (Output 1.4).	assessments are completely in a timely manner to ensure that results are fully accounted for in all other project activities Communities fully participate in the community based monitoring programme The GIS and TIPS are used by stakeholders to support enhanced governance and decision making that is informed by climate change considerations. Effective information for improved decision making relating to land use and water resources management is being used.
	1.2 Number of frameworks developed to support decision making that include climate change, land and water resources in the Bakhtegan Basin.	A comprehensive study on water and land resources was completed in 2007, with key results summarized in Annex 1 Researchers at the Water Resources Engineering Department, Tarbiat Modares University, Tehran have recently completed a baseline (current conditions) analysis for the Bakhtegan Basin using a modified version of the Soil and Water Assessment Tool (SWAT)	An integrated WLUP framework for the Bakhtegan Basin developed and used in decision making processes.	A published report and generated results integrated into the GIS and TIPS (Output 1.4)	
	1.3 Number of households and farmers regularly participating and using the community monitoring system.	There is currently no local community monitoring system focused on climate vulnerability and resilience in the Bakhtegan Basin	An operational community monitoring system is established. 40 villages, involving 13,011 households (Which 5,200 of them are Women) and 12,821 farmers (which 3,900 are women) are involved in the monitoring system.	- Field reports - Climate-related databases - Project reports: annual reports; mid-term and final evaluations	
	1.4 Number of operational decisions support systems incorporating a customized GIS platform and development of the information portal system (TIPS) 1.5 Number of local and provincial plans that incorporate adaptation to	There is currently no system in place for collating and sharing relevant climate change impact, risk and vulnerability data and information	A decision support system is established to improve decision making and governance in the Bakhtegan Basin by customizing a GIS to collate all relevant data and information and a TIPS which is developed and operationalized (through Component 4) Five (5) plans that incorporate considerations for adaptation to climate change: Fars Province,	TIPS web page Number of visits to the TIPS web page Use of TIPS data and information in revised plans for the Bakhtegan Basin	

	climate change considerations based on the decision support system.		Zone 1, Zone 2, Zone 3 and Zone 4 Plans		
Outcome 2 The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods	<p>2.1 Number of farmers with climate smart agriculture practices.</p> <p>2.2 Area (ha) of farmland with climate resilient agriculture practices</p>	<p>Research has been undertaken at the Marvdasht Agricultural Research Centre on improved water use efficiency for rice cultivation but has not yet been disseminated to farmers. There is no active research of climate smart agricultural systems for the Bakhtegan Basin. In the 11 target villages farmers are currently adapting autonomously with the following practices:</p> <ul style="list-style-type: none"> • Growing saffron (7 ha in 1 village), safflower (1 village) and other crops (4 villages) • Reducing water consumption (3 villages) • Using natural fertilisers (1 village) <p>The Central Zagros Mountains project implemented a sustainable agriculture program in Bakan village in 2012-2013, which was extended to 6 villages: Sarbast, Hossein Abad, Abbas Abad, Bakyan, Chogha, Mansour Abad. Achievements of the project were introduced to other villages in the Kor and Kamfiroz districts (39 villages)</p>	<p>4,425 farmers and gardeners (1,325 women) from the 15 target villages will be practicing climate smart agriculture</p> <p>21,910 hectares of cropping land will be converted to climate smart production systems</p> <p>1,726 hectares of horticultural land will be converted to climate smart production systems</p>	<p>- A published report on the market potential, including value chain analysis, of different climate smart agriculture crops, practices and systems</p> <p>- A published report on results from action research on climate smart agriculture</p> <p>- Project monitoring, including community based monitoring (Output 1.3)</p> <p>- Measured reductions in water use of at least 30 percent with participating farmers</p> <p>- Field reports</p>	<p>The market research will be successful in identifying economically viable climate smart crops, practices and systems</p> <p>Participating farmers and farmers more widely will be willing to adopt and sustain climate smart agriculture and reduce their water consumption</p> <p>Participating households and women will be willing to adopt and sustain alternative livelihoods</p>

	2.3 Number of households and women practicing alternative livelihoods	<p>In the 9 target villages for Output 2.2 (2 in Zone 1, 2 in Zone 2, 1 in Zone 3, 4 in Zone 4) there are currently 368 households practicing alternative livelihoods and 193 women receiving support from the Rural Women's Trust Fund.</p> <p>Details of the current alternative livelihood practices of each target village are provided in Annex 4.</p>	<p>In the 15 target villages for Output 2.2 there will be 766 households practicing alternative livelihoods and 900 women by receiving small-grants support. Most of the beneficiaries will be in the four Zone 4 villages where a total of 508 households will be practicing alternative livelihoods and 540 women by receiving small-grants support.</p>	<ul style="list-style-type: none"> - Project monitoring - Project reports 	
Outcome 3 The resilience of the natural environment of the Bakhtegan Basin is strengthened	3.1 Area (ha/M ³) of rangeland and forest with soil and water conservation practices implemented. [Adaptation Core Indicator]	<p>The following measures have been implemented more widely in the Bakhtegan Basin over the last 18 years:</p> <ul style="list-style-type: none"> -22 embankments -1,712 masonry check dams 61 groundwater artificial recharge projects 106,700 ha revegetated 65,000 ha with livestock excluded 	<ul style="list-style-type: none"> - Terracing in 160 ha of arable land and construction of water harvesting ponds in about 500 ha of downstream rangelands for livestock and crops in Charghalat and Kenare villages in Arsanjan county (seven counties in Zone 1 and 4) - Rainfall trapping and pitting in 250 ha of target sub-basins - Participatory forest rehabilitation by seeding and development of medicinal herbal plantation in degraded rangelands about 300 ha. - Participatory afforestation and revegetation in 400 ha of degraded areas in Zone 4 to combat desertification 	<ul style="list-style-type: none"> -Contractor reports -Project reports - Monitoring reports - Field reports - Soil health assessment reports 	<p>The introduced soil and water conservation practices, including rainwater harvesting measures through ponds and trapping, will lead to tangible and measurable improvements in the environment and help conserve water and reduce soil erosion. The rehabilitation work in national parks, protected areas and hunting prohibited areas will provide measurable benefits to the environment and wildlife and restoration of ecosystem services.</p>
	3.2 Area (ha) of wetlands rehabilitated. [Adaptation Core Indicator]	<p>The Bakhtegan Integrated Management Plan has been developed with a participatory approach but not yet implemented.</p> <p>The Central Zagros Mountains project included: development of an integrated rangeland management plan in the Kor catchment area of Sepidan County; implementation of a school plant nursery</p>	<p>30,000 ha will be rehabilitated in target area (Kamjam, Tashk and Bakhtegan) through the following activities:</p> <ul style="list-style-type: none"> - At least 50% of Bakhtegan Wetland water rights will be achieved. - Biodiversity monitoring system established, used by DoE and shared with relevant ministries to make informed decisions on climate change in protected areas 	<ul style="list-style-type: none"> -Project monitoring -Contractor reports -Project reports 	

	<p>3.3 Area (ha) of protected areas being monitored and rehabilitated. [Adaptation Core Indicator]</p>	<p>programme; equipping and activity the Mountain Biodiversity Resource Centre; planting of 2000 oak seedlings; drought tolerant tree cultivation; planting 850 ha with seedlings in Neyriz County</p> <p>Kamjan Marshes: local people acted independently to divert water from the arable lands drainage system into the Kamjan Marshes, and after some tension are now working cooperatively with local DOE staff to improve their local environment</p> <p>Bakhtegan National Park: The Bakhtegan Wetland has been completely dry for the last decade with significant impacts on migrant birds</p> <p>Bamou National Park: Environmental degradation of the national park fauna and flora resulted from drought</p> <p>Margoun waterfall protected area: Drought threats on the waterfall and the landscape</p> <p>Tang-e-Bostank protected area: endangering the wild life and endangered biodiversity due to drought</p> <p>Basiran hunting prohibited area: Lack of artificial watering and feeding during dry periods facilities/ accommodation system</p> <p>KouhSiah-e-Arsanjan hunting prohibited area: Lack of artificial watering and feeding during dry periods facilities/accommodation system</p>	<p>- At least 50% of sand and dust storm sources of wetland bed biologically stabilized.</p> <p>-Rehabilitation action plan for selected wetland areas has been developed and implemented which lead to rehabilitation of at least 30% of Bakhtegan wetlands.</p> <p>At least 70% of the total ha of target protected areas will be monitored through the following:</p> <p>-Bakhtegan basin protected areas ecosystems monitoring is established.</p> <p>-Rangers and game stations in targeted PAs are equipped with monitoring equipment.</p> <p>-At least 25% of the total ha of protected areas will be rehabilitated.</p> <p>-Climate resilience activities for at least 5 key species have been implemented</p> <p>20 artificial watering troughs built in targeted protected areas</p> <p>-In Bakhtegan and Bamous National Parks, rehabilitation of wildlife habitats in the dryland areas.</p>		
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Outcome 4 Institutional capacity at the local, regional and national level is strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.	4.1 Number of key beneficiaries and decision makers aware and trained by the project on wetland ecosystem services and climate change- related drought (disaggregated by gender).	Zero	Participatory communication, education, public awareness (CEPA) plan is developed and implemented by the following: -At least two (2) public awareness campaigns on wetland ecosystem services and climate change- related drought. (Women are main target group for these campaign) -At least 20 training material on climate change adaptation for different target groups developed and distributed. -At least 200 government expert/staff trained on climate change impacts and adaptation strategies (at least 100 women).	- Records of the quantities produced, published and disseminated of resource materials, training materials, videos, brochures and posters - Workshop participant lists - Records of SMS messages sent - Recording of the national TV programme - Attendance numbers for the arts events	Communities throughout the Bakhtegan Basin will be more informed about the situation in the basin, its underlying causes and the impacts of climate change. As a result of being more informed communities in the different Zones will be more willing to work together for the long-term benefit of the Bakhtegan Basin and its people. The spatial plan for the Bakhtegan Basin will be widely adopted and implemented.
	4.2 An integrated, multi-sectoral, spatial plan for the Bakhtegan Basin that fully considers climate change risks and needs for building resilience developed.	Water and environmental issues, including the restoration of wetlands, are identified as national priorities in the Sixth Development Plan. The draft National Strategic Plan on Climate Change identifies the need to: -Establish and improve climate smart agriculture to combat the negative effects of climate change and develop sectoral plans -Integrate climate change considerations into the management structure for natural resources and biodiversity -Strengthen the sectoral and multi-sectoral management and	An integrated, multi-sectoral, spatial plan for the Bakhtegan Basin is developed, taking full account of climate change, with full participation of all stakeholders including local communities	-A published spatial plan for the Bakhtegan Basin -Monitoring of project activities to ensure their alignment with the plan	The Bakhtegan Basin Council will be supported by communities, local authorities, provincial government and national government agencies in ensuring that the project is a success and that its outcomes are sustained into the future

		institutions for cooperation on water management			
	4.3 Number of governance structures in the Bakhtegan Basin strengthen by the project.	The existing governance structure in Fars Province involves the Provincial Government, Country and City Authorities and Village Islamic Councils. There is no specific governance structure in place to address issues in the Bakhtegan Basin	Establishment of a Bakhtegan Basin Council within the context of the existing governance framework for Fars Province. (at least 30% of members are women)	-Official record documenting establishment of the Bakhtegan Basin Council and its membership -Minutes of Council meetings	

F. Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

Project Objective(s)⁵⁶	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
To increase the resilience of communities and the natural environment of the Bakhtegan Basin to climate variability and change through integrated landscape management.	Number of villages (disaggregated by households / women) in the Bakhtegan Basin with increased resilience to climate variability and change.	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets.	9,092,768
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.	1.1 Number of climate change scenarios developed to assess climate risks and climate change impacts in target area.	Output 1.1: Risk and vulnerability assessments conducted and updated	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments (by sector and scale)	\$179,962
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 1: A data and information management system for decision support and communications is developed and implemented to support development of	1.2 Number of frameworks developed to support decision making that include climate change, land and water resources in the Bakhtegan Basin.	Output 7: Improved integration of climate-resilience strategies into country development plans.	7.1. No., type, and sector of policies introduced or adjusted to address climate change risks.	\$950,565

⁵⁶ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

long-term climate resilience in the Bakhtegan basin.	<p>1.3 Number of households and farmers regularly participating and using the community monitoring system.</p> <p>1.4 Number of operational decisions support systems incorporating a customized GIS platform and development of the information portal system (TIPS).</p> <p>1.5 Number of local and provincial plans that incorporate adaptation to climate change considerations based on the decision support system.</p>			
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods.	<p>2.1 Number of farmers with climate smart agriculture practices.</p> <p>2.2 Area (ha) of farmland with climate resilient agriculture practices</p>	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1.No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	\$1,489,130
Outcome 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods.	2.3 Number of households practicing alternative livelihoods.	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability.	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies.	\$1,731,170
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened	3.1 Area (ha/M3) of rangeland and forest with soil and water conservation practices implemented	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies.	\$1,594,010
Outcome 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened	<p>3.2 Area (ha) of wetlands rehabilitated</p> <p>3.3 Area (ha) of protected areas being monitored and rehabilitated.</p>	Output 5: Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability.	5.1. No. and type of natural resource assets created, maintained or improved to withstand	\$1,978,620

			conditions resulting from climate variability and change (by type of assets)	
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 4: Institutional capacity at the local, regional and national level is strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.	4.1 Number of key beneficiaries and decision makers aware and trained by the project on wetland ecosystem services and climate change- related drought (disaggregated by gender). 4.2 An integrated, multi-sectoral, spatial plan for the Bakhtegan Basin that fully considers climate change risks and needs for building resilience developed. 4.3 Number of governance structures in the Bakhtegan Basin strengthened by the project.	Output 2.1: Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events.	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events	560,720

G. Detailed budget with budget note

Award ID:	TBA					Project ID:		TBA				
Award Title:	Iran AF PIMS 6190: Reducing vulnerability to climate change in the Lake Bakhtegan Basin											
Business Unit:	IRN10											
Project Title:	Reducing vulnerability to climate change in the Lake Bakhtegan Basin											
PIMS no.	6190											
Implementing Partner (Executing Agency)	Department of Environment (DoE)											
Components	Responsible Party / Implementing Agency	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)	Total (USD)	Budget Note
OUTCOME 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.	DoE	62040	AF	71300	Local consultants	40,000	60,000	75,000	75,000	50,890	300,890	1
				71400	Contractual Services - Individuals	7,850	8,175	8,500	8,825	9,150	42,500	2
				71600	Travel	4,000	3,000	3,000	2,500	3,550	16,050	3
				72100	Contractual services - Companies	35,250	100,750	120,750	120,750	109,087	486,587	4
				72200	Equipment and furniture	90,000	50,000	20,000	20,000	9,500	189,500	5
				74500	Miscellaneous Expenses	6,000	6,000	6,000	6,000	6,000	30,000	6
				75700	Training, Workshops and Conferences	20,000	15,000	12,000	7,000	11,000	65,000	7
				Sub-total Outcome 1		203,100	242,925	245,250	240,075	199,177	1,130,527	
OUTCOME 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of	DoE	62040	AF	71200	International consultants	30,000	80,000	80,000	75,000	40,500	305,500	8
				71300	Local consultants	20,000	12,000	8,000	7,000	3,000	50,000	9
				71400	Contractual Services - Individuals	23,850	25,175	26,500	27,825	29,150	132,500	10
				71600	Travel	10,000	10,000	8,000	7,000	5,760	40,760	11
				72100	Contractual services - Companies	162,000	300,000	300,000	300,000	150,740	1,212,740	12
				72300	Material & goods		75,000	75,000	75,000	75,000	300,000	13

sustainable agro-ecological practices and alternative livelihoods				72600	Grants	-	236,500	236,500	236,500	236,500	946,000	14
				74500	Miscellaneous Expenses	9,560	9,560	9,560	9,560	9,560	47,800	15
				75700	Training, Workshops and Conferences	59,000	49,000	24,000	19,000	34,000	185,000	16
				Sub-total Outcome 2		314,410	797,235	767,560	756,885	584,210	3,220,300	
OUTCOME 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened.	DoE	62040	AF	71300	Local consultants	64,750	64,750	64,750	64,750	64,954	323,954	17
				71400	Contractual Services - Individuals	23,850	25,175	26,500	27,825	29,150	132,500	18
				72100	Contractual services - Companies	467,000	592,000	703,000	526,000	307,361	2,595,361	19
				72200	Equipment and furniture	77,500	127,500	67,500	17,500	10,000	300,000	20
				74500	Miscellaneous Expenses	8,000	8,000	8,000	8,000	8,000	40,000	21
				75700	Training, Workshops and Conferences	60,000	50,000	30,000	15,000	25,815	180,815	22
				Sub-total Outcome 3		701,100	867,425	899,750	659,075	445,280	3,572,630	
OUTCOME 4: Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures	DoE	62040	AF	71200	International consultants	8,000	12,000	13,000	8,000	4,000	45,000	23
				71300	Local consultants	25,000	25,000	35,000	45,000	32,000	162,000	24
				71400	Contractual Services - Individuals	7,850	8,175	8,500	8,825	9,150	42,500	25
				74200	Audiovisual & Print Production Costs	10,000	12,000	15,000	10,000	15,850	62,850	26
				74500	Miscellaneous Expenses	2,100	2,100	2,100	2,100	2,100	10,500	27
				75700	Training, Workshops and Conferences	35,974	50,474	50,474	50,474	50,474	237,870	28
				Sub-total Outcome 4		88,924	109,749	124,074	124,399	113,574	560,720	
Project Execution cost	DoE	62040	AF	71200	International consultants					32,000	32,000	29
				71300	Local consultants	10,000	-	-	-	28,000	38,000	30
				71400	Contractual Services - Individuals	51,100	53,300	55,500	57,700	59,900	277,500	31

				71600	Travel	1,000	1,000	6,000	1000	6,000	15,000	32
				72100	Contractual services - Companies	1,440	1,440	1,440	1,440	1,440	7,200	33
				72200	Equipment and furniture	28,000	5,000	5,000	2,000	2,000	42,000	34
				72400	Communications	250	250	250	250	250	1,250	35
				72500	Supplies	1,000	1,000	1,000	1,000	1,000	5,000	36
				72800	IT Equipment	8,000	3,000	1,000	1,000	1,000	14,000	37
				74100	Professional services (Audit)	3,000	3,000	3,000	3,000	3,000	15,000	38
				74200	Audiovisual & Print Production Costs	4,800	4,800	4,800	4,800	4,800	24,000	39
				74500	Miscellaneous Expenses	250	250	250	250	250	1,250	40
				74500	Service to Project - GOE	29,818	37,252	35,960	24,255	9,106	136,391	41
				Sub-total PMU		138,658	110,292	114,200	96,695	148,746	608,591	
				TOTAL PROGRAMME COST		1,446,192	2,127,626	2,150,834	1,877,129	1,490,987	9,092,768	

Budget Notes

Outcomes/Outputs	Note	ATLAS Number	ATLAS Budget Description	5 year Total (USD)	Description of Expenditures
OUTCOME 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.					
Total: 1,080,277 USD					
1.1 An integrated model for climate risk and climate change assessment supports medium and long term decision making 1.2 A land and water use planning	1	71300	Local consultants	44,500	Contract for national experts to develop and undertake analyses with SimCLIM for the Bakhtegan Basin (Output 1.1)
				45,500	Contract for national experts to conduct training in the use of WLUP (Output 1.2)
				44,520	Contract for national experts to develop and undertake analyses with WLUP (Output 1.2)
				44,570	Contract for local consultants to facilitate workshops with targeted villages on development of vulnerability and resilience indicators and a local community monitoring programme following GAAP recommendations (Output 1.1)

<p>framework is developed and implemented to support decision making</p> <p>1.3 Community engagement, empowerment and ownership in decision making is supported through local community monitoring</p> <p>1.4 A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making</p>				96,800	Contract for local consultants to pay quarterly visits to project target villages to ground truth the local community monitoring platform (Output 1.3)
				25,000	Contract with a local consultant to integrate all relevant data into the GIS platform and TIPS (Output 1.4)
	2	71400	Contractual Services - Individuals	12,500	Tehran Coordinator - 25% of contract charges to Output 1
				13,000	Communication expert - 20% of contract charges to Output 1
				9,500	National Project Manager (NPM) - 10% of contract charges to Output 1
				7,500	Deputy National Project Manager (DNPM) - 10% of contract charges to Output 1
	3	71600	Travel	16,050	Travel costs for quarterly visits to project target villages (Output 1.3)
	4	72100	Contractual services - Companies	73,477	Contract for development and provision of a customised version of SimCLIM (Output 1.1)
			Contractual services - Companies	23,860	Contract for international experts to conduct training in the use of SimCLIM (Output 1.1)
			Contractual services - Companies	39,500	Contract for development and provision of a customised version of WLUP (Output 1.2)
			Contractual services - Companies	213,250	Development of a comprehensive plan for allocating water and land resources in a sustainable and climate resilient manner (Output 1.2)
			Contractual services - Companies	56,500	Development of a participatory platform for use by participating villagers on agreed vulnerability and resilience indicators (Output 1.3)
			Contractual services - Companies	65,000	Contract to develop a customised GIS platform for integrating all results from Component 1 (Output 1.4)
			Contractual services - Companies	15,000	Contract to develop the Information Portal System (TIPS) for sharing results from Component 1 (Output 1.4)
	5	72200	Equipment and furniture	189,500	Equipment costs for monitoring water use changes with participating farmers (Output 1.3)
	6	74500	Miscellaneous Expenses	30,000	Miscellaneous costs associated with the climate change and climate risk assessment; the land-use change and land-use planning assessment; the local community monitoring programme; data and information sharing (Output 1.1-1.4)
	7	75700	Training, Workshops and Conferences	32,500	Workshops and meetings to define the scope of the climate change and climate risk analyses to be undertaken following GAAP recommendations (Output 1.1)
			Training, Workshops and Conferences	32,500	Workshops and meetings to define the scope of WLUP analyses to be undertaken following GAAP recommendations (Output 1.2)

OUTCOME 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods
Total: 3,049,300 USD

<p>2.1 Climate smart agriculture practices are adopted in target areas</p> <p>2.2 Alternative livelihoods are adopted by vulnerable households in target villages</p>	8	71200	International consultants	160,000	Contract with international consultants to undertake market research, including value chain analysis, on climate smart alternative crops, cropping systems and added value products, including organically certified crops and products (international markets) (Output 2.1)
				80,000	Contract with international organic certification agency to support the extension of climate smart organically certified agriculture (Output 2.1)
				65,500	Contract with international consultants for market participatory planning, market research, vocational training support for alternative livelihoods.(Output 2.2)
	9	71300	Local consultants	50,000	Contract with local consultant for training of facilitators (Output 2.1)
	10	71400	Contractual Services - Individuals	9,500	National Project Manager (NPM) - 10% of contract charges to Output 2
				13,000	Communication expert - 20% of contract charges to Output 2
				7,500	Deputy National Project Manager (DNPM) -10% of contract charges to Output 2
				90,000	4 Field Coordinators - 50% of contract charges to Output 2
				12,500	Tehran Coordinator - 25% of contract charges to Output 2
	11	71600	Travel	40,760	Cost of farmer field visits to extend results to other farmers (Output 2.1)
	12	72100	Contractual services - Companies	187,000	Contract with local consultants for development of Climate Smart Agriculture Plans (Output 2.1)
				90,000	Contract with national consultant to undertake market research, including value chain analysis, on climate smart alternative crops, cropping systems and added value products, including organically certified crops and products (national markets)(Output 2.1)
				62,500	Contract with national consultants to extend existing knowledge and research results on alternative crops and cropping systems that are more climate smart (Output 2.1)
				200,000	Contract for the development of an applied research programme on climate smart agriculture at the Marvdasht Research Station based on the results of the market research (Output 2.1)
				99,870	Contract with national consultants to extend the results of the applied research programme on climate smart agriculture to participating farmers (Output 2.1)

				64,500	Contract with national consultant to support extension of existing organically certified agriculture initiatives to participating villages, focused on climate smart practices (Output 2.1)
				40,370	Contract with national consultants for market participatory planning, market research, vocational training support for alternative livelihoods. (Output 2.1)
				400,000	NGOS to support the development the selected livelihoods in the targeted villages/households in Zone, 1, 2, 3 and 4. (Output 2.2)
				68,500	Contracts with national consultant to assess lessons learned from the Rural Women's Trust Fund (Output 2.2)
	13	72300	Material & goods	300,000	Cost of seed, seedlings and biologically friendly inputs for participating farmers in Zone 1, 2, 3 and 4 to implement climate smart agriculture systems.(Output 2.1)
	14	72600	Grants	946,000	Implementation of alternative livelihoods plans in Zone, 1, 2, 3 and 4.(i.e. sewing, carpet weaving, dried fruit processing, traditional aviculture, etc.) via the Microgrant schemes according to UNDP Low Value Grants Policy, or through other relevant established mechanisms. AF grants will be channeled directly to selected NGOs, community-based organizations (CBOs) and local cooperatives. Maximum grant per project is \$50,000. (Output 2.2)
	15	74500	Miscellaneous Expenses	47,800	Miscellaneous costs associated with the development, extension and communication of all climate smart agriculture activities and alternative livelihood activities (Output 2.1-2.2)
	16	75700	Training, Workshops and Conferences	100,000	Cost for facilitation of workshops to develop Climate Smart Agriculture Plans following GAAP recommendations (Output 2.1)
85,000				Workshops and meetings with targeted households and villages to identify opportunities and capacities for livelihoods diversification at the local level following GAAP recommendations (Output 2.2)	
OUTCOME 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened					
Total: 3,572,630 USD					
3.1 A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks	17	71300	Local consultants	88,954	Contract with national consulting companies to develop analysis at the target sub-basins based on IWM approach (Output 3.1)
				80,000	Cost of monitoring Output 3.1 activities in target watersheds (Output 3.1)
				155,000	Develop and implement a climate resilience action plan for the key species (Output 3.2)
3.2 Landscape rehabilitation to	18	71400	Contractual Services - Individuals	9,500	National Project Manager (NPM) -10% of contract charges to Output 3
				13,000	Communication expert -20% of contract charges to Output 3

restore functionality of ecosystem services to increase climate resilience.				90,000	4 Field Coordinators -50% of contract charges to Output 3
				7,500	Deputy National Project Manager (DNPM)-10% of contract charges to Output 3
				12,500	Tehran Coordinator -25% of contract charges to Output 3
	19	72100	Contractual services - Companies	356,000	Contracting to design and construct water harvesting ponds and terracing (Output 3.1)
				229,760	Contracting for the water artificial recharge projects in target sub-basins (Output 3.1)
				136,401	Capacity building and training for local people to work as the contractors to construct water harvesting ponds, terracing, etc. following Best Management Practices; Training authorities and local people on rehabilitation of Zagros Forest and Bakhtegan basin (Output 3.1)
				21,700	Rehabilitation of the rangelands (Output 3.1)
				120,000	Cultivation of the medicinal plants (Output 3.1)
				45,000	Development and protecting the Zagros forest area (Output 3.1)
				258,500	Vegetation rehabilitation to combat desertification (Output 3.1)
				225,000	Biodiversity monitoring in target areas (Output 3.2)
				185,000	Biological treatment of drainage & reforming the wetland (Output 3.2)
				120,000	Cost of construction and reconstruction of wildlife artificial watering troughs in the summer (Output 3.2)
				120,000	Cost of feeding wild life during the dry summers (Output 3.2)
				378,000	Rehabilitation of the wildlife habitats in the dryland ecosystem national parks (Output 3.2)
				350,000	Protecting wildlife hunting prohibited areas (Output 3.2)
				50,000	Commission a study for the water rights and re allocation of water rights within target area (Kamjan, Tashk, Bakhtegan), (Output 3.2)
	20	72200	Equipment and furniture	300,000	Equipping DoE's monitoring stations to improve monitoring at basin level (Output 3.2)
	21	74500	Miscellaneous Expenses	13,680	Miscellaneous costs associated with the all ecosystem conservation activities (Output 3.1)
				26,320	Miscellaneous costs associated with the development, extension and communication of all rehabilitation and conservation in target areas (Output 3.2)

	22	75700	Training, Workshops and Conferences	59,375	Participatory workshops and meetings with identified target communities to define the scope of IWM results & measures to be undertaken following GAAP recommendations (Output 3.1)
				49,300	Participatory workshops to raise awareness of local people surrounding Bamou and Bakhtegan National Parks following GAAP recommendations (Output 3.1)
				72,140	Comprehensive extension, communication and education programme following GAAP recommendations (through Output 4.1), (Output 3.1)
OUTCOME 4: Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures Total: 560,720 USD					
4.1 A comprehensive communications, education and capacity building programme on climate resilience is implemented 4.2 A Bakhtegan Basin Council is formed to facilitate the long-term sustainable and climate resilient management of the Bakhtegan Basin	23	71200	International consultants	45,000	International consultant/facilitator to support establishment of Bakhtegan Basin Council (Output 4.2)
	24	71300	Local consultants	75,000	National consultant/facilitator to support establishment of the Bakhtegan Basin Council (Output 4.2)
			Local consultants	87,000	Contract with a research center to study existing national frameworks and policies relating to climate change adaptation and land and water resources planning and management to establish a “national spatial strategy plan” to be trialed in the Bakhtegan Basin.(Output 4.2)
	25	71400	Contractual Services - Individuals	9,500	National Project Manager (NPM) -10% of contract charges to Output 4
				12,500	Tehran Coordinator -25% of contract charges to Output 4
				7,500	Deputy National Project Manager (DNPM) -10% of contract charges to Output 4
				13,000	Communication expert -20% of contract charges to Output 4
	26	74200	Audiovisual & Print Production Costs	62,850	Cost of visual aids of trainings (Output 4.1)
	27	74500	Miscellaneous Expenses	10,500	Miscellaneous costs associated with the development, extension and communication related to education, capacity building and communications (Output 4.1- 4.2)
	28	75700	Training, Workshops and Conferences	159,170	Cost of public awareness campaigns which includes training video, publications, brochures, posters, TV programs (Output 4.1)
				58,000	Cost of rolling out trainings to ensure the relevant activities will be linked directly to Output 2.1, 2.2, 3.1 and 3.2 following GAAP recommendations (Output 4.1)
				20,700	Miscellaneous costs associated the establishment of the council (Costs of organizing the Bakhtegan Basin Council meetings during 5 years) (Output 4.2)
Project Execution Total: 829,839 USD					

Project Execution cost	29	71200	International consultants	32,000	International expert for final review of the project
	30	71300	Local consultants	13,000	Local experts for final review of the project
				25,000	Support to inception and final review workshops and technical meetings
	31	71400	Contractual Services - Individuals	57,000	National Project Manager (NPM) - 60% of contract charges to PMU
				45,000	Deputy National Project Manager (DNPM)/M&E - 60% of contract charges to PMU
				13,000	Communication expert - 20% of contract charges to PMU
				65,000	Finance expert
				57,500	Administrative Assistant
				40,000	Driver/clerk
	32	71600	Travel	15,000	Transport for Project Management Unit
	33	72100	Contractual services - Companies	7,200	Contractual Service to support communication (Website Maintenance)
	34	72200	Equipment and furniture	42,000	Office Equipments & Furniture
	35	72400	Communications	1,250	Communications
	36	72500	Supplies	5,000	Supplies
	37	72800	IT Equipment	14,000	IT equipment
	38	74100	Professional services(Audit)	15,000	NIM Audit
	39	74200	Print and Publication	24,000	Print and Publications
	40	74500	Miscellaneous Expenses	1,250	Miscellaneous
	41	74500	Service to Project - GOE	136,391	Costs of providing support services to the project, including financial management/payment process, HR services, Procurement services, and travel & general services. Total cost is \$136,391 for the duration of the project

H. Breakdown of the IE Management Fee for support to Adaptation Fund Project

Category	Services Provided by UNDP	UNDP Fee (8.5%)
Identification, Sourcing and Screening of Ideas	<ul style="list-style-type: none"> • 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. 	\$38,644
Feasibility Assessment / Due Diligence Review	<ul style="list-style-type: none"> • 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. 	\$115,933
Development & Preparation	<ul style="list-style-type: none"> • 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. 	\$154,577
Implementation	<ul style="list-style-type: none"> • 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. 	\$347,798
Evaluation and Reporting	<ul style="list-style-type: none"> • 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 	\$115,933
Total		\$772,885

I. Implementation Schedule

	Year 1				Year 2				Year 3				Year 4				Year 5				TOTAL Budget (USD)
	Q 1	Q 2	Q 3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
OUTCOME 1: A data and information management system for decision support and communications is developed and implemented to support development of long-term climate resilience in the Bakhtegan basin.																					
1.1 An integrated model for climate risk and climate change assessment supports medium and long term decision making				22,618				37,743				42,923				40,423			36,255		179,962
1.2 A water and land use planning framework is developed and implemented to support decision making				48,084				81,962				94,361				91,992			81,496		397,895
1.3 Community engagement, empowerment and ownership in decision making is supported through local community monitoring				120,682				97,692				77,429				77,028			54,839		427,670
1.4 A GIS based data and information management system and an information portal system are developed to facilitate more informed, effective and timely decision making				11,716				25,528				30,537				30,632			26,587		125,000
SUB - TOTAL:				203,100				242,925				245,250				240,075			199,177		1,130,527
OUTCOME 2: The environmental, social and economic resilience of the Bakhtegan Basin is strengthened through implementation of sustainable agro-ecological practices and alternative livelihoods.																					
2.1 Climate smart agriculture practices are adopted in target areas				192,162				369,539				350,251				341,845			235,333		1,489,130
2.2 Alternative livelihoods are adopted by vulnerable households in target villages				122,248				427,696				417,309				415,040			348,877		1,731,170
SUB - TOTAL:				314,410				797,235				767,560				756,885			584,210		3,220,300

OUTCOME 3: The resilience of the natural environment of the Bakhtegan Basin is strengthened.										
3.1 A range of watershed management measures are implemented in target areas aimed at increasing resilience to drought risks				310,447	360,522	397,027	307,629	218,385	1,594,010	
3.2 Landscape rehabilitation to restore functionality of ecosystem services to increase climate resilience.				390,653	506,903	502,723	351,446	226,895	1,978,620	
SUB - TOTAL:				701,100	867,425	899,750	659,075	445,280	3,572,630	
OUTCOME 4: Institutional Capacity at the local, regional and national level is strengthened for improved governance and decision making in relation to climate risk management and effective implementation of adaptation measures.										
4.1 A comprehensive communications, education and capacity building programme on climate resilience is implemented					48,730	64,125	67,282	62,438	68,445	311,020
4.2 A Bakhtegan Basin Council is formed to facilitate the long-term sustainable and climate resilient management of the Bakhtegan Basin					40,194	45,624	56,792	61,961	45,129	249,700
SUB - TOTAL:					88,924	109,749	124,074	124,399	113,574	560,720
PROJECT MANAGEMENT / EXECUTION COSTS:					138,658	110,292	114,200	96,695	148,746	608,591
GRAND TOTAL:					1,446,192	2,127,626	2,150,834	1,877,129	1,490,987	9,092,768

J. Disbursement schedule


	Upon signature of Agreement	One Year after Project Start ^{a)}	Year 2 ^{b)}	Year 3	Year 4 ^{c)}	Total
Scheduled date	June 2020	June 2021	June 2022	June 2023	June 2024	
Project Funds	1,446,192	2,127,626	2,150,834	1,877,129	1,490,987	9,092,768
Implementing Entity Fees	383,239	107,758	110,793	95,645	75,450	772,885
Total	1,829,431	2,235,384	2,261,627	1,972,774	1,566,437	9,865,653

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

A. Record of endorsement on behalf of the government⁵⁷

<i>H.E. Mr. Mohsen Esperi Director General for International Environmental and Sustainable Development Affairs of the Ministry of Foreign Affairs and National Designated Authority</i>	Date: 1 September 2019
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B. Implementing Entity certification

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 and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
 <p> <i>Executive Coordinator Global Environmental Finance Bureau for Policy and Programme Support United Nations Development Programme Implementing Entity Coordinator</i> </p>	
Date: 20 February 2020	Tel. and email: +66 87 017 8667; pradeep.kurukulasuriya@undp.org
Project Contact Person: Lianchawii Chhakchhuak	
Tel. And Email: +6623049100 ext.5286; Lianchawii.Chhakchhuak@undp.org	

⁵⁷ 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.

To: Mr. Claudio Providas
Resident Representative
UNDP Iran Office

1 Sep. 2019

Dear Sir,

Subject: Endorsement of the Request for Provision of Project Support Services under National Implementation Modality
"Reducing vulnerability to climate change in the Lake Bakhtegan Basin" (UNDP PIMS 6190)

In our capacities as Designated Authority for the Adaptation Fund in the Islamic Republic of Iran and the Implementing Partner for the project "Reducing vulnerability to climate change in the Lake Bakhtegan Basin", we endorse the request by the Implementing Partner (Department of Environment of Iran) to UNDP for the direct project support services as elaborated below.

This support service request is an exceptional request. Although DoE is the main implementing Partner of this project, the multidisciplinary nature of the project requires a close collaboration with several government organizations and ministries, private sectors and local communities and the IP needs support to enhance capacities which is limited by the IP. To facilitate the successful collaboration and smooth implementation of project among several stakeholders, UNDP support is required for some services including contractual, procurement and payment arrangements. In this regard, financial and payment mechanisms for this project will be handled by UNDP in full coordination with IP, through requests for direct payments which involve UNDP operations system in support services including vendor creation, Payment processing, etc.

The implementation of this project may also require international procurements and consultancy services which the IP does not have the required mechanism to handle.

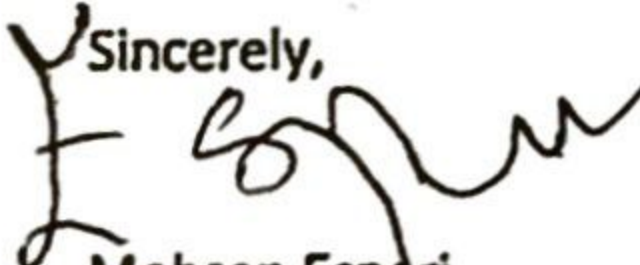
By ensuring UNDP support to the list of services provided in the table below, the project is expected to deliver in a timely manner.

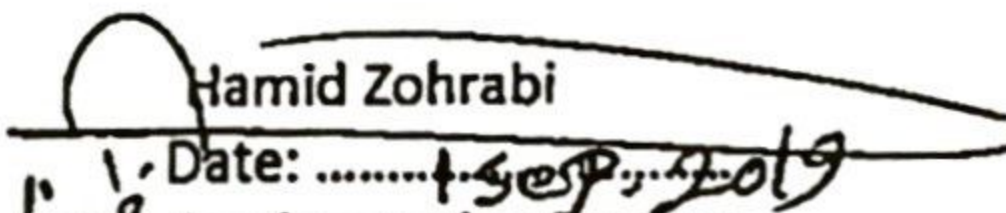
2017 Universal Price List and Local Price List - UNDP Iran		Total number of items throughout the Project lifetime	Total Cost to UNDP of providing such support services (where appropriate)
Valid as of 1 January 2017			
Services	UPL/LPL 2017 (USD)		

Financial Management/Payment Process			
Payment process	38.79	2,450	95,036
GLIE Creation and approval	32.76	25	819
AP Journal (APJV)	22.72	60	1,363
Approve PO only (below \$30000)	9.64	32	308
Approve PO only (over \$30,000)	37.79	30	1,133
HR Services			
Recruitment Process _Advertisement (20%)*	126.61	61	7,723
Procurement Services			
Full Procurement Process	566.56	33	18,696
Travel Services			
Incoming visa process	99.46	30	2,983
Ticket booking	16.73	37	619
Hotel Reservation	26.61	34	905
F10 settlement per case (for local travel without advance payment)	12.93	201	2,599
General Services			
Vendor profile (Creation or Modification)*	20.92	201	4,204
Total			136,391

I affirm that the provision of such services shall be in conformity with both AF and UNDP regulations, rules, policies and procedures, and it is codified in detail through a Standard Letter of Agreement signed between UNDP and the Department of Environment for the provision of support services in June 2019. The government shall retain overall responsibility for the nationally managed project through its designated institution as mentioned above.

We look forward to our continued collaboration in this project.

Sincerely,

 Mohsen Espari
 Date: 28-09-2019
 AF Operational Focal Point
 Ministry of Foreign Affairs
 Tehran, Iran


 Hamid Zohrabi
 Date: 1-10-2019
 Implementing Partner
 Department of Environment
 Tehran, Iran