



FAO/GLOBAL ENVIRONMENT FACILITY PROJECT DOCUMENT



PROJECT TITLE: SUSTAINABLE LAND MANAGEMENT AND CLIMATE-FRIENDLY AGRICULTURE	
PROJECT SYMBOL: GCP /TUR/055/GFF	
Recipient Country/ies: Turkey	
Resource Partner: Global Environmental Facility (GEF)	
FAO project ID: 613134	GEF Project ID: 4583
Executing Partner(s): Ministry of Forestry and Water Affairs (MFWA) and Ministry of Food, Agriculture and Livestock (MFAL)	
Expected OED (starting date): October 2014	
Expected NTE (End date): September 2019	
Contribution to FAO's Strategic Framework¹	a. Strategic objective/Organizational Result: SO2, Outcome 1 and Outcome 2. b. Regional Result/Priority Area: Priorities 1 and 3 of the Africa Regional Framework c. Country Programming Framework Outcome: 1.1, 2.1 and 3.1
GEF Focal Area/LDCF/SCCF: BD, LD, CC	
GEF/LDCF/SCCF Strategic Objectives: CCM-1, CCM-5, LD-1, BD-2	
Environmental Impact Assessment Category (insert √): A B [√] C	
Financing Plan: GEF/LDCF/SCCF allocation:	5,750,000
<u>Co-financing:</u>	
MFWA (in kind)	1,000,000
MFWA (cash)	9,100,000
MFAL (in kind)	1,000,000
MFAL (cash)	7,700,000
FAO (in kind)	500,000
FAO (cash)	200,000
Konya Sugar (cash)	1,000,000
Nature Conservation Centre (cash)	1,600,000
Nature Conservation Centre (in kind)	200,000

¹ For projects operated by country offices, it is necessary to link projects in FPMIS at OR level. For all other projects, linkage at product/service level is necessary

<u>Sub-total co-financing:</u>	22,300,00
Total Budget:	28,050,000

EXECUTIVE SUMMARY

The **project objective** is to improve sustainability of agriculture and forest land use management through the diffusion and adoption of low-carbon technologies with win-win benefits in land degradation, climate change, and biodiversity conservation and increase farm profitability and forest productivity. The project will achieve this objective by addressing three barriers: Barrier #1: Minimal experience among key government and civil society stakeholders in developing and implementing sustainable land management and forest management practices; Barrier #2: Farmers under-exposed to innovative low carbon technologies for farming and farm waste management; Barrier #3: Inadequate enabling environment (legal, regulatory and institutional framework) and capacity for sustainable land management.

The project will address these barriers through interventions structured under the following three inter-linked components.

Component 1: Rehabilitation of Degraded Forest and Rangeland

Outcome 1: Degraded forest and rangelands rehabilitated and management practices improved.

Under this component, the GEF project will build on the baseline scenario by financing the incremental costs associated with: (i) increased attention to rehabilitation of degraded lands in production landscapes such as degraded forest lands and rangelands; (ii) production of soil organic carbon maps for pilot sites; (iii) preparation of integrated SLM and biodiversity conservation land use plan for the Mt. Karacadağ pilot area; (iv) certification of forest and rangeland landscapes by internationally recognized environmental standards that incorporate biodiversity considerations, (v) establishment of biodiversity monitoring system, and; (vi) quantification of ecosystem services values in pilot areas of KCB. As a result, it is expected that: (i) 78-105,000 tCO₂ eq will be mitigated; (ii) 20,000 hectares of rehabilitated forest lands will be sequestering 50-70,000 tons of CO₂; (iii) 30,000 ha of range and pastureland will be rehabilitated; and (iv) 6,680 hectares of protected habitat will be managed sustainably.

Component 2: Climate-Smart Agriculture

Outcome 2. Climate-smart agriculture techniques applied across productive landscapes.

Key activities under this component will include the incremental costs associated with: (i) development of models for conservation agriculture demonstrations on private farms, (ii) information dissemination on TIGEM's experience in terms of conservation agriculture; (iii) pilot-scale investments in bio-digesters to recuperate methane from agricultural waste and produce electricity; (iv) for high potential opportunities, incentives for the investment in the development of the infrastructure to capture methane; (v) monitoring the adoption of climate-smart agricultural technologies, including monitoring of GHG mitigation and biodiversity impacts; (viii) different management practices such as reduced tillage, mulching, organic and inorganic fertilizer and suitable irrigation increase soil carbon pool and storage in plant tissue and soil body. As a result of these interventions it is expected that: (i) Conservation agriculture practices will be applied on a total of 40-50,000 Ha of arable land; (ii) 18-22,000 tCO₂eq will be reduced; (iii) 9,900 tCO₂eq tons of CH₄ emissions will be reduced; (iii) 50 livestock/poultry producers and 10,000 head of livestock will be contributing to digesters; (iv) average annual income from crop and livestock production increased from USD \$ 1 073 to \$ 1 341.

Component 3: Enhanced enabling environment for sustainable land management

Outcome 3: Enhanced enabling environment for sustainable land management

Under the current baseline, there is very little energy being focused upon building a strong constituency for agricultural practices that deliver SLM, climate change, and biodiversity conservation benefits. Without this constituency, it is very difficult to generate and/or support the implementation of necessary enabling environment improvements. Using GEF funding, the project will directly address this barrier. The project will set in place a farmer field school model that is designed specifically to empower farmers and ranchers to become better informed regarding steps they can take to improve production, maintain ecosystem integrity, and reduce the long-term economic risks associated with degradation. This model will be interwoven throughout all project components, using the various investments as a way to strengthen the knowledge base of local resource users and government extension officers. The farmer field school model will provide a conduit for continued delivery of learning between government staff and farmers. This conduit will also provide the impetus, information and support required to generate enabling environment improvements.

The interventions will result in; (i) 500 farm and/or ranch households adopting new practices that support biodiversity conservation, SLM and climate change mitigation; (ii) 1250 FFS members (750 males and 500 females); (iii) Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score of 2; (iv) Forest policy enhancement score of 3; (v) Agriculture policy enhancement score of 3; (vi) 1 pilot site level policy framework operationalized to integrate SLM, BD and CC based land use planning across productive landscapes; and (vii) 1 national monitoring program for CC, BC and SLM.

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GLOSSARY OF ACRONYMS

AWP/B	Annual Work Plan and Budget
BD	Biodiversity
CEO	Chief Executing Officer (GEF)
CSA	Climate Smart Agriculture
CV	Curriculum Vitae
ÇATAK	Environmentally Based Agricultural Land Protection Program
DSI	State Hydraulic Works
EOP	End of Project
FA	Focal Area
FAO	Food and Agriculture Organization of the United Nations
FE	Final Evaluation
FSC	Forest Stewardship Council
FSP	Full – size Project
FPMIS	Field Project Management Information System
GEBs	Global Environmental Benefits
GEF	Global Environment Facility
GEFSEC	GEF Secretariat
GoT	Government of Turkey
GIS	Geographic Information System
IUCN	International Union for the Conservation of Nature
IA	Implementing Agency
IAS	International Accounting Standard
IBA	Important Bird Areas
IPSAS	International Public Sector Accounting Standards
KBA	Key biodiversity area
KCB	The Konya Closed Basin
LTO	Lead Technical Officer
LTU	Lead Technical Unit
METT	Monitoring Evaluation Tracking Tools
MEU	Ministry of Environment and Urbanization
MFAL	Ministry of Food, Agriculture and Livestock
MFWA	Ministry of Forestry and Water Affairs
MP	Management Plan
M&E	Monitoring and Evaluation
MTE	Mid-Term Evaluation
NGO	Nongovernmental organization
NBSAP	National Biodiversity Conservation Strategy and Action Plan
PIF	Project Identification Form (GEF)
PIM	Project Implementation Manual
PIR	Project Implementation Review
PMO	Project Management Office
PPG	Project Preparation Grant (GEF)
PPR	Project Progress Report
PSC	Project Steering Committee
PTM	Project Task Manager
PY	Project Year
PRODOC	FAO Project Document
SC	Stakeholder Committees

SFM	Sustainable forest management
SLM	Sustainable land management
SO	Strategic Objectives
STAP	Scientific and Technical Advisory Panel
TAGEM	General Directorate of Agricultural Research and Policies
TCI	Investment Centre Division (FAO)
TRGM	General Directorate of Agrarian Reform
TOR	Terms of Reference
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
US\$	United States Dollar
WWF	World Wildlife Fund
WB	World Bank

SECTION 1 – RELEVANCE

1.1 General Context

A. General development context related to the project

National Context

The nation of Turkey encompasses approximately 780,000 km² of territory. The rural land base is divided as follows: 38% arable land, 30% pasture and meadow, and 28% forests. The nation has three primary climate zones: temperate climate of the Black Sea region, continental climate of the interior and the Eastern Anatolian Highlands, and Mediterranean climate of the Aegean and Coastal Mediterranean regions.

Turkey's total population is estimated to exceed 76.7 million (2013). Of this, 38.2 million are women and 38.5 million are men. The national literacy rate is estimated to be 92%. The median age is estimated to be 30 years. Approximately 8.6 % of the total population lives in rural areas (towns and villages) and 91.4 % live in urban areas (province and district centers).

Turkey is a middle-income country. The nation's GDP is within the world's top 20. The primary economic engines are: agriculture 9.4 %, industry 25.9 % and services 64.7 %, including trade, transportation, communication, financial institutions' services, self-employed people services, non-profit organization services.

The per capita average Gross National Income (GNI) is approximately US\$ 8,720. National unemployment is approximately 10%. There are marked income disparities in terms of gender and less developed regions. A recent study showed the people living the rural forest areas have a per capita income of approximately 7% the national average. Unemployment and under-employment are substantially higher in rural areas. Women comprise 27% of the work force.

Agriculture is an important contributor to Turkey's economy. The agriculture sector employs nearly 25% of Turkey's total population. The 2012 value of agricultural production was US\$ 62 billion with agriculture representing approximately 8% of the national GDP. This was an increase of 244% over the past 10 years. Sheep and goat numbers increased from 32.5 million in 2002 to 35.8 million in 2012. Turkey's poultry production increased from 663,000 tons in 2000 to 1.2 million tons in 2012 to an estimated 1.39 tons in 2014.

There are over two million private farms in Turkey. The average size of a Turkish farm is 6.1 ha. In 2012, there were approximately 28 million hectares in agriculture with 15.3 million hectares sown. There are 15 state farms in Turkey covering just over 300,000 hectares. The primary purpose for these state farms is to provide seed and breeding stock to private agriculturalists. Most of the agriculture in Turkey is highly dependent upon government policies and support. For instance, the government helps bolster the flagging traditional cattle sector by regulating feed prices and lowering import duties on breeding stock.

Approximately 280,000 km² of Turkey's territory is classified as forest. Silviculture is widely practiced. The productive forests are mainly found at higher elevations. Two species, Calabrian pine (*Pinus brutia*) and Black pine (*Pinus nigra*), account for over 75 % of the coniferous forest. There are also significant quantities of fir (*Abies* sp.), juniper (*Juniperus* sp.) and Scots pine (*Pinus sylvestris*). Beech (*Fagus* sp.) and oak (*Quercus* sp.) make up most of the broadleaf forest. Oak constitutes nearly

50 % of the total coppice area. Other species include alder (*Alnus* sp.), chestnut (*Castanea sativa*) and poplar (*Populus* sp.).

Three different phyto-geographic regions intercept in Turkey, making this nation one of the temperate zone's most biodiversity-rich. There are approximately 10,000 plant species. Over 3,000 are endemic. The nation has more than 1,500 vertebrate species.

Turkey's protected areas cover 5,647,568 hectares or 7.24% of the country. Turkey has 11 types of protected areas: National parks, nature reserve areas, nature parks, nature monuments, wildlife development areas, conservation forests, natural sites, specially protected areas, Ramsar sites, biosphere reserves and world heritage sites. As of 2013, there are 40 national parks, 31 nature reserve areas, 184 nature parks, 107 nature monuments, 80 wildlife development areas, 58 conservation forests, 1273 natural sites, 15 specially protected areas, 14 Ramsar sites, 1 biosphere reserve and 11 world heritage sites.

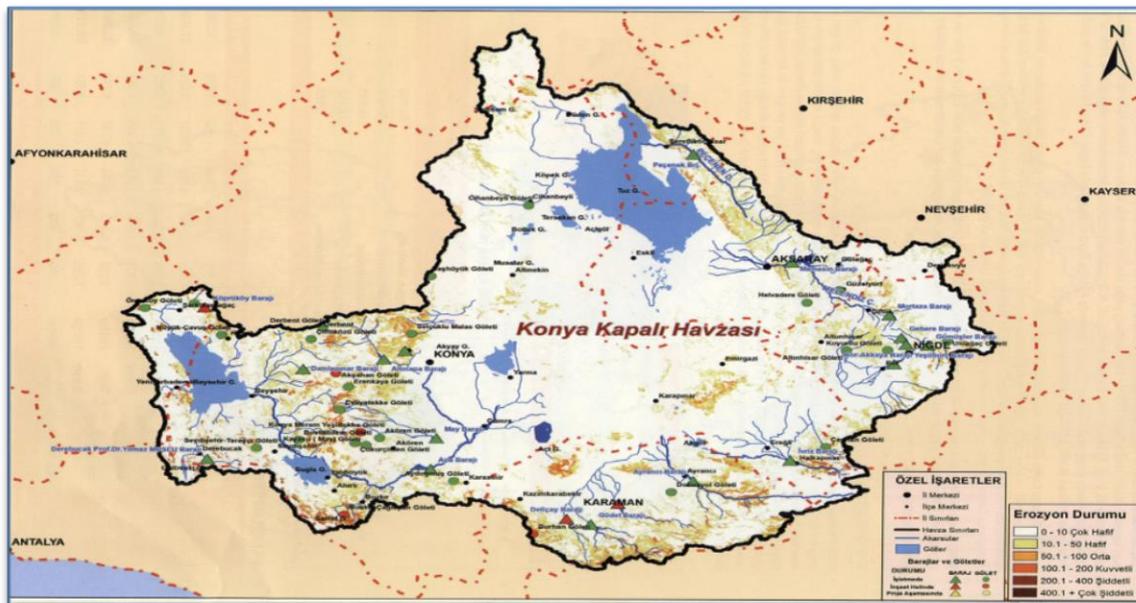
Site Level Context

The majority of project activity will take place within the Konya Closed Basin or KCB.

The KCB is located in the middle of the Central Anatolian Plateau. The territory of the KCB area is roughly 53,000 km². The elevation varies between 900m to 1,050m. Land classifications are as follows: 41% agricultural lands, 34% pastures/rangelands, 13% forest lands, 8% wetlands, and 4% rock and sand dunes. The KCB is semi-arid with an average annual precipitation of 378 mm.

The provinces of Konya, Karaman, and Aksaray share KCB territory. The territory is roughly divided as 56,0% Konya, 12% Karaman, and 14,0% Aksaray.

The majority of the KCB is contained within the Province of Konya. The municipality of Konya is the provincial capital. The province has thirty-one districts. The province's total population is roughly 2.1 million. Over 75% of these residents live in urban areas. The remaining 25% live in rural areas. The area has two emigration patterns: to other regions of Turkey and from rural to urban areas within the KCB. As of 2012, populations in urban areas are: Konya 2,052,281, Karaman 235,424 and Aksaray 379,915. The average annual income per capita is estimated as US\$ 11,387 for urban households and US\$ 8,648 for rural households.



Agriculture dominates the local economy. Agricultural supports are critical. Over the last decade, the KCB has received on average US\$ 1.6 billion each year.

Sugar beets are by far the largest cash crop. Four sugar beet factories service 72,210 farms. These farms produce over 750,000 tons of sugar annually. The second largest sector is livestock production. Livestock numbers are surging, particularly dairy and feeder cattle. The number of cattle increased by over 25% in the last year alone. The total number of cattle in the KCB now exceeds 600,000. Over 500,000 are maintained in either dairies or feedlots. Sheep and goat numbers are also increasing. Total pastureland area in KCB is 1.9 million ha, including mountain and steppe grasslands. The rangelands are owned by the state. Animals are grazed widely on steppe and forested lands through a mostly open access grazing system. Both sugar beet and intensive livestock production are major contributors to land degradation and climate change.

Other crops include: cereals, animal fodder, fruits, vegetables and legumes, and livestock. Konya Province produces on average one million tons of cereal with an average return of 2,600 kg/ha. Konya generates 796,355 tons of milk and 25,798 tons of meat. In Aksaray Province, nearly 70% of the local population works for the agriculture sector. Aksaray's total cereal production is 548,832 tons with a productivity rate of 2,800 kg/ha. The total milk production is 202,881 tons. Meat production is 4,682 ton. In Karaman Province, the agricultural production is more diverse. Thirteen-percent of arable lands are orchards and 5% is in vegetable production. Total cereal production of the province is 231,883 ton with productivity rate of 1,630 kg/ha. Total milk production is 92,804 ton and meat production is 1,278 tons.

KCB agriculture is highly dependent upon irrigation. The total arable land in the Basin is approximately 2.2 million ha. Approximately 427,000 ha of this officially are irrigated. The actual hectares under irrigation are likely substantially higher. The economic value of irrigated versus non-irrigated land is nearly three times greater. Irrigated lands within the KCB generate annual crops valued at US\$ 2.3 billion. Non-irrigated lands generate crops valued at US\$ 760 million.

Table 1: Number of animals in KCB.

Provinces in KCB	Cattle	Goat	Sheep	Total
Konya	460,814	14,708	1,349,248	1,824,770
Karaman	34,400	37,432	302,866	374,698
Aksaray	133,298	30,000	370,000	533,298
Total	628,512	82,140	2,022,114	2,732,766
Total grazed in open range				2 229 956
Total kept in large farms/feed lots ²				502 809

¹20% of cattle are household level grazed on pastures together with all sheep and goats.

²80% of cattle are kept in feedlots, requiring fodder to be grown; also this is the population of cattle from which manure can be used to contribute to biogas generation.

A substantial amount of the basin is forested. The total basin area designated as forested lands is 733,760 ha. This includes nearly 100,000 ha of productive or commercial forest area. The remaining forested areas are rangelands and/or degraded forests. Fragmentation is high, with 20 % of degraded forests fragmented with 10 % to 40 % canopy cover. KCB's main tree species are: Black pine (31 %), oak (24 %), juniper (20 %), fir (9 %), Calabrian pine (8 %), and cedar (3 %).

The biodiversity of KCB is globally significant. For a detailed summary of KCB biodiversity, please see Appendix 10. There are 24 Key Biodiversity Areas in KCB and 12 protected areas. There are 21 IBA's and 1 Ramsar sites designated in the KCB. Much of the globally significant species are highly dependent upon these wetlands. Examples of such species include the white-headed duck (*Oxyura leucocephala*, Endangered) and Eurasian river otter (*Lutra lutra*). For instance, the *Barbatula eregliensis*, a critically endangered and endemic fish species occurs only within the Ereğli marshes. The KCB is globally recognized as an historical nesting area for tens of thousands of flamingos.

The KCB steppe is a globally unique habitat hosting numerous threatened and restricted range plant and animal species. The KCB salt steppe is the largest and most pristine in Turkey. The KCB is the most important basin for endangered Great Bustards in Turkey. There are several key sites for the species including IBAs such as Tuz Lake, Sarayönü, Kulu Lake. Once a steppe bird the species has adapted breeding in croplands. Although they built their nests in cereal fields they are using fallowlands and natural steppes for foraging around Sarayönü and Kulu. The remaining steppes matter for the survival of the species.

Steppe plant species of note include: *Astragalus gigantostegius*, a narrow endemic known from one locality (Critically Endangered), *Astragalus cicerellus* (Critically Endangered), *Astragalus victoriae* (Critically Endangered), *Campanula antalyensis* (Endangered) and *Gladiolus humilis* (Endangered). The pilot site has an endemic butterfly species, the Anatolian black-eyed blue (*Glaucopsyche Astraea*). The mountainous foothills provide habitat for the endemic *Quercus* (oak) species (*Quercus vulcanica*).

The project has identified four sub-pilot sites within the Konya basin. These four sub-pilot sites are briefly summarized below. For a full description of the sites and specifics regarding project interventions, please see Appendix 9.

Pilot Site One: Ayranç-ı-Karaman

The pilot site covers an area of 264,700 ha. The elevation varies from 1,000 to 1,800 meters. The province has 45,000 ha of forests, 101,930 ha of arable lands and 44,768 ha of pastures. The population is roughly 7,000. Most residents live in villages. However, agriculture (livestock and cultivation) remains the main income source, employing approximately 70% of the population.

The agricultural lands of the region are heavily degraded. Wind erosion is a major problem. The intensified use of inputs such as fertilizers and chemicals has contributed to this degradation. This has decreased the organic content of the soil and increased its susceptibility to further wind erosion. Some authorities would like to see 30,000 ha of irrigated land under crop production. However, due to the general water scarcity in the region, the total irrigated lands decreased from 17,098 ha to 9,839 ha in the last 10 years. As a result, local farmers are increasingly turning to ground water sources. In the last decade, nearly 250 wells were opened. Approximately 36% of these are unlicensed.

Government provides support for the livestock sector. Sheep and goat numbers have risen from 89,000 in 2007 to 106,211 in 2012. Cattle numbers have climbed from 5,563 in 2007 to 7,820 in 2012. Pressure on pastures is increasing with fodder quality suffering. The increase in livestock numbers has resulted in a rise of methane emissions. Grazing pressure on forests by nomadic people who are live in south Anatolia during the winter and move northwards to Konya and Karaman area is substantial. More than 130 families with herds exceeding 50,000 goats and sheep move into the region each year.

While migrating, these nomads pass through forest areas including the Karaman-Ayrancı Pilot Site. This results in understory and regeneration disturbance.

The forest structure is mainly in natural character and is composed of oak, cedar, juniper and black pine trees. The canopy coverage rate of the forests is 55% and site indices range in the 3rd level. In general, the forests are heavily degraded. For instance the forest canopy cover rate was 85% in 1990 and 55% in 2000s. Yeşildere Key Biodiversity Area extends along the Yeşildere River and obtains its KBA status from a freshwater fish species, *Gobio hettitorum*. The species is endemic and lives nowhere else. There are no protected areas in the pilot site.

Pilot Site Two: Green Belt

The pilot site covers an area of 101,000 ha. The average elevation is around 970 meters. The coverage of forests is 25,000 ha. The human population is approximately 15,000 people. The main economic activities are temporary forestry labor and animal husbandry. Although the animal husbandry is a key livelihood, there are no pastures in the region. Agriculture is limited to the surroundings of the villages for gardening and small-scale crop production. There are no protected areas in the pilot site for wildlife and natural values nor IBAs and KBAs. The Greenbelt is under certain protection by MFWA. Local authorities fenced the area. Access is forbidden. Local residents use the area for grazing animals and illegal small-scale agricultural practices. The illegal use of forestland for grazing purposes and occupation of forests for agriculture has a serious cost on afforestation activities. The primary industry is poultry and egg production. This has a high environmental cost, particularly in terms of climate change.

Pilot Site Three: Karapınar, Ereğli, Emirgazi

The pilot site covers an area of 292,600 ha. The average elevation is around 1,000 meters. There are 20,100 ha of forests, 130,000 ha of arable lands, and 142,000 ha of pastures. The population is 78,500. In the project site, the main income sources are production of field crops, animal production and agro-industries.

Most farmers have changed their farming practices from dryland to irrigated farming systems due to Government subsidy supports. Sugar beet, maize, sunflower and also horticulture have increased dramatically. Currently about 82,000 ha of land are irrigated. This is an increase of 55% within the last decade. The irrigation demand far exceeds the potential water capacity. Annual precipitation ranges from 250 to 350 mm. More than 5,000 wells exist in the region. More than 70% are unlicensed. As a result, the ground water level and the quality of available water are diminishing. Groundwater levels have dropped nearly 15 meters during the last ten years. Further water loss is caused by the usage of open channels (evaporation and leaks) for irrigation, contributing to the unconscious overuse of water.

The intensive agriculture production techniques based on an overuse of inputs (e.g. fertilizer, chemicals, irrigation) and improper mechanization techniques (e.g. intensive soil tillage, field trafficking) have resulted in further degradation of land in the project area. This degradation has also decreased the organic content of the soil and increased its susceptibility to wind erosion. Although farmers are intensifying the use of inputs such as irrigation and fertilizers for compensation, the approach is not sustainable in the long term. Wind erosion is another major problem in this area especially affecting the sediments remaining from an ancient shallow lake. Fertile soil is threatened to be lost completely and wind erosion also causes further humidity loss from the topsoil. This is enlarged by inappropriate land-use techniques, e.g. an increased ploughing depth to turn moist soil contents to the surface for the seeding bed, which also shifts the organic matter to deeper layers.

Sheep and goat husbandry is one of the main activities in the project site. About 530,000 animals are kept in the area. This represents an 80% increase over the last 10 years. As the pressure on pastures has increased, the fodder quality of the pastureland diminished. The GoT support system for cattle breeding has contributed to an increase in the project site and the number of cattle has doubled over

the last ten years reaching up to 145,000 animals. Cattle breeding is managed intensively using feed lots. This limits pressure on pasturelands while increasing demand for irrigation intensive fodder crops such as alfalfa and maize. The entire industry drives higher methane emission levels. Parts of these pasturelands are not suitable for growing grass species due to the aforementioned salinity problems in the soil. The overall salinity has increased. Nearly 44,000 ha of pastures and meadows and about 9,000 ha of agricultural fields are affected by severe salinity due to these insufficient water management practices.

Forests of the region are concentrated around Karacadağ and Ereğli. The majority of the forest is natural and consists of coniferous and deciduous species but it is degraded due to overgrazing by goats. As a result, the forest cover is less than its original coverage in the past. Site indices have worsened and the productivity of the stands have dropped by 60%. In order to rehabilitate the forest stands, trees have been planted in this area for at least three decades. However, those rehabilitation activities could not reach their objectives due to the intensive grazing by goats. The trees were also used as fuel wood and branches were cut for livestock feeding by local forest villagers.

The pilot site has two protected areas: a Nature Reserve Area in Ereğli marshes and a Ramsar site called Meke Maar. It was declared a Ramsar site and a nature monument under national regulation. The Meke Maar gathers its importance due its geological specialty. There are 2 key biodiversity areas in the project site: Karapınar Plain and Ereğli Plain.

Pilot Site Four: Sarayönü-Cihanbeyli

The pilot site covers an area of 232,750 ha. The average elevation is 1,050 meters. There are 15,000 ha of forests, 139,000 ha of arable lands and 57,000 ha of pasture. Gözlü State Farm in Sarayönü is 28,000 ha used as both farm and pastureland. The total population is 21,293. The primary income sources are crops (70%) and livestock (30%).

Most of the farmers have switched their farming practices from dryland farming to irrigated farming due to government price supports. The Government supports oil seed production (sunflower, safflower, maize), sugar beet and fodder crops (alfalfa, vetch) and livestock. In three years, sugar beet, maize and sunflower production has increased three-fold. This contributes to methane emissions from sugar production factories in KCB.

The amount of irrigated area covers 7,250 ha land. This is an increase of over 60% in the past decade. Most of the irrigation is applied with pressurized irrigation techniques. This is a very dry area. Annual precipitation ranges from 300-350 mm. There are no surface water resources. Irrigation water is from groundwater only. Over the past decade, the number of wells has doubled from 350 to 700 wells. At least 20% are unlicensed. Poorly regulated groundwater use is resulting in a rapid decline of water resources. The water table has dropped approximately 30 meters in the last ten years.

Intensive agriculture production techniques (fertilizer, chemicals, irrigation etc.) and non-proper mechanization techniques like intensive soil tillage further degrade the land, triggering wind erosion and decreased organic content. To compensate, some farmers simply increase irrigation and fertilizer use. The local soil texture is very sensitive to erosion due to the small particle (grain) size. The major threat is loss of fertile topsoil through wind erosion. The wind erosion causes humidity loss in the topsoil. The situation is worsen by inappropriate land-use techniques, e.g. increased plough depth to turn the moist soil content to the surface for the seed bed which also removes the organic matter from the top layer.

Sheep and goat husbandry is one of the main activities in the project site. There are 93,294 domestic animals. The 10% increase rate over the past decade is low compared to other pilot areas. This is due to degradation of the pasturelands and related water scarcity. Local officials estimate that over 57,000 ha pastureland is severely degraded. In Gözlü TİGEM State Farm the numbers of sheep and goats is

13,700. This number will be increased to 20,000 in 2014 following the rehabilitation of pasturelands. Only in 2013, 100 ha pasture was rehabilitated.

With the support of GoT, cattle husbandry has become important in the region. The number of cattle has increased 10% and reached 15,000 in the last 10 years. In Gözlü State Farm, with the establishment of the cattle barns, the numbers of cattle will be 5,000 in few years. There are no manure storage/processing facilities in the region. Methane release is a major contributor to the atmospheric greenhouse gas level. Approximately 200,000 tons of animal manure is produced annually in the pilot site. This resource will be used for the improvement of the degraded farmlands. Poultry is another major activity, with substantial waste produced.

This pilot site is advanced in terms of the use of progressive agricultural technologies such as direct seeding. Nearly 2,500 ha are under the program of Leader Farmers Union. There are 26 direct seeding machines only in Sarayönü region. In 2013, 40 farmers asked for direct seeding machine support from the MFAL. The Ministry financed eleven.

The forest structure of the pilot site is mainly plantations consisting of coniferous and deciduous species. Current forest cover is approximately 15,000 ha. This includes 5,000 ha degraded oak, juniper and black pine. Forest areas are also used for pasturelands. This leads to degradation. Some agricultural lands were converted into forest government decree.

There are no protected areas in the pilot site. There are two key biodiversity areas; Insuyu Valley and Sarayönü KBAs. The former is important for endemic plant and fish species. The latter holds one of the few breeding sites of globally threatened Great Bustards.

B. Global Environmental Benefits (GEB) status, threats and causes (for GEF Projects)/Climate Change (CC) vulnerability (for LDCF/SCCF projects) and problems the project will address

Land degradation and climate change both threaten the integrity of the KCB's ecosystems. Deforestation and desertification are reducing ecological resilience and the richness of the KCB's globally significant biodiversity. The KCB's already vulnerable system faces imminent collapse when combined with the potential adverse impacts of emerging climate change. Simultaneously, much of the human activity within the KCB such as existing cattle and poultry production practices contributes to climate change.

Evidence of land degradation is widespread in the KCB. National experts estimate that nearly 50% of the remaining coppice forests; 92% of pasturelands; 40% of arable lands are degraded. Soil erosion has adversely impacted 350,000 hectares in the KCB. National studies show that 65% of the KCB's historical wetlands are degraded or completely destroyed. Tuz Lake is a globally significant breeding ground for the Greater Flamingo. Tens of thousands of breeding pairs have historically been sited here. In 2007, this wetland was completely disappeared due in large part to hydrological changes related to land degradation.

There are several activities driving land degradation in the KCB. Over-grazing and fuel-wood collection contribute to forest degradation. Historic and unsuccessful afforestation and forest rehabilitation activities contribute to a lesser extent. As noted above, the number of livestock is increasing. Although cattle are largely pen raised, sheep and goats graze under a nearly open access regime. On the steppe, overgrazing causes destruction of the botanical composition of the natural vegetation and also decreases rangeland efficiency leading to erosion. Long-lasting irregular grazing (heavy, early, uncontrolled etc.), especially on the hillsides, and cultivation are the major reasons of degradation of the rangelands. Conversion of rangelands to temporary dry arable land is a common practice in the KCB, but as yield potential is low this contributes little to food production.

Cultivation represents the perhaps the most pressing land degradation challenge. A great deal of the KCB has and is being converted from steppe and wetland to crops. In the last 10 years, more than 250,000 hectares have been put under cultivation. This is an increase of 42%.

There are some very hopeful signs emerging showing that more sustainable, climate-smart agriculture is possible in the KCB. These trends and activities are discussed in the baseline section. However, for the most part, agricultural practices are becoming increasingly intensified and ecologically inappropriate. For instance, stubble burning is commonly practiced. This results in the loss of the biological quality of the topsoil, prevents preservation of soil moisture, and ultimately accelerates erosion. Inappropriate cropping patterns and rotations such as wheat-sugar beet-wheat and wheat-fallow-wheat are practiced frequently. The use of fertilizers and pesticides has increased drastically. In 2013, approximately 276 kg of chemical fertilizer was applied per hectare in the KCB. In the last 10 years, the rate of increase was 32%. In 2013, approximately 2.1 kg of pesticides was used per hectare in the KCB. In the last 10 years the rate of increase has reached up to 11.6%. The result is a slow degradation of soil structure, loss of biodiversity and changes in the pH value of soil.

KCB agriculture is largely dependent upon irrigation. Increased production demands are rapidly depleting available surface and ground water sources. In 2011, approximately 2,023,513 hectares of KCB were under cultivation. As of 2002, there were 1,760,456 hectares under cultivation. This is a dramatic rise. High water demand crops such as sugar beets represent approximately 909,329 hectares of this increase in cultivated lands. In 2002, there were approximately 45,000 wells in the KCB. There are now over 100,000.

Most surface water within the basin is appropriated. The ground water table in the KCB is dropping at an estimated 3 meters annually and in some places even faster. The result is increased desertification, wind erosion and salinization. Natural functions are being lost, including the evaporation of wetlands. The pace and rate of loss of biodiversity especially in wetlands is daunting. Increased salinization due to the water table drop now prevents the abstraction of water by plants. This eventually decreases overall vegetative cover.

Loss of ecosystem integrity is perhaps the most evident indicator of land degradation in the KCB. The inappropriate conversion of pasturelands to forests through industrial afforestation measures degrades ecosystem health and fragments steppe habitats. Inappropriate agriculture practices, including overgrazing and excessive tilling can trigger erosion and a reduction in health of steppe plant community diversity, which reduces habitat complexity and thus species diversity. Pollution of surface and ground water from the inappropriate disposal of agricultural waste degrades aquatic and wetland habitats. Excessive use of water resources undermines the ecosystem health of wetland systems and contributes to a cycle of depleting water resources, increased salinization, dust storms and reduced land resilience.

The Turkish Society for the Protection of Nature (Today's WWF-Turkey) completed a comprehensive study of birds and plants during 1998-1999. Studies of Important Bird Areas and Important Plant Areas were completed and published at 1997 and 2003. Later, Turkish Nature Association (Doğa Derneği) updated the IBA inventory in 2004 and published the Key Biodiversity Areas Book in 2006. The Key Biodiversity Areas Book summaries all of the information on key taxa for the KCB including birds, mammals, plants, reptiles, amphibians, plants, butterflies and dragonflies. The findings all indicate that KCB agriculture and water resource use policies and practices result in the habitat degradation and the subsequent loss of biodiversity.

According to climate change scenarios completed by independent experts, the KCB will be one of the most negatively affected regions in the country by climate change. This prognosis is directly related to the existing and increasing levels of land degradation that will be exacerbated by climate change. However, climate change is not comprehensively factored into regional natural resource management policies and practices. Therefore, the full range and impact of risks posed by climate change in the KCB are not well understood.

There are both observed and projected changes in the climate that are and will impact the KCB. Early signs of climate change include rising winter temperatures, early springs, and drying wetlands. These are already having dramatic effects on ecosystems and their species diversity (biodiversity). For instance, many wildfowl species are not anymore present in the Basin such as Marbled Teal. Other water birds such as ducks, geese, shorebirds, gulls and terns that were once common in the basin are scarce animals of today. Moreover, although there is not an existing monitoring program, the effects of climate change on sensitive endemic plant species is expected to be high. Projected impacts include more frequent wildfires, insect pests, larger and more frequent dust storms and greater water stress are among the major factors of degradation that are predicted to accompany on-going climate change. Increasing temperatures raise evapotranspiration rates and reduce soil moisture. In conjunction with shifting rainfall patterns, this will affect vegetation patterns and the growing period for crops.

Prolonged dry spells and erratic climatic conditions may lead to short-term coping strategies such as deforestation and overgrazing. Inappropriate agricultural practices and overgrazing reduce above-ground organic carbon, leading to a decline in soil carbon. This decline in organic matter leaves the land even more vulnerable drying and to erosion caused by more intense rainfall that is becoming more and more common as the climate changes. It also affects adversely several physical, chemical, and biological soil properties that impact land productivity, biodiversity, and ecological function. Land cover changes can also lead to changes in local climatic conditions due to different surface reflectivity and water transpiration.

Equally important is the KCB's contribution to climate change. As noted, livestock industry is developing. Since 2008, the numbers of cattle has increased to 500,000 animals with an increase of 25%. This is resulting in increased release of methane. Turkey's methane emission has increased from 33.5 million tonnes CO₂e to 54.3 million tonnes CO₂e between 1995 and today. This increase is similar in KCB with a 1,200,000 tonnes CO₂e.

C. Institutional and policy framework

Please see Appendix 8 for a comprehensive summary of the project's institutional and policy framework.

Institutional Framework

The *Ministry of Forestry and Water Affairs* (MFWA) is responsible for a host of conservation issues. The MFWA sets and implements forest management standards. This responsibility extends to rangeland management within forest areas. The MFWA is responsible for many aspects of water management. This includes preparing basin wide management plans for Turkey. The MFWA's General Directorate for State Hydraulic Works (DSI) and associated regional directorates oversees establishment of irrigation infrastructures, including construction of dams and reservoirs. The MFWA regulates the conservation of biodiversity, manages conservation areas and oversees critical habitats, including streams, lakes and wetlands. The MFWA is responsible for soil protection, including erosion control and rehabilitation.

Agencies or "General Directorates" within the MFWA implement the Ministry's management responsibilities. This includes Directorates for: Combating Desertification; State Hydraulic Works (DSI); Water Management; Erosion; and, Forestry. Within the Directorate for Forestry there are Departments of Biodiversity, National Parks and Sensitive Areas.

Within the KCB, a number of Regional Directorates carry out the MFWA's mandates. These Regional Directorates oversee afforestation and erosion control, rangeland rehabilitation, combating desertification, flood and avalanche control, and the development and implementation of integrated watershed projects. The Ministry's DSI Konya Regional Directorate is responsible for surface and

ground water management and soil erosion control. The MFWA also has regional directorates. For instance, the Regional Directorate of Meteorology prepares weather forecasts and oversees the “Drought Monitoring System”.

The *Ministry of Food, Agriculture and Livestock* (MFAL) is responsible for nearly all aspects of agriculture management. This includes extension services, policies, and monitoring of the agriculture sector. The MFAL is mandated to conserve soil, water, and biodiversity resources. The General Directorate of Agrarian Reform (TRGM) determines agriculture policies and subsidies.

Within the KCB, the Ministry of Food, Agriculture and Livestock is represented by two provincial directorates located in Konya and Karaman. These directorates are responsible for improving the agricultural practices, including extension services. Each province also has a Soil Preservation Board to examine, assess and monitor the activities related to land utilization. The regional Agricultural Support and Guidance Committee is responsible for the determination of the supports and subsidies that will be given to the farmers during the following years..

The *Ministry of Environment and Urbanization* (MEU) implements Turkey’s climate change related policies as well as preventing pollution and ensuring the fulfillment of environmental impact assessments. This is done primarily through the Ministry’s Climate Change Department. The *Ministry of Energy and Natural Resources* oversees issues related to renewable energy.

Legal Framework

The *Forest Law* (No: 6831, 1956) sets forth the basic forestry legislation. The boundaries of protected forests are determined and declared to the surrounding villages. The conditions, principles and periods of designation of such forests and management, development, improvement and utilization principles and decisions are decided by the MFWA. The grazing of herds on the state forestlands should be done according to the plans and permission of the forestry administration.

The *National Mobilization Law for Forestation and Erosion Control (4122) (1995)* includes procedures and principles for expansion of forest lands; Maintaining natural stability among soil, water and plants and coordination of control measures for erosion which will be conducted by public institutions, people and nongovernmental organizations.

The *National Afforestation and Challenge Law (2008)* aims for the rehabilitation of degraded forest areas and plantations in the unproductive forest areas, bare land plantation action plans. Rehabilitation of degraded forest areas issues were re-regulated base on National Environmental Action Plan (NEAP) and National Action Program on Combating Desertification.

The *Agricultural Law (5488) (2006)* aims to determine agricultural sector and rural area development plans and strategies in line with the policies and regulations supporting agricultural development. The Law defines the principles, objectives and priorities of agricultural policies, training and advisory services for farmers, protection of biodiversity and genetic resources; and ensuring bio security and bio safety. The Law also covers provisions on product councils, producer organizations and rural development. Furthermore, the Law outlines duties, principles and objectives of the Agricultural Support and Guidance Committee. The Law finally specifies measures to be taken to prevent pests and infectious diseases affecting plants.

The *Soil Conservation and Land Use Law (5403/ 5578) (2005/2007)* sets forth the rules and principles for determining land and soil resources and their classification, preparing land utilization plans, preventing non-purpose utilization, and defining the tasks and obligations to ensure land and soil preservation.

The *Pasture Law (4342) (1998)* sets forth basic procedures and rules for defining and allocation of pasture areas to various villages and municipalities. MFAL is authorized to determine the boundaries

of pastures and their allocation to relevant entities. The procedure for this application is clearly defined in the Law.

The *Organic Farming Law (5262) (2004)* supports organic farming and maintain consumer safety. The Law sets up the principles and procedures of organic farming and defines the rules and procedures of inspection and control; and, certification. The Law further covers provisions on duties and obligations of the Ministry of Agriculture and Rural Affairs on supervision of organic farming and of organic products.

The *Water Law (No: 831, 1926)* is the first law that regulates reassurance and management of water is given to civic government and village's council to respond public need after the declaration of Republic of Turkey in 1923. Drinking water and irrigation water issues were considered together under this law. The *Environmental Law (2872) (1983)* aims to protect and improve the environment, which is the common asset of all citizens including conservation of water. The *Under Ground Water Law (No:167, 12/16/1960, Modification Dates: 07/04/1988, 02/07/1990, 07/03/2003, 01/23/2008, and 02/13/2011)* is the legislation to set all research, protection, registry and usage activities of these water resources. DSI is the organization to undertake the duties rising from this law. The *Irrigation Associations Law (6172) (2011)* is there to regulate duties and responsibilities between DSI and irrigation associations for management, operation, maintenance, monitoring and evaluation of irrigation schemes, which constructed by DSI in order to use water resources of country.

The *Renewable Energy Law (6094) (2010)* is one of the key legislation in Turkey regarding the climate change. The legislative framework adjusts the prices for the sale of electricity to the state according to their generation method.

The *Terrestrial Hunting Law (1937, revised 2003)* regulates all decisions on species and habitat conservation, including within protected areas. The *National Parks Law (2871/5919) (1983/2011)* sets forth the rules and procedures of the selection of national parks, natural monuments, nature parks, and nature reserve areas. It outlines the duties and responsibilities of the MFWA concerning the management and protection of protected areas and granting permissions. The Law further covers rules to the protect ecosystem and wildlife and to prevent soil, water or air pollution and prohibits construction of any building or facility as well as the production of forest products, pasturage and hunting that might harm the ecosystem and or biological diversity.

The *Directive on Protection of Wetlands (25818/2005)* regulates the identification of internationally and nationally important wetlands, defines protection zones, prepares management plans and declare Ramsar sites.

1.1.1. Rationale

A. Baseline projects and investments for the next 3-5 years addressing the identified GEB threats and causes and development of the CC vulnerable sector (main co-financing sources of the project)

National and international stakeholders are implementing numerous project related initiatives. The summary below highlights key baseline investments/activities. For a comprehensive description and accounting of the total baseline, please see Appendix 9.

Table 2: Summary Baseline investments/activities

Baseline project Co-funders	Name of Co-financier	Brief Description of Co-funded Baseline Project Activities	Type of Co-financing	Amount (\$)
National Government	The Ministry of Forestry and water Affairs (MFWA)	- Rehabilitation of degraded forest lands (56 %), afforestation (28 %), erosion control in degraded forest areas (14 %) and range rehabilitation in the vicinity of forests (2 %)	Cash	9,100,000
National Government	MFWA	- MFWA staff, office, transport services and procurement of facilities	In-kind	1,000,000
National Government	The Ministry of Food, Agriculture and Livestock (MFAL)	- Incentives and direct payment for conservation agriculture practices - Subsidies for machineries - Rehabilitation of lands under Range Reform Program	Cash	7,700,000
Private Sector	Konya Sugar	- Afforestation activities of the company in pilot sites.	Cash	1,000,000
Civil Society	Nature Conservation Centre Foundation	- The NGO is leading the Life Plus Environment Program in collaboration with MFAL with the grant of Coca Cola Life Plus Foundation.	Cash	1,800,000
Total				22,300,000

The “National Program on Afforestation and Erosion Control Mobilization Action Plan” intends to rehabilitate 2.3 million hectares of forests nationally. The aim is to prevent erosion and land degradation, preserve soil and water resources, increase forested areas, and address climate change. From 2008 – 2012, the Government of Turkey invested US\$ 1.5 billion into this program. The estimated investment in KCB is US\$ 168,000,000 and will ideally restore 112,300 ha forests within 5 years.

The “National Land Consolidation Program” is actually an amalgamation of several significant government land reforms. The overriding policy is to re-orientate property lines to create more “square” parcels. This will increase productivity via the use of modern farm machinery. The program commenced in 2008, will run at least 10 years and will impact 8.5 million hectares nationally. The total investment is US\$ 660 million. In the KCB, the program will cover at least 200,000 ha in the territories of 53 villages. The total budget for KCB is nearly US\$ 8.4 million. The program does not fully integrate issues related to SLM, CC, and/or BD. The package does include limited programs to address land degradation, e.g., land restoration, improved irrigation systems, token biodiversity corridors and reforestation.

The MFAL carries out extension services throughout the KCB. This is currently supported by a budget of US\$ 8.5 million a year. In the KCB (Konya, Karaman and Aksaray Provinces), there are around 450 extension officers. These 450 extension officers are responsible for servicing around 93,000 farms. There is no significant investment in raising awareness and effectiveness of farmers with regards to SLM, CC, and/or BD. This includes almost no formal training and/or training materials related to climate smart agriculture.

The MFAL “Environmentally Based Agricultural Land Protection Program (ÇATAK)” promotes environment friendly agriculture with financial incentives. This includes subsidizing environment friendly practices. Commenced in 2008, the program to date has invested US\$ 17 million nationally. The KCB program covers nearly 12,000 ha and has spent US\$ 7 million so far.

MFAL is leading a project with EU support under IPARD program to introduce a subsidy system in line with the EU biodiversity mechanism designed to protect farmland species. The globally threatened Great Bustards will be part of this program. Farmers will be subsidized to change their agriculture techniques to support Great Bustard conservation. The KCB Polatlı State Farm of MFAL

near Ankara. Polatlı population of the Great Bustards is just the northern extension of Sarayönü population. Therefore these two populations are connected to each other. This proposed project will be aligned to coordinate with the IPARD program.

The Government is investing US\$ 40 million in irrigation projects for the KCB. Projects in both Ereğli and Ayrancı will shift open channel irrigation to pressurized irrigation. This will impact 72,225 hectares of farmland and conserve an estimated 22,000,000 cubic meters of water. Although the scheme will save water, it does not address underlying water management concerns. Reserved water will likely be reallocated to allow for expanded farm operations.

The Government's "*Range Reform Program*" considers degradation of rangelands and associated issues of food security. Initiated in 1998 to support implementation of the Range Law and Soil Conservation and Land Use Law, the program supports demarcation of range areas and regulation of use rights, allocation and use rules, increasing productivity through rehabilitation and maintenance, continuous surveillance, and protection. Unfortunately, implementation has not produced expected results due to a lack of capacity. Conversion of rangelands continues even though the government annually invests about US\$ 10-15 million with approximately US\$ 1 million spent each year in the Konya Basin.

Several KCB state farms (Gözlü, Konuklar, Altınova) as well as the Konya City Water Treatment are constructing biogas facilities. Four private sector biomass utilities in KCB are currently producing 10 Mwe.

There are numerous small, but important investments in agricultural improvement. For instance, MEVKA (development agency in Konya region) spent US\$ 117,000 this year to provide no-till machinery to farmers. TUBITAK spent US\$ 260,000 on soil erosion, reduced tillage, direct seeding and liquid manure.

The MFWA is spending US\$ 10 million to stimulate biodiversity inventory studies to establish the biodiversity-monitoring baseline. In 2013, 32 projects were initiated with one in the KCB. The program will reach 81 provinces by 2018.

The State Hydraulic Works of MFWA invested US\$ 450,000 to help restore the Ereğli Marshes. The MFWA is also preparing management plans for wetlands nationally. A management plan was prepared for Ereğli and is waiting for ratification. The Meke Maar Ramsar site has no management plan.

Another program run by MFWA is for the conservation of Anatolian Wild Sheep. The Konya Province of the Ministry has a station in Bozdag for the conservation of the species. The bred animals are introduced to different places of their original distribution of Turkey including the KCB. The annual total budget of the program is ca. US\$ 150,000.

In terms of management of the forest in Turkey, OGM have undertaken several different projects that are incorporating biodiversity conservation and climate change mitigation and adaptation approaches. One of these projects was named as "Adaptation of Forest Ecosystems and Forestry to Climate Change in Seyhan Basin: Ecosystem Services (Social), Biodiversity (Environmental) and Forest Products (Economic)" and it was led by Adana Regional Directorate of OGM and Nature Conservation Centre. Within the project two outputs were achieved: Predictions for changes and vulnerabilities in forest ecosystems during climate change were developed and adaptation capacity to climate change of forestry sector was developed. The project has produced the knowhow for The General Directorate of Forestry on adapting to climate that can be benefitted within this project.

There are lessons to be taken from the Murat River Watershed Rehabilitation Project increasing household income through preventing natural resource degradation. Linking natural resource

rehabilitation and sustainable management with diversifying and improving natural resource-based household income generating activities are critical features. The proposed project will ultimately relate rehabilitation of natural resources with decreasing rural poverty. The value-added that will be contributed through this sustainable land management and climate-smart agriculture project is in the innovative synergies between climate change, biodiversity and land degradation and their long-term impacts on rural poverty.

Furthermore as a result of the project activities in both areas, emissions of approximately 4,192,800 kgC to the atmosphere was estimated to be prevented per year. The project is a good best practice to prove the importance of conserving wetlands for mitigation efforts.

Although the climate smart agriculture techniques are relatively new to Turkey there have been several significant implementations going on in the country. Some of these activities have been supported under the ÇATAK program of MFAL with several best cases in KCB too. For instance, Sarayönu region also lies in one of the pilot sites of the project can be told to be leading on some aspects of the climate smart applications. 2400 ha of agricultural land have already been transformed to climate smart approaches just in few years. This existing success is highly motivating to local farmers and should be used by the project as a best practice in terms of demonstrating to other farmers.

Two forest and climate related projects exist. One of them has just started and run by WWF Turkey in partnership with UNDP Turkey, OGM and Nature Conservation Centre. The project aims to contribute to the long preservation of Mediterranean forests and their capacity of delivering ecosystem services, crucial element to the wellness of the populations in the region. The Konya Regional Directorate of OGM will be the partner of the action and hence the outputs and know how obtained in the project should easily be transformed to the other. Moreover, UNDP Turkey has initiated another GEF 5 project for OGM called as “Integrated approach to management of forests in Turkey, with demonstration in high conservation value forests in the Mediterranean region”. The project objective is to promote an integrated approach to management of forests in Turkey, demonstrating multiple environmental benefits in high conservation value forests in the Mediterranean forest region. The project has just started and know-how exchange between two projects is key to the delivery of successful results.

OGM has been working on mainstreaming biodiversity conservation into forest management in the managed forest. The project has been funded by BTC Pipeline Company under its Environmental Investment Program and run by Nature Conservation Centre and OGM. A practical system has been developed within the project for mainstreaming and General Directorate of Forestry has adopted the system and has been implementing it for 3 years. This experience should be benefited by the project as there is biodiversity mainstreaming implementation foreseen under degraded forests as well as for agricultural areas.

In 2010, the Adana Regional Directorate of Forestry and Nature Conservation Centre finalized the “Adaptation of Forest Ecosystems and Forestry to Climate Change in Seyhan Basin: Ecosystem Services (Social), Biodiversity (Environmental) and Forest Products (Economic)” project supported by the UN Joint Programme on Enhancing the Capacity of Turkey to Adapt to Climate Change. The total budget was US\$137,000. Two outputs were achieved: (1) Predictions for changes and vulnerabilities in forest ecosystems during climate change were developed and (2) adaptation capacity to climate change of forestry sector was developed.

The General Directorate of Forestry is mainstreaming biodiversity into forest management plans. Working with the Nature Conservation Centre, they have produced a very suitable methodology. The guidelines and demonstrations have been implemented in several regions of Turkey. The BTC Pipeline Company currently supports the program with US\$ 1 million in annual funding. The mainstreaming projects with GEF funding should benefit the existing knowledge of this system.

Private Initiatives

Several agricultural development cooperatives and unions exist in KCB. These include irrigation unions, agricultural production cooperatives, agricultural credit cooperatives and sugar beet cultivators unions. They mainly serve members to boost agricultural production and provide extension services for farm development. There is increasing concern among farmers about possible negative effects of unsustainable agricultural production, which can be attributed to decreases in productivity, water resources and increased pollution and more frequent dust storms in the Basin. As the beneficiaries of the GEF project, these cooperatives represent an important part of the baseline. They will work closely with the project to shift towards more conservation oriented agricultural practices.

GEF Projects

The UNDP/GEF and MFWA project “Integrated approach to management of forests in Turkey with demonstration in high conservation value forests in the Mediterranean region” commenced in early 2014. The project objective is to promote an integrated approach to management of forests in Turkey, demonstrating multiple environmental benefits in high conservation value forests in the Mediterranean forest region. The total GEF contribution is US\$ 7,120,000.

The FAO/GEF project Alignment of Turkey's National Action Plan with UNCCD 10-Year Strategy and reporting process aims to revise the national action plan on Combating Desertification and Erosion. The plan will be finalized in 2014 and will be implemented 2015 onwards.

The FAO/GEF project Conservation and Sustainable Management of Turkey's Steppe Ecosystems focuses upon the steppes for Turkey. The project has a GEF contribution of US\$ 2,328,767. The project aims to improve the conservation and effective management of steppe ecosystems of Turkey through effective protected area management and streamlining of steppe biodiversity into the production landscapes. Currently the PIF has been approved.

Non-Governmental Initiatives

The Nature Conservation Centre is implementing a Coca-Cola and UNDP funded grant, the Life Plus Environment Program. The project has a budget of US\$ 1,500,000 for 2013-2016. Within the KCB, the project is designed to improve water-holding capacity of soil, ensure the efficient use of land and water and to increase the capacity to use the ecosystem services in agriculture. To date the project has started working in Karapınar and initiated several conservation agriculture activities including direct seeding and wind barrier construction as well as training to farmers. The project is implementing climate smart agriculture techniques such as no till ploughing, establishing windbreaks and use of animal manure as fertilizers. The project is aiming to conserve the Great Bustard population in Sarayönü-Cihanbeyli pilot site. Although this endangered species is highly sensitive to agricultural practices and hunting, there is wide range of knowledge and experience in EU countries. Especially the experience of Spanish and Hungarian BirdLife International partners will be a key to gather this experience to Turkey. Close links are established with the farmers. A working committee was founded with the participation of local stakeholders including technical staff from local public institutions, NGOs and farmer organizations. The Life Plus project is an important part of this proposed GEF baseline. During project design, the GEF PPG team and Nature Conservation Centre worked very closely to make certain activities are well-aligned and mutually beneficial. This will continue throughout implementation.

The Nature Association (a BirdLife International partner in Turkey) and Nature Research Association monitor wildlife, including mid-winter waterfowl counts, Great bustard surveys, surveys on breeding birds of several wetlands in the region and monitoring of Greater Flamingo colony in Tuz lake.

WWF-Turkey supports the Adapting Mediterranean Forest to Climate Change Project. The project will assess climate change vulnerability for Mediterranean forests, including the KCB, and seek to improve forest management plans to integrate specific adaptation measures. The project hopes to will raise CC awareness. The total budget is US\$ 603,000.

B. Remaining barriers to address threats on GEB (for GEF Projects) / CC vulnerabilities (for LDCF/SCCF projects)

Barrier #1: Minimal experience with participatory and integrated land use planning and implementation approaches on the ground.

Under the baseline, a key barrier to SLM in the KCB is the tendency for organizations to favor impractical and overly structural or intensive land rehabilitation investments versus process oriented, restoration measures driven by natural restoration carried out by local communities. These approaches tend to be top-down with minimal meaningful participation of local stakeholders. Participatory and integrated land use planning and implementation approaches have not been institutionalized in part because there are no practical guidelines for how to do so and no formalized mechanisms needed to enable local participatory management. This project will provide the basis for formalizing new participatory mechanisms for sustainable land management.

Improving management practices for pasture and natural forestlands in Turkey has been hampered by inadequate coordination at the local level among the MFWA and MFAL, Regional and Provincial directorates and farmer organizations/cooperatives and village leaders. Although the MFWA is responsible for conservation and sustainable use of natural resources, it has no role in permitting/leasing grazing lands, which is the purview of MFAL and each Province. The adoption and implementation of SLM/SFM at the local level is hampered by the lack of experience among stakeholders in land and resource use planning for pasture and forestlands and the lack of a cross-sectoral, participatory land-use planning process at the local level. The real cost of land degradation is very high in the KCB but this cost has yet to be assessed by local authorities and ascribed to the value of healthy forests and pasturelands. This hampers the ability of stakeholders first to recognize and then to maximize synergies among various sectors, particularly the ecosystem service values provided by sustainable natural resources management including carbon sequestration, biodiversity conservation, water quality and quantity, reduced downstream negative effects. This ecosystem services “cost-benefit” calculation gap undermines the ability of local governments and communities to ensure that the natural resources upon which they depend are stewarded in a sustainable way. Sharing the experiences on the SLM is very crucial to reach the best practices about sustainable forest management and climate smart agriculture.

Mechanisms and approaches for integrating biodiversity conservation into agricultural and pasture management are not in place and not tested in a comprehensive way in Turkey. The lack of technical, analytical and managerial capacity for SLM among decision-makers is one of the critical constraints to sustainable land management. The training of technical personnel is not enough. There is a need for analytical and planning capacity as well. Practical, experience-based training can provide stakeholders with the basic tools and approaches to begin applying SLM in their work. This kind of training is lacking among key stakeholders’ organizations currently including the MFWA, MFLA and the farmers’ organizations such as, KCB Union of Agriculture cooperatives, Leader Farmers’ Associations, Sugar Beet Farmers’ cooperatives (PANKOBİRLİK), and others. Technical guidelines based on demonstration practices can also help to increase capacity for SLM.

The ability to determine carrying capacity or the condition and health of pasture are uncommon skills in KCB. There is no systematic approach to capacity building for SFM/SLM. Essentially no local authorities have any training in how to monitor and enforce by-laws specifying pasture, or on the importance of healthy zones to groundwater recharge to erosion control and flood mitigation.

Barrier #2: Farmers under-exposed to new innovative low carbon technologies for farming and farm waste management.

In the KCB and across Turkey, unsustainable agricultural practices are resulting in land degradation and carbon emissions. Conservation agriculture techniques such as reduced tillage, direct seeding, crop rotation, permanent soil cover, crop residues management, mulching, etc., have been researched

and tested in several parts of the country, mainly on government lands. These tests have been done mainly for field crops on both irrigated and rainfed lands, introducing new crop rotations. Another objective of these tests is to reduce or eliminate the following practices in rainfed arable lands. Compared to conventional agricultural practices, the results showed a 10-20% increase in agricultural productivity, saving time and energy use for soil cultivation, increasing in vegetative covers and carbon sequestration, reduction in surface soil erosion, improvement in soil compaction and reduction in water loss by non-productive evapotranspiration. These results show multi-benefits, as do FAO's conservation agricultural practices, but these initiatives have not yet been demonstrated in-situ in the KCB by farmers, for farmers. This gap between applied research results and effective demonstration to the farmers hampers the ability of farmers to uptake new and innovative low-carbon farming tools and techniques. It also results in a lack of awareness among farmers about the benefits.

Inefficient extension services, technical difficulties regarding suitability of machineries and equipment to the local conditions, short term and non-discriminative incentives for these technologies and practices, lack of cooperation between farmers and relevant industry also hamper the adoption of such technologies. Developing model conservation agriculture demonstrations will open a new window for farmers. Water harvesting techniques and water saving irrigation systems will help to increase soil quality and improve biological productivity. At the same time, the introduction of wind breaks will prevent soil movement and loss of soil fertility in degraded lands.

The actual total renewable energy capacity (solid waste, geothermal, biogas and industrial wastes) of Turkey is a mere 1% of the total potential capacity of over 15,000 MW according to December 2009 data. A few industrial wastewater treatment plants and large-scale livestock are utilizing digesters. Some European suppliers have solicited livestock farms and agro-industrial food processors. This process was mostly driven by the supplier interest in selling the equipment. However, the biggest challenge relates to the cumulative impact of small and medium sized livestock operations. There is a fundamental absence of support and experience for this sector under the baseline. This lack of experimental evidence based approach to demonstrating this anaerobic digestion systems technology has hampered its adoption by Turkey's agricultural sector. In the case of Turkey there is a need for systematic demonstration to enable the identification and removal of specific barriers for wider technology adoption through the market.

Barrier #3: Inadequate enabling environment (legal, regulatory and institutional framework) and capacity for sustainable land management.

The lack of technical, analytical and managerial capacity for SLM among decision-makers is one of the critical constraints to sustainable land management. The training of technical personnel is not enough; there is a need for analytical and planning capacity as well. Practical, experience-based training can provide stakeholders with the basic tools and approaches to begin applying SLM in their work; this kind of training is lacking among key stakeholder organizations currently, including the MFWA, MFLA and the KCB Union of Agriculture Cooperatives. Technical guidelines based on demonstration practices can also help to increase capacity for SLM.

Existing laws such as Rangeland Law include general provisions for maintaining environmental health and call for pastures to be managed to produce multiple benefits. However, there are no specific by-laws to guide extension workers and farmers on how to achieve multiple benefits and establish sustainable conditions and how results can be monitored and enforced. Existing grazing management practices provide inadequate consideration of long-term implications for sustainability or the economic, social and environmental benefits of alternative pasture and forest land management practices. For example, in the past they had an informal pasture management system at the village level. Now, there is a Directorate of Special Provincial Administration in each Province that manages pasturelands by issuing grazing permits to private pastoralists for up to 25 years subject to approval every 5 years. This in effect means that the lessee has no security in property right, creating an atmosphere of short-term uncertainty, which in turn creates the perverse incentive to take as much

from the pasture and forestlands as possible (in terms of forage) because the license may not be renewed next year.

This highlights another important barrier: insufficient incentives to promote sustainable resource management. For example, grazing rights are leased or charged on a per hectare basis, which creates the perverse incentive for the farmer to lease as few hectares as possible while maximizing the number of animals. While on paper the number of grazing permits does not exceed the legal limit, in practice the number of animals grazing the land far exceeds the permitted number.

The legislation regarding grazing, pasturelands, and forests does not make specific provision for the direct involvement of municipalities and local people in these sectors, making it difficult to develop effective decentralized capacities for planning and regulation. The ability to determine carrying capacity or the condition and health of a pasture are uncommon skills in Turkey. There is no systematic approach to capacity building for SFM/SLM. MFAL has several SLM programs, but the results of the activities could not reach to the expected targets. During the last 10 years PDAs of Konya and Karaman implemented some local SLM projects in KCB.

Essentially no local authorities benefit from training in how to monitor and enforce by-laws specifying pasture, or on the importance of healthy riparian zones to groundwater recharge, to erosion control, and flood mitigation. At the local level, producer and community-based organizations are poorly developed with limited opportunities for training in sustainable resource management. Livestock grazers receive no extension support or training in sustainable grazing practices.

Extension services for the forestry, rangeland, and agricultural sectors have limited capacity. There is no formal training program to prepare extension officers to assist rural stakeholders with issues related to climate change, SLM, or biodiversity conservation. Even if such training existed and was supported by materials designed to expose extension officers to best available international principles and practices, there is no mechanism or pathway to deliver this information to the stakeholder farmers. The result is a dearth of information and opportunity available to enable natural resource management improvement and/or subsequent support for necessary enabling environment improvements.

C. Incremental/additional reasoning (added value of the project in particular the GEF/LDCF/SCCF financing)

The Government of Turkey, private enterprises, and other stakeholders clearly understand the importance of addressing the identified threats. Turkey's agriculturalists are particularly aware of these challenges. Farming families rely almost entirely upon natural resources for their economic survival. These stakeholders faced the very real impacts of environmental degradation and climate change daily. They very much desire to change the current course of events. However, despite efforts and investment being undertaken within the baseline, none of the existing barriers are being addressed adequately. Without GEF investment, these barriers will persist and current environmental challenges will accelerate. Therefore, the GEF funded alternative will systematically address each of the identified barriers. The project will do this in a way that is targeted and precise, making the best use of limited GEF funds to leverage substantial and lasting change.

The project will introduce an integrated approach to sustainable land management in the KCB where land rehabilitation, biodiversity and climate-smart agriculture practices including methane capture will be implemented. This case study in KCB will help to develop mechanisms for collaboration between the forestry and agriculture sectors to promote sustainable natural resource management practices. An integrated land management approach will have strong climate change mitigation impact with the biogas production in the project area. GEF's incremental investment will further strengthen participatory and integrated management of land resources to secure global LD, CCM and BD benefits at national and pilot project area levels. GEF funding will support measures to mitigate CC through

conservation agriculture, methane capture from agricultural wastes, restoration of degraded rangelands and forest by adoption new practical restoration practices, and improve management of pasture areas that in turn will avoid emissions caused by degradation, increase sequestration through enhanced biomass and improved productivity of land resources.

Incremental GEF resources will support the mainstreaming of SLM, climate change mitigation and biodiversity conservation objectives into production landscapes practices. The proposed project will provide an opportunity for a major scaling up and strengthening of participatory and integrated land management techniques to address capacity constraints within the main sectors in charge of land management. In doing so, the project will introduce participatory and integrated SLM, climate change mitigation and biodiversity conservation through three interlinked components: (i) rehabilitation of degraded lands (ii) climate smart agriculture, and (iii) strengthening enabling environment for sustainable land management.

The project will dismantle the “having minimal experience on integrated land use planning and implementations approach barrier” by demonstrating improved management mechanisms designed to deliver measureable improvements to sustainable land management, biodiversity conservation, and climate change mitigation/adaptation. This will be achieved through a series of interventions that will culminate in land use management and planning approaches that are adaptive, organic, and whose success is predicated upon delivery of SLM, BD, and CC indicators.

The project will dismantle the regulatory and sustainable capacity barrier by setting in place a series of institutional and regulatory structures designed to support and encourage agricultural changes. The incremental GEF investment will assist government at both the local and national levels to build and apply capacities required to change current policy structures that inhibit achievement of SLM, BD, and CC objectives. The project will also set in place an institutional framework designed to generate environment friendly production methods. The framework will create formal pathways for these improvements to be delivered from concept to the farm level. The farm level program encapsulated in a farmer field school approach will create the mechanisms required to supply farmers with the knowledge capacity and awareness necessary to implement production improvements. The activities of member farmers will then be captured, creating a formal mechanism to monitor system improvements and to feed those improvements into higher level policy and extension service programs for wider scaled distribution and adoption.

The project will dismantle the exposure barrier by working with farmers, livestock producers, and extension officers to set in place new ways of doing business. This will include assisting these stakeholders to identify, demonstrate, and replicate agricultural production methods that generate SLM, BD, and CC improvements. This will be shown across a wide range of production systems showing how changes in farming practices can improve ecosystem integrity, reduce production risks and vulnerability, and increase and/or maintain economic stability. Project effort will also address this exposure barrier by working with small and medium scale livestock operations to assist them to achieve economies of scale necessary to support digesters that will substantially reduce GHG emissions. This will include setting in place mechanisms to assist these producers and government regulators to actively monitor emissions to inform operational improvements to drive reductions.

The GEF investment will catalyze a new era for production that is fully aligned to identify and address SLM, BD, and CC concerns. The final result will not only be the delivery of immediate and measureable improvements in things like GHG, species conservation, land/water degradation. The final result will be a new way of doing business. This new business model will create a holistic management approach to agriculture and forest management. Stakeholders at all levels will have the tools and the decision-making pathways required to understand, measure, and regulate the productive landscape as a system rather than disenfranchised sectors. Stakeholders will be capable of strategically determining the long and short-term impacts of natural resource use decisions upon the vitality of overall ecosystem integrity. By project end, this new business model established at the site level will be leveraged to deliver local, regional and national change.

Reference is also made to the Global Environmental Benefits listed in Section 2.5.

1.1.2 FAO's comparative advantages

In the field of sustainable land management, FAO (i) promotes sustainable forest management by placing technical expertise in forestry at the disposal of member countries through field projects, (ii) gives guidance to climate-friendly agriculture and related activities and (iii) provides intensive experiences to reduce GHG emissions from deforestation and forest degradation as well as from agricultural practices. FAO supports member countries on a wide range of complementary sustainable land management technologies and approaches (such as conservation agriculture, integrated land and water management, local land planning, and farmer field schools) by providing training, information, communications, tools and equipment, advisory services for institutional strengthening, policy reform and national programming.

FAO is the leading agency in gathering and disseminating data and information related to land degradation and SLM, which are built upon scientific knowledge, local experience and farmer innovation, available through FAO's web sites and information systems such as FAOSTAT, TERRASTAT, LRIS, and GTOS. FAO is also a leading partner in several international initiatives, such as the Land Degradation Assessment in Drylands (LADA), the World Overview of Conservation Approaches and Technologies (WOCAT), the Asia-Pacific Agro-forestry Network (APAN), and the Participatory Watershed Management in Asia Network (WATMANET). Regarding climate change mitigation, FAO also has proven experience in climate change mitigation in agriculture and forestry through carbon sequestration, substitution and conservation, assessing carbon stocks and modeling win-win scenarios of carbon sequestration through land use change, and capacity development in developing countries.

The project will directly contribute to the global strategic objectives of FAO, specifically *Strategic Objective 2 (SO2): Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner*. This is also in line with regional priority areas under the SO2. The specific outcome and outputs that the project will contribute to: Outcome 1: Producers and Natural Resource Managers Adopt Practices that Increase and Improve the Provision of Goods and Services in the Agricultural Sector Production Systems in a Sustainable Manner. *Output 1.1:* Innovative practices for sustainable agricultural production are identified, assessed and disseminated and their adoption by stakeholders is facilitated. *Output 1.2:* Innovative approaches for ecosystem valuation, management and restoration are identified, assessed, disseminated and their adoption by stakeholders is facilitated. *Output 1.3:* Organizational and institutional capacities of stakeholders are strengthened to support innovation and the transition toward more sustainable production systems.

Finally, FAO's work on sustainable land and good agricultural activities in the Turkish Republic and the wider region includes projects for capacity development on the assessment and systematic development of modernization of forestry and agricultural management, including training on above mentioned subjects. FAO has also piloted its tools and methods for assessing and mapping land use systems, land degradation and SLM (LADA-WOCAT) through training on national mapping and assessment with CACILM (Central Asia Countries Initiative on Land Management).

FAO has considerable experience, expertise and a proven comparative advantage in sustainable forest and land management and the climate change focal areas of GEF.

The FAO office in Ankara is well equipped with a multi-disciplinary team, including crop, land and water, livestock and forestry specialists, as well as project management and administration. FAO-Ankara is fortunate to have both a local and regional FAO technical staff in the same location. This means that FAO has in-house regional specialists covering sectors such as environmental services, bio-energy, forestry, rangelands management, and crop production.

1.1.3 Participants and other stakeholders

This is a complex and multi-dimensional project. The issue of stakeholder analysis and inclusion was critical to the project design phase and will be critical to the project implementation phase.

Both MFWA and MFAL were heavily involved in the project design process. The General Directorate of Desertification and Combatting Erosion and General Directorate of Forestry and General Directorate of Agrarian Reform were the active participants of the project design. High-level representatives were appointed as a focal point of their organizations. Moreover, regional, provincial, and district directorates of relevant ministries have participated to the planning.

A series of meetings and workshops were held in Ankara and in Konya to gather the contributions of institutions to the project. On 25 July 2013, an inception workshop was held in Konya with the participation of 81 national and regional stakeholders representing 22 different organizations. The workshop was held with the financial support of MFWA. Moreover, another introductory meeting was held in Ankara with the participation of relevant stakeholders with more than 30 participants.

During 23 – 26 July 2013, a preliminary site visit was held in the KCB, with the participation of stakeholders. This was followed by three more site visits of the FAO-SEC and experts team. In those meetings almost all of the local governmental organizations including regional, provincial and district branches of relevant ministries as well as NGOs, private sector representatives were consulted.

The project preparation experts have undertaken face-to-face meetings with central stakeholders between July 2013 and February 2014, including different branches of MFAL and MFWA as well as national NGOs including the Buğday Ecological Life Association, Nature Conservation Centre, WWF Turkey and Nature Association (BirdLife International in Turkey).

The MFWA and the MFAL are the two lead executing partners. The project will be executed by the provincial directorates of the MFWA and the MFAL at the field level. MFWA will contribute to the project US\$ 1 million in-kind and US\$ 9.5 million cash. MFAL will contribute to the project US\$ 1 million in-kind and US\$ 7.9 million cash. The executing partners will work closely with a wide range of stakeholders, including farmer cooperatives, private farmers, the private sector, universities, research institutions, civil society organizations, local communities and residents.

At the national level, a Project Steering Committee will be established for the coordination of project activities. It will include representatives of the MFWA, the MFAL, the Ministry of Development, universities, national NGOs and farmer organisations, etc. At the local level, a Project Implementation Unit will be established, which will include the representatives of local staff of relevant GoT agencies, local farmer organisations and NGOs. Around 350 extension agents of the Province Directory of the MFAL will promote SLM and SL/WM practices at village level. The project will also benefit from existing coordination mechanisms, such as the UNCCD National Coordination Body, the National Drought Management Unit and contribute to the effectiveness of the these mechanisms towards sustainable land management in Turkey.

The project will be launched by a well-publicized multi-stakeholder inception workshop. This workshop will provide an opportunity to provide all stakeholders with updated information on the project, as well as a basis for further consultation during the project's implementation, and will refine and confirm the work plan. In addition, certain project activities will be specifically designed to directly involve stakeholders in project implementation.

Farmer cooperatives, private farmers and the private sector are key beneficiaries. The members of Konya Union of Agricultural Cooperatives and Konya Leader Farms' Associations will be key stakeholders under this project as indicated in the baseline project section.

State Farms have considerable investments in CA and the project will assist them wherever possible to further develop CA for the local conditions while extending to other farmers. The General Directorate of Agrarian Reform (TRGM) and General Directorate of Agricultural Research and Policies (TAGEM) will assist with lessons learned from agricultural research and production initiatives. Bahri Dağdaş International Agricultural Research Institute and Konya Soil, Water and Combating Desertification and Erosion Research Station will assist in monitoring information on soil, including organic carbon levels. Universities, civil societies and NGOs, such as the Selcuk University, Nature Conservation Centre and Chamber of Agricultural Engineers will be included to assist with project preparation and oversight as needed.

The biggest agro processing company in KCB is the Konya Sugar Joint Venture Company. The main shareholders of the company are Sugar Beet Cooperatives. There are four of these cooperatives in region. There are several sugar beet factories. These factories contract with approximately 18,100 sugar beet farmers in 245 villages. They produce 496,200 tons/year of sugar. This is one-fifth of the national sugar demand. The company paid around US\$ 250 million to farmers in 2013. Besides these sugar beet factories, the Konya Sugar Joint Venture holds 20 other companies. These 20 companies work on banking, insurance, seed and chemical fertilizer production, agricultural machinery, dairy products, bakery products, vegetable oil and animal feed.

Table 3: Roles of Stakeholders

<i>Stakeholder</i>	<i>Relevance</i>
National Government	
Ministry of Forestry and Water Affairs (MFWA)	MFWA is responsible for conservation and improvement of range land, natural parks, nature parks, nature conservation areas and wildlife resources; water resources, streams, lakes and ponds besides forest conservation planning, and national standards and regulations about forest protection, organization and implementation of the establishment of forest protection zones in Turkey. MFWA will support for the design, implementation, financing and mainstreaming of the strategy, policy improvements and related activities for this project and will be a member of Project Steering Committee and executive partner of the Project. MFWA will take place coordination and implementation of the Project and support impact and progress monitoring and information dissemination and national replication/scaling up of project success.
Ministry of Food, Agriculture and Livestock (MFAL)	MFAL is responsible for organizing, coordinating and guiding of conservation of soil and agricultural lands, prevention of soil and land degradation and loss of soil and water resources, and biodiversity conservation. MFAL will support for the design, implementation, financing and mainstreaming of the provincial level policy strategy, policy improvements and related activities. MFAL will make certain agency action and regulatory frameworks are designed and implemented to achieve project objectives and will a member of Project Steering Committee and be an executive partner of the project (with WFWA). MFAL will take place coordination and implementation of the Project and support impact and progress monitoring and information dissemination. MFAL will be responsible to upscale of project success on nationwide.
Ministry of Development	Ministry of Development of the Republic of Turkey is an expert based organization which plans and guides Turkey's development process in a macro approach and focuses on the coordination of policies and strategy development. Will support impact and progress monitoring and information dissemination.
General Directorate of Agricultural Research and Policies (TAGEM) (MFAL)	GDARP of MFAL that was formerly named TAGEM is responsible to conduct research studies on vegetable and animal production issues and make collaboration with international research institutions. Soil, Fertilizer and Water Resources Central Research Institute that is one the research unit of GDRAP will assist in monitoring information on soil, including organic carbon levels.

General Directorate of Agricultural Enterprises (GDAE) (MFAL)	GDAE has 15 state farms in Turkey. They cultivate 319 870 ha land and their main responsibility is seed production and animal breeding in order to meet improved seed and genetic materials requirements of the farmers. GDAE will assist dissemination of SL/WM information among farmers.
UNCCD National Coordination Body.	The main aim of the UNCCD National Coordination Body is to coordinate the formulation and implementation of the National Action Programmes and to mobilize national and international resources. Also will contribute to the build up effective mechanisms towards sustainable land management in Turkey.
National Level NGOs	
The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats (TEMA)	The main aim of TEMA is create effective and conscious public opinion on environmental problems, specifically soil erosion, deforestation, desertification, climate change and biodiversity loss.
Soil Science Society of Turkey	The main aim of the society is to improve soil science, extend and work on adoption of improved knowledge. It will assist in monitoring information on soil, including organic carbon levels.
World Wildlife Fund Turkey (WWF)	The main aim of the WWF is to stop the degradation of planet's natural environment, and build a future in which humans live in harmony with nature. WWF will share information and support impact and progress monitoring and information dissemination on the rural areas. WWF will share information and support impact and progress monitoring and information dissemination on the rural areas.
Nature Conservation Centre	The main aim of the Centre is conservation of biodiversity and sustainable management of natural resources. Centre will share information and support impact and progress monitoring and information dissemination on the rural areas.
Regional-Government Agencies	
Regional Directorate of Forestry and Water Affairs (RDoM) (MFWA)	RDoM is serving the four provinces in the Konya Closed Basin and these provinces are Konya, Nevşehir, Karaman and Aksaray. RDoM is responsible for conservation and improvement of forest, range land, natural parks, nature parks, nature conservation areas and wildlife resources; water resources, streams, lakes, ponds, and wetlands in the forests in these provinces. RDoM participates in the works and activities related to the conservation and enhancement of plant and animal genetic resources within its responsibility. RDoM will make certain agency actions are guided to achieve SLM conservation management objectives and standards. The Regional Directorate will be a member of the project implementation unit and support monitoring of objective achievement and information sharing.
Regional Directorate of State Hydraulic Works (DSI)	DSI is serving to Konya, Niğde, Karaman and Aksaray provinces. DSI is responsible for multiple utilization of surface and ground waters and prevention of soil erosion and flood damages. DSI is equipping all economically irrigable land with modern irrigation facilities. DSI will make certain agency actions are guided to achieve SLM conservation management objectives and standards. DSI will be a member of project implementation unit and support monitoring of objective achievement and information sharing.
Regional Directorate of Forestry (RDOG M)	RDOG M is also serving to Konya, Karaman, Nevşehir and Aksaray provinces and responsible for activities such as afforestation and erosion control, rehabilitation of rangelands, combating desertification, floods and avalanche control in any area within forests and outside forests; to develop and implement integrated watershed projects. RD will achieve all related data needed during the planning and implementation of project. RDOG M will be a member of project implementation unit and support monitoring of objective achievement and information sharing.
Regional Directorate of Meteorology (RDM)	RDM is serving to Konya, Karaman; Aksaray and Niğde. RDM is preparing and making weather forecasts for use in the affected areas in fighting adverse agricultural conditions and conducting "Drought Monitoring System". RDM will provide all climatic data that will needed during the planning and implementation of project. RDM will a member of project implementation unit and support monitoring of objective achievement and information sharing.

KOP Regional Development Administration (KOP-RDA)	KOP-RDA is serving four provinces in KCB (Konya, Karaman, Niğde and Aksaray). KOP-RDA will be responsible at the regional level for coordinating the implementations of the several public institutions, private sectors' interventions and NGOs' participations; carry out regional based economical and technical research, planning, programming, designing of projects, monitoring, evaluation and dissemination of the results.
MEVLANA Development Agency	The agency provides several supports to Konya and Karaman. MEVLANA is responsible for contributing to regional and rural development studies by the way of capacity development and support those projects. MEVLANA will be a member of project implementation unit and will promote and publicize the success stories and successful experience about SL/WM practices.
Provincial Government Agencies	
Province Directorate of Ministry of Food, Agriculture and Livestock (PDAs) (in Konya and Karaman provinces)	PDAs will be the member of project implementation unit in the region. They are responsible for dissemination of information about improving the conservation of natural resources and sustainability; improve of agricultural practices and farmers training activities. PDAs will cover coordination and implementation of the Project on the provincial level (including all project sites) and they will support impact and progress monitoring and information dissemination on the rural areas.
District Directorates of MFAL (KONYA)	Responsible for transferring of information about conservation of natural resources and sustainability and making collaboration with farmers, farmers unions, universities and NGOs. A member of project implementation unit in the region. This will include directorates at: Karapınar, Ereğli, Emirgazi, Sarayönü, Cihanbeyli and Ayrancı
State-owned Farms	
Konuklar, Altınova and Gözlu State Farms	State Farms are in Konuklar, Altınova and Gözlu for supporting of increasing crops and animal production amount, diversification of crop pattern and improvement of quality for farmers in the region. They will be members of project implementation unit and provide technical expertise on SL/WM interventions to increase vegetative cover in agro-ecosystems and information on SLM technologies. They will support training activities in the field and will support monitoring of objective achievement and information sharing.
International Development Organizations and Donors	
FAO	FAO is the main partner for the project. In the field of sustainable land management, FAO: <ul style="list-style-type: none"> • promotes sustainable forest management by placing technical expertise in forestry at the disposal of member countries through field projects, • serve to climate smart agriculture and related activities, • provide intensive experiences to reduce GHG emissions from deforestation and forest degradation as well as from agricultural practices. On the other hand, FAO has considerable experience and expertise and a proven comparative advantage in the sustainable forest and land management and climate change focal areas of the GEF. FAO will be a member of Project Steering Committee and executive partner of the project (with MFWA). FAO will take place coordination and implementation of the Project and support impact and progress monitoring and information dissemination.
UNDP	One of the core areas of UNDP is environment and sustainable development. UNDP has supported many environmental projects in country and made partnership before. Project will establish close collaboration with UNDP to exchange information and experience.
GIZ	GIZ operates in many fields: economic development and employment promotion; governance and democracy; security, reconstruction, peace building and civil conflict transformation; food security, health and basic education; and environmental protection, resource conservation and climate change mitigation. GIZ has already supported many environmental projects in the country and established partnerships before.
Local NGOs	
Konya Leader Farmer Association	The association has 302 members (55 of them in project sites) and is responsible for transferring new and applicable information and technologies about

	sustainable agricultural production technologies to its members. A representative of the Association will be a member of project implementation unit and disseminate information about conservation of natural resources and sustainability among the members within the project aims.
Konya and Ereğli Sugar Beet Producers' Cooperatives (COOPs)	COOPs are the main representative of the sugar beet producers and responsible for transferring useful information about production technologies and productivity. Water saving methods and mitigation for water erosion issues can take COOPs' attention during the project implementation period. They will be member of project implementation unit and disseminate information about conservation of natural resources and sustainability among the partner (approximately 20 000 farmers in Konya and Karaman).
Konya Commodity Exchange (KTB)	KTB has been established in 1912 and it is one of the biggest Exchange around Turkey, KTB has eight branch offices and one centre in Konya. KTB maintains different committees that are specialized on specific products and issues. The committee members are big traders or producers of goods. Special Committees are Cereal, Feeders, Live Stocks, Traders, Butchers, Leather, Wheat Flour, Dairy Products, Vegetable Oil and Traders. KTB is one of the most valuable exchanges of Turkey. Konya produces 10% of the national wheat and 14% of the national barley crop. Daily prices are determined according to the transactions in the Exchange Hall. Goods are brought into the Exchange and sold by auction. On the Crop season total capacity is nearly 4 000 - 5 000 MT of goods. Exchange can determine prices of 130 different products per hour. KTB has the first and only Electronic Exchange Hall of Turkey with 1 400 members. KTB will support dissemination of information about SLM and SL/WM through audio visual training material distribution among farmers and stakeholders.
Egg Producers Union (YUMBIR) (Konya Branch)	Egg Producers Central Union (YUMBIR) established in 2006 in Turkey. Konya YUMBIR is the one of the branch of Egg Producers Central Union. Konya Union has 66 members and they have 8.5 million hens. They produce 2.5 billion eggs annually. The main purpose of the union is to support its members in the fields of healthy egg production, productivity and increasing their competition power in the market.
Local Academic and Scientific Organizations	
Bahri Dağdaş International Agricultural Research Institute (ARI)	ARI is serving an institute for MFAL and responsible for conducting research studies on biodiversity, sustainable natural resource use. ARI will support technical advise on types of innovative SL/WM practices (i.e. biodiversity, sustainable natural resource use and plant and animal breeding.) and introduced at field level and training activities and will be a member of project implementation unit. ARI will also support monitoring of objective achievement and information sharing and training.
Konya Soil, Water and Combating Desertification and Erosion Research Station (DERS)	DERS is responsible for conducting research studies on soil and water use, development of new methods for combating desertification and dissemination of that information. DERS has very good background information and experiences on these subjects in KCB. DERS will a member of project implementation unit and provide all supports on information sharing and training.
Agricultural Faculty of Selcuk University (AGF) (Konya)	AGF has the technical expertise available on land use, direct seeding, reduced tillage, pasture management, irrigation, carbon capture and hydrological, botanical and zoological aspects. The University can be contacted for collaboration and consultation during the planning and implementation periods.
Local and Indigenous Communities	
Nomadic People	Nomadic people who are living in South Anatolia during the winter (Silifke, Anamur, Erdemli, Bozyazi and Aydincik districts of Mersin province) and move northwards to Konya and Karaman area with their herd in order to graze their animals. There are around 130 to 150 families and herding about 50 000 goats and sheep. They usually spend six months in the south between November and end of April. Three months are then spend on the way and they stay three months on the highlands around Konya and Karaman. During their movement, they pass through forest areas and their animals damage young trees by grazing. They complain about their lifestyle and their main aim is to settle down permanently around Karaman province. Young generations in these families do not prefer to

	continue this style of life anymore. The movement period does not match with the educational calendar and children cannot attend school regularly. But the main challenge is to find employment in other sectors.
Private sector	
Konya Sugar J.V	Konya Sugar JV work with around 18100 contract farmers and those farmers produce 3.3 million tons sugar beet in a year. A representative of the Company will be a member of project implementation unit and disseminate information about conservation of natural resources and sustainability among the members within the project aims.
Farmers and livestock producers	The project will work with hundreds of farmers and livestock producers in the region. These producers will be critical stakeholders.

1.1.4 Lessons learned from past and related work, including evaluations

This highly innovative GEF project represents the first effort in Turkey where LD, BD, and CC concerns are brought together to deliver integrated synergies on the productive landscape. No single project could provide linear lessons. Regardless, the project design team worked hard to review a host of past and on-going projects to garner lessons to strengthen the proposed GEF endeavor. A complete list of projects reviewed may be found in the baseline summary located in the project document annex.

For instance, the objective of “Biodiversity and Natural Resource Management Project” was to sustainably conserve the biological diversity and ecological integrity of selected forest, wetland, steppe and alpine ecosystems that are representative of Turkey’s four major bio-geographical zones. While the project made major strides in advancing biodiversity conservation planning in four sites within the major bio-geographical zones, work remains to be done in terms of putting in place physical conservation measures on the ground and in reforming the legal framework and institutional processes. The lesson learned from this project is that institutional and policy reforms must be tackled from the project initiation and not delayed until late in the project cycle.

The GEF funded “Enhancing Coverage and Management Effectiveness of the Subsystem of Forest Protected Areas in Turkey’s National System of Protected Areas (2008 – 2012)” shows that sustainable project results and scaling up of project good practices can benefit from integration with the long-term plans and strategies of a variety of government and private stakeholders. For instance, the project integrated new objectives within the strategies of relevant regional development agencies. The result is that those agencies are now well positioned to provide on-going financial and technical support.

The Anatolian Water Basins Rehabilitation Project’s objective was to support the sustainable natural resources in 28 micro-catchments in Anatolia and Black Sea Regions. The project was to increase the income of communities affected by resource depletion. The project attempted to rehabilitate degraded natural resources, to undertake income generation activities, awareness raising and capacity building. Main lesson learned from the project was to establish a direct link between the natural resource rehabilitation and concrete economy. The primary lesson learned here is that if the project does not engage private sector stakeholders from the outset and generate incentives for their participation, including locally scaled approaches, challenges will be faced in terms of adoption of project proposed improvements.

1.1.5 Links to national development goals, strategies, plans, policy and legislation, GEF/LDCF/SCCF and FAO’s Strategic Objectives

A. Alignment national development goals and policies

The project will directly contribute to the Ninth Development Plan of Turkey (2007-2013), which for the first time included ‘Sustainable Management of Natural Resources’ as a top priority for the

country's overall economic development. The project's promotion of integrated management of the country's lands and other natural resources, including forests, rangelands and agricultural production landscapes, will significantly support this priority of the Development Plan. Moreover, the project will clearly support implementation of the GoT's National Rural Development Plan (2009-2013), which targets the conservation of agricultural areas, pastures and forests, including soil and water resources in areas that will be integrated into forest regimes. The Rural Development Plan underscores the relationship between rural poverty and natural resource degradation, recognizing a significant increase in recent years in erosion and degradation of land and water resources in the country, in many cases due to improper farming techniques and increasing climate variability (droughts, floods and landslides). To mitigate these processes, the Plan gives priority to strategies, measures and activities that address desertification and promote proper management of land and water land resources. The agricultural and natural resources management practices included in the proposed project will directly contribute to the objectives and implementation of this Rural Development Plan.

The government's overall approach to Turkey's economic and social development is set out in the Long-term Strategy 2001-2023 which features the pursuit of rapid sustained economic growth, human resource development and employment in high technology industry, infrastructure advances and regional development, coupled with transfer payments to poorer segments of society. In this context, the National Rural Development Plan (NRDP, 2010-2013) entails four strategic objectives of which the last is crucial to the marginal communities targeted by the project: "Protection and improvement of the rural environment through the adoption of environmentally friendly agricultural practices, protection and sustainable use of forest resources and the management and improvement of protected areas". The NRDP is underpinned by an array of policy statements related to the physical environment including the National Forest Programme 2004-2023 (NFP), the National Action Programme on Combating Desertification 2006, and the National Climate Change Strategy (2010-2020).

Combating with Erosion Action Plan (2012), covering the period 2013-2017, was prepared with related agents and agencies under coordination of MFWA. It aims at restoring ecological balance by targeting soil losses, increasing coordination of public agencies that combat erosion, efficient use of public resources and effectiveness of erosion-combating activities. In the scope of this action plan afforestation, rehabilitation, erosion control and rangeland rehabilitation works will be realized on 1.4 million ha in 5 years. In the past, combating erosion and maintenance work have already been realized on 2.3 million ha through afforestation and erosion control. The project will support the achievement of these targets.

Ninth Development Plan of Turkey (2007-2013), which for the first time included 'Sustainable Management of Natural Resources' as a top priority for the country's overall economic development. The project's promotion of integrated management of the country's lands and other natural resources, including forests, rangelands and agricultural production landscapes, will significantly support this priority of the Development Plan. Moreover, the project will clearly support implementation of the GoT's National Rural Development Plan (2009-2013), which targets the conservation of agricultural areas, pastures and forests, including soil and water resources in areas that will be integrated into forest regimes. The Rural Development Plan underscores the relationship between rural poverty and natural resource degradation, recognizing a significant increase in recent years in erosion and degradation of land and water resources in the country, in many cases due to improper farming techniques and increasing climate variability (droughts, floods and landslides). To mitigate these processes, the plan gives priority to strategies, measures and activities that address desertification and promote proper management of land and water land resources. The agricultural and natural resources management practices included in the proposed project will directly contribute to the objectives and implementation of this Rural Development Plan.

Medium Term Programme (2010-2012) aims at the resumption of a robust and sustainable growth period for Turkey under the current international conjuncture. The programme indicates that the objective of the agricultural sector is to develop a well-organized and highly competitive structure by

taking food security and safety concerns into account along with the sustainable use of natural resources. Within this framework: Forests will be protected and exploited considering health and needs of society within the approach of sustainable management; afforestation, rehabilitation and urban forestry will be extended; and training and public-awareness activities having more emphasis on ecosystems will be intensified

10th Development Plan of Turkey (2014-2018). The project will also directly contribute to the 10th Development Plan of Turkey (2014-2018). Its main goal for “Management of the Soil and Water Resources” is to preserve and improve the quantity and quality of water and soil resources. A development of “Management Systems” aiming at the sustainable use of water and soil is also targeted.

B. Alignment with NAPA, NAPs, NBSAP, NIPs, NAMA

Turkey has ratified the following relevant international agreements:

Convention/Agreement	Signed
Convention on Biological Diversity	1992
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	1996
Convention to Combat Desertification	1998
Framework Convention on Climate Change	2004
Kyoto Protocol to the United Nations Framework Convention on Climate Change	2009
Cartagena Protocol on Biosafety to the Convention on Biological Diversity	2004
Convention to Wetlands of International Importance especially as Waterfowl Habitats [Ramsar]	1994
World Heritage Convention on Nature and Culture Sites under UNESCO	1983
United Nations Convention to Combat Desertification	1998

The proposed project is consistent with the various strategies, programs and action plans promulgated by the Government of Turkey (GoT) pursuant to its commitments under the relevant international environmental conventions, as well as with the relevant national development plans adopted by the GoT. With respect to the environmental conventions, i.e. the UN Convention to Combat Desertification (UNCCD), the UN Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD), the proposed project is fully consistent with and will contribute significantly to implementation of the following strategies, programs and action plans:

The *National Action Program on Combating Desertification* (2006) calls for identifying the causes of desertification and specifying appropriate responses for addressing the problems caused. The proposed project will contribute specific responses to address a number of the causes of desertification identified in the National Action Program, including (i) mismanagement of agricultural lands and inappropriate agricultural practices; (ii) unplanned, uncontrolled over-grazing of rangelands and pastures; (iii) the lack of due regard for botanical, cultural and physical soil conservation measures; and (iv) soil degradation from wind and water erosion.

Pursuant to the UNFCCC, the GoT formulated its *National Climate Change Strategy* (2010), which specifically addresses land use, agriculture and forestry strategies in its chapter on greenhouse gas (GHG) emission control. The proposed project will support many of the short, medium and long-term strategies identified for mitigating GHG emissions (e.g. improved agricultural techniques, adoption of proven technologies for carbon sequestration and/or absorption in soil (and monitoring) and methane gas capture, afforestation and rehabilitation of degraded lands with drought tolerant species and plant varieties). Furthermore, the project addresses priorities identified in the GoT’s new Climate Change Action Plan 2011-2023 (2011), such as increasing the sink capacity of and decreasing GHG emissions from the agricultural sector, as well as increasing carbon sequestered in forests and reducing deforestation and forest damage. Determination of carbon capture potential is one of the major activities in the Action Plan and the project will support achievement of this priority.

Pursuant to the CBD, the GoT developed its *National Biodiversity Strategy and Action Plan* (2001, 2007), which identifies as one of its strategic objectives “the identification and monitoring of the impacts of climate change on biological diversity and taking measures for protection of the most affected ecosystems and species from these impacts”. The proposed project will directly facilitate implementation of this objective by preparing and implementing a land-use plan that incorporates biodiversity conservation considerations into a production landscape in a fragile steppe ecosystem, thus providing improvements to natural habitats for threatened or endangered species by effectively rehabilitating and sustainably managing degraded ecosystem lands. In addition, the project will gather FSC certification within one of the pilot sites for the forest and rangelands that incorporate biodiversity considerations. Furthermore, the project will directly address one of the crosscutting issues requiring capacity development, namely sustainable land management, identified in Turkey’s National Capacity Self-Assessment under Rio Conventions (2011).

C. Alignment with GEF focal area and/or LDCF/SCCF strategies

The proposed project takes a cross-cutting approach, linking the GEF Land Degradation, Climate Change Mitigation and Biodiversity focal area strategies, focusing on measures that (i) reduce or reverse land degradation trends in production landscapes, (ii) improve agricultural management and increase the value of agricultural wastes (thus promoting climate- friendly agriculture) and (iii) strengthen the enabling environment for sustainable land management (building institutional and technical capacities).

The project has been designed in line with CCM, LD and BD to establish sustainable land management (SLM) and climate-friendly agriculture activities in Konya Closed Basin, including sustaining the livelihoods of rural and forest-dependent people. It is in line with the Climate Change Mitigation (CCM- 1 and CCM- 5), Land Degradation (LD-1 and LD-2) and Biodiversity (BD-2) Focal Area strategies of the GEF-5.

The project addresses CCM-1, to “Promote the demonstration, deployment, and transfer of innovative low-carbon technologies”. It will introduce and support the diffusion of methane capture through no-tillage and energy-saving agricultural activities. CCM-5: “Promote conservation and enhancement of carbon stocks through sustainable management of land-use change, and forestry” by enabling Turkey to adopt good management practices in sustainable land management. This includes restoring and enhancing carbon stocks in forests and wider landscapes, through the adoption of a carbon stock monitoring system and promotion of innovative SLM and climate-friendly agricultural practices. The project will restore degraded lands by successfully institutionalizing innovative technologies and practices, such as reforestation of degraded lands, rotational grazing/resting, wind breaks, use of drought-resistant and salt-tolerant species and varieties, water harvesting and conjunctive water-use models.

The project addresses LD-1 to eliminate main barriers to sustainable agriculture. This will be done by improving policies, the legal and regulatory environment and human and institutional capacities as well as by facilitating the transfer of knowledge and technology relevant to the management of agricultural lands. Promotion of innovative SLM practices at the field level to increase vegetative cover will lead to a sustained flow of ecosystem services in agricultural landscapes. The project will help to establish a sound policy environment to recognize the value of forest and agro ecosystem functions and reduce GHG emissions from deforestation and forest degradation as well as from agricultural practices. These activities are also linked to the CCM-5 outputs. LD-2 addresses the sustainable flow of forest ecosystem services in arid regions, including sustaining livelihoods of forest dependent people. This objective focuses on the removal of barriers to sustainable forest management by promoting an enabling environment, access to technology and best practices combined with large-scale applications on the ground. Results will ultimately lead to a net gain in forest area and the improvement of selected forest ecosystem services such as provisioning (e.g. food and fuel for livelihoods), regulating (e.g. reducing greenhouse gas emissions, erosion control) and supporting functions (e.g. soil protection and habitats for biodiversity).

The project addresses BD-2 to “Mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors”. Complementing its investments in the sustainability of protected area systems, the project will promote measures to reduce the negative impacts of productive sectors on biodiversity. This will have effects in particular outside of protected areas, especially on landscape species and highlight the contribution of all components of biodiversity to ecosystem functions, economic development and human well-being, a set of actions often referred to as “mainstreaming”. Biodiversity-dependent production sectors and those with large ecological footprints on biodiversity-rich habitats, including habitats for threatened species that depend on landscape scale measures, will be targeted: agriculture and forestry. A biodiversity monitoring system will be established by the project and the system will provide regular information to decision-makers.

The project will create capacities for the proliferation of good management practices pertinent to SLM and climate-friendly agriculture in Konya Closed Basin.

Table 4: Relevance of project to Focal Area objectives

FA Objectives	Expected FA Outcomes	Expected FA Outputs
LD-1	Outcome 1.1: An enhanced enabling environment within the agricultural sector Outcome 1.2: Improved agricultural management	Output 1.1: National policies that guarantee smallholder and community tenure security Output 1.2: Types of Innovative SL/WM practices introduced at field level Output 1.3: Suitable SL/WM interventions to increase vegetative cover in agro-ecosystems Output 1.5: Information on SLM technologies and good practice guidelines disseminated
CCM-1	Outcome 1.1: Technologies successfully demonstrated, deployed, and transferred	Output 1.1: Innovative low-carbon technologies successfully demonstrated
CCM-5	Outcome 5.1: Good management practices in LULUCF adopted both within the forest land and in the wider landscape Outcome 5.2: Restoration and enhancement of carbon stocks in forests and non-forest lands	Output 5.1: Carbon stock monitoring system established Output 5.2: Forests and non-forest lands under good management practices
BD-2	Outcome 2.1: Increase in sustainably managed landscapes that integrate biodiversity conservation	Output 2.2 National and sub-national land-use plans that incorporate biodiversity and ecosystem services valuation

D. Alignment with FAO Strategic Framework and Objectives

FAO is a signatory to the United Nations Development Cooperation Strategy for Turkey prepared in accordance with Ninth Development Plan, which focuses on strengthening policy formulation and implementation capacity for the protection of the environment and cultural heritage in line with sustainable development principles - taking into consideration climate change and disaster management.

This project is aligned with FAO’s Global Strategic Objective 2 (SO2): Increase and improve provision of goods and services from agriculture, forestry and fisheries in a sustainable manner. The project will contribute in particular to Outcome 1 “Producers and natural resource managers adopt practices that increase and improve the provision of goods and services in agricultural sector production systems in a sustainable manner” and Outcome 2: “Stakeholders in member countries

strengthen governance – the policies, laws, management frameworks and institutions that are needed to support producers and resource managers - in the transition to sustainable agricultural sector production systems”.

This is also reflected by the Regional Priorities for Europe and Central Asia in the areas of [1] Strengthening food security and nutrition as well as [3] Natural resource management, including climate change mitigation and adaptation.

The project is also in line with country level priorities defined under the FAO Country Programming Framework (CPF) for Turkey (2012-2015). This tool is used by FAO to define the medium-term response to assistance needs of member country in accordance with the principles of FAO and in pursuit of national development objectives, MDGs and other Internationally Agreed Development Goals (IADG) within FAO’s Strategic Framework and Regional Priorities. After informal consultation meetings, the following five priority areas of assistance were emphasized for Turkey:

- Natural resource management including climate change mitigation and adaptation
- Food security and nutrition (both in-country and abroad);
- Policy support to small farmers;
- Control of trans-boundary pests and diseases (animal and plant);
- Policy and institutional support for EU accession and integration.

The specific CPF Outcomes agreed upon are: “Improve quality and safety of food at all stages of the food chain”; “Protect, improve and ensure sustainable use of natural resources and forests and raise awareness on climate change”; and “Improve and reinforce organizations related with agricultural sector to enable them to deliver better service”. In line with these outcomes, FAO provides assistance for “forestry”, “protection of natural resources and climate change” and “institutional capacity building”. Development of non-wood products and supporting/strengthening of monitoring and updating the NFP is the main contribution to forestry stakeholders in Turkey. “Preventing organic deposition due to aquaculture production in marine and fresh waters”, “awareness raising on climate change adaptation and mitigation” and “supporting sustainable land and water resources management” are the main activities under protection of natural resources and climate change. They are achieved through the development of sustainable on-the-job training facilitation, supporting/strengthening of research and innovation systems in human resource development for “institutional capacity building”.

SECTION 2 – PROJECT FRAMEWORK AND EXPECTED RESULTS

2.1 Project strategy

This project represents a first for Turkey. The project will address the issues of SLM, BD, and CC on an integrated level across the productive landscape. This will be done in ways that will positively impact forests, wetlands, rangelands, and agricultural production areas. The project will bring into play new ways of doing business that are designed to provide tangible results. Implementation will be supported by a strategic approach predicated upon advancing learning and informed decision-making based on evidence and lessons learned. The project will set in place capacities for information generation, management, and monitoring to make certain all levels of decision-makers from national policy makers to individual farmers are better equipped to address existing and emerging challenges associated with each of these sectors of concern for GEF. The project will do this by leveraging substantial co-financing that will assist with project implementation and, ultimately, insure that adequate financial and human resources are emplaced to maintain and expand project success into the future.

The project strategy will be to confront the three primary barriers using three parallel and closely integrated sets of project activities. These activities supported by GEF's incremental investment will further strengthen participatory and integrated management of land resources to secure global LD, CCM and BD benefits at national and pilot project area levels. GEF funding will support measures to mitigate CC through conservation agriculture, methane capture from agricultural wastes, restoration of degraded rangelands and forests by adopting new practical restoration practices, and improve management of pasture areas that in turn will avoid emissions caused by degradation, increase sequestration through enhanced biomass and improved productivity of land resources.

The project will introduce an integrated approach to sustainable land management in the KCB where land rehabilitation, biodiversity and climate smart agriculture practices, including direct seeding in fallow lands, reduced tillage, limited irrigation techniques, increased use of animal manure for fertilizer and methane capture, will be implemented. The project will help to develop mechanisms for collaboration between forestry and agriculture sectors to promote sustainable natural resource management practices. An integrated land management approach will have strong climate change mitigation impact with manure and waste management in the project area.

Ultimately, the GEF funded alternative will improve the sustainability of agriculture and forest land use management through the practical demonstration and subsequent adoption of low-carbon technologies with win-win benefits in LD, CC and BD conservation and increased farm profitability and forest productivity while enhancing ecosystem resilience to CC.

2.2 Project objective

The project objective is to improve agriculture, pasture and forest land use management through the diffusion and adoption of low-carbon technologies with win-win benefits in land degradation, climate change, and biodiversity conservation and increased farm profitability and forest productivity.

2.3 Expected project outcomes

Outcome 1: Degraded forest and rangelands rehabilitated and management practices improved

Indicators:

- 20,000 hectares of rehabilitated forest lands sequestering 43,000 tons of CO₂eq
- 30,000 ha of range and pastureland rehabilitated sequestering 25,000 tons of CO₂eq

- 6,680 hectares of protected habitat managed sustainably

Outcome 2. Climate-smart agriculture techniques applied across productive landscapes

Indicators:

- A total of 40-50,000 ha of arable land using conservation agriculture practices
- 23,000 tCO₂eq reduced
- 9,900 tons CH₄ emissions reduced
- 50 livestock/poultry producers and 10,000 head of livestock contributing to digesters
- Average annual income from crop and livestock production increased from USD \$ 1 073 to \$ 1 341.
- Sustained productivity score of 2

Outcome 3. Enhanced enabling environment for sustainable land management

Indicators:

- 500 farm and/or ranch households adopting new practices that support biodiversity conservation, SLM and climate change mitigation
- 1250 FFS members (750 males and 500 females)
- Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score of 2
- Forest policy enhancement score of 3
- Agriculture policy enhancement score of 3
- 1 pilot site level policy framework operationalized to integrate SLM, BD and CC based land use planning across productive landscapes
- 1 national monitoring program for CC, BC and SLM

2.4 Project components and outputs

This project has three linked components: i) Rehabilitation of degraded forest and rangeland; ii) Climate-smart agriculture; iii) Enabling environment for sustainable land management.

Component 1: Rehabilitation of degraded forest and rangeland

Component Budget: GEF (US\$ 2,188,864), Co-financing (US\$ 10,800,000)

GEF's incremental investment in Component 1 will result in rehabilitation of degraded forest and rangeland. The investment will build the capacity required to monitor and alleviate future degradation. SLM activities will result in climate change mitigation and adaptation benefits. Rehabilitation will contribute to the restoration of natural habitat for threatened biodiversity in degraded production landscapes. Restored forest and rangeland landscapes in one of the pilot sites will be certified by Forest Stewardship Council (FSC) certification in order to demonstrate the environmental benefits of biodiversity mainstreaming into forest and rangeland management and restoration practices. The certification process will also be used as a training tool for the regional forestry department staff for future applications.. The certification process will be carried out in a participatory approach with different levels of decision makers and technical staff in order to achieve sustainability and ownership. The standards of FSC will be implemented with full compliance so that the benefits and effectiveness is achieved at full scale. Studies will be conducted under the proposed project to assess and monitor biodiversity levels. The GEF alternative will build on the baseline scenario by financing the

incremental costs associated with: (i) increased attention to rehabilitation of degraded lands in production landscapes such as degraded forest lands and rangelands, (ii) production of soil organic carbon maps for pilot sites, (iii) preparation of integrated SLM and biodiversity conservation land use plan for the Mt. Karacadağ pilot area, (iv) certification of forest and rangeland landscapes by FSC standards that incorporate biodiversity considerations, (v) establishment of biodiversity monitoring system, and (vi) quantification of ecosystem services values in pilot areas of KCB.

The main outputs from this component are:

- Output 1.1 Innovative rehabilitation technologies and practices introduced

This output will focus on demonstrating evidence-based and improved rehabilitation activities. Forest restoration will be accompanied by incentives that prevent communities from relapsing into behaviors that originally lead to degradation. Rangeland restoration activities such as rest rotational systems will be accompanied by improvements to community grazing management agreements that codify improved grazing regimes.

A strategic rehabilitation plan will be generated by the PMO within the project's first year. This plan will fully identify current rehabilitation and management gaps and propose very targeted interventions; evidence-based and designed to address root-cause needs. This project strategy will help inform the land use plan completed under Output 1.2. Examples of funded demonstrations may include fencing, rest-rotation improvements, diversification of native species used for restoration, soil preparation practices, machined ploughing, selection of terraces types and drought tolerant species to enhance the evidence base. Further details on specific rehabilitation techniques planned for each project site are contained in Annex 10.

Implementation of the rehabilitation program will be closely linked with the monitoring and capacity building programs implemented under all three Components. For instance, the Farmer Field Schools established under Component 3 will be used as an instrument for implementation and support of financed rehabilitation activities. This will provide the individual FFS with a practical, evidence-based experience in designing, implementing and monitoring grazing and forest management improvements designed to deliver ecosystem-based benefits. Lessons learned from demonstration activities will be integrated into FFS training and extension. The rehabilitation programs will also be used as a capacity building exercise for government agencies within the KCB. This will have a knock-on impact in terms of institutional and decision-making improvements to be generated under Component 3. The range and forest rehabilitation schemes will also be designed and integrated with Component 2's climate smart agriculture activities.

Success will be measured on several levels. First, the interventions will be monitored to be certain they are delivering meaningful improvements to ecosystem integrity. This will include biodiversity, climate change, soil productivity and the status and security of water resources. Interventions will be monitored to determine whether they are delivering meaningful improvements to the quality of life of rural households in terms of income generation and quality of life. The interventions will be monitored to see if they are being up-scaled and adopted on a meaningful scale. The results of this monitoring will determine the effectiveness of the project investment and lessons learned will form the basis for further planning steps.

- Output 1.2 Decision-making tools for range and forest lands established and delivering SLM, BD, and CC benefits

Under this output tools required to make informed SLM decisions will be developed. By project closure, both private and public sector stakeholders should be more knowledgeable regarding current ecosystem status. These parties should be better able to monitor system

changes and project the ecological impacts of natural resource management decisions. Together, these tools will allow stakeholders to strategically align natural resource use in forests and rangelands so that it maintains, rather than degrades, ecological integrity.

The project will at a minimum generate and demonstrate the application of the following tools:

- Soil organic carbon maps for pilot sites
- Integrated SLM and biodiversity conservation land use planning
- Certification of forest and rangeland landscapes by FSC standards
- Biodiversity monitoring system
- Identification and quantification of ecosystem services values

During the project's first six months of operation, a brief implementation strategy will be completed describing steps that will be taken to implement this sub-component. The strategy will include a refinement of pilot sites, detailing of monitoring priorities, listing of primary ecosystem services to be quantified, and definition of boundaries for land use plans and certification.

During the project's first year of implementation, baseline assessments will be made building upon the work completed during project preparation. This will include the production of soil organic carbon maps for selected pilot sites. These maps will help project stakeholders and others to assess and monitor the CC benefits of project interventions. In addition, the project will assess the value of ecosystem services to proximate communities. This valuation process will describe how ecosystem services or lack-there-of impact the quality of life for stakeholders, particularly those reliant upon forest and rangelands for their livelihoods. Project support for ecosystem services valuation will help stakeholders understand if and how maintaining ecosystem integrity helps minimize exposure to climate change impacts, preserves scarce resources such as water, and generally impacts quality of life issues. The summarization of ecosystem services value will be revisited during project implementation to help monitor progress and inform capacity building and enabling environment activities.

The project will identify and pilot best models for integrating biodiversity and ecosystem services conservation into the management of production landscapes. The project will generate a working example for biodiversity and ecosystem services monitoring system for production landscapes. Data will be gathered, assessed and key zones for biodiversity and ecosystem services will be mapped. Following this, planning decisions for integration to different sectors will be identified and incorporated. Upon this experience, at the end of the project, an ecosystem services centered biodiversity integration system will be developed. Although MFWA has a biodiversity integration system for production forests, an integration system for arid and semi-arid regions for different sectors like agricultural and pasturelands as well as arid forests is missing currently. Guidelines will be prepared and training programs will be delivered to the key organizations.

One of the key species of global importance is the Great Bustard. The species is classified as threatened by IUCN and KCB is the most important region for the species. It is highly dependent on the management of agricultural practices. The project will integrate the management needs of the species and integrate to the agricultural practices in Sarayönü region. This experience will be distributed to the KCB wide as well as other parts of the country. Moreover, the project will develop a wetland management approach for the Eregli Marshes. The site is under a restoration process currently. The project will identify the ecological restoration approaches including the hydrology and species management. As many wetlands are dried in Turkey restoration activities are getting commoner. This experience on management of wetlands with ecology-centered approach can be used elsewhere by the

MFWA. Lastly, conservation of narrow range saline endemic plants that are thriving in the elegant saline steppes of the KCB will be integrated into the rangeland management practices during the project and specific conservation measures will be developed.

During project year one, the project will set in place and operationalize a comprehensive biodiversity monitoring system. This system will focus upon indicator plant and animal species. The primary objective will be to ascertain the status of globally significant species. Wetlands and wetland dependent species will be of particular concern. During project implementation, these species and the habitats upon which they depend will be monitored to determine whether project interventions are having a positive effect. Prior to project close, the Government of Turkey will assume full responsibility for continuing this monitoring program to determine whether post-project activity is resulting in the conservation of globally significant biodiversity.

Within the project's fourth year, forest and rangeland within at least one pilot are will be certified through FSC. This certification process will be used as a training exercise so that public and private sector stakeholders can better understand the process, costs and benefits associated with certification.

The most important element of this multi-prong approach to informed decision-making will be the completion of a resource conservation plan for the Mount Karacadağ region. The objective of this land use plan will be to maintain and/or rehabilitate ecosystem integrity in order to deliver SLM, CC, and biodiversity conservation benefits. The subsidiary objective of this plan will be to foster the environmental conditions required to support and safeguard sustainable livelihoods for local stakeholders. The plan will focus upon determining better modalities for rangeland management. This will include investigating how best to utilize the existing regulatory framework to improve rangeland management, identification of constraints and challenges, and proposals for alleviating those regulatory challenges. The plan will benefit from a stakeholder engagement process that is informed by ongoing and project emplaced monitoring, e.g., baseline carbon assessment, biodiversity monitoring programs, etc. These monitoring elements will inform plan design, monitor plan effectiveness, and provide evidence based reasoning for adapting the plan's approach over time.

The project will support the completion of a trial plan prior to the close of project year two. The plan will be implemented with project support during project year three. The plan will be revisited and updated based upon project findings during the second semester of project year four. Also during project year four, a hand-over plan will be completed and implemented so that relevant stakeholders, and particularly the MFWA and MFAL and their related agencies, can take over full responsibility for funding and implementing the plan post-project. As with all project activities, the Mount Karacadağ resource conservation plan will be approached as a test case designed to build knowledge and demonstrate benefits. Therefore, prior to the close of project year three, the project will support the design of a manual describing how the planning process should or should not work. This will be accompanied by a series of workshops and training programs to expose key decision makers at both the KCB and national level to the fundamental principles and practices at play. Finally, the project will work with key stakeholders at the MFAL and MFWA in KCB to generate a replication plan, identifying strategic locations within the KCB that would benefit from a similar planning exercise and the steps required for government sponsorship of such a plan.

All activity under this subcomponent will result in capacity improvements for both the public and private sector. This will include working closely with representatives of both MFWA and MFAL, particularly extension officers responsible for forestry and rangeland issues. Activities under this sub-component will integrate with farmer field schools under Component 3, making certain that field school members actively participate in and benefit from the monitoring and planning exercises set-in place. The activities will also be vital to

informing the policy and institutional improvements that will be undertaken through Component 3.

Component 2. Climate smart agriculture

Component Budget: GEF (US\$ 2,411,136), Co-financing (US\$ 8,800,000)

This component's objective is to embed climate smart agriculture within small and large-scale agricultural operations. As noted, in the baseline analysis, agriculturalists within the KCB and nationally recognize that current production methods are pushing the edges of sustainability. They are very eager to learn of and adopt production methods that are cost effective and limit ecosystem-based vulnerabilities. Although there has been some movement to generate these improvements, the approaches are sporadic and in their infancy. Agriculturalists would benefit greatly from the incremental investment of GEF funds to help strategically deliver international best practices and provide concrete proof of success/failure.

The result will be an increase of 50,000 hectares of existing agricultural land delivering climate change mitigation, biodiversity conservation and SLM benefits. The project will achieve this by creating an evidence base through capacity-building demonstrations introducing climate-smart techniques such as direct seeding in fallow lands to reduce wind erosion, reduced tillage approaches, limited irrigation methods and the use of animal manure to increase organic content of the soil. Confirmed best practices will be integrated into the enabling environment and capacity building efforts implemented under Component 3. Proven best practices and lessons learned will be disseminated for adoption through the established farmer field school system. This will culminate with proven best practices integrated within and supported by institutional and policy framework improvements.

Key activities will include the incremental costs associated with: (i) development of models for conservation agriculture demonstrations on private farms, (ii) information dissemination on TIGEM's experience in terms of conservation agriculture; (iii) pilot-scale investments in bio-digesters to create an evidence base for recuperating methane from agricultural waste and producing electricity; (iv) for high potential opportunities, incentives for the investment in the development of the infrastructure to capture methane; (v) monitoring the adoption of climate-smart agricultural technologies, including monitoring of GHG mitigation through EX-ACT tool and biodiversity impacts; (viii) different management practices such as reduced tillage, mulching, organic and inorganic fertilizer and suitable irrigation increase soil carbon pool and storage in plant tissue and soil body.

The main outputs from this component are:

- Output 2.1 Innovative agricultural land rehabilitation technologies introduced
Under this output activities will focus on providing agricultural professionals with examples of how degraded agricultural land can be rehabilitated by means that are both economically viable and capable of delivering high levels of SLM, CC, and biodiversity conservation benefits. Interventions will be designed to improve ecosystem integrity, limit agricultural investment risks, and improve profitability. Emphasis will be placed upon rehabilitation techniques that strengthen the over-all integrity of the KCB ecosystem. Details of specific CSA techniques that will be implemented in pilot sites are contained in Annex 10. The project will work with select private and state farms to develop multi-faceted approaches so that individual operations can be fostered as rehabilitation success "models". These farms will be part of the FFS approach implemented under Component 3.

During the project's first year of operation, a strategic rehabilitation investment strategy will be generated. This plan will build upon the information generated during the project design phase. The strategy will establish a firm baseline of current activity so that improvements can be categorically described prior to project close. The strategic plan will identify and select

farms where demonstrations are most likely to show the cumulative restorative impacts of numerous interventions. The strategic plan will identify and describe international best practices related to KCB specific restoration challenges. This compendium will serve as an implementation guideline and form the basis for the generation of best practices manual and website to be completed prior to project close. These best practices will then be applied to demonstration rehabilitation potential. This may include simple interventions such as windbreaks or irrigation channel shade trees or complex interventions such as drip irrigation and drought resistant crops. The strategy will benefit from a series of stakeholder meetings and discussions to emphasize local challenges, international best practices, and most strategic approaches to be certain project investments lead to measurable improvements and long-term impacts.

Rehabilitation demonstrations will be conducted during project years 2, 3, and 4. These demonstrations will be based upon the findings and directions set out in the restoration strategy/plan and guidelines. The demonstrations will be preceded by a comprehensive evaluation of the existing economic, social and environmental conditions at each demonstration site. This baseline assessment will make certain that investments are strategic and will ensure that prior to project close a careful assessment and evaluation of project impact will exist. By project year four, best practices will be fully captured and prepared for up-scaling. This will be integrated with and achieved through Component 3 activities.

Output 2.2 Innovative methane capture and agriculture production technologies demonstrated

This output is expected to catalyse a change in farming techniques to reduce agricultural sector contributions to climate change. This will be achieved on two levels. First, the project will demonstrate how small and medium-sized enterprises can benefit from best available GHG capture technologies. This evidence-based approach will show how crop and animal waste can be effectively utilized to reach the project's CCM goals. Second, the project will demonstrate innovative and economically viable conservation agriculture technologies that result in GHG emissions reductions that will be monitored by EX-ACT tool that will be established during the project period.

During the project design phase, the team worked very closely with stakeholders to identify existing and potential appropriate technologies for methane capture. There are 2 large methane capture facilities operating currently within the KCB and one is under construction in Sarayönü Gözlü State Farm. The scale of those facilities however does not support the ability of small and medium-sized agricultural operations to contribute. At the same time, economies of scale prevent small/medium-sized operations from independently creating economically viable approaches on their own. Economic incentives do not exist to motivate small/medium-sized enterprises to make necessary investments. The project will, therefore, work within this opportunity space to demonstrate methods for small/medium-sized methane producers to coordinate and cooperate in creating digesters that are economically feasible.

During project year 1, the project will complete a thorough investigation of current practices and identify specific opportunities within the project's pilot site area. This will include identifying participants, drawing up guidelines for participation, and completing a comprehensive business plan describing the investment requirements, potential returns, operational approaches, decision-making frameworks, management responsibilities, etc., as well as the intended climate change mitigation benefits. The mitigation benefits will help the project meet or exceed targets as described in the results framework and tracking tool. This first year period will also be used to identify and secure co-financing already obligated by the Turkish Government for digester investment. During project years 2 – 4, the digesters will become operational. This period will include monitoring to make certain climate change mitigation levels are being reached. The implementation period will be used to make other

potential groups of agricultural interests aware of the program and to create pathways for replication based on lessons learned through public awareness and media. During project year three, a strategic hand-over plan for all operations will be completed. This plan will be implemented during project year four so that by project close all operations are under the management and financial responsibility of participating agro-businesses. The established and fully operational sites will provide a substantial improvement from the current baseline, opening a pathway for small and medium sized enterprises to cooperate and generate economies of scale. The overall approach will be based on explicit evidence attested by the demonstration approach. The lessons learned will furthermore contribute to the FFS training and extension under Component/Outcome 3 and be integrated into local, regional and national planning and upscaling processes. As the project initially concentrates on pilot sites and not the whole KCB, it will be possible to efficiently collect data on comparable non-participating enterprises and communities to assess the outcome of pilot activities in relation to those control units. Effects will be constantly tracked by the project and positive as well as negative trends will inform planning, application and extension steps for each component.

The second tier of GHG reduction activities will take place “in the field”. The project will work with participating farmers to demonstrate SLM technologies that are climate smart. These technologies will help farmers to reduce emissions and alleviate climate change vulnerabilities. Again, the project will take a very strategic approach to the design and application of specific interventions. Interventions will place a premium on maximization of impact in terms of climate change benefits, economic viability, and opportunities for capacity building and replication. The project will seek to reduce GHG emissions using low or negative cost interventions. This may include low carbon technologies, residue management, mulching, providing viable alternatives to the practice of burning crop residues, lowering water consumption, improving the efficiency of fertilizer use, reduced tillage, recuperation of degraded land, improved management of manure, adoption of agro-forestry practices, etc.

A strategic investment plan to describe priority approaches will be devised during project year one. The strategy will be aligned with rangeland and forest rehabilitation activity planning under Component 1. This plan will closely coordinate with the farmer field schools being developed under Component 3. Any investment in climate smart agricultural demonstrations will be completed through the farmer field school program so that participant farmers and extension officers may benefit. Members of farming field school program members will be solicited for their “best” ideas for climate smart agriculture. Proposals will be vetted annually and winning proposals that fall within the parameters of the project’s strategic investment plan will receive funding. Funded activities will serve as capacity building nodes to build awareness and to generate materials for replication. This will include the design and implementation of innovative farmer-to-farmer information exchanges. Funded demonstrations will be closely monitored to determine whether they are delivering intended economic, social and environmental benefits. Particular attention will be paid to climate change mitigation benefits. During project year four, the project will complete a number of public awareness materials designed to capture and encourage the dissemination of lessons learned and best practices. This will include a best-practices manual, media events, entry into websites, etc. During project year four, the project will also complete a hand-over strategy so that the Government of Turkey is well-prepared to take over and expand the climate smart agricultural demonstration program, particularly as it links to both the farmer field schools, agricultural extension services, and providing seed funding and other financial incentives required to mobilize and encourage private farmers to adopt of best available climate smart agricultural practices.

Component 3. Enabling legal, policy and institutional environment for sustainable land management

Component Budget: GEF (US\$ 892,500), Co-financing (US\$ 500,000)

The objective of this component is to more fully integrate climate change mitigation, biodiversity conservation and SLM concerns within agricultural management. This will be achieved at multiple levels and through an integrated, evidence-based approach woven through all three-project components. A strong enabling environment requires awareness and support from both government agencies and stakeholder constituents. In this case, those constituents are represented by KCB agriculturalists.

Policies, regulations, and financial incentives will benefit from government agents on national and KCB levels who are more fully aware of issues of concern and national/international best practices to address these concerns. National and KCB level decision-making bodies, and particularly staff and agencies associated with the MFAL and MFWA, will benefit from capacity building associated with the generation of demonstrations, lessons learned and other Component 1 and 2 activities. These capacity building efforts will be coordinated through Component 3 and augmented by formal training programs that focus upon creating regulatory and policy pathways to support agricultural practices that contribute to ecosystem integrity.

Under the current baseline, there is very little energy being focused upon building a strong constituency for agricultural practices that deliver SLM, climate change, and biodiversity conservation benefits. Without this constituency, it is very difficult to generate and/or support the implementation of necessary enabling environment improvements. Using GEF funding, the project will directly address this barrier. The project will set in place a farmer field school model that is designed specifically to empower farmers and ranchers to become better informed. The model will build on the evidence base and integrate lessons learned from demonstration activities to improve production, maintain ecosystem integrity and reduce the long-term economic risks associated with degradation. This model will be interwoven throughout all project components, using the various investments as a way to strengthen the knowledge base of local resource users and government extension officers. The farmer field school model will provide a conduit for continued delivery of learning between government staff and farmers. This conduit will also provide the impetus, information and support required to generate enabling environment improvements.

The main outputs from component are:

- Output 3.1 Institutional integrated management capacity building programme established for national and local level decision-makers

This output will focus on mainstreaming SLM and Climate Smart agriculture within new and existing decision-making bodies. The project will first set in place a mechanism to formally build MFWA and MFAL capacity, particularly within the KCB, to better understand SLM and CSA. The project will then assist with the creation of a formal institutional mechanism designed to bridge decision-making with the KCB so that it becomes more holistic and informed by ecosystem-based principles and practices. It is envisioned that this board will include representation from major interests within the KCB, including government, non-governmental, and private sector interests. Ultimately, this institution will be able to provide insights and support to the generation of KCB wide planning with particular emphasis upon how to incentivize more SLM and climate smart approaches within the productive sector. This may include providing comments to major policies and planning documents. The body will benefit from the results of the various project interventions. These interventions will ideally provide both existing and new institutions with models that may be adopted and replicated more broadly, including both within the KCB and nationally. In addition, the new and existing institutional framework and decision-making structures will be able to integrate and take-on-board the various monitoring and information generation systems set in place. This will assist these decision-makers to make more informed decisions and to understand their long and short-term impacts, and determine whether these decisions are setting government and private sector stakeholders on a course to achieve SLM and CSA related

objectives. Finally, these decision-making bodies will benefit from the improved extension services set in place by the project. These extension services, and particularly the farmer field schools, will be instruments for trialling progressive rangeland, forest, and farming methods. The farmer field schools will be instruments for broadcasting information related to SLM and CSA, including lessons learned, best principles and practices. The farmer field schools will be instruments for monitoring and reporting the results of various practices, creating a conduit for improving the level of information available to provincial, regional and national level decision makers. The sum result of this will be a regulatory, policy, and fiscal (subsidies and incentives) that much better positioned to address emerging SLM and climate related challenges.

The project will focus upon making certain that best practices demonstrated are fully operational and being up-scaled throughout the KCB. The project will hold a series of seminars to expose stakeholders – and particularly decision-makers – to project best practices. A “best practice” guide will be completed, including the evidence base and lessons learned of demonstration activities. This guide will be distributed to farmer field schools and will be available electronically on the project sponsored website. The guide will provide a roadmap for adoption of best practices. It will cover issues related to necessary regulatory improvements, including potentials subsidy reforms. The guide will explain the specific economic, social and environmental benefits that accrue from the adoption of improved methods.

GEF incremental resources will enable MFWA and MFAL to develop and adopt a package of modifications in the policy and regulatory framework to strengthen participatory and integrated land management as the primary mechanism to contribute to climate change mitigation and prevention of land degradation and to achieve biodiversity mainstreaming. The project will introduce a holistic approach to forests, rangelands/pastures and agricultural lands. With GEF support, an enabling environment for a basic management strategy will be developed for sustainably managed landscapes that consider to conserve biodiversity, mitigate climate change and reduce land degradation. Beside individual and institutional capacity building programmes among decision-makers, technical staff and local beneficiaries will increase their ability to move towards integrated approach.

This work will include; (i) the elaboration of legislative framework (laws, regulations and guidelines) towards SLM practices, (ii) delivery of training programmes to technical staff on SLM practices/techniques at national and pilot area levels, (iii) awareness raising programmes to local beneficiaries on SLM practices (e.g. workshops and other dissemination events such as articles, TV and publications), (iv) development of guidelines for SLM, specifically for restoration of degraded lands to be applied by the MFWA, for conservation agriculture to be applied by farmers and cooperatives in cooperation with MFAL, and for range rehabilitation to be applied by MFAL, MFWA and local authorities, (v) carbon stock monitoring system for production landscapes and (vi) monitoring and evaluation system for the project. Strengthened enabling environment will contribute to the improved management of 2,229,000 ha agricultural lands, 733,760 ha forests and 1,877,410 ha rangelands and pastures.

- Output 3.2 Comprehensive SLM and CSA extension and awareness programme in place

Activities under this output will operationalize farmer field schools throughout the KCB. These farmer field schools will utilize existing extension services, integrating field and extension officers from both the MFAL and MFWA. The farmer field school model will be based upon successful examples generated by FAO globally. The curriculum will focus upon issues related to ecosystem-based adaptation principles. The thrust of the effort will be to create a formal system for facilitating the adoption of climate smart agricultural practices. The success or failure of various practices will be determined based upon indicators that measure both ecological and economic improvements.

The project will support the creation of farmer field schools (FFS). The FFS will be to create loci for learning. The FFS will be designed to build the capacity of rural communities within and near the pilot sites to improve their knowledge of SLM, climate change, and biodiversity conservation. The project will facilitate the establishment of 5 FFS. Each FFS will include approximately 500 households. To address gender specific issues and challenges, each FFS will have a women cohort.

The model curriculum and approach will integrate best international and national principles and practices. This curriculum will include practical guidelines for rotational grazing, range restoration, improved conjunctive water management.

The FFS will raise the level of local knowledge and facilitate public participation in the natural resource management processes. The training will enhance the ability of local resource users to understand and maintain ecosystem services. The training will be tailored to fit specific resource management and biodiversity conservation challenges, e.g., grazing systems and models, climate smart agriculture, water resources management, forest and fuel-wood management, biodiversity monitoring, etc.

The program will augment and substantially improve current extension approaches. Trained technical staff from both the MFAL and MFWA will support the FFS. As part of the FFS development and implementation process, these technical staff will receive training in SLM, climate change, biodiversity conservation and other topics relevant to maintaining ecosystem integrity. These trained staff, including extension supervisors, will then have the capacity to deliver knowledge products to FFS participants.

The FFS model will integrate tools designed specifically to address climate change mitigation and adaptation. The FFS will stress the use of low-cost ecosystem based approaches. Concepts will improve the farm family's quality of life while supporting long-term ecosystem integrity. The training will assist rural communities to raise their levels of food security and potentially diversify their livelihood options. The curriculum will build farmer knowledge of practical CSA practices such as direct seeding, reduced tillage, the use of animal manure, and improved crop varieties. The curriculum will assist farmers to identify and apply opportunities to improve practices related to tillage and soil conservation, site-specific nutrient management, water use, fisheries and livestock management. The knowledge tool will help provide farmers with information regarding increased productivity and crop diversification to enhance food security and improved nutrition. The model curriculum will assist farmers to generate livelihood options based upon climate smart practices. This may include identifying more cost-effective production methods and improve financial management, product marketing and business planning.

The FFS module will offer a conduit to bring the best international principles and practices to improve on-the-ground action. The FFS curriculum will be innovative, combining a host of advanced learning methodologies. The curriculum will include on-the-ground practices and models with reference to initiatives funded under Components 1 and 2. The curriculum will integrate formal and informal learning, stressing the facilitation of peer-to-peer or circle learning among field school participants (e.g., farmer demonstration competitions, field fairs, peer evaluations, etc.). The strategy will stress cooperation and peer-to-peer learning both within and between pilot areas. This may include the provision of multi-media tools such as tablets (e.g. I-Pad) that allow farmer field school participants to digitally record and share progress and lessons learned. These tools will facilitate the ability of FFS to access and share international and national sources of information.

The FFS women cohorts will benefit from a specific curriculum and approach targeting the needs of women. By project close, the FFS women cohort-training module will be fully

integrated as a section within the FFS curriculum. Project technical staff will generate and support the piloting of women specific FFS curriculum and learning. Each FFS' women cohort will provide a foundation for organizing knowledge building. The cohort approach will offer rural women opportunities to benefit from women-centered knowledge building and information exchange. FFS will enhance the agricultural skills of established FFS women cohorts. Gender specific FFS modules for women cohorts will be guided by opportunities for woman-to-woman learning both within and between pilot sites. The FFS curriculum designed for women cohorts will address gender specific issues related to nutrition and food security, including food use and stability. Innovative knowledge tools will assist rural women to share traditional knowledge, increase their awareness of conservation issues, and reduce their vulnerability to climate change. For each FFS, at least one demonstration site established specifically for women, ideally on a farmstead owned and/or operated by a woman headed household.

International and national technical experts will work closely with key extension officers and other relevant government agents to develop and implement the FFS modules. The project will also coordinate very closely with other private and public initiatives with relevant agendas. Together, these parties will inform and vet the curriculum developed for the FFS. The FFS curriculum will be team-taught using a combination of international and national project staff, extension services, and local stakeholders. In this way, the FFS process will make certain these persons are fully capable of supporting the implementation and continual improvement of the FFS model. By project close, a cohort of at least 15 government staff will have sufficient knowledge and capacity to support the sustainable replication of the established FFS curriculum.

During project years 1, the project team will design the FFS curriculum and mobilize establishment of FFS at each of the pilot sites. The curriculum will be developed based upon international practices. The curriculum will integrate biodiversity conservation specific issues and knowledge building. The curriculum will be developed based upon a needs assessment. This will include reference to the baseline assessments completed under Components 1 and 2. The development team will include representatives from key national and local government agencies, including: MAFL and MWFA. A draft curriculum will be completed by the close of project year two.

During project 2 - 3, the curriculum will be rolled out and tested with the newly established FFS. It is envisioned that each FFS will be convened monthly. Trial implementation will be closely monitored with both successes and challenges assessed by the curriculum development team and FFS participants. These results will be used to insure sustainability and broad-scale replication. The assessment will disaggregate results by gender to make certain impacts are unbiased.

At the close of project year 3, successful interventions will be used to improve and modify the curriculum. The curriculum will be updated to integrate lessons learned and reflect any necessary improvements. At the close of project year 4, the FFS approach will again be assessed and updated and prepared for possible national upscaling.

The project will design a strategy for FFS establishment. This strategy will describe how capacities will be built and responsibilities transferred. This will include mechanisms for sustainable financing. By project close, FFS implementation should be fully supported by government extension workers with adequate financing allocated.

- Output 3.3 Project monitoring and carbon monitoring system based on EX-ACT established

The expected output is to set in place a monitoring system that can be used to inform decision-making by government resource managers and private resource users. During project implementation, this monitoring system will be used to measure achievement of project indicators. This will evolve during the project implementation period so that the monitoring system will be fully adopted by KCB government resource managers. This will be achieved prior to project close. During the project's third year of implementation, the PMO will generate a hand-over strategy detailing how the project monitoring system will be mainstreamed within standard government operating systems. This will be closely aligned and integrated with the decision-making tools set in place under Component One.

The carbon monitoring during the project period will be undertaken by using the Ex-Ante Carbon-balance Tool (EX-ACT) that was developed by FAO. The tool provides estimates the impacts generated by the project activities regarding the carbon stock changes such as emission reductions or carbon sequestration. The results are presented as GHG emissions per unit of land, expressed in equivalent tonnes of CO₂ per hectare and year. The EX-ACT tool will be introduced with the start of the project and the methodology to use it will be determined by the project team.

2.5 Global Environmental Benefits

The objective of the GEF funded alternative is to improve the sustainability of agriculture and forest land use management through the demonstration and adoption of low-carbon technologies with win-win benefits in LD, CC and BD conservation and increased farm profitability and forest productivity while enhancing ecosystem resilience to CC. The project will introduce a shift from the current unsustainable practices to SLM practice that will generate significant global benefits, as detailed in the table below:

Table 5: Project Global Environment Benefits

Current Practices	Improved practices introduced by project	Selected Global Benefits
Degradation of forest lands through heavy grazing, agricultural intrusion, and soil erosion.	Improved management of degraded forest lands: <ul style="list-style-type: none"> -Reforestation of degraded forest lands, improvement/rehabilitation of rangeland in/around forests -Use of wind breaks, water harvesting techniques, drought-resistant and salt-tolerant local species -Limits on grazing in forest - Ecosystem services valuation -Capacity building for improving integrated and participatory management 	<ul style="list-style-type: none"> -Rehabilitation of 20,000 hectares of degraded forest lands with a mitigation target of 43,000 tons of CO₂ eq/year sequestration, -Improved management of 733,760 ha forest lands -Less damages from floods and land slides -Decrease in soil erosion in degraded forest lands (baseline will be determined in preparation stage)
Degradation of agricultural land through inappropriate farming practices result in the loss of vegetative cover, soil and soil carbon. Inadequate management of agricultural waste results in significant GHG emissions, and an inadequate level of soil replenishment.	Improved agricultural land management: <ul style="list-style-type: none"> -Conservation agriculture (reduced tillage, crop residue management, vegetative cover, crop rotation, mulching, direct seeding, habitat enhancement) -Introduction of drought-resistant and salt-tolerant species and varieties -Rehabilitation of degraded arable lands -Integrated land rehabilitation to increase soil fertility, including agro forestry trails, wind breaks - Water harvesting and water-saving systems to reduce water logging and soil salinity - Improved conjunctive water management reduces pressure on natural habitats and biodiversity 	<ul style="list-style-type: none"> -Improved management of 2,229,000 ha arable lands - Avoided emissions of: 23,000 tCO₂eq/year in 40-50,000 Ha of arable land using conservation agriculture practices -Decrease in soil erosion in arable lands (baseline to be determined in preparation stage) -Improvement of water harvesting and uses -Improvement in soil organic content, fertility and moisture and increase in vegetative cover - Contribution to mitigation in at least 50 methane capture diffusion sites with a mitigation target of 8-10,000 tCO₂eq/year

Current Practices	Improved practices introduced by project	Selected Global Benefits
<p>Degradation of Pasture lands through overgrazing on hilly and plain pastures resulting in degradation of vegetative cover, increased erosion, loss of soil carbon.</p>	<p>-Demonstration of methane capture practices from wastes of livestock and agro-processing -Capacity building for SLM and its integration into farming and rangelands activities and role in GHG balance and biodiversity conservation</p> <p>Improved pasture management: -Reduced and/or rotational grazing to reduce pressure on vegetative cover - Improved vegetative cover on rehabilitated pastures including agro-silvo-pastoral systems; soil conservation measures including erosion control, improvement of soil fertility, water accumulation/preservation, windbreaks, and buffer strips.</p>	<p>-Improved management of 1,877,410 ha rangelands and pastures. -Contribute to carbon storage in 30,000 hectares of degraded rangelands and pastures with a mitigation target of 25,000 tCO₂eq/year, -Decrease in soil erosion in rangelands and pastures (baseline will be determined in preparation stage)</p>
<p>Biodiversity Habitat degradation as a result of intensive agriculture, heavy grazing and land degradation, lack of monitoring and assessment</p>	<p>Improved mainstreaming biodiversity conservation into production landscapes: -Development of monitoring and assessment system for biodiversity conservation -Increasing soil fertility, water retention capacity and biological activity for the conservation and improvement of above and below-ground biodiversity -Introduction of certification for production landscapes</p>	<p>-Biodiversity conservation mainstreamed in least 80,000 ha of production landscapes (20,000 ha forest land; 30,000 ha pasture; 30,000 ha arable land) - Certification of at least 10,000 ha land that incorporates biodiversity conservation measures by FSC standards -Restoration of natural habitats essential for threatened biodiversity</p>

2.6 Cost effectiveness (alternative strategies and methodologies considered)

During project design, several alternative scenarios were considered from the point of view of cost-effectiveness. These included extensive purchase of hardware and other tactical equipment, construction of major facilities for administration and agriculture and expensive international training programs. Stakeholders eventually abandoned these options after carefully considering conservation priorities relevant to a limited budget. In the end, the highly precise and, therefore, cost-effective investment rested on a number of principles, each integrated within the activities and expenditures of this proposed project. The relatively small investment is targeted to catalyze a substantial course change. The result is a relatively small amount of financing potentially will leverage the long-term conservation of an immense landscape and associated global benefits. Paramount was the desire to build the regulatory, management and financial capacity required for Turkey to independently maintain effective conservation efforts. For instance, the project’s limited investment will help to create capacity and decision-making pathways that enable local governments to use revenues to make pro-conservation investments rather than ill-advised and unsustainable short-term investments. This catalytic effect coupled with the objective of sustainability makes the GEF investment highly cost-effective.

2.7 Innovativeness

This project represents a ‘first’ for Turkey. While recognizing and building upon the existing baseline, this project will have innovative approaches that will remove resilient barriers. The project will take an ecosystem-based approach that will alleviate business risks (e.g., soil degradation, water loss, deteriorating productivity) while delivering SLM, CC, and biodiversity conservation benefits. This innovation is reflected in the project’s three components. Each of these three components are purposefully integrated to increase synergy. They are designed to culminate in capacity improvements for both the public and private sector. Within the project there are specific innovations related to various outputs.

Component 1 will set in place a much more strategic and integrated approach to forest and pastureland management that is based upon holistic ecosystem management principles and practices. The land use planning process set in place under Component 1 will, for the first time, address the issues of range and forest management informed by a cohesive SLM, CC, and biodiversity monitoring program.

Component 2 will promote dramatic improvements in the agriculture sector that will address CC challenges and drive improvements for SLM and biodiversity. The project will catalyze the creation a methane digesters that help small and medium sized agro-businesses achieve economies of scale that would otherwise not be possible.

Under Component 3, regulatory and institutional frameworks will benefit from internationally and nationally proven best principles and practices related to the management of the productive landscape in ways that promote, rather than degrade, ecosystem integrity and deliver global benefits. The Farmer Field School concept implemented under Component 3 may not be new to the world, but this certainly represents a national innovation. This will be the first time such an organized extension approach will be attempted in Turkey. This will be particularly groundbreaking on two levels. First, this represents the first time that Turkey will have the tools required to provide local farmers with the knowledge required to advance production that address CC, biodiversity, and SLM challenges. Secondly, farmer field schools will provide a linkage to inform regional and national level policy makers and extension officers with information regarding what practices on the field level actually work to sustain farming families and provide global environmental benefits. Fitting the Farmer Field Schools within each of the project components and using the various activities and outputs to build the short and long-term capacity of both government extension officers and farmer field school participants represents a major innovation.

SECTION 3 – FEASIBILITY (FUNDAMENTAL DIMENSIONS FOR HIGH QUALITY DELIVERY)

3.1 Environmental impact assessment

The project and the GEF resources invested are expected to have positive impacts on the sustainability of agricultural and forest resources, improve the integrity of ecosystems, and result in tangible environmental benefits including biodiversity conservation, sustainable land management, and climate change mitigation and adaptation. Based on the project objective, outcomes and outputs no adverse environmental or social impacts are likely and it conforms to FAO’s pre-approved list of projects excluded from a detailed environmental assessment.

3.2 Risk Management

3.2.1 Risks and mitigation measures

Table 6: Risks and mitigation measures

Risk type	Probability	Mitigation
Poor coordination for SLM	High	Close and collaborative cooperation between the many institutional stakeholders (particularly the MFWA and the MFAL) will be essential for the project to achieve its stated goal and objectives. This is mitigated to some extent by the positive collaboration experience of the AWRP, and further through the structure of a PMU, project management and project steering committee for project management, in addition to the new SLM mechanism that will be piloted under Component 3.
Weak capacity of local and national institutions	Medium	Capacity of staff at various levels, particularly limited understanding of new technologies, may impede adoption rates. This will be mitigated through the development of a capacity building program and training at central and local levels.
Natural calamities	Medium	Natural calamities, such as drought and floods, may impede the adoption of new technologies. The project is designed as a multi-year intervention, where demonstrations can be run over several seasons. The project will also be linked to the early warning services of the MFWA.
Climate change	Low	On the one hand, climatic changes will require evolving research on the best approach for the newly proposed technologies. The MFAL and the MFWA, with support of FAO technical expertise, are in a good position to adopt forthcoming research results. On the other hand, climatic changes can also increase political support for the project.
Low ownership and lack of sustainability of new technologies and techniques	Low	Lack of ownership and subsequent lack of sustainability of new technologies promoted under the project could cause difficulties in achieving desired adoption levels. This will be mitigated through the above mentioned capacity building program and through an awareness campaign targeted at project beneficiaries. This capacity building program will involve tools, such as economic models and plans, economic analysis that clearly show that there is an economic and social benefit to the adoption of these technologies (win-win). The GoT has already developed and put into place incentive programmes for CA and land rehabilitation that specifically include equipment and machine support up to 70% of the cost, as well as

		support for private afforestation and nursery development. The Project will contribute to linking existing incentive systems into integrated sustainable land management practices in order to develop a holistic approach.
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3.2.2 Fiduciary risk analysis and mitigation measures (only for NEX projects)

A. Macro analysis

B. Micro analysis

C. Action plan for capacity strengthening of Executing Partner if needed

SECTION 4 – IMPLEMENTATION AND MANAGEMENT ARRANGEMENTS

4.1 Institutional Arrangements

a. General institutional context and responsibilities

The project will be implemented through a National Project Implementation Unit (NPIU) supported by the Field Office. The MFWA and the MFAL are the two lead executing partners. The NPIU will consist of MFWA and MFAL representatives but it will be placed under MFWA. MFWA will be responsible for the implementation of component 1 and MFAL for component 2, while component 1 will be jointly implemented. The field office will be established in Konya. Linkages with local stakeholders will be established, including representatives of local staff of relevant agencies, local resource user associations and NGOs. The MFWA and MFAL will work closely with a wide range of stakeholders, including resource beneficiaries, farmers and herders, the private sector, universities, research institutions, civil society organizations, etc. at the national, provincial and districts levels.

At the national level, a Project Steering Committee will be established for the coordination of project activities. It will include representatives of the MFWA and the MFAL.

The project will be launched by a well-publicized multi-stakeholder inception workshop. This workshop will provide an opportunity to provide all stakeholders with updated information on the project, as well as a basis for further consultation during the project's implementation, and will refine and confirm the work plan. In addition, certain project activities will be specifically designed to directly involve stakeholders in project implementation.

b. Coordination with other ongoing and planned related activities

The proposed GEF project will be implemented in coordination with a number of FAO on-going and pipeline projects in Turkey which are all consistent with and complementary to the project objectives and outputs:

- Support Capacity Building for Sustainable Management of Mountain Watersheds in Central Asia and the Caucasus (GCP/SEC/002/TUR; 2012-2014)
- Identification, Assessment and Stewardship of Globally Important Agricultural Heritage Systems (GIAHS) in Turkey (GCP /RER/028/TUR; 2010-2014)
- Support for Extension of Conservation Agriculture Practices
- Capacity Development on Coping with Water Scarcity, Drought Risk Management, Salinity Management and Water Harvesting
- National Geospatial Soil Fertility and Soil Organic Carbon Information System Project (Soil, Fertilizer and Water Resources Central Research Institute) (UTF/TUR/057/TUR; 2012-2014)

Other stakeholders will include the Global Methane Initiative, who will provide guidance on methane capture and conversion. The project will be executed by the provincial directorates of the MFWA and the MFAL at the field level. MFWA will contribute to the project US\$ 1 million in-kind and US\$ 9.5 million cash. MFAL will contribute to the project US\$ 1 million in-kind and US\$ 7.9 million cash. The executing partners will work closely with a wide range of stakeholders, including farmer cooperatives, private farmers, the private sector, universities, research institutions, civil society organizations, local communities and residents.

The project will be closely aligned and engaged with the Nature Conservation Centre. This NGO has extensive experience working in the KCB, including with the implementation of the US\$ 1.5 million Coca Cola Life Plus Environment Program.

The project will also benefit from existing coordination mechanisms, such as the UNCCD National Coordination Body, the National Drought Management Unit, etc. and contribute to the effectiveness of these mechanisms towards sustainable land management in Turkey. Further analysis and detailed design of the coordination scheme will be done during project preparation to make sure that a strong interaction among key stakeholders is facilitated.

Farmer cooperatives, private farmers and the private sector are key beneficiaries. The members of Konya Union of Agricultural Cooperatives and Konya Leader Farms' Associations will be key stakeholders under this project as indicated in the baseline project section.

State Farms have considerable investments in CA and the project will assist them wherever possible to further develop CA for the local conditions while extending to other farmers. The General Directorate of Agrarian Reform (TRGM) and General Directorate of Agricultural Research and Policies (TAGEM) will assist with lessons learned from agricultural research and production initiatives. Bahri Dağdaş International Agricultural Research Institute and Konya Soil, Water and Combating Desertification and Erosion Research Station will assist in monitoring information on soil, including organic carbon levels. Universities, civil societies and NGOs, such as the Selcuk University, Nature Conservation Centre (DKM) and Chamber of Agricultural Engineers will be included to assist with project preparation and oversight as needed.

The proposed project will also benefit from the Rehabilitation of the Degraded Agricultural Lands Project (RDAL-STATIP), includes re-identification of land use classification in 16 provinces. By the end of the year, land use classes will be updated to be serviced to Province Directorates all over the country. These practices will be regularly updated in order to determine land use changes. The experience with capacity development of the Çoruh River Watershed Rehabilitation Project (2012-2018) and Murat River Watershed Rehabilitation Project (2013-2018) will inform similar activities under the proposed project. This may include practices such as workshops, practical training courses in connection with sub-projects and implementation, and technical study tours or training visits for the project implementation staff abroad. These diversified activities cover both local communities and technical staff.

National Basin Management Strategy of Turkey (NBMS) will be one of major projects with which the present proposal will coordinate. The results and the recommendations of NBMS will lead the Project to identify the participatory measures that would maximize social economic benefits and build capacity among key stakeholders – including local governments, communities and private sector as part of the process of building resilience of the rural economy and ensuring the sustainability of the natural resource base.

c. Coordination with Other GEF Financed Initiatives

The project will be fully coordinated with a host of on-going GEF activities as summarized in Table 7.

Table 7: Relevant GEF-funded Projects

Title	Agency	Dates	GEF Grant US\$	Project Objective and Primary Activities	Project Coordination Measures
Summary of GEF Funded Projects					
Conservation and Sustainable Management of Turkey's Steppe Ecosystems	FAO/GEF	Pipeline (2015 - 2018)	US\$ 2,328,767 National	Project's objective is to improve the conservation and effective management of steppe ecosystems of Turkey through effective protected area management and streamlining of steppe biodiversity into the production landscapes.	The project's PIF has been prepared. The PPG process will start in 2014.
Alignment of Turkey's National Action Plan with UNCCD 10-Year Strategy and reporting process	FAO/GEF	Pipeline (2014 - 2017)	US\$ 136,986 National	The objective of the project is to assist Turkey in aligning its National Action Programme (NAP) under the UNCCD with the 10-year strategy and facilitate review and reporting processes for UNCCD.	The project will contribute to the strategic goals of the action plan as well as benefit from the strategic directions set in the NAP.
Decision Support for Mainstreaming and Scaling up of Sustainable Land Management	FAO/GEF	Pipeline (2014 - 2018)	US\$ 6,116,730 Global	To improve the capability and the decision making of Countries and Regions engaged in the Mainstreaming and Scaling Up of SLM to Combat Land Degradation, as well as to enhance Food Security, mitigation and adaptation to Climate Change and preservation of Biodiversity.	PPG Phase
Lifecycle Management of Pesticides and Disposal of POPs in Central Asian Countries and Turkey	FAO/GEF	Pipeline (2014 - 2018)	US\$ 8,136,990 Regional	To safeguard and safely dispose of POPs posing high risk to public health and the environment, and to implement sound pesticide management programme in Central Asia countries and Turkey.	N/A
POPs Legacy Elimination and POPs Release Reduction Project	UNDP/GEF	Pipeline (2014 - 2017)	US\$ 11,065,000 National	Protection of health and environment through elimination current POPs legacies, ensure longer term capacity to manage POPs into the future consistent with international practice and standards, and integrate POPs activities with	N/A

				national initiatives.	
Integrated approach to management of forests in Turkey, with demonstration in high conservation value forests in the Mediterranean region	UNDP/GEF	2014 - 2017	US\$ 7,120,000 National	The project objective is to promote an integrated approach to management of forests in Turkey, demonstrating multiple environmental benefits in high conservation value forests in the Mediterranean forest region	Some project activities will be undertaken by the General Directorate of Forestry and its regional branch in Konya
Small and Medium Enterprise Energy Efficiency Project	IBRD/GEF	2013 - 2018	US\$ 3,640,000 National	The Project Development Objective is to improve the efficiency of energy use in small and medium enterprises, by scaling-up commercial bank lending for energy efficiency investments.	On-going
GEF-UNIDO Cleantech Programme for SMEs in Turkey	UNIDO/GEF	2013 - 2016	US\$ 990,000 National	Promotion of clean energy technology innovations and innovative clean energy technology entrepreneurship in SMEs in Turkey through a Clean Energy Technology Innovation Competition and Entrepreneurship Accelerator Programme.	On-going
Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well-being	UNEP/GEF	2012 - 2016	US\$ 5,517,620 Global	To strengthen the conservation and sustainable management of agricultural biodiversity through mainstreaming into national and global nutrition, food and livelihood security strategies and programmes.	On-going
Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on POPs	UNIDO/GEF	2012 – ongoing	US\$ 225,000 National	The overall objective of the proposed Enabling Activities is to review the National Implementation Plan and have it endorsed and submitted by the Government to the Stockholm Convention Conference of Parties.	N/A
MED: Sustainable Governance and Knowledge Generation	IBRD/GEF	2011 - 2015	US\$ 3,000,000 Global	The Project's development objectives are to secure and enhance the delivery and impacts of the Sustainable MED Program, to put in place the sustainability elements	On-going

				of improved management of freshwater, coastal and marine resources of Mediterranean countries, and to strengthen the integration of environmental issues into sectoral and development policies.	
Support for the Implementation of the National Biosafety Framework	UNEP/GEF	2011 - ongoing	US\$ 542,650 National	To further develop and implement the Biosafety Framework of Turkey in line with its national development priorities and international obligations, especially the Cartagena Protocol on Biosafety.	N/A
Enabling Activities for the Preparation of Turkey's Second National Communication to the UNFCCC	UNDP/GEF	2010 - ongoing	US\$ 500,000 National	To assist the Republic of Turkey in implementation of obligations under UNFCCC by preparation of Second National Communication.	On-going
GEO: Turkey Geofund	IBRD/GEF	2010 - 2015	US\$ 10,000,000 National	To address barriers to geothermal markets in Turkey through technical assistance and Geological Risk Mitigation.	On-going
Improving Energy Efficiency in Industry	UNDP/GEF	2010 - 2015	US\$ 5,900,000 National	To improve energy efficiency of the Turkish industry by enabling and encouraging companies in the industrial sector for efficient energy use.	On-going
Promote Energy Efficiency in Buildings	UNDP/GEF	2010 - 2014	US\$ 2,620,000 National	To reduce energy consumption and associated GHG emissions in buildings in Turkey.	On-going

4.2 Implementation Arrangements

a. Roles and responsibilities of the executing partners

The MFWA and MFAL will be the lead executing partners. At the request of the Government of Turkey, the project will be executed by FAO in close consultation with MFWA and MFAL and the other project partners. MFWA and MFAL will carry out their responsibilities to support project execution through the National Project Director (NPD). The NPD will be designated by the national executing partners MFWA and MFAL, in consultation with the FAO Budget Holder and the Lead Technical Officer. The NPD will be a senior staff member of the MFWA with relevant experiences, and will be able to devote sufficient time to take part in the project during its implementation. Among the many duties of the NPD, he/she will act as the responsible focal point at the political and policy level within MFWA and MFAL and he/she will ensure that all necessary support and inputs from Government personnel are provided by MFWA and MFAL to enable the project to implement all of the proposed component activities.

Other partners supporting the execution will work closely with the MFWA and MFAL through their nominated technical focal points at the national, provincial and local levels. Other collaboration partners for the project will include 2 Provincial Governorates (Konya and Karaman), several districts and resource-users organizations at pilot sites. The project is designed to achieve many of its key outputs by means of letters of agreement (LoA) with key partners. These LoA are listed under the “Contracts” Budget Line of the project budget. Further detail on results-based LoA work plans and budgets will be developed during inception phase of the project. Specific Letters of Agreement (LoA) will be elaborated and signed between FAO and the respective collaborating partner. This will include inter alia, civil society organizations as appropriate. Funds received under a LoA will be used to execute the project activities in conformity with FAO’s rules and procedures.

- b. FAO’s role and responsibilities, as the GEF Agency (and as an executing agency, when applicable), including delineation of responsibilities internally within FAO

FAO will be the GEF implementing and executing agency. As the GEF Agency, FAO will be responsible for project oversight to ensure that GEF policies and criteria are adhered to, and that the project efficiently and effectively meets its objectives and achieves expected outcomes and outputs as established in the project document. FAO will report on project progress to the GEF Secretariat and financial reporting will be to the GEF Trustee. FAO will closely supervise the project by drawing upon its capacity at the global, regional and national levels, through the concerned units at FAO-HQ, the Sub-Regional Office and the FAO Representation in Ankara. There is a complete separation between the GEF oversight responsibilities and project execution roles and responsibilities, as described below.

Executing Responsibilities (Budget Holder):

Under FAO’s Direct Execution modality, the FAO Representative in Turkey will be the Budget Holder (BH) of this project. The BH, working in close consultation with the LTO, will be responsible for timely operational, administrative and financial management of the project. The BH will head the multidisciplinary Project Task Force that will be established to support the implementation of the project and will ensure that technical support and inputs are provided in a timely manner. The BH will be responsible for financial reporting, procurement of goods and contracting of services for project activities in accordance with FAO rules and procedures. Final approval of the use of GEF resources rests with the BH, also in accordance with FAO rules and procedures.

Specifically, working in close collaboration with the LTO, the BH will: (i) clear and monitor annual work plans and budgets; (ii) schedule technical backstopping and monitoring missions; (iii) authorize the disbursement of the project’s GEF resources; (iv) give final approval of procurement, project staff recruitment, LoAs, and financial transactions in accordance with FAO’s clearance/approval procedures; (v) review procurement and subcontracting material and documentation of processes and obtain internal approvals; (vi) be responsible for the management of project resources and all aspects in the agreements between FAO and the various executing partners; (vii) provide operational oversight of activities to be carried out by project partners; (viii) monitor all areas of work and suggest corrective measures as required; (ix) submit to the GEF Coordination Unit, the TCID Budget Group and the LTO semi-annual financial reports on the use of the GEF resources (due 31 July and 31 January). These reports will show the amount budgeted for the year, amount expended since the beginning of the year, including un-liquidated obligations (commitments), and details of project expenditures on an output-by-output basis, reported in line with project budget lines as set out in the project budget included in the Project Document; (x) be accountable for safeguarding resources from inappropriate use, loss, or damage; (xi) be responsible for addressing recommendations from oversight offices, such as Audit and Evaluation; and (xii) establish a multi-disciplinary FAO Project Task Force to support the project.

The FAO Lead Technical Unit (LTU). The Forest Assessment Management and Conservation Division (FOM) of FAO's Forestry Division will be the LTU for this project and will provide overall technical guidance to its implementation. FOM will delegate the responsibility for direct technical supervision to the FAO Office in Ankara, under direct supervision of the FAO Country Office.

FAO Lead Technical Officer (LTO). The Senior Forestry Officer in the FAO Country Office will be the LTO for the project. Under the general technical oversight of the LTU, the LTO will provide technical guidance to the project team to ensure delivery of quality technical outputs. The LTO will coordinate the provision of appropriate technical backstopping from all the concerned FAO units represented in the Project Task Force. The Project Task Force is thus composed of technical officers from the participating units (see below), operational officers, the Investment Centre Division/GEF Coordination Unit and is chaired by the BH. The primary areas of LTO support to the project include:

- (i) review and ensure clearance by the relevant FAO technical officers of all the technical Terms of Reference (TOR) of the project team and consultants;
- (ii) ensure clearance by the relevant FAO technical officers of the technical terms of reference of the Letters of Agreement (LoA) and contracts;
- (iii) lead the selection of the project staff, consultants and other institutions to be contracted or with whom an LoA will be signed in consultation with MoE;
- (iv) review and clear technically reports, publications, papers, training material, manuals, etc.;
- (v) monitor technical implementation as established in the project RF;
- (vi) review the Project Progress Reports (PPRs) and the annual Project Implementation Review (PIR).

A multidisciplinary Project Task Force will be established by the Budget Holder and comprised of technical units in the Country Office and FAO Headquarters, the Subregional office for Central Asia (SEC), and the GEF Coordination Unit. Participating units from across FAO will be involved in supporting the project's work and in ensuring that the project stays on track to achieve its overall objectives and indicators of success. When appropriate, these units within the Sub-regional Office for Central Asia and HQ will provide technical support in areas such as: forest and sustainable land management, climate smart agriculture, gender, climate change vulnerability assessment and adaptation. The Asia and Pacific Service (TCIB) of the FAO Investment Centre Division will provide adaptive management support and results-based management oversight and guidance to the LTO and the participating units.

Oversight

The FAO GEF Coordination Unit in Investment Centre Division will review and approve PPRs, annual PIRs and results-based financial reports and budget revisions. The GEF Coordination Unit will organize annual independent supervision missions, in consultation with the LTU, LTO, the BH and TCIB. The PIRs will be included in the FAO GEF Annual Monitoring Review submitted to GEF by the GEF Coordination Unit. The GEF Coordination Unit will work closely with the FAO Evaluation Office (OEDD) to ensure that the project's mid-term review and final evaluations meet GEF requirements by reviewing evaluation ToRs and draft evaluation reports. Should the PIRs or mid-term review highlight risks affecting the timely and effective implementation of the project, the GEF Coordination Unit will work closely with the BH and LTO to make the needed adjustments in the project's implementation strategy.

The Investment Centre Division Budget Group (TCID) will provide final clearance of any budget revisions.

The FAO Finance Division will provide annual Financial Reports to the GEF Trustee and, in collaboration with the GEF Coordination Unit and the TCID Budget Group, call for project funds on a six-monthly basis from the GEF Trustee.

c. Project technical, coordination and steering committees

Steering Committee

A Project Steering Committee (PSC) will be established and co-chaired by MFWA and MFAL. A deputy general director from relevant general directorates will be members of the PSC (see the table below) with the participation of the FAO representative and observers from NGOs and the Private Sector when needed. The PSC will meet at least two times per year and its specific responsibilities will be: (i) overall oversight of project progress and achievement of planned results as presented in six-monthly Project Progress Reports; (ii) take decisions in the course of the practical organization, coordination and implementation of the project; (iii) facilitate cooperation between NPIU/MFWA and project participating partners and project support at the local level; (iv) advise the NPIU on other on-going and planned activities facilitating collaboration between the Project and other programmes, projects and initiatives in Turkey; (v) facilitate that co-financing support is provided in a timely and effective manner; and (vi) review six-monthly Project Progress and Financial Reports and approve AWP/B.

<i>Member Organization</i>	<i>Organization Representative (Job title/position) (e.g. Deputy Director General)</i>
Ministry of Forestry and Water Affairs (MFWA)	One member from each; General Directorate of Combating Desertification and Erosion (ÇEM), General Directorate of Forestry (OGM), General Directorate of Nature Conservation and National Parks (DKMPGM).
Ministry of Food, Agriculture and Livestock (MFAL)	One member from each; General Directorate of Agrarian Reform (TRGM), General Directorate of Agricultural Research and Policies (TAGEM), General Directorate of Vegetative Production.
FAO	One representative from FAO.

National Project Implementation Unit

The National Project Implementation Unit (NPIU) will have staff from MFWA and MFAL, be hosted by MFWA and will be responsible for day-to-day project operations. The role of the NPIU will be, in close consultation with the PSC and independent expert group (IEG) members (see below), to ensure the coordination and execution of the Project through the timely and efficient implementation of annual work plans. The NPIU will act as secretariat to the PSC. It will coordinate work and follow closely the implementation of project activities, handle day-to-day project issues and requirements, coordinate project interventions with other on-going activities and ensure a high degree of provincial and local inter-institutional collaboration, monitor project progress and ensure the timely delivery of inputs and outputs. It will organize workshops and annual meetings for the Project for monitoring project progress and develop work plans with detailed budget for the next year to be approved by the PSC. It will be responsible for implementing the project's M&E plan, managing its monitoring system and communication programme, the elaboration of six-monthly Project Progress and Financial reports and assist in the preparation of the annual Project Implementation Review (PIR) and midterm and final evaluations. Project Progress Reports on implemented activities and progress in achieving project outputs and outcomes, and financial statements of expenditures and status for the previous year will be submitted together with the Annual Work Plan and detailed Budget (AWP/B) to the PSC and FAO via Project Director.

The NPIU will consist of the following MFWA and MFAL staff financed by the MFWA and MFAL co-financing: (i) a part-time National Project Director (funded by MFWA) in charge of overall coordination and supervision of the project and coordination with other sector departments; (ii) a full time SFM Technical Officer (funded by MFWA); and a full time SLM Technical Officer (funded by MFAL), managing project information and documentation, and distribution of project reports, newsletters and training materials to relevant stakeholders; managing project M&E, conducting regular field M&E visits to project sites, and assisting the National Project Manager (see below) in

preparing six-monthly Project Progress Reports monitoring progress in achieving project outputs and outcome indicators, and in liaising with FAO Representation's Finance and Administrative Assistant (for preparing financial reports). MFWA will also provide office space, equipment and utilities and part of travel as a counterpart contribution to project management.

Project Management Team

To further strengthen the NPIU the GEF resources will finance (i) a full-time National Project Coordinator in charge of project daily management and technical supervision including, preparing "Annual Work Plan and Budget (AWP/B)" and allocating tasks to Field Office, preparing TORs and technical requirements for consultancy services contracting documents and material and equipment procurement documents, providing technical supervision and guidance to the Field Office in implementing project activities, conducting regular field supervision visits and provide on-site guidance to oblast/rayon technical staff, day-to-day coordination and communication with Field Office staff in charge of the GEF project, and preparing the project progress reports; (ii) an Operations, Finance and Procurement/Administrative Assistant (based in the FAO Representation) in charge of preparing detailed budgets for cash transfer requests based on the AWP/B and project account cash balance, keeping the financial records and regular review of the project account, reviewing the receipts and financial reports submitted by field office and sub-contractors and preparing six-monthly financial statement of expenditures, preparing the personnel and services contracting and procurement documents and participate in contracting and procurement processes including of submission of documentation to FAO for ex-antes clearances, and preparing relevant documents for internal and external financial audits.

The Field Office will be responsible for pilot site activities and work under supervision of the NPIU. The Field Office will be established in Konya (also responsible for Karaman). The Field Office will work closely with local stakeholders and resource user associations and reporting to the NPIU.

Independent Technical Expert Group

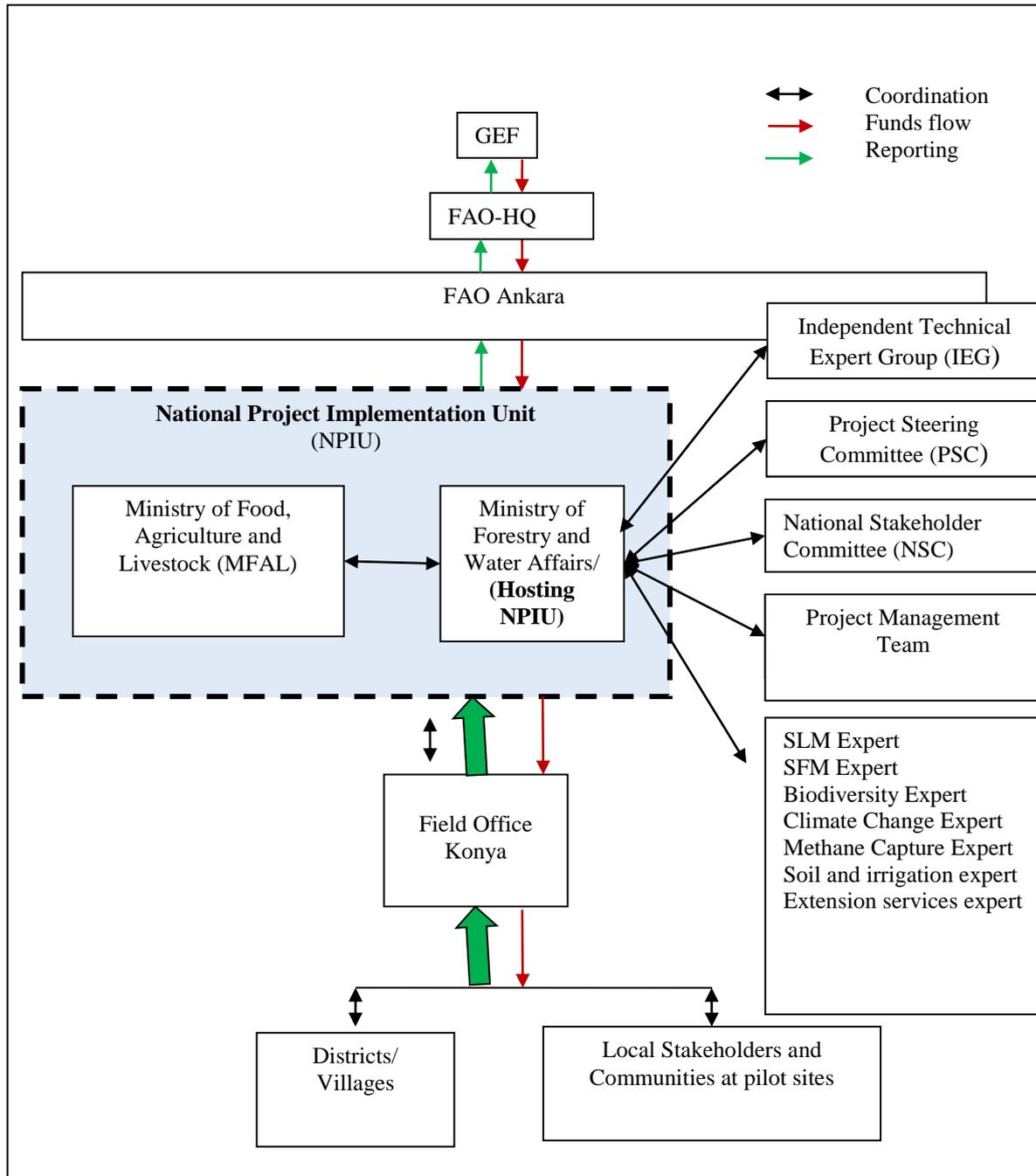
An Independent Expert Group (IEG) will be established to provide technical advice on specific project components and outputs and may among others be composed of MFWA and MFAL technical staff representing all departments participating in the Project (e.g., General Directorate of Forestry; General Directorate of Combating to Desertification and Erosion Control, General Directorate of Agrarian Reform, etc.), technical staff from other sector departments of the oblasts involved in the management and/or use of the land and forest resources at the pilot sites, Konya and other research institutions, and FAO. The main tasks of the IEG will be to provide technical advice to the PSC, backstop the NPIU on request, advise the NPIU on other on-going and planned activities and facilitate collaboration between the Project and other programmes, projects, and initiatives of sector agencies and research institutions. The IEG may also be involved in technical evaluation of project progress and outputs, and identification of possible solutions and/or changes in project activities when technical issues arise in the course of project implementation.

National Stakeholder Committee

The National Stakeholder Committee (NSC) will: (i) provide advice on relevant policies, actions and measures in particular related to participation of local communities at the pilot sites in the 2 provinces and 6 districts; (ii) provide new ideas and thinking on conflict resolution over management of natural resources, options for increased carbon sequestration and sustainable use, and creative initiatives on how to increase public awareness of socio-economic and global environmental benefits generated by SFM and SLM; and (iii) promote communications between the government agencies and local communities and the private sector. The composition of the NSC will include representatives from local farming and herding communities, municipal, Leader Farms Associations, Universities, involved in tree plantation, farming, pasture management and conservation. The National Stakeholder

Committee will meet back-to-back with the PSC to provide consolidated advice on stakeholder participation and engagement.

d. Organizational chart



4.3 Financial Planning and Management

4.3.1 Financial plan (by component, outputs and co-financier)

Component/output	MFWA	MFAL	FAO	Nature Conservation Centre	Konya Sugar	Total Co-financing	% Co-financing	GEF	% GEF	Total
Component 1: Capacities built to rehabilitate currently degraded forest and rangeland	8,600,000			700,000	1,000,000	10,300,000	0.82	2,171,500	0.18	12,570,500
Output 1.1 Degraded range and forest lands rehabilitated using innovative technologies and practices	8,600,000				1,000,000	9,600,000	0.91	1,026,500	0.09	10,625,500
Output 1.2 Decision-making tools for range and forest lands established and delivering SLM, BD, and CC benefits				700,000		700,000	0.37	1,145,000	0.63	1,845,000
Component 2. Capacities built to apply climate smart agriculture techniques across productive landscapes	500,000	7,700,000		1,100,000		9,300,000	0.79	2,372,500	0.21	11,710,000
Output 2.1 Innovative agricultural land rehabilitation technologies produce SLM, CC, and BD benefits	500,000	5,000,000		1,100,000		6,600,000	0.80	1,567,500	0.20	8,200,000
Output 2.2 Demonstration of innovative methane capture and agriculture production technologies generate SLM, CC, and BD benefits waste.		2,700,000				2,700,000	0.77	805,000	0.23	3,510,000
Component 3. Strengthening enabling environment for multiple benefits from sustainable land management			500,000			500,000	0.37	881,000	0.63	1,381,500
Output 3. Institutional integrated management capacity building			250,000			250,000	0.68	115,000	0.32	365,000

programme established for national and local level decision-makers										
Output 3.2 Comprehensive SLM and CSA extension and awareness programme emplaced			250,000			250,000	0.33	505,000	0.67	755,000
Output 3.3 Project monitoring and carbon monitoring system based on EX-ACT established							-	261,500	1.00	261,500
Project Management	1,000,000	1,000,000	200,000			2,200,000	0.88	325,000	0.12	2,525,000
Total Project	10,100,000	8,700,000	700,000	1,800,000	1,000,000	22,300,000		5,750,000		28,050,000

Sources of Co-financing for baseline project	Name of Co-financier	Type of Co-financing	Amount (\$)
Turkish Government	MFWA	In-kind	1,000,000
Turkish Government	MFWA	Cash	9,100,000
Turkish Government	MFAL	In-kind	1,000,000
Turkish Government	MFAL	Cash	7,700,000
GEF IA	FAO	Cash	500,000
GEF IA	FAO	In-kind	200,000
Private Sector	Konya Sugar	In-cash	1,000,000
Civil Society	Nature Conservation Centre	In-cash	1,600,000
Civil Society	Nature Conservation Centre	In-kind	200,000
Total Co-financing			22,300,000

GEF Agency	Type of Trust Funds	Focal Area	Country Name/ Global	(in \$)		
				Project amount (a)	Agency Fee (b)	Total c=a+b
FAO	GEF	CC	Turkey	2,040,909	204,091	2,245,000
FAO	GEF	BD	Turkey	859,091	85,909	945,000
FAO	GEF	LD	Turkey	2,850,000	285,000	3,135,000
Total GEF Resources (excluding project preparation)				5,750,000	575,000	6,325,000

4.3.2 GEF/LDCF/SCCF inputs

The GEF funds will finance inputs needed to generate the outputs and outcomes under the Project. These include: (i) local and international consultants for technical support and Project management; (ii) support to designing and piloting SLM/SFM activities; (iii) support to direct monitoring and conservation activities; (iv) LoA/contracts with technical institutions and service providers supporting the delivery of specific Project activities on the ground; (v) international flights and local transport and minor office equipment; and (vi) training and awareness raising material.

4.3.3 Government inputs

Government in-kind co-financing will mainly consist in staff time, office space and utilities, and support for local travel.

4.3.4 FAO inputs

FAO co-financing will be used to support technical assistance. FAO will provide the following co-financing: US\$ 500,000 cash and US\$ 200,000 in-kind.

4.3.5 Other co-financiers inputs

Private enterprises, and particularly farmers and ranchers, participating in the co-management models will contribute with parallel financing in terms of their time and experience. They will also provide inputs by supporting much of the financial risk associated with shifting from land degrading to SLM supportive practices.

4.3.6 Financial management of and reporting on GEF/LDCF/SCCF resources

Financial Records. FAO shall maintain a separate account in United States dollars for the Project's GEF resources showing all income and expenditures. Expenditures incurred in a currency other than United States dollars shall be converted into United States dollars at the United Nations operational rate of exchange on the date of the transaction. FAO shall administer the Project in accordance with its regulations, rules and directives.

Financial Reports. The BH shall prepare six-monthly project expenditure accounts and final accounts for the project, showing amount budgeted for the year, amount expended since the beginning of the year, and separately, the un-liquidated obligations as follows:

1. Details of project expenditures on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document, as at 30 June and 31 December each year.
2. Final accounts on completion of the Project on a component-by-component and output-by-output basis, reported in line with project budget codes as set out in the Project document.
3. A final statement of account in line with FAO Oracle Project budget codes, reflecting actual final expenditures under the Project, when all obligations have been liquidated.

The BH will submit the above financial reports for review and monitoring by the LTO and the FAO GCU. Financial reports for submission to the donor (GEF) will be prepared in accordance with the provisions in the GEF Financial Procedures Agreement and submitted by the FAO Finance Division.

Budget Revisions. Semi-annual budget revisions will be prepared by the BH in accordance with FAO standard guidelines and procedures.

Responsibility for Cost Overruns. The BH is authorized to enter into commitments or incur expenditures up to a maximum of 20 percent over and above the annual amount foreseen in the Project budget under any budget sub-line provided the total cost of the annual budget is not exceeded.

Any cost overrun (expenditure in excess of the budgeted amount) on a specific budget sub-line over and above the 20 percent flexibility should be discussed with the GCU/TCIB with a view to ascertaining whether it will involve a major change in Project scope or design. If it is deemed to be a minor change, the BH shall prepare a budget revision in accordance with FAO standard procedures. If it involves a major change in the Project's objectives or scope, a budget revision and justification should be prepared by the BH for discussion with the GEF Secretariat.

Savings in one budget sub-line may not be applied to overruns of more than 20 percent in other sub-lines even if the total cost remains unchanged, unless this is specifically authorized by the GCU upon presentation of the request. In such a case, a revision to the Project document amending the budget will be prepared by the BH.

Under no circumstances can expenditures exceed the approved total Project budget or be approved beyond the NTE date of the project. Any over-expenditure is the responsibility of the BH.

Audit. The Project shall be subject to the internal and external auditing procedures provided for in FAO financial regulations, rules and directives and in keeping with the Financial Procedures Agreement between the GEF Trustee and FAO.

The audit regime at FAO consists of an external audit provided by the Auditor-General (or persons exercising an equivalent function) of a member nation appointed by the Governing Bodies of the Organization and reporting directly to them, and an internal audit function headed by the FAO Inspector-General who reports directly to the Director-General. This function operates as an integral part of the Organization under policies established by senior management, and furthermore has a reporting line to the governing bodies. Both functions are required under the Basic Texts of FAO which establish a framework for the terms of reference of each. Internal audits of imprest accounts, records, bank reconciliation and asset verification take place at FAO field and liaison offices on a cyclical basis.

4.4 Procurement

Careful procurement planning is necessary for securing goods, services and works in a timely manner, on a "Best Value for Money" basis, and in accordance with the Rules and Regulations of FAO. It requires analysis of needs and constraints, including forecast of the reasonable timeframe required to execute the procurement process. Procurement and delivery of inputs in technical cooperation projects follow FAO's rules and regulations for the procurement of supplies, equipment and services (i.e. Manual Sections 502 and 507). Manual Section 502: "Procurement of Goods, Works and Services" establishes the principles and procedures that apply to procurement of all goods, works and services on behalf of the Organization, in all offices and in all locations, with the exception of the procurement actions described in Appendix A – Procurement Not Governed by Manual Section 502. Manual Section 507 establishes the principles and rules that govern the use of Letters of Agreement (LoA) by FAO for the timely acquisition of services from eligible entities in a transparent and impartial manner, taking into consideration economy and efficiency to achieve an optimum combination of expected whole life costs and benefits ("Best Value for Money").

As per the guidance in FAO's Project Cycle Guide, the BH will draw up an annual procurement plan for major items which will be the basis of requests for procurement actions during implementation. The plan will include a description of the goods, works, or services to be procured, estimated budget and source of funding, schedule of procurement activities and proposed method of procurement. In situations where exact information is not yet available, the procurement plan should at least contain reasonable projections that will be corrected as information becomes available.

4.5 Monitoring and reporting

4.5.1 Oversight and monitoring responsibilities

Monitoring and evaluation of progress in achieving project results and objectives will be done based on the targets and indicators established in the Project Results Framework. Monitoring and evaluation activities will follow FAO and GEF monitoring and evaluation policies and guidelines. The project Monitoring and Evaluation Plan has been budgeted at USD \$182,000 (see Table 8)

At the initiation of implementation of the GEF Project, the NPIU will set up a project progress monitoring system. Participatory mechanisms and methodologies for systematic data collection and recording will be developed in support of outcome and output indicator monitoring and evaluation. During the inception workshop M&E related tasks to be addressed will include: (i) presentation and clarification (if needed) of the project's Results framework with all project stakeholders; (ii) review of the M&E indicators and their baseline; (iii) drafting the required clauses to include in consultants' contracts to ensure they complete their M&E reporting functions (if relevant); and (iv) clarification of the respective M&E tasks among the Project's different stakeholders. One of the main outputs of the workshop will be a detailed monitoring plan agreed to by all stakeholders based on the monitoring and evaluation plan summary.

The day-to-day monitoring of the Project implementation will be the responsibility of the PMO driven by the preparation and implementation of an AWP/B followed up through six-monthly PPRs. The preparation of the AWP/B and six-monthly PPRs will represent the product of a unified planning process between main project partners. As tools for results-based-management (RBM), the AWP/B will identify the actions proposed for the coming project year and provide the necessary details on output targets to be achieved, and the PPRs will report on the monitoring of the implementation of actions and the achievement of output targets. NR-specific inputs to the AWP/B and the PPRs will be prepared based on participatory planning and progress review with local stakeholders and coordinated through the PMO and facilitated through project planning and progress review workshops. An annual project progress review and planning meeting should be held. Subsequently the AWP/B and PPRs are submitted to the PSC for approval (AWP/B) and Review (PPRs) and to FAO for approval. The AWP/B will be developed in a manner consistent with the project's Results Framework to ensure adequate fulfillment and monitoring of project outputs and outcomes.

Following the approval of the Project, the project's first year AWP/B will be adjusted (either reduced or expanded in time) to synchronize it with an annual reporting calendar. In subsequent years, the FSP work plan and budget will follow an annual preparation and reporting cycle.

4.5.2 Indicators and information sources

To monitor project outputs and outcomes including contributions to global environmental benefits specific indicators have been established in the Results Framework. The framework's indicators and means of verification will be applied to monitor both project performance and impact. Following FAO's monitoring procedures and progress reporting formats data collected will be of sufficient detail to be able to track specific outputs and outcomes and flag project risks early on. Output target indicators will be monitored on a six-monthly basis and outcome target indicators will be monitored on an annual basis if possible or as part of the mid-term and final evaluations. The project output and outcome indicators have been designed to monitor on-the-ground impacts and progress in building and consolidating capacities.

The main sources of information to support the M&E program will be: (i) participative progress monitoring and workshops with beneficiaries; (ii) on-site monitoring of implementation; (iii) project progress reports prepared by the PMO; (iv) consultants reports; (v) participants training tests and evaluations; (vi) mid-term and final evaluations completed by independent consultants; (vii) financial

reports and budget revisions; (viii) Project Implementation Reviews prepared by the FAO Lead Technical Officer supported by the Project Task Manager in the FAO Office in Ankara and the PMO; (viii) FAO supervision mission reports; and (ix) post project impact and evaluation studies.

4.5.3 Reports and their schedule

Specific reports that will be prepared under the M&E program are: (i) Project inception report; (ii) project implementation strategy; (iii) Annual Work Plan and Budget (AWP/B); (iv) Project Progress Reports (PPRs); (v) annual Project Implementation Review (PIR); (vi) Technical Reports; (vii) co-financing Reports; and (viii) Terminal Report. In addition, assessment of the GEF Monitoring Evaluation Tracking Tools (METTs) against the baseline (completed during project preparation) will be required at midterm and final project evaluation.

Project Inception Report. After FAO approval of the project an inception workshop will be held. Immediately after the workshop, PMO will prepare a project inception report in consultation with the FAO Project Task Manager and other project partners. The report will include a narrative on the institutional roles and responsibilities and coordinating action of project partners, progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation. It will also include a detailed first year AWP/B, a detailed project monitoring plan based on the monitoring and evaluation plan summary presented in section 4.5.4 below, and a progress and completion report on all actions agreed in the mitigation plan of fiduciary risks (as referred to in section 3.2.2). The draft inception report will be circulated to FAO and the PSC for review and comments before its finalization, no later than three months after project start-up. The report should be cleared by the FAO Ankara, LTO, LTU and the FAO GEF Coordination Unit and uploaded in FPMIS by the LTO.

Project Implementation Workplan. Immediately following the inception workshop, the project will be tasked with generating a strategic workplan. The workplan will outline the general timeframe for completion of key project outputs and achievement of outcomes. The workplan will map and help guide project activity from inception to completion. To ensure smooth transition between project design and inception, the inception workshop and work planning process will benefit from the input of parties responsible for the design of the original project, including as appropriate relevant technical advisors.

Annual Work Plan and Budget (AWP/B). PMO will submit to the FAO Representation in Turkey a draft Annual Work Plan and Budget no later than 10 January. The AWP/B should include detailed activities to be implemented by project outputs and divided into monthly timeframes and targets and milestone dates for output indicators to be achieved during the year. A detailed project budget for the activities to be implemented during the year should also be included together with all monitoring and supervision activities required during the year. The draft AWP/B is circulated to and reviewed by the FAO Project Task Force, DWP/PMO incorporates eventual comments and the final AWP/B is sent to the PSC for approval and to the FAO for final no-objection and upload in FPMIS by the GEF Coordination Unit. (See AWP/B format in Execution Agreement Annex 4.B)

Project Progress Reports (PPR). PMO will prepare six-monthly PPRs and submit them to the FAO Representation in Turkey no later than July 15 (covering the period January through June) and 15 January (covering the period July through December). The 1st semester six months report should be accompanied by the updated AWP/B, for review and no-objection by FAO. The PPR are used to identify constraints, problems or bottlenecks that impede timely implementation and take appropriate remedial action. PPRs will be prepared based on the systematic monitoring of output and outcome indicators identified in the project's Results Framework Appendix 1). The FAO Project Task Manager will review the progress reports and collect and consolidates eventual FAO comments from the LTO, LTU, the GEF Coordination Unit, and the Budget Holder Office and provide these comments to the DWP/PMO. When comments have been duly incorporated the LTO will give final approval and submit the final PPR to the GEF coordination Unit for final clearance and upload in FPMIS.

Annual Project Implementation Review (PIR). The LTO supported by the LTU and the FAO Project Task Manager and with inputs from the PMO, will prepare an annual PIR covering the period July (the previous year) through June (current year) to be submitted to the GEF Coordination Unit for review and approval no later than 31 July. The GEF Coordination will upload the final report on FAO FPMIS and submit it to the GEF Secretariat and Evaluation Office as part of the Annual Monitoring Review report of the FAO-GEF portfolio. The GEF Coordination Unit will provide the updated format when the first PIR is due.

Technical Reports. Technical reports will be prepared as part of project outputs and to document and share project outcomes and lessons learned. The drafts of any technical reports must be submitted by PMO to the FAO Representation in Turkey who will share it with the LTO and LTU for review and clearance and to the GEF Coordination Unit for information and eventual comments, prior to finalization and publication. Copies of the technical reports will be distributed to the PSC and other project partners as appropriate. The final reports will be posted on the FAO FPMIS by the LTO.

Co-financing Report. PMO will be responsible for collecting the required information and reporting on in-kind and cash co-financing provided. PMO will submit the report to the FAO Representation in Turkey in a timely manner on or before 31 July covering the period July (the previous year) through June (current year).

GEF Tracking Tools. Following the GEF policies and procedures, necessary tracking tools will be submitted at three moments: (i) with the project document at CEO endorsement; (ii) at the project's mid-term evaluation; and (iii) with the project's final evaluation or final completion report.

Terminal Report. Within two months before the end date of the Execution Agreement PMO will submit to the FAO Representation in Turkey a draft Terminal Report. The main purpose of the final report is to give guidance at ministerial or senior government level on the policy decisions required for the follow-up of the Project, and to provide the donor with information on how the funds were utilized. The terminal report is accordingly a concise account of the main products, results, conclusions and recommendations of the Project, without unnecessary background, narrative or technical details. The target readership consists of persons who are not necessarily technical specialists but who need to understand the policy implications of technical findings and needs for insuring sustainability of project results. Work is assessed, lessons learned are summarized, and recommendations are expressed in terms of their application of best principles and practices within the context of national priorities as well as in practical execution terms. This report will specifically include the findings of the final evaluation. A final project review meeting should be held to discuss the draft terminal report before it is finalized by the PMO and approved by the FAO LTO, LTU and the GEF Coordination Unit.

4.5.4 Monitoring and evaluation plan summary

Table 8 below provides a summary of the main M&E reports, responsible parties and timeframe.

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Inception Workshop	PMO, FAO Project Task Manager (PTM) supported by the FAO LTO, BH, and the GEF Coordination Unit	Within two months of project start up	US\$ 19,000
Project Inception Report	PMO, FAO PTM cleared by FAO LTO, LTU, and the GEF Coordination Unit	Immediately after workshop	Covered under PMO responsibilities, valued at \$2,000
Field based impact monitoring	PMO and relevant line agencies.	Continually	US\$ 70,000, for national consultant

Type of M&E Activity	Responsible Parties	Time-frame	Budgeted costs
Supervision visits and rating of progress in PPRs and PIRs	PMO, FAO LTO/LTU and GEF Coordination Unit	Annual or as required	The visits of the FAO LTU and the GEF Coordination Unit will be paid by GEF agency fee. The visits of the PMO will be paid from the project travel budget
Project Progress Reports	PMO, with inputs from project partners	Six-monthly	Covered under PMO responsibilities, valued at US\$ 6,000
Project Implementation Review report	PMO supported by FAO PTM, LTO, LTU, and project partners and cleared and submitted by the GEF Coordination Unit to the GEF Secretariat	Annual	Covered under PMO/PTM responsibilities, valued at US\$10,000. FAO officers' time cover by GEF agency fee
Co-financing Reports	PMO	Annual	Covered under PMO responsibilities, valued at US\$ 5,000
Technical reports	PMO	As appropriate	
Mid-term Evaluation	External Consultant, FAO independent evaluation unit in consultation with the project team including the GEF Coordination Unit and other partners	Conducted and completed during project months 23 and 24	US\$ 40,000 for external consultant. In addition, either FAO staff time and travel or an additional consultant will be paid through the agency fee
Final evaluation	External Consultant, FAO independent evaluation unit in consultation with the project team including the GEF Coordination Unit and other partners	Conducted and completed during project months 45 and 46	US\$ 40,000 for external consultant. In addition, either FAO staff time and travel or an additional consultant will be paid through the agency fee
Terminal Report	PMO	Completed by project month 47	US\$ 10,000 for national consultant
Total Budget			US\$ 1820,000

4.6 Provision for evaluations

An independent Mid-Term Evaluation (MTE) will be undertaken during project months 23 and 24. The MTE will review progress and effectiveness of implementation in terms of achieving project objective, outcomes and outputs. Findings and recommendations of this evaluation will be instrumental for bringing improvement in the overall project design and execution strategy for the remaining period of the project's term if necessary. FAO will arrange for the MTE in consultation with project management.

The evaluation will, inter alia: (i) review the effectiveness, efficiency and timeliness of project implementation; (ii) analyse effectiveness of partnership arrangements; (iii) identify issues requiring decisions and remedial actions; (iv) propose any mid-course corrections and/or adjustments to the implementation strategy as necessary; and (v) highlight technical achievements and lessons learned derived from project design, implementation and management.

An independent Final Evaluation (FE) will be completed by project month 46. The FE will identify the project impacts and sustainability of project results and the degree of achievement of long-term results. This Evaluation will indicate future actions needed to sustain project results, expand on the existing Project in subsequent phases, mainstream and up-scale its products and practices, and disseminate information to responsible management authorities to assure continuity of the processes initiated by the Project.

The FAO Project Task Manager will prepare the first draft of the Terms of Reference for the mid-term and the final evaluations and consult with and incorporate comments from key project partners, including the FAO budget holder, the FAO Lead Technical Unit and Officer, and the FAO GEF Coordination Unit. Subsequently the TORs will be sent to the FAO Office of Evaluation for finalization, in accordance with FAO evaluation procedures and taking into consideration evolving guidance from the GEF Evaluation Office.

4.7 Communication of project results and visibility

Giving high visibility to the project and ensuring effective communications in support of the project's message has been addressed in a number of activities that have been incorporated into its design. The project will sponsor a series of quarterly workshops with the KCB to discuss on-going project activities. During these workshops, key stakeholders from both the private and public sector will report on their personal involvement with project related activities. Members of the press will be invited to key events such as workshops, field trips, and monitoring programs. The project will be creating farmer field schools through the pilot areas. Each of these schools will be using project generated information materials, further enhancing project visibility within the KCB and greater Turkey. The project will launch a website. The site will be designed as an information and learning portal. The project will sponsor several national and regional policy meetings and workshops. The project will have inception, mid-term and final results meetings at the pilot site, KCB, and Ankara levels. These events will expose mid and high-level decision makers to the project activities and results.

SECTION 5 – SUSTAINABILITY OF RESULTS

5.1 Social Sustainability

As detailed throughout this project document, the investment is designed to promote social sustainability. This includes making certain that more vulnerable sectors of society, such as women and the rural poor, benefit directly from project activities. The project will help rural communities work in a more cooperative manner to understand and identify environmental issues that might cause social instability. For instance, land degradation and climate change both increase economic risks and decrease social cohesion. By working to reduce land degradation and minimize the impacts of climate change, the project will be promoting social sustainability. This will also be improved by creating opportunities for stakeholder engagement and discussion, such as capacity building functions, farmer field schools, and activities related to land use planning.

5.2 Environmental Sustainability

The project in its entirety is designed to promote environmental sustainability. The project will result in both on-the-ground improvements that will be carried forward as well as policy improvements. This will have positive ramifications in terms of climate change mitigation/adaptation, SLM, and biodiversity conservation. All project activity is directed towards achieving improvements in ecosystem integrity and making certain that these improvements are supported and progress over time. This includes setting in place a comprehensive monitoring system linked to decision-making frameworks to make certain environmental sustainability is achieved.

5.3 Financial and Economic Sustainability

Each component has integrated within it a hand-over plan. This hand-over plan will specify the financial and economic factors required to carry forward project-initiated activities. The Government of Turkey and other stakeholders have shown a willingness to co-finance the project and a desire to fully absorb and continue identified best practices.

5.4 Sustainability of Capacities Developed

The project at all levels is designed to set in place not only mechanisms to support the sustainability of capacities developed but to continue to improve those capacities. This is particularly the case in terms of the Farmer Field Schools, monitoring programs, and land use planning initiatives. Each of these activities and all others are designed to grow, evolve and improve over time, all the while building and supporting capacities within the private and public sector to support SLM, CC mitigation/adaptation and biodiversity conservation.

5.5 Appropriateness of Technology Introduced

The project design benefited from the inputs of numerous national experts, government staff, and private stakeholders. Each of these parties had a hand in helping to define the types of technology that the project will support and introduce. This applies to sophisticated technologies such as methane capture and improved cultivation techniques as well as more mundane technologies such as the use of manure for fertilizer. Each technology has been scaled to match the technical and financial capacities of the participating stakeholder group.

5.6 Replicability and scaling up

This is fundamentally a demonstration project. Every element of this project is designed to create models that are appropriate for replication and pathways to facilitate replication and scaling up. At both the KCB and national level, representatives of both the MFAL and MFWA throughout the project design process have repeatedly expressed their desire to use this project to identify best practices and broadly apply lessons learned. These agencies stand ready provide the financial and technical support required to support replication and upscaling. This will be enhanced by decision-making and policy structures designed to encourage and facilitate replication and upscaling.

APPENDICES

Appendix 1: FAO/GEF Strategic Results Matrix

Objective/Outcome	Indicator	Start of Project Baseline	Project Mid-Term Target (if any)	End of Project Target	Means of Verification	Assumptions
<p>Project Objective:</p> <p>To improve agriculture and forest land use management through the diffusion and adoption of low-carbon technologies with win-win benefits in land degradation, climate change, and biodiversity conservation and increased farm profitability and forest productivity.</p>	<p>Land cover delivering global environmental benefits in the project target area as reported in the GEF LD tracking tool</p>	<p>16 650 hectares of vegetative cover</p> <p>1200 Kg C/ha/year of biomass</p> <p>30 trees per ha of tree density</p>	<p>30 000 hectares of vegetative cover</p> <p>1450 Kg C/ha/year of biomass</p> <p>40 trees per hectare of tree density</p>	<p>60 000 hectares of vegetative cover</p> <p>1600 Kg C/ha/year of biomass</p> <p>50 trees per ha of tree density</p>	<p>Independent evaluations</p> <p>Annual monitoring through EX-ACT tool</p>	<p>High-level ownership by MFWA and MFAL to apply reforms continues</p> <p>Substantial buy-in from private industry is sustained and expanded</p>
	<p>Avoided emissions and carbon sequestration delivering global environmental benefits in the project target area as reported in the GEF LD and CC tracking tools</p>	<p>20,000 of degraded forest targeted by the project</p> <p>No arable land under conservation agriculture due to project intervention</p> <p>No degraded rangelands and pastures under improved management due to project intervention</p> <p>No methane capture sites developed due to project intervention</p>	<p>10,000 Ha of degraded forest rehabilitated,</p> <p>20-25,000 ha of arable land under conservation agriculture</p> <p>15,000 of degraded rangelands and pastures under improved management</p> <p>8-10,000 tCO₂-eq avoided from methane capture sites</p>	<p>20,000 Ha of degraded forest rehabilitated, capturing 43,000 tons of CO₂eq per year</p> <p>40-50,000 ha of arable land under conservation agriculture, avoiding 23,000 tons of CO₂eq per year</p> <p>30,000 ha of degraded rangelands and pastures under improved management capturing 25,000 tons of CO₂eq per year</p> <p>8-10,000 tCO₂-eq avoided from methane capture sites</p>		

Objective/Outcome	Indicator	Start of Project Baseline	Project Target (if any)	Mid-Term Target	End of Project Target	Means Verification	of	Assumptions
	Number of hectares of forest, pasture, and arable land with biodiversity mainstreamed in management practices resulting from project investments at site level	Biodiversity mainstreamed into management practices covering: 0 ha forest 0 ha pasture 0 ha arable land	Biodiversity mainstreamed into management practices covering: 10,000 ha forest 10,000 ha pasture 10,000 ha arable land		Biodiversity mainstreamed into management practices covering: 20,000 ha forest 30,000 ha pasture 30,000 ha arable land			
	Spatial coverage of integrated natural resource management practices in wider landscapes as reported in GEF LD tracking tool	Spatial coverage of integrated natural resource management practices in wider landscapes: 0 million ha agricultural lands 0 million ha pasture lands 0 ha forests	Spatial coverage of integrated natural resource management practices in wider landscapes: 0 million ha agricultural lands 0 million ha pasture lands 0 ha forests		Spatial coverage of integrated natural resource management practices in wider landscapes: 2.2 million ha agricultural lands 1.8 million ha pasture lands 700,000 ha forests			

Objective/Outcome	Indicator	Start of Project Baseline	Project Mid-Term Target (if any)	End of Project Target	Means of Verification	Assumptions
Component 1: Rehabilitation of degraded forest and rangeland						
Outcome 1: Degraded forest and rangeland rehabilitated	Total emission reductions resulting from project related forest and rangeland management improvements	0 tCO ₂ eq mitigated as a result of improved range and pastureland management	-	66,000 tCO ₂ eq mitigated per year as a result of rehabilitated forests and improved range and pastureland management	Project reporting, in particular reports from FFS and from independent certification agents Independent evaluations Monitoring through Ex-Act tool	High-level ownership by MFWA and MFAL to apply reforms continues Substantial buy-in from private industry is sustained and expanded
	Hectares of rehabilitated forest land sequestering CO ₂ as a result of project investments	0 ha of rehabilitated forest land sequestering	10,000 ha of forest land rehabilitated	20,000 hectares of forest land rehabilitated		
	Hectares of degraded range and pasturelands rehabilitated as a result of project investments	0 ha of range and pastureland rehabilitated	10,000 ha of range and pastureland rehabilitated	30,000 ha of range and pastureland rehabilitated		
	Measureable global biodiversity benefits in the project target area as reported in the GEF LD tracking tool	Wetland in the pilot site is legally protected, but no ecological restoration plan is in place	Ecological restoration plan developed for 6,680 hectares of protected habitat	6,680 hectares of protected habitat managed under ecological restoration plan		
Output 1.1	Innovative rehabilitation technologies and practices introduced					
Output 1.2	Decision-making tools established					

Objective/Outcome	Indicator	Start of Project Baseline	Project Mid-Term Target (if any)	End of Project Target	Means of Verification	Assumptions
Component 2: Climate Smart Agriculture						
Outcome 2: Capacities built to apply climate smart agriculture techniques across productive landscapes	Total hectares under conservation agricultural practices as a result of project investments	0 hectares under project driven conservation agricultural practices	20,000 hectares under project driven conservation agricultural practices	40-50,000 ha under conservation agriculture practices	Project reporting, in particular Project Implementation Reports and impact evaluation reports	High-level ownership by MFWA and MFAL to apply reforms continues Substantial buy-in from private industry is sustained and expanded
	Total emissions reduced as a result of project driven conservation agricultural practices	0 tCO ₂ eq reduced as a result of project driven conservation agricultural practices	7,000 tCO ₂ eq reduced as a result of project driven conservation agricultural practices	23,000 tCO ₂ eq reduced as a result of project driven conservation agricultural practices		
	Total amount of GHG emissions reduced as a result of project driven livestock production improvements, including digesters	0 tons CH ₄ emissions reduced as a result of project driven livestock production improvements, including digesters	8,000 tons CH ₄ emissions reduced as a result of project driven livestock production improvements, including digesters	9,900 tons CH ₄ emissions reduced as a result of project driven livestock production improvements, including digesters	Independent evaluations	
	Number of livestock/poultry producers and number of livestock contributing to digesters as a result of project investments	0 livestock/poultry producers and 0 head of livestock contributing to digesters	20 livestock/poultry producers and 2,500 head of livestock contributing to digesters	50 livestock/poultry producers and 10,000 head of livestock contributing to digesters	Tracking tools	
	Average annual income from crop and livestock production as reported in GEF LD tracking tool remains constant	Average annual income of USD \$ 1 073 from crop and livestock production	Average annual income of \$ 1 180 from crop and livestock production	Average annual income of \$ 1 341 from crop and livestock production		

	and/or improves for farmer field school participants ¹					
Output 2.1 Innovative agricultural land rehabilitation technologies introduced						
Output 2.2 Innovative methane capture and agriculture production technologies introduced						

¹ Baseline, mid-term and final targets to be determined during project year one

Objective/Outcome	Indicator	Start of Project Baseline	Project Mid-Term Target (if any)	End of Project Target	Means of Verification	Assumptions
Component 3: Enabling legal, policy and institutional environment						
Outcome 3: Enabling legal, policy and institutional environment for land management strengthened	Number of farm and/or ranch households adopting improved practices that support biodiversity conservation, SLM, and climate change mitigation	Number of farm and/or ranch households adopting new practices that support biodiversity conservation, SLM, and climate change mitigation: 0	Number of farm and/or ranch households adopting new practices that support biodiversity conservation, SLM, and climate change mitigation: 150	Number of farm and/or ranch households adopting new practices that support biodiversity conservation, SLM, and climate change mitigation: 500	Project reporting, in particular Project Implementation Reports, reports evaluating training and awareness raising programs, reports based on Ex-Act implementation and reports from FFS	High-level ownership by MFWA and MFAL to apply reforms continues Substantial buy-in from private industry is sustained and expanded
	Number of FFS members	Number of FFS members: 0 males 0 females	Number of FFS members: 500 males 250 females	Number of FFS members: 750 males 500 females		
	Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score as reported in GEF LD tracking tool	Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score of 1	Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score of 2	Capacity strengthening to enhance cross-sector enabling environment for integrated landscape management score of 2	Independent evaluations Tracking tools	
	Forest policy enhancement score as reported in GEF LD tracking tool	Forest policy enhancement score of 2	Forest policy enhancement score of 2	Forest policy enhancement score of 3		
	Agriculture policy enhancement score as reported in GEF LD tracking tool	Agriculture policy enhancement score of 2	Agriculture policy enhancement score of 2	Agriculture policy enhancement score of 3		
	Number of pilot site level policy frameworks	0 pilot site level policy frameworks operationalized to	1 pilot site level policy framework operationalized to	1 pilot site level policy framework operationalized to		

	operationalized to integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes	integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes	integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes	integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes		
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Objective/Outcome	Indicator	Start of Project Baseline	Project Mid-Term Target (if any)	End of Project Target	Means of Verification	Assumptions
	Number of national policy frameworks operationalized to integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes	0 national policy frameworks operationalized to integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes	N/A	1 national policy framework operationalized to integrate SLM, BD, and CC based land use planning and monitoring across productive landscapes		
	Number of national level monitoring programs for CC, BD, and SLM to inform management decision-making	0 national level monitoring programs for CC, BD, and SLM	0 national level monitoring programs for CC, BD, and SLM	1 national level monitoring programs for CC, BD, and SLM		
Output 3.1	Institutional integrated management capacity building programme established for national and local level decision-makers					
Output 3.2	Comprehensive SLM and CSA extension and awareness programme emplaced					
Output 3.3	Project monitoring and carbon monitoring system based on EX-ACT established					

Appendix 2: Work plan

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Component 1: Rehabilitation of degraded forest and rangeland		MFWA & MFAL																
Output 1.1 Innovative rehabilitation technologies and practices introduced	A brief implementation strategy will be completed describing steps including refinement of pilot sites, detailing of monitoring priorities, listing of primary ecosystem services to be quantified, and definition of boundaries for land use plans and certification.	MFWA (Coordinating), MFAL																
	Preparation of a strategic rehabilitation plan to identify the current rehabilitation and management gaps and propose very targeted interventions designed to address root-cause needs.																	
	Rehabilitation of 20,000 ha of degraded forests with innovative techniques according to the plan.																	
	Supporting the local communities including the nomadic people with incentives that prevent communities from relapsing into behaviours that originally lead to degradation; and taking precautions that are increasing their living conditions.																	
	Rehabilitation of 10,000 ha of degraded rangelands that are within the forestlands according to the plan.																	
	Monitoring the success of the rehabilitation program.																	
Output 1.2 Decision-making tools for range and forest lands established	Production of soil carbon maps to help project stakeholders and others to assess and monitor the CC benefits of project interventions.	MFWA (Coordinating), MFAL																
	Completion of a functional management plan for the Mount Karacadağ and Ayrancı regions focusing on maintaining and/or rehabilitating ecosystem integrity in order to deliver SLM, CC, and biodiversity conservation benefits.																	

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	Generating a replication plan, identifying strategic locations within the KCB that would benefit from a similar planning exercise.																	
	Gathering a FSC certification for the forest and rangeland within at least one pilot area to be used as a training exercise so that public and private sector stakeholders can better understand the process, costs and benefits associated with certification.																	
	Developing an ecosystem services centered biodiversity integration system for the SLM focused management of production landscapes with planning and implementation decisions for different sectors including drought impact and vulnerability assessment on ecosystems and mitigation options.																	
	Preparing and implementing a comprehensive biodiversity monitoring system that is focusing upon indicator plant and animal species aiming at ascertaining the status of globally significant species.																	
	Ensuring the continuation of biodiversity integration and monitoring programs through preparing a way forward plan.																	
	Establishing a biodiversity and hydrology monitoring program and developing an ecological restoration strategy in order to re-establish the quality of wetland habitats and biodiversity values in Ereğli Marshes.																	
	Assessing the value of ecosystem services to proximate communities to describe how ecosystem services or lack-there-of impact the quality of life for stakeholders, particularly those reliant upon forest and rangelands for their livelihoods.																	
Component 2: Climate smart agriculture		MFAL & MFWA																
Output 2.1 Innovative agricultural land rehabilitation	Preparation of a strategic rehabilitation strategy to identify and select farms where demonstrations are	MFAL (Coordinating), MFWA																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
technologies introduced	most likely to show the cumulative restorative impacts; and identify and describe international best practices related to KCB specific restoration challenges with the participation of stakeholders and taking into account of local challenges, international best practices, and most strategic approaches.																	
	Implementation of the rehabilitation strategy in 40-50,000 ha arable land that may include interventions such as windbreaks, irrigation channel shade trees, reduced or no till farming practices, crop residue management, mulching, field traffic reduction, crop rotation approaches, drip irrigation, water harvesting, limited irrigation and drought resistant crops.																	
	Undertaking rehabilitation activities in 20,000 ha of pasturelands that may include interventions such as wind breaks, reclamation of saline soils (e.g. water leaching , gypsum), planting drought resistant and salt tolerant species such as saltbush and kochia, as well as rotational grazing/resting, use of halophyte species.																	
	Integrating the conservation of endangered Great Bustards into the management of arable lands in Sarayönü - Cihanbeyli pilot site followed by a dissemination strategy.																	
	Establishing the necessary monitoring structure in order to measure the success of rehabilitation implementations (such as wind erosion measurement system)																	
	Undertaking a comprehensive evaluation of pilot demonstrations, reporting the best practices and preparation of an up-scaling plan integrated with capacity development programs.																	
Output 2.2 Innovative methane capture and agriculture production technologies introduced	Investigation of current practices and identify specific opportunities within the project's pilot site area in terms of GHG emissions. This will include identifying participants, and completing a comprehensive	MFAL																

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
	business plan describing the investment requirements, potential returns, operational approaches, decision-making frameworks, management responsibilities, etc., as well as the intended climate change mitigation benefits.																	
	Establishment of several digesters aiming at methane capture of 10,000 CO ₂ eq with monitoring activities to make certain climate change mitigation levels are being reached accompanied by public outreach activities to make other potential groups of agricultural interests aware of the program and to create pathways for replication.																	
	Helping farmers to reduce emissions and alleviate climate change vulnerabilities in the field design and application of specific interventions by low or negative cost interventions. The possible interventions may include low carbon technologies, residue management, mulching, providing viable alternatives to the practice of burning crop residues, lowering water consumption, improving the efficiency of fertilizer use, reduced tillage, recuperation of degraded land, improved management of manure, adoption of agro-forestry practices.																	
	Increasing the ownership of GHG emission reductions techniques through training in farmer field schools.																	
	A way forward plan with best practices and guidelines will be prepared for the GoT to disseminate the results.																	
Component 3: Enabling environment for sustainable land management		MFWA & MFAL																
Output 3.1 Institutional integrated management capacity building programme established for national and local level decision-makers	Establishing the SLM board to ensure informed SLM decision making.	MFWA & MFAL																
	Undertaking a series of awareness raising and technical training activities targeting at the decision makers in the relevant ministries on SLM.																	

Output	Activities	Responsible institution/ entity	Year 1				Year 2				Year 3				Year 4			
			Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
Output 3.2 Comprehensive SLM and CSA extension and awareness programme in place	Conducting several training activities targeting the provincial and regional directorates of MFWA and MFAL staff on building appropriate institutional capacity in central and local level.	MFWA & MFAL																
	Establishing and operationalizing 5 Farmer Field Schools as a tool of capacity building in the region focusing upon issues related to ecosystem-based adaptation principles, knowledge of SLM, climate change, and biodiversity conservation with examples from all over the World. Using the Karapınar Station for Combatting Desertification as an awareness-raising center and strengthening the infrastructure accordingly.																	
	Developing implementation guidelines and directions and dissemination.																	
Output 3.3 Project monitoring and carbon monitoring system based on EX-ACT established	Setting up a monitoring system that can be used to inform decision-making to measure achievement of project indicators.	MFWA (coordinating), MFAL																
	Establishing a carbon monitoring system based on EX-ACT in Turkey.																	

Appendix 3: Results budget

Summary Budget by Component		
Comp 1	2,171,500	37.8%
Comp 2	2,372,500	41.3%
Comp 3	881,000	15.4%
Subtotal Comp 1 to 3	5,425,000	
Project Management	325,000	6.0%
TOTAL GEF Funds	5,750,000	100%

Appendix 4: Risk Matrix

See table in Sections 3.2.1

Appendix 6: Terms of Reference (TORs)

Position Titles	\$/Person Week	Estimated Person Weeks	Tasks to be Performed
For Project Management			
Local			
National Project Director			<p>Full time position. The National Project Director is funded by the government and ensures country ownership of the project by carrying out the following activities:</p> <ul style="list-style-type: none"> • Assume overall responsibility for the successful execution and implementation of the project, accountability to the Government and FAO for the proper and effective use of project resources; • Serve as a focal point for the coordination of projects with other Government agencies, FAO and outside implementing agencies; • Ensure that all Government inputs committed to the project are made available; • Supervise the work of the National Project Coordinator and ensure that the National Project Coordinator is empowered to effectively manage the project and other project staff to perform their duties effectively; • Select and arrange, in close collaboration with FAO, for the appointment of the National Project Coordinator; • Supervise the preparation of project work plans, updating, clearance and approval, in consultation with FAO and other stakeholders and ensure the timely request of inputs according to the project work plans; • Represent the Government institution (national counterpart) at the tripartite review project meetings, and other stakeholder meetings.
National Project Coordinator	US\$ 1000	170	<p>Full-time position. National Project Director will be responsible from overall coordination of the project to ensure the achievement of project results. This person is expected to have an experience on sustainable land management as well as biodiversity and ecosystem services.</p> <p>He/she will be responsible for overall management and implementation of the project on a day-to-day basis and for effective and efficient use of resources, as well as for facilitating information to the stakeholders and steering committee. He/she will be responsible from delivering technical support to the project team and project consultants in order to achieve project outputs.</p> <p>This person will also have responsibility on management of project budget and fulfillment of all project reporting according to the GEF and FAO principles.</p> <p>Moreover, this person will establish the links between project coordinators at Ministerial level, the steering committee and the stakeholder board. He/she will be ensuring the decision making is made in an informative</p>

			way across all levels.
Operations Officer			<p>The operations officer will provide support to the National Project Director and the National Project Coordinator to ensure the day to day activities are carried out in time, particularly in DEX projects where FAO is providing the government additional support services (procurement, financial management, contracting).</p> <ul style="list-style-type: none"> • Prepare annual and quarterly workplans and prepare ToR for all inputs; • Ensure all PMO staff and all consultants fully understand their role and their tasks, and support them in their work; • Oversee day-to-day implementation of the project in line with the workplans; • Assure quality of project activities and project outputs; • Organise regular planning and communication events, starting with inception mission and inception workshop; • Oversee preparation and implementation of M&E framework; • Oversee preparation and implementation of Project communication and knowledge management frameworks; • Prepare progress reports and all monitoring reports. <p>Lead interactions with stakeholders</p> <ul style="list-style-type: none"> • Liaise with government agencies and regularly advocate on behalf of the Project; • Coordinate project interventions with other ongoing activities, especially those of co-financers and other GEF projects; • Regularly promote the project and its outputs and findings on a national, and where appropriate, regional stage.
Procurement and Financial Associates	US\$ 1000	100	<p>Project procurement/finance officers will support National Project Director and National Project Coordinator in managing the administrative and financial issues. He/she will be ensuring that all information is accurate, relevant books are kept; reports are prepared and payments are done according to the FAO/GEF standards.</p> <p>In addition, the procurement associate will ensure that all procurement activities are in line with FAO's procurement rules and will be responsible for supporting the National Coordinator in the preparation and implementation of the project's annual procurement plans.</p> <p>This persons will be monitoring the project activities, budgets and financial expenditures and come up with standards for all project counterparts on applicable administrative procedures. This person will be responsible from preparation of procurement and recruitment processes. He/she will be assisting the</p>

			project team in terms of logistic issues as well as preparations for meetings, training and workshops.
International			
N/A			
Justification for travel, if any: Project director and project associates are expected to travel between Konya Closed Basin and Ankara regularly.			
For Technical Assistance			
Local			
Sustainable Forestry Specialist	US\$ 1000	40	<p>This person will be responsible from supporting the activities related to rehabilitation of forests. He/she will be establishing the necessary innovative approach to management of forests, afforested areas with an ecosystem based focus. This person will be responsible from fulfilling the relevant outputs under the component 1 and also giving support to the relevant extension services under the component 3.</p> <p>He/she will be contributing to the management planning activities that will be held in Karacadag and Ayranci regions.</p> <p>He/she is expected to have a background on forestry, land management, sustainable forestry methodology and forest ecology.</p> <p>This person will be working closely with international Forest and Grassland Specialist and National Project Director as well as Biodiversity Conservation Specialist and Pastureland Management Specialist.</p>
Sustainable Agriculture Specialist	US\$ 1000	40	<p>This person will be supporting the activities under the component 2 and partly component 3. He/she will be supporting the project team on delivering the outputs related to the sustainable agriculture activities and provide approaches that are integrating conservation of biodiversity and ecosystem services related to the arable lands.</p> <p>His/her main tasks will be providing the vision for the climate smart agricultural methodologies and development of necessary approaches, implementation and monitoring.</p> <p>This person is expected to have a background on sustainable agricultural practices, agro-biodiversity and ecosystem services concepts.</p> <p>This person will work closely with the international Climate Smart Agriculture Specialist, Soil and Water Resources Specialist as well as National Project Director.</p>
Biodiversity Conservation/Monitoring Specialist	US\$ 1000	40	The Biodiversity Conservation/Monitoring Specialist will be providing his/her expertise on integrating biodiversity conservation into the management approaches for production lands. He/she will be

			<p>working mainly to fulfill the activities under the component 1 and component 2.</p> <p>This person will be working with the National Project Director and other consultants to make sure that the biodiversity integration is placed in all levels of forestry and agricultural activities. Moreover, he/she will be establishing the methodology for biodiversity monitoring system, testing it and finally ensuring the implementation.</p> <p>This person is expected to have a background on biodiversity conservation, biodiversity monitoring, experience on working in agricultural areas as well as forestry practices.</p>
Pastureland Management Specialist	US\$ 1000	25	<p>This person will be supporting the activities under the component 1 and component 2 and partly component 3. He/she will be supporting the project team on delivering the outputs related to the restoration and management of pasturelands and providing approaches that are integrating conservation of biodiversity and ecosystem services to pasturelands.</p> <p>This person is expected to have a background on pastureland rehabilitation and management in dryland, sustainable agricultural practices, animal husbandry, working with shepherds.</p> <p>This person will work closely with the international Forest and Grassland Specialist as well as National Project Director.</p>
Methane Digester Technology Specialist	US\$ 1000	15	<p>Methane Digester Technology Specialist will be responsible from advising on the methane related issues under the Component 2 and partly capacity development activities related to the methane capture under the Component 3.</p> <p>This person is expected to advise on establishing the small-scale methane digesters in the villages. He/she is expected to provide the most suitable approaches in terms of facilities that are compatible with the existing circumstances and meeting the needs of villagers in the pilot sites.</p> <p>Moreover, this person is expected to provide the techniques for methane capture in the field and relevant capacity development programming for the Farmer Field Schools.</p> <p>The Methane Digester Technology Specialist will be working closely with the National Project Director as well as Sustainable Forestry Specialist and sustainable Agriculture Specialist.</p> <p>He/she is expected to have a proven experience on methane digesters as well as methane capture methods.</p>
Soil and Water	US\$ 1000	15	<p>This person will be supporting the activities under the</p>

Resources Specialist			<p>component 2 and partly component 3. He/she will be supporting the project team on delivering the outputs related to soil protection and irrigation efficiency.</p> <p>His/her main tasks will be detailing the activities targeting to improve the conditions of soil in agricultural and pasturelands as well as achieving efficiency in irrigation of arable lands in dry regions.</p> <p>This person is expected to have a proven background on soil protection, efficient irrigation systems and water harvesting.</p> <p>This person will work closely with the international Climate Smart Agriculture Specialist, Sustainable Agriculture Specialist and the National Project Coordinator.</p>
Extension Services Specialist	US\$ 1000	30	<p>This person is expected to program the capacity building activities under the component 3. The capacity building activities will be targeting three different groups: decision makers, technical staff within the local and central offices of ministries and the farmers/forest villagers.</p> <p>This person is expected to be experienced in designing training programs according to the target groups with the given targets. He/she will be working closely with project team and other consultants to prepare the capacity building approach. On the field demonstration activities will provide a suitable environment for capacity building activities and thus he/she should be integrating these demonstrations into the learning structure.</p>
Gender Specialist	US\$ 1000	10	<p>This person will be working to monitor and analyze the effect of project activities to the women in the KCB. Then he/she will be providing approaches, suggestions to minimize the negative effects of the project on women communities and maximize the know-how obtained from them.</p> <p>This person is expected to have a background on sociology and especially working with women. The Gender Specialist will be reporting to the National Project Director.</p>
Communication Specialist	US\$ 750	12	<p>Communication Specialist will be working closely with the National Project Director throughout the project period. He/she will prepare a communication plan that is compatible with the project plan. Then he/she will be helping the project team in the implementation of this strategy. This person will be advising on all audio-visual materials, press releases, guidelines and other communication materials to ensure that all these materials are in right structure to deliver the maximum effect in the targeted audience. He/she is expected to have a proven experience in communication.</p>
International			

Climate Smart Agriculture Specialist	US\$ 2500	15	<p>International Climate Smart Agriculture Specialist will be providing the high level vision for the activities under the component 2 and partly component 3. He/she will be supporting the project team in agriculture activities and provide approaches that are integrating conservation of biodiversity and ecosystem services related to the arable lands. He/she will be transferring the knowledge existing in the world in terms of climate smart agricultural activities in dry regions to Turkey.</p> <p>He/she will be the main actor on designing the agricultural approaches that will be implemented in the pilot sites that are integrating the ecosystem-based approaches. His/her experience on different countries will be helping the national team to apply the best and proven approaches according to the Turkey's conditions.</p> <p>This person is expected to have a proven background on climate smart agricultural practice as well as agrobiodiversity and ecosystem services concepts.</p> <p>This person will work closely with the Sustainable Agriculture Specialist, Extension Services Specialist as well as the National Project Coordinator.</p>
Forest and Grassland Specialist	US\$ 2500	7	<p>The Forest and Grassland Specialist will be responsible from providing the high level vision for the activities related to rehabilitation of forests and pasturelands. He/she will be establishing the necessary innovative approaches to the rehabilitation and management of forests and afforested areas with an ecosystem-based focus that is integrating the biodiversity and ecosystem services in the planning and management approaches. This person will be responsible from fulfilling the relevant outputs under the component 1, component 2 and partly component 3 in terms of providing the capacity development needs for the relevant stakeholders/beneficiaries.</p> <p>He/she will be contributing to the management planning activities that will be held in Karacadag and Ayranci regions. This person is expected to transfer the existing international experience from regions with similar conditions.</p> <p>This person will be working closely with Sustainable Forest Specialist, Pastureland Management Specialist and National Project Director as well as Biodiversity Conservation Specialist.</p> <p>This person is expected to have a proven background on forestry, management of upland forests and pasturelands as well as ecology and ecosystem services.</p>
<p>Justification for travel, if any:</p> <p>The international specialist are expected to have at least two international travels to Turkey. Other specialists will be traveling to the KCB according to their work plan and responsibilities.</p>			

Appendix 7: Environmental Screening and Environmental Management Plan

Environmental Screening Checklist

Would the project, if implemented:	Yes	No	Unable to determine
1. Have significant adverse impacts on public health or safety?		X	
2. Have significant or controversial environmental effects on biophysical resources such as land, water, soil, biodiversity?		X	
3. Have adverse impacts on unique characteristics, such as wilderness, natural rivers, aquifers, prime farmlands, wetlands, floodplains, or ecologically significant areas?		X	
4. Have adverse impacts on traditional practices or agricultural systems in the area?		X	
5. Have highly uncertain and potentially significant environmental and social impacts with unique or unknown risks?		X	
6. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental and social impacts?		X	
7. Set in motion or contribute to a progressive accumulation of significant environmental and social impacts?	X		
8. Have adverse impacts (direct or indirect) on natural habitats such as wetlands, mangroves, tropical forests?		X	
9. Have adverse impacts on important national or international species (listed or proposed) or on critical species habitats?		X	
10. Have adverse impacts on local or indigenous populations residing in the area of interest?		X	

Would the project, if implemented:	Yes	No	Unable to determine
11. Contribute to introduction, continued existence, or spread of non-native invasive species or promote the introduction, growth or expansion of the range of non-native invasive species?		X	
12. Threaten national, local, tribal or indigenous peoples' requirements for use of natural resources or protection of the environment?		X	
13. Trigger or exacerbate unresolved land tenure conflicts concerning rights or alternative uses of natural resources?		X	
14. Have a disproportionate, significant adverse effect on low-income or disadvantaged populations?		X	
15. Restrict access to traditional or ceremonial sites or adversely affect the physical integrity of such religious sacred sites?		X	
16. Have adverse impacts on natural resources or properties of historic or cultural significance?		X	
17. Lead to significant impacts indicated by a national, district or local community group?		X	
18. Have the potential to be controversial because of stakeholder disagreement?		X	
19. Encourage migration or other population shifts?		X	
20. Increase the workload of local communities or subgroups within the communities?		X	
21. Work in opposition with ongoing socio-economic development goals or efforts?	X		
22. Require Capacity Development of affected or involved individuals and organizations? Require Capacity Development to review and update of policies, laws, regulations, or to develop partnerships?		X	

Please answer the following questions:

1. Are the personnel preparing this form familiar with the site?
2. Are the personnel familiar with the populations living in or near the site?
3. List the name of those who have conducted or will conduct site visits and the dates (*N.B. If a Category B rating is made and no site visit is expected, then please explain*):

Yes
Yes

No
No

CERTIFICATION

Project Category A or B	Yes	No
I affirm the completion of an analysis of the potential environmental and social impacts for this project and certify it to be in Category B . The analysis included information to assess the potential negative and positive impacts and is addressed in the project design through appropriate prevention or mitigation measures. (Attach documentation).	X	
I affirm the completion of an analysis of the potential environmental impacts and have determined this project should be classified as Category A . (Attach documentation).		X

Title, name and signature of project leader:

Date:

24/7/2014


Aytegül Alan Assistant Pmo Representative

Environmental Management Plan

Specific impacts for attention	Probability of impacts ¹ /description	Significance of impacts ²	Likely affected population ³ /natural resources ⁴ /economic ⁵ effects	Preventive actions and mitigation measures ⁶
<p style="text-align: center;">- 7 -</p> <p>Set in motion or contribute to a progressive accumulation of significant environmental and social impacts</p>	<ul style="list-style-type: none"> - Forest, rangeland and pasture rehabilitation [High] - Habitat protection [Medium] - Change of agricultural practices [Medium] - Certification of rangelands and forests [Medium] 	<p style="text-align: center;">High</p> <p style="text-align: center;">Low</p> <p style="text-align: center;">High</p> <p style="text-align: center;">Medium</p>	<ul style="list-style-type: none"> - Rural/poor farmers, shepherds, forest villagers - Water, soils, forests & pastures - Increased & diversified income, improved infrastructure (shepherds) 	<ul style="list-style-type: none"> - Strategic rehabilitation plan, including temporary fencing of forest land under rehabilitation - Farmer Field Schools (practical experience with designing, implementing and monitoring grazing and forest management improvements; stressing the use of low-cost ecosystem-based approaches to improve quality of life; diversify livelihood options) - Best practices for integrating biodiversity and ecosystem services conservation into management of production landscapes - Monitoring and capacity-building under all project components - Biodiversity monitoring system (indicator plants and animals; Government of Turkey to assume full responsibility prior to project close)
<p style="text-align: center;">- 21 -</p> <p>Work in opposition with ongoing socio-economic development goals or efforts</p>	<ul style="list-style-type: none"> - New crop pattern/rotation entering into competition with sugar beet, a strongly subsidized crop with high water consumption [High] 	<p style="text-align: center;">Medium</p>	<ul style="list-style-type: none"> - Professional (medium to large scale) farmers (no effect on subsistence farming) - Water and (agricultural) soils - Other crops with lower value but also lower water consumption 	<ul style="list-style-type: none"> - Awareness raising and capacity building exercise for government agencies and private sector (institutional and decision-making improvements) on new crop pattern/rotations that are compatible with water availability.

¹ Probability of impacts: high, medium, low

² Significance of impacts: high, medium, low

³ Likely affected population: category (poor, rural, urban, etc.), social system (indigenous), geographical distribution, etc.

⁴ Natural resources likely to be affected: water, soils, forests, coastal ecosystems, etc.

⁵ Economic effects: change in level of income, employment, etc.

⁶ Preventive actions and mitigation measures: project readjustment, institutional measures, other alternatives

Appendix 8: Extended Summary of Institutional, Policy and Regulatory Context

1. Project Relevant Institutional Management/Decision-Making Framework

Institution Name of Institution	Responsibilities Description and assessment of institution's management and development responsibilities
National	
Ministry of Forestry and Water Affairs (MFWA)	<p>Responsible for the supervision and management of the national forestry and ecological construction, making the principles and policies of the forestry and ecological construction, making development strategy, planning and drafting relevant laws and regulations, and supervising the implementation of the organization to carry out investigation, monitoring of forest, wildlife and wetland resources.</p> <p>On the other hand, MFWA is responsible for rational development and utilization of water resources, to develop the water conservancy strategic planning and policy, and the drafting of relevant laws and regulations, the preparation of the state for the important rivers and lakes, flood control planning, protection of water resources, water function zoning, organizational preparation of water conservation planning for the major rivers, lakes, and supervise the implementation of the approved waters assimilative capacity, proposed to limit the total amount of emissions, to guide the protection of drinking water sources, groundwater exploitation and urban planning area protection of groundwater resources management.</p> <p>Organizing, coordinating and guiding national wetland conservation, making wetland conservation planning, and national standards and regulations about wetland protection, organization and implementation of the establishment of wetland protection district, the wetland park protection and management, supervising the rational use of wetlands, to coordinate the relevant international Convention on Wetlands compliance work.</p> <p>Responsible for the supervision and management of the Forest Nature Reserves and water resources in accordance with the law to guide the construction and management of forests, wetlands, wildlife nature reserves, water resources management and is responsible for the protection of biodiversity.</p>
The Ministry of Food, Agriculture and Livestock (MFAL)	<p>Organization of agricultural resources divisions, ecological agriculture and agricultural sustainable development, guide for protection and management of agricultural land and fishing waters, rangelands, and agricultural biological species resources. Responsible for the development of animal husbandry, protection of fishery waters ecological environment and provide good conditions to develop the food safety regulations and control all stage of food production.</p> <p>Drafting of laws and regulations about plant and animal epidemic prevention and quarantine, signing intergovernmental agreements, agreements to develop standards, organization, supervision of domestic animals and plants epidemic prevention and quarantine work, publishing the epidemic and responsible for the organization of extinguishing.</p>
Ministry of Development	<p>Formulating and organizing the implementation of national economic and social development strategies, medium-and long-term plans and annual plans, co-ordination of economic and social development, put forward the national economic development objectives, policies and responsible for planning major construction projects and distribution of productive forces.</p> <p>Promoting the sustainable development strategy, making the plans and policy of resource conservation and utilization, coordinating the implementation of these plans participating in the major issues including preparation of plans of</p>

	ecological construction and environment protection, coordinating ecological construction, resource conservation and comprehensive utilization.
Regional (Provincial)	
Regional Directorate of Forestry	<p>Responsible for the supervision and management of the regional and province's forestry and ecological construction, and organize the survey, monitoring and evaluation of provincial forest resources.</p> <p>Organization, coordination, guidance, and oversight of the province's conservation work, development of province-wide forest, range land, natural parks, nature parks, nature conservation areas and wildlife resources; water resources, streams, lakes, ponds, and wetlands in the forests.</p> <p>Responsible for the supervision and management of forestry nature reserves, responsible for the protection of biodiversity, and undertake to carry out teaching and research into the regional and provincial nature reserve buffer.</p>
Regional Directorate of MFWA	<p>Responsible for the supervision and management of the regional and province's ecological construction, and organize the survey, monitoring and evaluation of provincial terrestrial wildlife resources, and the wetland resources.</p> <p>Organization, coordination, guidance, and oversight of the province's wetland conservation work, development of province-wide, regional wetland conservation planning, and provincial standards and regulations, organization and implementation of the establishment of the province's wetland reserve wetland park protection and management oversight rational use of wetlands; organization, guidance terrestrial wildlife resources protection and rational utilization.</p> <p>Responsible for the supervision and management of nature reserves, responsible for the protection of biodiversity, and undertake to carry out teaching and research into the provincial nature reserve buffer, enter the provincial nature reserves experimental area to visit and approval tourism.</p>
Provincial Directorates of MFAL (Konya and Karaman)	<p>Guide the protection and management of agricultural land and rangelands for agriculture and agricultural development. Responsible for the development of arable land and basic farmland quality protection and improvement of policies and guide the implementation and management of the quality of arable land in accordance with the law. The use of engineering facilities, agronomy, agricultural, biological, and other measures to develop crop and livestock development.</p> <p>The development and implementation of agro-ecological activities planning, guidance to improve of rural livelihood, to guide the development of agricultural biomass industry and agriculture and energy saving in rural areas, undertake guidance related to agricultural nonpoint source pollution control work. Delineation of the prohibited agricultural production area, guiding ecological agriculture cycle development of agriculture. Responsible for the protection of the ecological environment of the fishing waters. Led management of alien species.</p> <p>PDA is also responsible for dissemination of information about improving the conservation of natural resources and sustainability; improve of agricultural practices and farmers training activities.</p>
KOP Regional Development Administration (Konya, Karaman, Niğde, Aksaray)	Responsible for development of policies towards centralized and local policies and strategies regarding regional development, to increase the level of institutionalization of local authorities, and to guide and coordinate implementation of regional policies.
MEVLANA Development Agency (Konya, Karaman)	Responsible for contribution to regional and rural development studies by the way of capacity development and support those projects. To selected thematic subjects that will be subsidies by the national budget to improve the rural investments.

Regional Directorate of State Hydraulic Works (DSI) (Konya, Niğde, Karaman, Aksaray)	DSI is responsible for single and multiple utilization of surface and ground waters and prevention of soil erosion and flood damages in four provinces. DSI is responsible for the development of new irrigation projects that will be support water saving system in the existing irrigation schemes.
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2. Project Relevant Policy and Planning Framework

Title of Policy, Strategy, or Plan	Adoption Date	Description/Assessment of relevant strategy, policy or plan
National		
National Strategy Document on Combating Desertification (2013-2023)	2013	The mission of this strategy development study is to implement policy and programs which were developed in order to reduce to the negative impact of the drought and desertification, rehabilitation of degraded lands. Participation of local people, contribution for rural development and international dialogue are the main elements of this study.
Drought Strategy and Action Plan for Combating Agricultural Drought in Turkey (2013-2017)	2013	<p>“Combating Drought Strategy Action Plan (2008-2012) has been revised and “Drought Strategy and Action Plan for Combating Agricultural Drought in Turkey (2013-2017)” has been put in force. Main Objective of Combating Agricultural Drought</p> <ul style="list-style-type: none"> ➤ to create awareness to the public, ➤ to include all shareholders in the process, ➤ to ensure the sustainable use of agricultural water, take a necessary measures before the drought, ➤ to minimize the effects of drought by applying effective combating program during crisis. ➤ to develop an institutional structure that has reached ➤ to sufficient capacity, ➤ to realize combating under an integrated and comprehensive plan, ➤ to achieve a structure in which agriculture sector is affected by drought at minimum level.
Combating Erosion Action Plan (2013-2017)	2012	It is aimed to combat with erosion effectively in whole Turkey, to provide coordination in between agents and agencies which combat with erosion and efficient use of public resources. Working of all parts of the society and public agents and agencies in a coordinated way will be provided by Action Plan covering 2013-2017 years. In the scope of plan, afforestation, rehabilitation, erosion control rangeland rehabilitation works will be realized in 1.4 million hectares of land in 5 years in order to combating with erosion and maintenance work will be realized in 2,287,000 ha of land in afforestation and erosion control fields worked in the past.
Preparation of Basin Protection Action Plans	2011	Turkey has started to prepare its Basin Protection Action Plans in 2011. These plans will be completed by year 2013 to meet sustainable usage and protection of water sources in all 25 basins, with consideration of pollution, pressures and impacts, drinking water sources and protected areas. These Basin Protection Action Plans will be converted into River Basin Management Plans.
Climate Change Action Plan 2011-2023	2011	Turkey’s national vision within the scope of “climate change” is to become a country fully integrating climate change-related objectives into its development policies, disseminating energy efficiency, increasing the use of clean and renewable energy resources, actively participating in the efforts for tackling climate change within its “special circumstances”, and providing its citizens with a high quality

		of life and welfare with low-carbon intensity.
National Climate Change Strategy	2010	This strategy specifically addresses land use, agriculture and forestry strategies in its chapter on greenhouse gas (GHG) emission control. The proposed project will support many of the short, medium and long-term strategies identified for mitigating GHG emissions (e.g. improved agricultural techniques, adoption of proven technologies for carbon sequestration and/or absorption in soil (and monitoring) and methane gas capture, afforestation and rehabilitation of degraded lands with drought tolerant species and plant varieties).
National Rural Development Plan (2009-2013)	2009	Plan targets the conservation of agricultural areas, pastures and forests, including soil and water resources in areas that will be integrated into forest regimes. The Rural Development Plan underscores the relationship between rural poverty and natural resource degradation, recognizing a significant increase in recent years in erosion and degradation of land and water resources in the country, in many cases due to improper farming techniques and increasing climate variability (droughts, floods and landslides). To mitigate these processes, the Plan gives priority to strategies, measures and activities that address desertification and promote proper management of land and water land resources.
National Programme Afforestation and Erosion Control Mobilization Action Plan	2008 - 2012	This Plan foresees the rehabilitation of 2.3 million hectares, through afforestation, erosion control, pasture improvement (rehabilitation of pasture lands located in or around forest areas) and rehabilitation of degraded forests with the participation of all public institutions. Total cost of the plan is estimated to be US\$ 1.5 billion. Under the plan, it is planned to achieve 112,300 ha forest restoration works in Konya Closed Basin. The aim is to prevent erosion and land degradation, preserve soil and water resources, increase forested areas (thus decreasing greenhouse gases), enhance the mitigation methods for carbon emissions and mitigate the effects of climatic change. Despite these comprehensive objectives, implementation of the plan is mainly focused on quantitative achievements. Under the baseline plan, rehabilitation of degraded forest lands will continue to be quantity oriented and will lack meaningful incorporation of ecosystem-based qualitative practices and objectives such as biodiversity conservation and carbon sequestration into forest restoration works. Also lacking is a participatory approach and a simple and effective monitoring and assessment system. GEF resources will enable the MFWA to improve the ability of large scale land restoration works to generate global benefits while applying an integrated ecosystem-based approach for land management.
National Forestation Campaign Action Plan	2008	This action plan covers the years of 2008-2012. 2.3 million hectares of land will have been revised within the last five years. By courtesy of the plan, number of 300,000 rural resident populations will have been employed for six months in each year between 2008 and 2012. For the first twenty years period, 181.4 million tones of CO ₂ is estimated to be captured by Turkey's forests by means of mitigating the climate change. According to the FAO - Forest Resources Assessment (FRA) 2010 Report, Turkey has been the 5 th country in the world, in expanding its forests with the rate of 1.1%.
National Biodiversity Strategy and Action Plan	2007	This Strategy is a response to the obligation to prepare a national strategy for the purpose of guiding the implementation of the Convention on Biological Diversity. The aim of this Strategy is to identify and assess Turkey's biological diversity in brief, to determine a generally agreed strategy for conservation and to propose the actions required for achieving the goals of biological diversity conservation in Turkey. The Strategy is intended "to create a society that lives as part of nature that values biological diversity that does not consume more

		than what nature is capable of replacing, and that leaves to future generations a nature rich in biological diversity.
National Action Program on Combating Desertification	2006	Plan calls for identifying the causes of desertification and specifying appropriate responses for addressing the problems caused. The proposed project will contribute specific responses to address a number of the causes of desertification identified in the National Action Program, including (i) mismanagement of agricultural lands and inappropriate agricultural practices; (ii) unplanned, uncontrolled over-grazing of rangelands and pastures; (iii) the lack of due regard for botanical, cultural and physical soil conservation measures; and (iv) soil degradation from wind and water erosion.
National Environmental Action Plan	1998	Turkey has made great progress over the last fifteen years in creating mechanisms to address its environmental problems: the 1982 Constitution recognizes the right of citizens to live in a healthy and balanced environment; an Environment Act was passed in 1983; the Ministry of Environment was created in 1991; public awareness and demand for a clean environment are growing; and active non-governmental environmental organizations are emerging. Despite these positive developments, environmental issues have not been adequately incorporated into economic and social decisions. Turkey's Seventh Five Year Development Plan (1996 - 2000) recognizes this inadequacy and calls for development of a national environmental strategy. The Development Plan is the main instrument for coordinating government policies, including those for environmental management. The National Environmental Action Plan (NEAP) responds to the need for a strategy and can supplement the existing Development Plan with concrete actions for integrating environment and development. The goals of the NEAP are: <ul style="list-style-type: none"> ➤ better quality of life; ➤ increased environmental awareness; ➤ improved environmental management; and ➤ sustainable economic, social and cultural development.
Regional		
Konya Plain Project (KPP)	2001	The Konya Plain Project (KPP) is a comprehensive group of projects which includes construction of dams, hydroelectric power plants, and irrigation systems as well as providing developments in agricultural infrastructure, transportation industry, water supply, water budgeted, environmental impacts and in other issues. Konya Plain Project (KPP) is thought together with land consolidation studies in the region. The KPP comprises 47,720 km ² of area spreaded over 4 river basins in Konya closed basin. KPP includes four provinces (Konya, Karaman, Aksaray, Nigde) and consists of 12 projects including 9 big scale water projects, 2 water supply projects, energy projects, and a number of small scale surface and ground water irrigation projects.

3. Project Relevant Legal/Regulatory Framework

Law or Regulation Title	Adoption Date	Description/Assessment of Law/Regulation
National		
Regulation on the rules and procedures of the duties and functioning of the Agricultural	2012	This Regulation establishes an Agricultural Drought Management Board aiming at monitoring, performing risk assessments and reducing the effects of agricultural drought.

Drought Management Board.		The Regulation covers rules and procedures on the functioning and duties of the Agricultural Drought Management Board.
Regulation on Forestation	2012	Regulation includes main procedures and principles for forestation, erosion control, pasture improvement, seed production, seedling tree nursery, energy forestry.
Regulation amending the technical regulation on groundwater.	2011	This Regulation sets forth the technical rules and procedures of management of groundwater. The Regulation covers provisions on hydro geological research, application and issuing of permits for groundwater research and water treatment facilities. The Regulation also covers rules and procedures on preparation of irrigation plans and projects and preparing maps of groundwater systems as well as rules and provisions on the establishment of groundwater irrigation systems such as well, canal and tunnels. The Regulation finally defines sampling and analysis methods.
Regulation on Good Agricultural Practices	2010	Regulation includes main procedures and principles for (i) Agricultural production which does not give any damage to environment, human being and animal health, (ii) Protection of natural resources, (iii) Traceability and sustainability in agricultural production, and (iv) Safe food.
Regulation On Soil Pollution Control	2010	This Regulation includes; technical and administrative procedures and principles for preventing of soil pollution, determination of polluted and possibly polluted lands, monitoring and cleaning of polluted soil and lands.
Regulation on Environmental Impact Assessment (EIA)	2008	The purpose of this Regulation is to determine and assess all impacts of the activities that real and legal person plans to carry out, covered hereby, on environment and to regulate administrative and technical methods and principles to be conformed with in Environmental Impact Assessment in order to preclude negative impacts within environmental sector. It defines what environmental activity an EIA is required; administrative and technical methods to be conformed; working methods and principles; institutions and bodies entitled to issue EIA report, etc. Annexes specify requirements to be satisfied in order to perform any activity relevant with environment.
Agricultural Law (5488)	2006	The purpose of this Law is to determine agricultural sector and rural area development plans and strategies in line with the policies and regulations supporting agricultural development. The Law defines the principles, objectives and priorities of agricultural policies, training and advisory services for farmers, protection of biodiversity and genetic resources; and ensuring biosecurity and biosafety. The Law also covers provisions on product councils, producer organizations and rural development. Furthermore, the Law outlines duties, principles and objectives of the Agricultural Support and Guidance Committee. The Law finally specifies measures to be taken to prevent pests and infectious diseases affecting plants.
Regulation on the Principles and Implementation of Organic Farming.	2005	This Regulation amends some provisions of the previous one. The representative of the controlling and/or certification agencies for Turkey should preferably be an Agricultural Engineer, and these agencies should conform to Turkish Accreditation criteria and to EN 45011. The controlling and/or certification agencies, managers, partners,

		<p>controllers and employees are not allowed to engage in organic farming commercially. Apprentice controllers neither are allowed to perform single handed controlling nor prepare controlling reports. Controlling courses are organized by the Ministry of Agriculture and Rural Affairs once a year when deemed necessary.</p>
Regulation on Protection of Wetlands	2005	<p>Regulation includes main principles about protection of all wetlands whether they have international importance or not, improvement and, cooperation and coordination of authorized institutions based on International Ramsar Agreement.</p>
Soil Conservation and Land Use Law (5403/ 5578)	2005, rev. 2007	<p>This Law sets forth the rules and principles for determining land and soil resources and their classification, preparing land utilization plans, preventing non-purpose utilization, and defining the tasks and obligations to ensure land and soil preservation. Soil Preservation Boards are established in each province to examine, assess and monitor the activities related to the preservation, development and productive utilization of lands. Lands are classified as absolute farming lands, special croplands, cultivated farming lands and marginal farming lands. Except for objectives and circumstances clearly defined in the Law, farming lands cannot be used for any purpose other than the one defined in the utilization plans. These exceptions are specified in the Law. Areas that are deteriorated or likely to be deteriorated due to natural or artificial incidents will be classified as erosion-sensitive areas. In order to rationalize land utilization, land aggregation projects will be prepared and implemented either with the consent of the majority of land owners or by a government decree, if deemed necessary, regardless of receiving any consent.</p>
Regulation on wildlife preservation and wildlife development areas.	2004	<p>The objective of this regulation is to define the procedures and principles regarding the establishment, management, inspection and permitted activities of wildlife preservation and development areas. Areas chosen for wildlife preservation should be large enough to accommodate large population of migrating animals. Areas that could be proclaimed as wildlife preservation areas are proposed by the regional directorate of the Ministry of Environment and Forestry, accompanied by a survey report. Areas found appropriate by the General Directorate of Nature Preservation and National Parks are proclaimed as wildlife preservation area by the Ministry of Forestry for areas under the forestry regime, and by the Council of Ministers for all other areas. Wildlife preservation areas are managed by the regional directorate of the Ministry of Environment and Forestry, in accordance to management and development plans. These plans are prepared by the General Directorate of Nature Preservation and National Parks. Activities other than specified in the management plans are not allowed in those areas, and constructions of any kind that could damage the ecosystem and objectives of the areas are prohibited. Measures against any possible diseases in wildlife preservation areas are taken by the General Directorate of Forestry and by the Ministry of Agriculture and Rural Affairs. Hunting is not allowed until the holding capacity of the area is exceeded. Gaming rules and timing are determined by the General Directorate of Nature Preservation and National Parks.</p>

Organic Farming Law (5262)	2004	The purpose of this Law is to support organic farming and maintain consumer safety. The Law sets up the principles and procedures of organic farming and defines the rules and procedures of inspection and control; and certification. The Law further covers provisions on duties and obligations of the Ministry of Agriculture and Rural Affairs on supervision of organic farming and of organic products.
Pasture Law (4342)	1998	This Law sets forth basic procedures and rules for the defining and allocation of pasture areas to various villages and municipalities. The Ministry of Agriculture and Rural Affairs is authorized to determine the boundaries of pastures and their allocation to relevant entities. The procedure for this application is clearly defined in the Law. The finalized boundaries are then recorded to corresponding title deeds. Allocation process is renewed every five years. Area that can only be used after an improvement process can be leased to individuals and companies who would undertake their improvement. Areas that are allocated under this Law cannot be used for any other purposes unless a written consent is obtained from the Ministry of Agriculture, and this consent can only be given under specific conditions that are set in the Law. The Law also has provisions to prevent overgrazing in those areas. A "Pasture Fund" will be established under the direct management of the Ministry of Agriculture for financing the activities set forth in this Law.
National Mobilization Law for Forestation and Erosion Control (4122)	1995	The law includes procedures and principles for ;(i) Expansion of forest lands, (ii) Maintaining natural stability among soil, water and plants, (iii) Coordination of control measures for erosion which will be conducted by public institutions, people and nongovernmental organizations.
Regulation On Solid Waste Control	1991	The main purpose of this Regulation is to prohibit directly or indirectly delivering of polluter solid waste to habitat, storage and transfer. Also main principles in order to prevent polluters' permanent negative impact on water resources, soil, plants and animals are included.
National Parks Law (2871)(5919)	1983, rev. 2011	This Law sets forth the rules and procedures of the selection of national parks, natural monuments, nature parks, and nature reserve areas. The Law also sets forth the rules and procedures on the management, protection and development of these areas. It is consisted of 8 Chapters: (i) Purpose and definition; (ii) Selection, planning and nationalization; (iii) Granting of permissions; (iv) Duties; (v) Protection; (vi) National Park Fund; (vii) Penalties, and (viii) Final provisions. The Law defines the duties and responsibilities of each ministry and the Council of Ministers concerning the designation and nationalization of National Parks. It outlines the duties and responsibilities of the Ministry of Forestry and Water Affairs concerning the management and protection of national parks and granting permissions. The Law further covers rules to the protect the ecosystem and wildlife and to prevent soil, water or air pollution and prohibits construction of any building or facility as well as the production of forest products, pasturage and hunting that might harm the ecosystem and or biological diversity.
Environmental Law (2872)	1983	The objective of this Law is to protect and improve the environment which is the common asset of all citizens; make better use of, and preserve land and natural resources in rural

		and urban areas; prevent water, land and air pollution; by preserving the country's vegetative and livestock assets and natural and historical richness, organize all arrangements and precautions for improving and securing health, civilization and life conditions of present and future generations in conformity with economical and social development objectives, and based on certain legal and technical principles.
Forestry Law (6831)	1956	This Law sets forth the basic forestry legislation. The boundaries of protection forest are determined and declared to the surrounding villages. The conditions, principles and periods of designation of such forests and management, development, improvement and utilization principles and decisions are decided by the Ministry of Forestry and Water Affairs. The grazing of herds on the State forest lands should be done according to the plans and permission of the forestry administration. The costs of cutting, hauling, and stacking with tariff price and the necessities of the ones who are entitled to the right to building timber and the people among this group with poor status are determined by the board of village alderman with the participation of the forest chief considering the productivity of the forest and the requirements of the demanders. Private forests are managed and administered in accordance with management plans and maps undertaken by their owners and approved by the forest administration. A Reforestation Fund is established within the Ministry of Forestry and the Water Affairs for supporting reforestation/afforestation establishment and maintenance activities by the villagers.

Appendix 9: Baseline investments: climate change mitigation, land degradation, biodiversity conservation

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
Summary of Relevant Government Projects					
National Program on Afforestation and Erosion Control Mobilization Action Plan	MFWA	2008-2012	US\$ 1.5 billion for up to now.	This Plan foresees the rehabilitation of 2.3 million hectares, through afforestation, erosion control, pasture improvement (rehabilitation of pasture lands located in or around forest areas) and rehabilitation of degraded forests with the participation of all public institutions.	The existing knowledge and lessons learnt from the program must be integrated to the project's forest rehabilitation activities.
Biodiversity Inventory of Turkey	MFWA	August 2013 - 2018	US\$ 10,000,000 National	Identification of biodiversity of all provinces. The biodiversity inventory project is carried out in 32 provinces of Turkey in 2013 including Konya.	The results of the inventory can feed into the project.
Rehabilitation of Ereğli Marshes	MFWA	2013	US\$ 450,000	The Ministry has been working on the rehabilitation of Ereğli Marshes through establishing a permanent wetland cover. The process is undertaken by State Hydraulic Works of MFWA.	The project will undertake several activities in the wetland: A monitoring program will be established and further conservation measures will be suggested and implemented in order to achieve ecological restoration on top of physical restoration work.
Preparation of Drought Management Plan for Konya Basin.	MFWA	2013-2015	US \$ 1,126,681 KCB	The project aims to define the drought severity in Konya Basin. The project will prepare drought models for different time intervals.	The project should benefit from the results and approaches of this project. The same methodology and approach should be adopted within the project.
Anatolian Wild Sheep Conservation Station	MFWA	Continuous	US\$ ca. 150,000 per year KCB	Conservation of remaining wild sheep population and introduction of wild sheep to other regions of the country.	Any efforts on pasturelands can have relation with the populations in the wild.
Machinery Supports	MFAL	2004-2013	66,672,705	To enable farmers to benefit from technology.	Machinery supports on climate smart agriculture machines

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
					can be used throughout the project such as no till machines.
Seed supports	MFAL	2004-2013	43,565,993	To guarantee the use of best seeds for crop production.	
Livestock supports	MFAL	2004-2013	1,232,898,360	In order to support the livestock investments.	
Crop productions supports	MFAL	2004-2013	1,196,840,746	To support crop production investments.	
Direct income supports	MFAL	2004-2013	645,107,346	To support fuel, fertilizers and soil analyse implementations.	This supports can be used in the pilot sites of the project.
Other subsidies and programs	MFAL	2004-2013	736,206,631	To match other needs in agricultural applications.	
Range Reform Program	MFAL	2005 onwards	US\$ 10-15 million National	Program is taking into consideration degradation of rangelands and associated food security problem of increasing population. The reform program covers several measures including comprehensive legal framework, demarcation of range areas and regulation of use rights, allocation and use rules, increasing productivity through rehabilitation and maintenance, continuous surveillance, and protection.	The project activities should benefit from the existing experience of the program.
IPARD	MFAL, supported by EU	2015 onwards	NA	Conservation of Great Bustards in Polatlı TİGEM and in the surrounding villages. Subsidizing the farmers for the conservation of species.	Although the project is in outside the KCB, the continuation of the IPARD program can include Sarayönü Gözlü TİGEM and/or lessons learned form this project can directly feed into the conservation - management of Great Bustards and their habitats as well as subsidy mechanisms.
ÇATAK	MFAL	2006-2013	US\$ 17,665,000 National US\$ 7,000,000 KCB	Supporting agricultural practices and techniques that will contribute to the protection of soil and water quality, enhance the sustainability of renewable natural resources, combat erosion and reduce the	Lessons learned from ÇATAK can feed into the project activities. Moreover, the pilot site farmers can benefit from ÇATAK program.

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
				negative effects of agriculture. Up to now the program was implemented in 60,000 ha with more than 20,000 farmers benefiting. In Konya and Karaman, the program has supported 11,600 ha with a budget of 7 million US\$ between 2008-2013.	
Turkey Land Consolidation Program	MFAL	2008-2019	US\$ 660,000,000 National	The land consolidation activities have been carried out since 2008 by MFAL. The total area of consolidation has reached to 4 million ha. The GoT is planning to finalize the consolidation activities within 5 years. It provides benefits for the farmers, such as new and economical cultivatable parcels, wind breaks, field roads, ecological corridors, proper irrigation systems and reduction of input usage (fuel, fertilizer, water, etc.).	In the region land consolidation is being carried out around Ereğli region that will provide multi benefit. The project activities in Ereğli should be assessed in line with land consolidation activities.
Ereğli Land Consolidation	MFAL	2012-2014	US\$ 5,000,000 KCB	Ereğli part of national land consolidation activities. The project will be implemented in 47,000 ha.	In the region land consolidation is being carried out around Ereğli region that will provide multi benefit. The project activities in Ereğli should be assessed in line with land consolidation activities.
Ereğli Pressurized Irrigation scheme	SHW	2014-	US\$ 15,000,000 KCB	Pressurized Irrigation scheme is aiming to change the irrigation system existing in Ereğli from open channels to closed ones with pressurized irrigation systems in the farms.	The project activities should coordinate with the program.
Ayrancı Pressurized Irrigation scheme	SHW	2014	US\$ 25,000,000 KCB	Pressurized Irrigation scheme is aiming to change the irrigation system existing in Ayrancı region from open channels to closed ones with pressurized irrigation systems in the farms.	The project activities should coordinate with the program.

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
Soil Erosion and Carbon emission	TUBITAK	2012-	US\$ 100,000 KCB	The effect on soil erosion and carbon emission of alternative tillage	Widespread of experiences of the university on sustainable agriculture in public and private sector farms.
Reduce tillage and direct seeding	TUBITAK	2006-2010	US\$ 80,000 KCB	The application of reduced tillage and direct seeding in cereal production in Konya province	Widespread of experiences of the university on sustainable agriculture in public and private sector farms.
Liquid manure	TUBITAK	2006-2010	US\$ 80,000 KCB	The application of liquid manure injection in cereal production	Widespread of experiences of the university on sustainable agriculture in public and private sector farms.
Direct seeding	MEVKA	2012	US\$ 117,000 KCB	Conservation agriculture technologies and practices should be disseminated and transferred to farmers.	Widespread of sustainable agricultural practices among regional farmers.
Summary of GEF Funded Projects					
Integrated approach to management of forests in Turkey, with demonstration in high conservation value forests in the Mediterranean region	UNDP/GEF	2014-2017	US\$ 7,120,000 National	The project objective is to promote an integrated approach to management of forests in Turkey, demonstrating multiple environmental benefits in high conservation value forests in the Mediterranean forest region	The project will be undertaken mainly by the General Directorate of Forestry and its regional branch in Konya. Therefore a good coordination should be established between both projects to increase the benefit.
Alignment of Turkey's National Action Plan with UNCCD 10-Year Strategy and reporting process	FAO/GEF	2014	US\$ 136,986 National	The objective of the project is to assist Turkey in aligning its National Action Programme (NAP) under the UN Convention to Combat Desertification (UNCCD) with the UNCCD 10-year strategy and facilitate review and reporting processes for UNCCD.	The project will contribute to the strategic goals of the action plan as well as benefit from the strategic directions set in the NAP.
Conservation and Sustainable Management of Turkey's Steppe Ecosystems	FAO/GEF	2015-2018	US\$ 2,328,767 National	Project's objective is to improve the conservation and effective management of steppe ecosystems of Turkey through effective protected area management and streamlining of steppe biodiversity into the production landscapes. The project's PIF has been	

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
				prepared. The PPG process will start during 2014.	
National Component of the "Decision Support for SLM Upscaling" Project	FAO/GEF	2014-2016	US\$ 6,300,000 National	The project aim to mainstream DLDD and SLM best practices assessment into national sector policies and programs as well as undertaking local projects (as catalytical support for upsclaing of SLM best practices in countries and within regions) and using knowledge management and decisions support system and tools to support GEF-6 LD strategy formulation, DLDD and SLM global processes.	The project should benefit from the lessons learned identified in this project and methods suggested.
National Geospatial Soil Fertility and Soil Organic Carbon Information System	FAO	2012-2014	US\$ 550,000 National	The expected outcome of the project is a National Geospatial Soil Fertility and Soil Organic Carbon Information System for Turkey with reliable data and information on upper soil quality, fertility properties, SOC and chemical fertilizer consumptions. The Soil Fertility and Soil Organic Carbon information system will be the first at national level which can serve all institutions and organizations in Turkey.	In the project soil organic carbon maps is planned to be produced in KCB. Synergy with this project must be achieved.
Summary of Relevant Donor Projects (GTZ, SIDA, UNDP, World Bank, etc.)					
Adaptation of Forest Ecosystems and Forestry to Climate Change in Seyhan Basin: Ecosystem Services (Social), Biodiversity (Environmental) and Forest Products (Economic)	UN Joint Programme on Enhancing the Capacity of Turkey to Adapt to Climate Change	2010	US\$ 137,000 Seyhan Basin	The Project was run by Adana Regional Directorate of OGM and Nature Conservation Centre. Within the project two outputs were achieved: (1) Predictions for changes and vulnerabilities in forest ecosystems during climate change were developed and (2) adaptation capacity to climate change of forestry sector was developed. The project has produced the knowhow for The General Directorate of Forestry on adapting to climate that can be	The project has produced the knowhow for The General Directorate of Forestry on adapting to climate that can be benefitted within this project.

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
				benefitted within this project.	
Adaptation to Climate Change and Protection of Biodiversity through Conserving and Sustainable Use of Wetland in Turkey	Ministry of Environment, Nature and Nuclear Security of Germany and GIZ	2009-2011	US\$ 1,777,000 (1,300,000 Euro) National, with one of the pilot sites in KCB	A model for managing wetlands in Turkey that takes the influence of climate change into account is available.	Project created a know-how on wetland restoration and management in Konya region.
Summary of Relevant NGO and Private Sector Projects					
Adapting Mediterranean Forest to Climate Change	WWF Turkey (Implementing), WWF Int. & MAVA Foundation (Donor)	Jan 2013 – Dec 2016	US\$ 603,000 (452,000 Euro) KCB (Partly)	Partners of the project are UNDP Turkey, OGM and Nature Conservation Centre. The project aims to contribute to the long preservation of Med. forest and their capacity of delivering ecosystem services, crucial element to the wellness of the populations in the region.	Inclusion of WWF and its partners to the project activities, meetings in order to increase the effectiveness of the project actions, learning from the lessons of the project.
Life Plus Environment Program	Coca Cola Life Plus Foundation, UNDP, Nature Conservation Centre	2014 onwards	At least US\$ 1,500,000 (3,000,000 TL) KCB	To improve water holding capacity of soil; ensure the efficient use of land and water. To increase the capacity to use the ecosystem services in agriculture. Project activities have started in Karapinar region in 2013 and can be replicated in other sub-provinces in Konya.	The Life Plus Environment Program is in line with the Project objectives. FAO and MFAL are the partners of the program. Close cooperation with the project is a key action to be taken.
Integration of Biodiversity into Forestry Management	Nature Conservation Centre and General Directorate of Forestry, BTC Co. Turkey	2009-Onwards	Over US\$ 1,000,000 US\$ National	The project has been funded by BTC Pipeline company under its Environmental Investment Program. Nature Conservation Centre has prepared a biodiversity integration system for Turkey's forest. General Directorate of Forestry has adopted the system and has been implementing it for 3 years.	The project has biodiversity mainstreaming outputs. The existing experience of Nature Conservation Centre and General Directorate of Forestry and lessons learnt must be obtained.
Afforestation Campaign	TEMA Foundation	On-going	Amount not known	TEMA Foundation has been working to combat against erosion. The organization with its strong grass roots have been undertaking	The Foundation should be consulted to gather their experience on plantation activities as well as to benefit from their vision for

Title	Donor or Agency	Dates	Budget US\$	Project Objective and Primary Activities	Project Coordination Measures
				widespread plantation programs all over the Turkey.	combatting erosion.
Compost facilities	Sözenler/ Karapınar	2008	US\$125,000	Product of organic fertilizers	Methane capture
Drying of manure	Atak Tavukculuk/S arayönü	2011	US\$ 1,000,000	Product of organic fertilizers	Methane capture
Machinery Supports	MFAL	2004-2013	66,672,705	To enable farmers to benefit from technology.	Machinery supports on climate smart agriculture machines can be used throughout the project such as no till machines.
Seed supports	MFAL	2004-2013	43,565,993	To guarantee the use of best seeds for crop production.	
Livestock supports	MFAL	2004-2013	1,232,898,360	In order to support the livestock investments.	
Crop productions supports	MFAL	2004-2013	1,196,840,746	To support crop production investments.	
Direct income supports	MFAL	2004-2013	645,107,346	To support fuel, fertilizers and soil analyse implementations.	This supports can be used in the pilot sites of the project.
Other subsidies and programs	MFAL	2004-2013	736,206,631	To match other needs in agricultural applications.	

Table – Summary of completed GEF funded projects

Title	Donor or Agency	Dates	GEF Grant US\$	Project Objective and Primary Activities	Project Coordination Measures
4th Operational Phase of the GEF Small Grants Programme	UNDP/GEF	2009 - 2010	US\$ 42,714,900 Global	Global environmental benefits in biodiversity and climate change focal areas secured through community-based initiatives and actions.	N/A
Strengthening Protected Area Network of Turkey - Catalyzing Sustainability of Marine and Coastal Protected Areas	UNDP/GEF	2009 - 2014	US\$ 2,300,000 National	To facilitate expansion of the national system of marine and coastal protected areas and improve its management effectiveness.	N/A
Market Transformation of Energy Efficient Appliances in Turkey	UNDP/GEF	2009 - 2014	US\$ 2,710,000 National	To reduce the greenhouse gas emissions of Turkey by accelerating the	N/A

				market transformation towards more energy efficient building appliances.	
Promoting Replication of Good Practices for Nutrient Reduction and Joint Collaboration in Central and Eastern Europe	UNDP/GE F	2008-2010	US\$ 974,816 Regional	To codify existing knowledge and experience through identifying, capturing, analyzing, displaying, and promoting replication of good practices International Waters and Transboundary Water Governance-related projects.	N/A
National Capacity Self Assessment for Global Environmental Management (NCSA)	UNEP/GE F	2008-2009	US\$ 199,500 National	The primary objective of the NCSA was to identify country level priorities and needs for capacity building to address global environmental issues.	Completed
Enhancing Coverage and Management Effectiveness of the Subsystem of Forest Protected Areas in Turkey's National System of Protected Areas	UNDP/GE F	2008 - 2012	US\$ 972,000 National	The overall objective of the project is to conserve biodiversity and ensure sustainable use of natural resources in Kure Mountains as a contribution to the objectives of Turkey's National Biodiversity Strategy and towards global biodiversity conservation.	Completed
Strategic Partnership for the Mediterranean Large Marine Ecosystem-Regional Component: Implemen. of Agreed Actions for the Protection of the Environ. Resources of the Mediterr. Sea and Its Coastal Areas	UNEP/GE F	2008 - 2013	US\$ 12,891,000 Regional	To (i) ensure the overall coordination of the Strategic Partnership; (ii) to facilitate policy, legal and institutional reforms; (iii) to promote the regional dissemination of new approaches; (iv) to monitor the progress of the Strategic Partnership and the effectiveness of the stress reduction measures being promoted; and (v) to contribute to the implementation of the Stockholm NIPs.	N/A
Building Partnerships to	UNDP/GE	2007 -	US\$	To promote the	N/A

Assist Developing Countries to Reduce the Transfer of Harmful Aquatic Organisms in Ships' Ballast Water	F	2010	5,688,000 Global	development of regional partnerships that will implement coordinated long-term measures to minimize the adverse impacts of aquatic invasive species transferred through ships' ballast water on coastal and marine ecosystems, economy, human health and well-being.	
Enhancing Conservation of the Critical Network of Sites of Wetlands Required by Migratory Waterbirds on the African/ Eurasian Flyways.	UNEP/GE F	2006-2010	US\$ 6,000,000 Regional	This project aims to improve the conservation status of African/Eurasian migratory waterbirds, by enhancing and coordinating the measures taken to conserve key critical wetland areas that these birds require to complete their annual cycle, including their stop-over sites during migration and their stay in their "wintering grounds".	N/A
Control of Eutrophication, Hazardous Substances and Related Measures for Rehabilitating the Black Sea Ecosystem: Tranche 2	UNDP/GE F	2005-2008	US\$ 6,000,000 Regional	To support participating countries in the development of national policies and legislation and the definition of priority actions to avoid discharge of nitrogen and phosphorus to the Black Sea.	N/A
Consultation for National Reporting, Participation in the National Clearing House Mechanism and Further Development of the National Biodiversity Strategy and Action Plan	UNEP/GE F	2005-2007	US\$ 365,300 National	A. To prepare Second and Third National Reports to the Conference of the Parties of the CBD. B. To further develop the national Clearing House Mechanism, plus technical and scientific cooperation. C. To better incorporate the decisions and work programmes of the Conference of the Parties of the CBD	N/A

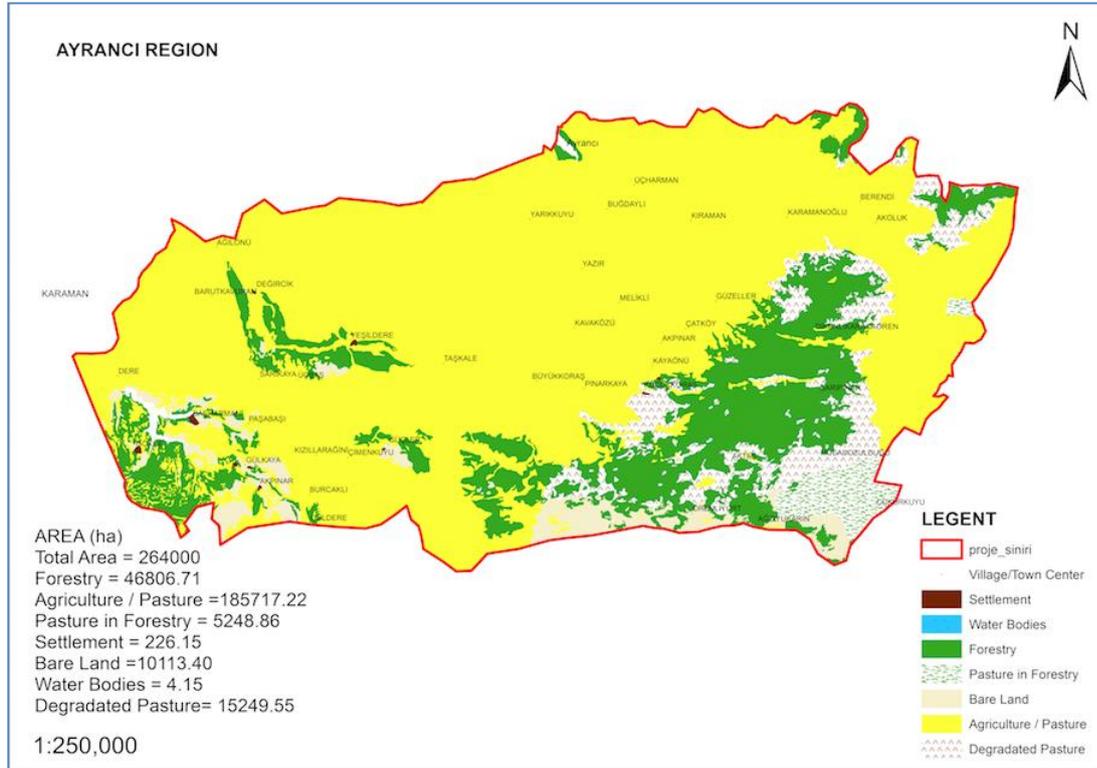
				into the National Biodiversity Action Plan.	
Enabling activities to facilitate early action on the implementation of the Stockholm Convention on POPs in the Republic of Turkey	UNIDO/GEF	2003 - ongoing	US\$ 469,700 National	The overall objective of the proposed Enabling Activities is to strengthen national capacity and capability to prepare a National Implementation Plan for the management of POPs.	N/A
Control of Eutrophication, Hazardous Substances and Related Measures for Rehabilitating the Black Sea Ecosystem	UNDP/GEF	2002-2004	US\$ 4,000,000 Regional	To prevent and remediate nutrient releases by evaluating the use of economic instruments, environmental regulations, strengthening public participation, monitoring of trends and compliance.	N/A
Biodiversity and Natural Resources Management Project	IBRD/GEF	2000-2008	US\$ 8,190,000 National	The project will support the establishment of effective management for biodiversity conservation and sustainable use in, and around, four priority protected areas.	Completed
Determination of Priority Actions for the Further Elaboration and Implementation of the Strategic Action Programme for the Mediterranean Sea	UNEP/GEF	2000-2006	US\$ 5,950,000 Regional	The Strategic Action Programme to Address Pollution from Land-Based Activities in the Mediterranean Region provides a broad framework for the implementation of mechanisms and measures that will lead to the protection of the marine environment, including its biological resources and diversity, from the effects of harmful land-based activities.	N/A
Developing the Implementation of the Black Sea Strategic Action Plan	UNDP/GEF	1997-2000	US\$ 1,790,000 Regional	To foster sustainable institutional and financial arrangements for effective	N/A

				management and protection of the Black Sea.	
In-Situ Conservation of Genetic Biodiversity	IBRD/GEF	1993-1998	US\$ 5,100,000 National	To identify and establish in-situ conservation areas for the protection of genetic resources and wild relatives of important crops and forest tree species that originated in Turkey.	N/A
Black Sea Environmental Management	UNDP/GEF	1992-1996	US\$ 693,750 Regional	To train officers in ODS monitoring and control, as well as establishment, operation and enforcement of licensing systems.	N/A

Appendix 10: Description of Project Sites

Pilot Site One: Ayrancı-Karaman

Map



1.1 General Site Description

The total size of the pilot site is 264,700 ha. The site is located in the south-eastern part of the KCB bordering the Karapınar-Ereğli pilot site. There is one province, which is called as Karaman and 1 district and also 18 villages in the pilot site. Average elevation differs between 1,000 - 1,800 meters.

The total area of the forests stands as 45,000 ha. In the pilot site, almost all of the forest tenure is public with a percentage of 99%. The main tree species are oak, locust, eleagnus, cedar, juniper and black pine. In Karacadağ, where the rehabilitation activities will be carried out, forest area covers 29,000 ha and includes pasturelands. This forest coverage is distributed in 150 compartments. Juniper and oak stands in Karacadağ belong to state but actual use rights are belonging to local people; that is the sites are owned by the state however GoT shares the usage rights to the local people.

The total area of cultivation is 44,768 ha and 37% of this is for cereals and 1.6% is for fodder crops. The pastureland area is 101,930 ha and approximately 90% of this is heavily degraded.

The main water resources in the pilot site are Divle creek, Buğdaylı creek and Koca Creek. These three creeks are discharging to Ayrancı Dam and the capacity of this dam is 30 million m³.

1.2 Social and Economic Factors

The total human population of the pilot site is 6,883 taking into consideration of people in the villages and towns. Detailed population numbers of the villages and towns are given in the table below.

The population trends in the region are available in the district level only. The population trends have been decreasing in the past decades according to the values of Ayrancı district. Karaman Province villages are very close to province center and their relation with agriculture is limited. Those villages can be assumed as sub-urban settlements. Population growth rate in Ayrancı districts between 2011 and 2012 was -0.16%. The population projections for 2023 estimates further decrease for Ayrancı. According to population projections, the population of Ayrancı will decrease 41%.

Average household population is 4.8 for Ayrancı villages and 3.8 for Karaman Province Central District villages. The trends have a tendency to decrease for both the villages and district center of Ayrancı.

District	Place	Population	District	Place	Population
	Buyukoras	201		Pınarkaya	404
	Kavakozu	314		Yarıkkuyu	195
	Kucukoras	242		Berendi	294
	Kayaonu	525	Karaman Province Central District	Yesildere (M)	955
	Akpınar	249		Sarikaya	29
Ayrancı	Melikli	258		Pasabağı	174
	Catkoy	333		Guldere	377
	Kıraman	844		Gucler	36
	Ucharman	313		Taskale(M)	707
	Bugdayli	115		Agilonu	318

The share of 15 - 65 age group that are known as the active population constitutes the 2/3 of the total population in the site. Moreover, the gender rates stands as 49.8% for males and 50.2% for females.

The average education levels are lower in the rural areas with respect to district centers as there are no schools other than primary schools. Therefore, higher education level people are living in the district centers. Illiteracy rate for Ayrancı district is 3.4%. Karaman province center villages have an advantage of easier access to higher schools with respect to the rural villages.

There is limited study about nutrition status in Turkey and these are mainly concentrated on city and district centers. In Turkey, there is no hunger problem in the rural areas as the people are self-sufficient in the rural region.

Depending on the agriculture characteristics, the average income level is lower in rural areas in comparison with district centers. It is well known that the living conditions of the some households in project site are under the average poverty value of Turkey. However, there is no data available to demonstrate that in the village level. On the other hand it can be said that income level for Karaman Province Centre villages higher than the Ayrancı district because of the additional employment possibilities in industrial and services sectors in Karaman province.

In the project site, main income sources are field crops and animal production. There is not any agriculture related industrial facilities in Ayrancı district. Karaman province is the main center for agro processing and agricultural input suppliers. There are so many agro processing industry facilities in Karaman Province, wheat process related products, meat products and fruit juice mainly. They sell their products are either in domestic or foreign markets.

The main economic activity and sector is agriculture in this pilot site. About 70% of the population is employed in the agricultural and livestock sectors and 30% in commercial and public services.

1.3 Natural Resource Management

In the pilot site there is no protected area in terms of wildlife and biodiversity. There are 2 key biodiversity areas in the project site. The pilot site covers all of the Yeşildere KBA and 5% of the Bolkar Mountains KBA.

Main government agencies in the project site are the Ayrancı district and Karaman province branches of MFAL. The main responsibility of the district branches is to follow up the annual plan and programs of the Province Directorate in the district level. Some of these duties are definition of arable lands, monitoring agricultural areas, and monitoring and assessment of subsidies given to the local farmers.

In Karaman province, besides the personnel working in the province and district levels, there are 24 extension staff. These experts will be main key actors in the implementation of the project activities; however, they will need to be trained according to the project focus area/issues. At the provincial level, there are total 230 and responsible mainly agricultural extension and animal health.

In Karaman, there is Directorate of Forestry under the Regional Directorate of OGM in Konya, which is responsible from all of the forest management in the project site. Besides, in Ayrancı, there is a local Branch of Directorate of Forestry that is responsible for the management of the forests in the region according to the management plans that are revised every 10 years.

Management capacity, Community/stakeholder outreach

Provincial agriculture master plan was prepared in 2008 and this plan is the main structure of agricultural activity planning in the Karaman province and districts. Karaman Province Directorate of the MFAL is preparing its annual plans upon this macro plan. Besides, cooperation programs are prepared with other relevant ministries for planning, implementation and M&E stages.

Wind erosion activities in Ayrancı has been started since 1970's and in this actions oak, cedar, juniperus, black pine, eleagnus and acacia were planted. By using these species sand mobility was prevented and stability ensured.

Projects/programs, including donor and NGO supported programs

In Ayrancı Region, a private company, UNSPED, has initiated its own agricultural program. Direct seeding techniques have been implemented in this facility with exported machineries since 2010. The company has invested 500,000 US\$ up to now.

There are several projects of the MFAL in the pilot site regarding the agriculture. These are aiming at to develop crop and fodder production, pasture management, extending the organic agriculture with a combined budget of ca 262,078 US\$ only for 2013. The findings and experience of these, project can support the Project implementations.

1.4 Justification for Site Selection

This pilot site is one of the most critical regions of the country due to the lack of water resources availability. Combined with the effects of wind erosion, the region faces a severe degradation in agricultural lands.

The total potential arable land is 81 095 ha, of this 44 768 ha are currently used for agricultural purposes. In 2013 about 68.5% (30 698 ha) of the total arable land was used for production and 32% of this amount was irrigated (9 839 ha). The total agricultural land has decreased by 5.3% within the last years due to emigration from the region. The main agricultural crops are cereals (wheat, barley and oat) and they cover 35% of the arable lands. Fodder crop production is increasing day by day in the project region.

GoT has been supporting the fodder crop production as well as livestock husbandry for the last 10 years. This has caused a change in agricultural patterns and crops like alfalfa, sugar beet, sunflower and maize need a substantial amount of water.

The Ayrancı Dam is the main surface water resource in the region. The capacity of the reservoir is 30 million m³ but, due to low precipitation levels, the dam has rarely reached its full capacity. In six of the last 13 years, the water level was only at one third of its total capacity. Due to the general water scarcity in the region, the total irrigated lands decreased from 17 098 ha to 9 839 ha in the last 10 years. In order to compensate for this gap, 247 wells were opened of which 36% are unlicensed. Furthermore, a significant amount of water is lost due open channels for irrigation. Due to the dry nature of the climate and to the limited storage capacity in the reservoirs, the orchard area has dropped from 1 589 ha (in 1989) to 1 046 ha (in 2009). However, as the amount of water stored in the reservoir was higher in recent years due to higher levels of precipitation, orchard lands increased again to 2 036 ha in 2013. The GoT's incentives towards fruit production have played a further role in this. About 7.9 million m³ of water were stored by the dam in 2008, 24 million m³ in 2009 and 30 million m³ in 2013 that is the full capacity. In this situation, about 30,000 ha of land could be irrigated but due to uncontrolled irrigation and incompatible crop-patterns a sustainable water supply cannot be ensured in the long-term. Moreover, the existing irrigation schemes are planned to be transferred from open channel to the pipe system in terms of saving and using water resources efficiently.

Wind erosion is another major problem affecting the farmlands in this area. It is seen mainly in the villages such as Dokuzyol, Büyükburun, Ambar and Kavuklar. The local soil categorized by a heavy texture (clay) and the rate of organic matter is about 0.8%. Therefore, a duff layer was established in the region. Moreover, wind erosion causes humidity loss from the topsoil, which is another factor contributing to the water scarcity in the region. As a result of agricultural mechanization (soil tillage, field trafficking), over-use of water in irrigation and wind erosion the agricultural lands of the region are heavily degraded. The intensified use of inputs such as fertilizers and chemicals has contributed to this degradation. This has decreased the organic content of the soil and increased its susceptibility to further wind erosion. The local branch of MFAL has prepared a project to establish wind breaks in consolidated lands around 7 villages.

In the region, lime content of the soil is around 35%, which is higher than average limits the nutrition uptake of plants. This is another reason for farmers to use more fertilizers but this approach is not sustainable in the long-term. In addition, crop rotation methods are not widely adopted in the region and vast areas of farmlands are left as fallow areas. This has caused a decrease in income levels of the local farmers and resulted in emigration from the area.

Land consolidation activities have been increasing in the project sites in the last years by the MFAL. 79 000 ha have been consolidated up to now and 115 000 ha is under planning. Land consolidation activities create very important benefits such as establishing wind breaks, field roads, ecological corridors, proper irrigation systems and savings from the decreased input usage (fuel, fertilizer, water, machinery etc.). The cost of land consolidation activities in Ayrancı is ca US\$ 15,800.

In the project site, the average age of the population is high, so the agricultural sector has not enough working power and they don't use modern agricultural techniques. As a result agricultural production is getting lower and it causes local income loss and hence outmigration is increasing.

As the need for input usage is rising in order to compensate for the negative impacts of the land degradation, the unit cost of the agricultural production is increasing as well. For instance, ten years before the organic content of the soil was ca 1.5%, now this amount is less than 0.8% in the last 10 years. Farmers are using more and more fertilizers to fill this gap.

In the pilot site, currently there is only one direct seeding machine in the pilot site that is far from being enough to demonstrate to the farmers the benefits that can be achieved through adoption of these new techniques. Another important approach on combating land degradation is the use of animal manure in agriculture. Although manure is available in the region, machines to process manure do not exist. Therefore, it cannot be used for the production of field crops. Introduction of these machines and methods can trigger a significant change in the region towards achieving sustainable land management goals.

In the pilot site pastureland covers an area of 101 930 ha that are in general poor in terms of organic richness. In the context of livestock, the numbers of sheep and goats have risen from 89 000 in 2007 to 106 211 in 2012. Sheep and goat husbandry is one of the main activities in the project site. Therefore, the pressure on pastures has increased dramatically in the past and as a consequence the fodder quality of the pastureland has dropped. Moreover, some of these pasturelands are not suitable for growing grass species due to low precipitation levels. Similarly, the number of cattle has risen from 5 563 in 2007 to 7 820 in 2012. The GoT support is one of the major reasons of this increase. Currently, cattle breeding are managed intensively in the barns and there is no direct pressure on pasturelands. In general, this increase in livestock has triggered the demand for fodder crops such as alfalfa, vetch and maize. The fodder production area stands for 1 062 ha in the region although this amount is not sufficient for the current number of animals. The increase in livestock has resulted in a rise of methane emissions, too. However, the extent of this situation is not measured yet. As there is no manure storage or processing facilities in the region, the methane release has been a major contributor to the atmospheric greenhouse gas levels.

The local authorities describes the local farmers of the pilot site as being generally more conservative than those in other pilot sites in terms of openness to new approaches and adoption of new implementations. That can be a barrier for the project activities.

In the pilot site, the total forest cover is 45 000 ha and 13 000 ha of this is pasturelands within the forest. The forests are mainly concentrated around Karacadağ (II) and surroundings (the Karacadağ II is another mountain in KCB, different from Karacadağ I in Karapınar). The forest structure is mainly in natural character and is composed of oak, cedar, juniper and black pine trees. The canopy coverage rate of the forests is 55% and site indices range in the 3rd level. In general, the forests are heavily degraded. For instance the forest canopy cover rate was 85% in 1990 and 55% in 2000s. In the Ayrancı region, the amount of degraded juniper forests reached 29 000 ha between 1998 and 2005.

The main reasons of the degradation of forests were the lack of fodder production and heating needs of the local forest villagers in the pilot site. Furthermore, the infrastructure of pastures (roads, shelter, wells, etc.) is very poor and this situation affects in particular the living standards of the people who are keeping the animals. Moving animals from shelters to grazing area is creating energy losses for animals. There are no paths in pastures and through compaction they cause further land degradation in the area. As the herds are moved on forest roads twice a day they also cause specific damage to the trees by grazing of the leaves and branches. This uncontrolled grazing of oak, cedar and black pine has resulted in degradation of the forest stand structure.

Another key issue regarding the grazing pressure on forests is the use of these lands by nomadic people. Nomadic people who are living in south Anatolia during the winter (Silifke, Anamur, Erdemli, Bozyazi and Aydıncık districts of Mersin province) start moving northwards to Konya and Karaman area around April with their herds in order to graze their animals. There are around 130 to 150 families with herds of about 50 000 goats and sheep. They usually spend six months in the south between November and end of April. Then, three months is then spent on the way and they stay three months in

Seydişehir, a district of Konya. During their movement, they pass through forest areas including the Karaman-Ayrancı Pilot Site and their animals damage young trees by grazing. They complain about their lifestyle and their main aim is to settle down permanently around Karaman province. Young generations in these families do not prefer to continue this style of life anymore. The movement period does not match with the educational calendar and children cannot attend school regularly. But the main challenge is to find employment in other sectors.

In order to rehabilitate the natural forests in the region, coniferous and deciduous species have been planted in the area for at least 50 years. However, rehabilitation activities could not reach the main management targets due to intensive grazing by goats. The trees were also used for fuel-wood purposes and branches were cut for livestock feeding. OGM has executed afforestation activities in the region, too. In Ayrancı watershed, the main historic afforestation attempt was the Ayrancı Dam Afforestation Project with the plantation of 80 210 seedlings in 2005. The planted species were cedar, black pine and junipers. In the region several other afforestation programs took place as well: Karaköy Project (353 ha in 1998), Pınarkaya Rehabilitation Project (278 ha in 2008), Karaman Afforestation Project (168 ha in 2002), Karaağaç and Üçarman Projects (306 ha from 2000 to 2009) were the major projects within this concept. Cedar, ash, black pine, eleagnus, locust and almond were used in the afforestation implementations. However, these projects were only partially successful. The main reasons were wrong soil cultivation techniques, precipitation scarcity and inappropriate species selection that are not drought tolerant. In general, in the Karaman region, the success of afforestation efforts stands for 50% success rate. As afforestation areas were protected by fences in those projects, grazing and fuel wood cuttings were not an issue in these projects.

The pilot site is important for biodiversity values. There are two key biodiversity areas that match with the boundaries of the pilot site. One of these sites is Yeşildere KBA and the pilot site covers all of it. The KBA extends along the Yeşildere River and obtains its KBA status from a freshwater fish species, *Gobio hettitorum*. The species is endemic and lives nowhere else. The species' conservation status was assessed in 2006, and its IUCN threat status was set as Vulnerable. There is not much information on the population and trend of the species. However, the recently built İbrala Dam (2011) could have affected the existence of the species. The KBA inventory indicates the need for action as Very Urgent.

The second KBA of the site is the Bolkar Mountains KBA. However, the pilot site covers only about 5% of the KBA. This KBA is one of the most biodiversity rich regions of the country. More than 150 species qualify the KBA status including endemic plants, birds, mammals and an endemic frog species as well as butterflies and dragonflies.

Another key issue regarding the site is the planning of a coal mining that will be bordering the northern border of the pilot site. The GoT has declared a particular area as coal rich region and planning to subtract this coal and establish power plants in the region. That can have immediate affects on agricultural lands that will be turned into mining sites, dust and polluting materials affecting the crop production, use of underground water for cooling purposes and as well as producing greenhouse gases. The construction of power plants can have an immense effect on agriculture in the region and hence should be carefully assessed and monitored.

Having considered the above-mentioned facts, the selection of this pilot site was inevitable. The effects of these problems are not only local but in terms of climate affects the results are also global. The proposed actions and expected outcomes can have a significant impact in the region in terms of land management as well as protection of natural habitats and biodiversity. The result that will be obtained in this site will be appreciated by the local stakeholders and can be further disseminated within the region as well as in Turkey.

Current agricultural practices and need for water for irrigation have resulted in building dams in the Basin that are blocking the natural flow reaching the natural habitats. This has caused habitat degradation and losses in most of the basin wetlands. One of these dams is the İbrala Dam that is placed on Yeşildere River. There is no study about the dam's impact on the Yeşildere River habitat

and the species thrive in. The water level changes and blockage of migration roots in the river systems as a result of operating dams are known to affect the species especially the riverine fishes, in this case the endemic *Gobio hettitorum*. The construction of the dam can have a cost of extinction of a fish species.

There are several projects of the MFAL in the pilot site regarding the agriculture. These are aiming at to develop crop and fodder production, pasture management, extending the organic agriculture with a combined budget of ca US\$ 262,078 only for 2013. The findings and experience of these, project can support the Project implementations.

MFAL is implementing an environmental project, the ÇATAK, that will contribute to the project results. Up to now, the ÇATAK funds were not widely used in the region. The existing programs were on obtaining several agro-machinery for stone collection etc. ÇATAK remains as an opportunity for the region to be used in the near future.

MFWA has been implementing at the regional level sustainable forest management criteria (6 criteria) and indicators (28 indicators) that were accepted and put in operation by MFWA 2003. These criteria and indicators are facilitating the sustainable use of the forest resources.

MFWA has almost completed the cadastral issue in project site in terms of the ownership of the lands.

1.5 Proposed Project Sponsored Activities

In the proposed project, **5,000 ha of forests is planned to be rehabilitated through** deep soil cultivation by excavators followed by plantation of oaks, junipers, eleagnus, locust, cedar and black pines in pilot site. The Ereğli State Nursery will be providing the necessary production and processing facilities for seeds and seedlings for plantation.

In the historic attempts of forest rehabilitation and afforestation in the region, soil was ploughed by hand and the seedlings that are non-resistant were chosen. The depth of the soil plough was not enough for successful planting. Moreover, the selected species were not the appropriate for the rehabilitation. Moreover, the access of goats to the site and illegal cutting of planted trees for fuel purposes have resulted in failure of rehabilitation trials in the past

In order to overcome the problems that were faced in the previous attempts, several protection measures will be practiced within the project. For instance, in order to prevent the access of goats and people to the **rehabilitation sites the area will be fenced.** The **illegal cutting of tree branches will be prevented** through the **rehabilitation of degraded pasturelands by using qualified species.** All these protected areas will be monitored and controlled by **the Regional Directorate of Forestry.**

Moreover, several activities will be held targeting the needs of nomadic people in the region. Those will include **improving the living conditions of nomadic people** through providing **solar panels** in four or five nomadic family house/tends for heating of water and providing electricity as demonstrating to improve the life condition of these communities; **cash or in-kind incentives will be given for the construction of their houses in terms of eco-friendly building;** nomadic shepherds will be **trained about** planned grazing, grazing technics, fodder species, animal husbandry and health, conservation of biodiversity, land tenure and land legislation.

As a result, the project activities are expected to demonstrate how the innovative forest rehabilitation techniques can be implemented in degraded forest in the project site.

In the project site, **12,000 ha of farmland** will be rehabilitated through climate-friendly agriculture approaches, such as direct seeding, reduced tillage and the use of animal manure Approximately 1,200 farmers will be benefited from these activities. Direct seeding implementation will be carried out in

6,500 ha fallow lands. Reduced tillage approaches will be implemented in 3500ha that. Sufflowers (a drought resistant species) and vetch will be chosen for production.

By cultivation of fallow lands through direct seeding methods, wind erosion will be prevented in the pilot sites. Furthermore, there will be a 50-80% reduction in fuel consumption and hence drop in CO₂ emissions with a direct positive affect to mitigation efforts. These practices will increase the amount of water that is kept in the soil.

In 1,600 ha of land animal manure will be spread to the fields as well as in cereal production liquid manure will be used. As the number of animals in barns has increased in the region the amount of animal manure has increased.

In the project site, the total animal manure production is around 52.5 tonnes per day. As the farmers generally don't have storing facilities, these manures create environmental pollution. Use of these manures in fields is a benefit in both ways. It can increase the organic matter in the soil that is less than 1% in the region, and also increases the water retention capacity of the soil. Moreover, it will overcome the storage problems of the cattle breeders. Similarly, the use of liquid manure can decrease the use of chemical fertilizers with a 35%.

Within the project, 200 ha of orchard will be established and drip irrigation techniques will be demonstrated.

In order to introduce effective water use, water harvesting methods will be implemented in 100 ha area in Ayranci. The activities will be implemented in several micro-basin with a dimension of 6x6m. With this approach applied in orchards of the region (apple, apricot, cherry) the amount of orchards is expected to be increased. In order to prevent water loss due evaporation, each micro-basin area is going to be covered with appropriate scarf materials.

About **10,000 ha of pastures will be rehabilitated** by using alfalfa and vetch in the project site. Moreover, an appropriate grazing plan that is including rotational grazing and protection measures (fencing) will be prepared and implemented.

The project activities that will be carried out in the project site will establish and demonstrate sustainable land management and climate smart agricultural activities as well as water resources management in order to achieve sustainability in the use of natural resources by public institutions and community based organizations.

Finally, a biodiversity-mainstreaming plan will be prepared and implemented in both forest and agriculture areas of the project in 22,000 ha land. The Biodiversity mainstreaming will be held in all of the project sites with a consistent methodology. That will help understanding and adoption of integrating biodiversity into different sectoral plans and strategies.

To improve the capacity of the different target groups to achieve the above mentioned goals, training needs assessment analysis will be undertaken at the beginning of the project, followed by a preparation of a training context. The methodology will be based on the training of trainers approach. The initial training will be given to trainers from the Provincial Directorate of MFAL, the Regional Directorate of OGM and representatives of local NGOs. The training program will be targeted to the different stakeholders. The project activities will build the capacity to implement targeted activities to raise awareness of the importance and opportunities for sustainable land management and climate smart agriculture in project site.

The project activities will build the capacity to implement targeted activities to raise awareness of the importance and opportunities for sustainable land management and climate smart agriculture in project site.

2.1 General Site Description

The total size of the project site is around 101,000 ha. The site is located in the western part of the center of the Konya province. There are two districts, Selçuklu and Meram, 5 towns and 6 villages. Two of these villages belong to another district that is Derbent. Average elevation is around 970 meters.

The total area of the forest areas stand as 25,000. In this pilot site all the forest tenure is public as a percentage of 99%. The main tree species is oak, locust, eleagnus, cedar, juniper and black pine. In the context of forestry, there is illegal occupation for agricultural purposes.

The main water resources in the Altınapa region are the existing creeks that are flowing to the Altınapa Dam Reservoir and the capacity of it is 50 million m³.

2.2 Social and Economic Factors

There are five towns (Sefakoy, Kiziloren, Tepekoy, Basarakavak and Saglik) of Meram and Selcuklu districts, four neighbourhood (Sille Subasi, Sulutas and Saraykoy) of Selcuklu and Meram districts and six villages (Mulayim, Guneykoy, Selahattin, Kucukmuhsine, Akpinar, Ulumuhsine) of Meram, Derbent and Selcuklu districts in this project site. Total population of the project site is approximately 15 000. Neighborhoods are the parts of the Konya city center and they are urban areas.

TYPE	DISTRICT	PLACE	POPULATION
Municipalities	Selcuklu	Tepeköy	5500
		Başarakavak	1440
	Meram	Sefakoy	2374
		Kiziloren	1186
		Saglik	657
Neighborhoods	Selcuklu	Saraykoy	N/A
		Sulutas	N/A
		Sille	N/A
	Meram	Erenkaya	N/A
Villages	Selcuklu	Selahattin	226
		Akpinar	327
		Kucukmuhsine	245
		Ulumuhsine	32
	Derbent	Mulayim	458
		Guneykoy	33

Population growth rate is positive in this site because of the above-mentioned reasons. There is almost no agricultural production for marketing but household income is relatively high and it does not affect local people's livelihood conditions on negative manner.

Because of the lack of further education after the primary school education in villages, education level is lower in villages when it is compared to towns and neighborhood. After the primary school education of their children some families go nearest district or province centers for education periods in order to access higher education possibilities. Illiterate rate is around 0.4 % in this site.

Main agricultural activities for villages and towns are temporary forestry labor works and animal husbandry. The main problem areas for the villages are low-income level (compared to closer non-agricultural income opportunities) and emigration of young generation to district and province center,

which is closer in order to work for non-agricultural sector. This movement reduces labor force that needed for backyard agricultural production and animal husbandry activities.

2.3 Natural Resource Management

Selçuklu and Meram municipalities are the main districts covering the project site as well as Derbent with only two of its villages being in the project site.

In the pilot site there is no protected area in terms of wildlife and biodiversity.

In Konya, there is Regional Directorate of OGM and other local directorates related to this headquarters that is responsible for the management of the forests in the region according to the management plans prepared every 10 years. All these directorates are responsible for the all forest management and protected areas.

Moreover, another government agency in the project site is the Provincial Directorate of MFAL. The main responsibility of the organization is to lead the annual plan and programs regarding the agriculture and animal husbandry. Among these, definition of arable lands, monitoring agricultural areas, and monitoring and assessment of subsidies given to the local farmers.

Selçuklu and Meram Municipalities are the other key actors in the region. Moreover, Konya Metropolitan Municipality is another key organization in terms of planning and leading the settlement programming in the region.

Provincial agriculture master plan was prepared in 2004 and following the Strategic Agricultural Development Plan has been issued in 2010. These plans are the main structure of agricultural activity planning in the provinces and districts. Moreover, these plans are accompanied by macro-economic policies of the Ministry. The Province Directorate of the MFAL is then preparing its annual plans upon those macro plans and programs. Besides, cooperation programs are prepared with other relevant ministries for planning, implementation and M&E stages.

Depending on the trainings needs relating to the programs and plans of the MFAL, training programs are prepared and organized in the relevant seasons in province and sometimes in central level. In Konya, besides the personnel working in the province and district levels, there are 350 extension agents of the ministry who are responsible for meeting training needs of farmers in daily life as well as implementing training programs planned by the Ministry. These experts will be a key to the implementation of project activities; however, they will need to be trained according to the project focus area and issues.

In Turkey, forest management plans are prepared for regional enterprises every 10 years. Following the management decisions, local branches of the Directorate of Forestry implement forestry activities. In the project region the management plan was prepared in 1993 and is revised on a 10-year basis.

Selçuklu Municipality has led a project around Sille region that is the eastern part of the pilot site on butterflies of the region in order to use these values in recreational planning around Sille. On the other hand the Municipality is currently building an extensive Butterfly Centre in city center that will be the biggest of its kind in whole of Europe. It will operate as a visitor and training center for Konya people and schools.

The Regional Directorate of OGM in Konya has been working on the Greenbelt afforestation activities for many years. This program is one of their major programs with a high priority as the site is just next to the city center.

There is significant poultry industry and relevant investment in the area by corporate organizations. They are organized under a union called YUMBİR.

2.4 Justification for Site Selection

The forest structure in the pilot site is mainly in artificial character and consisted of coniferous and deciduous species. The afforestation program was named as Konya Greenbelt (Yeşil Kuşak in Turkish) and the plantation works were mainly carried out between 1996 and 2005 and is still going on. The Greenbelt's aim was to create a picturesque landscape and erosion preventing in the western part of the Konya city center. Today, the forest cover is approximately 25,000 ha and this includes 5,000 ha of degraded oak, juniper and black pine. Altınapa Dam has been used as the source of water to irrigate the Greenbelt.

The Greenbelt is under certain protection by MFWA. Therefore the area was fenced by the local authorities and access of people is forbidden. However, local people of the region have been using the area for grazing animals and some of the region was illegally occupied for small-scale agricultural practices. As there are no pasturelands in the region the village people were out of option to use the Greenbelt area. Therefore, the project aims to establish new countryside pastures in the region in order to protect the Greenbelt structure.

Other reasons of degradation and not achieving the desired success in Greenbelt implementations were water scarcity, bad soil conditions and wrong plantation techniques such as inappropriate species selection for planting and wrong soil plough techniques. Furthermore, the infrastructure within the forest (roads, fire security roads, paths and fencing, etc.) was not sufficient, and that has affected in particular the structure of the plantation and level of success.

Although an important part of the life in the villages is animal husbandry, in the project site there are no pasturelands. Therefore the local villages are using the Greenbelt area for grazing their animals. In the villages there are 48,000 cattle and 160,000 sheep and goats. Cattles are generally kept in barns. There is not much information about the trends of animal husbandry as most of the land in the pilot site is part of the Meram and Selçuklu Municipalities of Konya city center.

One of the other main economic activities in the region is poultry. Konya city is the leading poultry production center of Turkey. According to 2013 numbers there are 13 million hens and annually 3 billion eggs are produced. Corresponding chicken manure production is 1,250 tons per day. Annual export income of the sector is estimated at US\$ 100 million. The environmental pollution around the city center due to hens farming is not yet solved in Konya region.

The pilot site doesn't have out-striking biodiversity. None of the key biodiversity areas or other globally important classification studies indicates the site as important. Also, there are no protected areas in the site too. On the other hand the Selçuklu Municipality has led a project around Sille region that is the eastern part of the pilot site on butterflies of the region. Nature Conservation Centre and Erciyes University have conducted the survey in 2012 and 2013. The findings of the survey indicate that 71 species of butterflies live in the region and 3 of them are endemic to Turkey. The Selçuklu District Municipality will integrate these biodiversity values into its recreational plans that will be undertaken around Sille Reservoir. The Municipality is currently building an extensive Butterfly Centre in city center that will be the biggest of its kind in whole of Europe. It will operate as a visitor and training center for Konya local people and schools.

In the pilot site, there is an ancient cedar trees covering 30 hectares around the Altınapa Dam region. These cedar trees are all old growth and valuable from the point of dendrology.

One of the main issues in the pilot site is its position, being next to the expanding Konya city. Selçuklu and Meram municipalities have been growing and the settlements are just bordering the pilot site. This situation can be viewed in both ways in terms of natural resource use. The Greenbelt can be used as recreational area for the people living in the city or the city can continue growing and expanding towards the greenbelt in the near future.

The pilot site is a crucial area due to preventing erosion and water resource as well as providing other ecosystem services to Konya city center, including recreational services, eco-tourism facilities and urban forestry. In terms of forests and landscape, the pilot site includes a specific peculiarity in context of topographic, climatic and socio-economic conditions. The planned rehabilitation approaches that will be implemented in this project will introduce the community forestry concept to the urban people. In fact, this green belt project aims to create an intellectual forestry awareness surrounding the city with the multifunctional social forestry dimensions.

In the site although animal husbandry is a key livelihood, there is no pastures in the region. The project will establish the first official and pioneering pastures models for the villages of the region.

Moreover, the site stands different than others in terms of being next to Konya city center. That can present the results of the project to all type of stakeholders as well as local inhabitants of the Konya.

This region is a key in terms of hens industry. The pollution coming from this industry has not been solved yet. Introduction of methane capture approaches can contribute to the solution and demonstrate good practices to the other facilities in the region. Moreover, the activities that will be done in this pilot site will contribute to the project's overall emissions target.

There is no numeric data on the cost of having no pastures in the region for villages. The pastureland that will be put in service of villages is expected to increase the current income levels of the villages.

The illegal use of forestland for grazing purposes and occupation of forest land for agriculture has a serious cost on afforestation activities. The investments are partly made for unsustainable and unsuccessful afforestation activities.

Moreover, the existing hens industry has an environmental cost. However, the extend of this is not known. The expected results are release of methane to atmosphere as well as burying of dead chickens into the ground holes made by facilities. The total cost of this to the environment has not been measured yet.

The one possible advantage of the site is its special location that is being next to the Konya city center. Konya is one of the growing cities of Turkey and it attracts vast amounts of investment from the GoT. The plans of two major municipalities of Konya will be a major factor of determining the future of the pilot site.

For instance, the Selçuklu Municipality is preparing recreational activities around Sille Reservoir that is an extension of cultural and touristic investments made in Sille town that is a historic and religious place. These recreational activities can further attract the interest of Konya inhabitants to the nature therefore increase the profile of rehabilitation activities of the project.

The existing knowledge of YUMBİR (Egg Producers Union) on establishing biogas facilities as well as their openness to the issue is another opportunity for the project.

1.6 Proposed Project Sponsored Activities

In the proposed project, it is planned to rehabilitate 6,000 ha of forests through deep soil cultivation by excavators followed by plantation of oaks, junipers, eleagnus, locust, hawthorn, true cypress, common yew cedar and black pines in pilot site. The state and private nurseries will be providing the necessary production and processing facilities for seeds and seedlings for plantation. In the historic attempts of forest rehabilitation in the region, soil was ploughed by hand and the seedlings that are non-resistant were chosen. The depth of the soil plough was not enough for successful planting. Moreover, the selected species were not the appropriate for the rehabilitation. In order to overcome the problems that were faced in the previous rehabilitation activities, several protection measures will be practiced

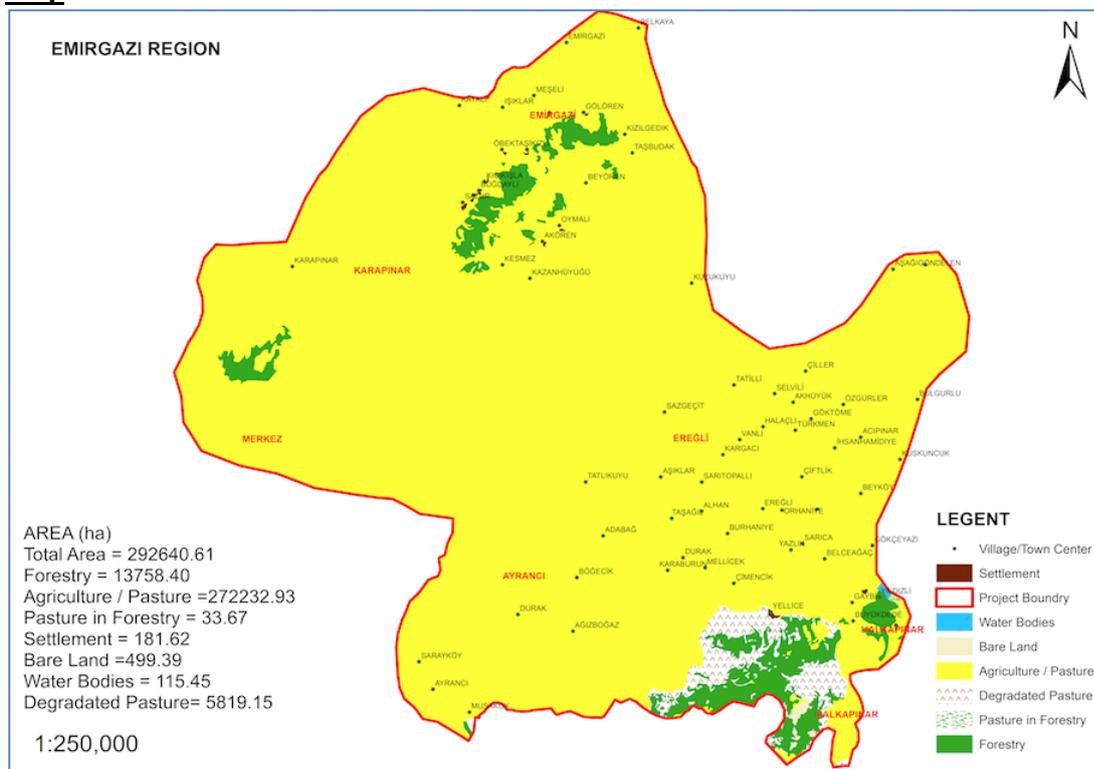
within the project. For instance, in order to prevent the access of people to the rehabilitation sites the area will be re-fenced or fences will be improved as well as appropriate seedling selection will be made and site-specific field preparation techniques will be applied

About 10,000 ha of pastures will be rehabilitated with a new pasture patterns and floristic fodder designs that are mixing alfalfa and vetch on the project site and suitable grazing plan that is including rotational grazing and protection measures (fencing) will be prepared and implemented within the project site.

Finally, a biodiversity-mainstreaming plan will be prepared and implemented in both forest and pasturelands in 16,000 ha land. The Biodiversity mainstreaming will be held in all of the project sites with a consistent methodology.

Pilot Site Three: Karapınar, Ereğli, Emirgazi

Map



3.1 General Site Description

The total size of the pilot area is 292 600 ha. The site is located in the south-eastern part of the KCB. There are three districts that fall within the boundaries of the site with three towns and 50 villages. Average elevation of the project site is 1 000 meters.

The district centres Karapınar, Ereğli and Emirgazi lie within this project site. Additionally, there are three sub-districts (Belkaya/Ereğli district; Kayalı and Yeşilyurt/Karapınar district) and 37 villages of Ereğli district, two villages of Ayrancı district, five villages of Emirgazi district, four villages of Karapınar district and three villages of Halkapınar, Bozkır and Yalılıyüyük districts of Konya in this project site.

The forests of the pilot site cover an area of 20 100 ha, including about 6 300 ha of pasturelands within forest areas. In this pilot site 99% of the forest tenure is public. The main tree species are oak and Black pine.

In Karacadağ, where the rehabilitation activities will be carried out, oak stands cover 4 270 ha in 101 compartments. The oak stands in Karacadağ are owned by the state but the actual use rights belong to local people.

The total area of cultivation is 130 000 ha, 80% for field crops and 15% for fodder crops. The pasturelands cover about 142 000 ha, 85% of it being heavily degraded.

The pilot site has two protected areas: a Nature Reserve Area in Ereğli marshes and a Ramsar site called Meke Maar. It was declared a Ramsar site and a nature monument under national regulation. The Meke Maar gathers its importance due its geological speciality.

There are 2 key biodiversity areas in the project site. It covers a big portion of the Ereğli Plain (KBA). The western part of the KBA is important for wetland taxa and the eastern part is covered by salt plain steppes that are key habitats for endemic plant species.

The main water resources in Ereğli region are Ivriz and Delimahmutlu creeks. These two creeks discharge into the Ivriz dam and the capacity of this reservoir is 83 million m³. In Emirgazi there are no surface water resources. However, the groundwater resources irrigate 5 275 ha of arable land. Karapınar also has no surface water resources but there are about 319 wells for irrigation.

3.2 Social and Economic Factors

The total human population of the pilot site is 78 500. This number includes all the population in the villages and district centres. Detailed population numbers of the villages and towns are given in the table below.

The population trends in the region are available in the district level only. The population trends have been decreasing in the past decades according to the values of these two districts. The population projections for 2023 estimates further decrease for all of the districts except for Ereğli. For instance, population growth rate in Ereğli and Karapınar districts between 2011 and 2012 was 0.51% and 0.17%, respectively. According to population projections, the population of Karapınar will decrease by 8% and Ereğli will increase by 2.2%. Average household population is 3.98 for Ereğli and 4.50 for Karapınar.

The trends have a tendency to drop in the villages and to increase in the district centres. Although there is an emigration from the project site, the net migration value is almost the same as the district centres attract people from the outside.

The rate of the 15-65 age group that is known as the active population constitutes 2/3 of the total age group in the site. Moreover, the gender rate stands 49.5% for males and 50.5% for females.

District	Place	POPULATION	District	Place	POPULATION
Ereğli	Ereğli Center	98 663		Ciller	406
	Belkya (M)	4965		Bahceli	170
	Kizilgedik	19		Hacimemis	1889
	Tasbudak	362		Cimencik	1089
	Kuzukuyu	236		Melicek	548
	Asagigondelen	499		Karaburun	423
	Yukarigondele n	232		Ulumese	235
	Bulgurluk	672		Burhaniye	269
	Acipinar	186		Yellice	694
	Bahceli	170		Adabag	274
	Kuskuncuk	529	Ayrancı	Ayrancı Center	8785
	Beykoy	850		Agızbogaz	365
	Belceagac	759		Bogecik	275

	Gokceyazi	551	Emirgazi	Emirgazi Center	5027
	Yildizli	301		Meseli	26
	Gaybi	265		Karaoren	99
	Buyukdede	178		Goloren	116
	Tasagil	504		Obektas	75
	Tatlikuyu	362		Ekizli	379
	Sarica	277	Karapinar	Karapinar Center	32374
	Asiklar	162		Kayali (M)	2718
	Saritopalli	320		Yagmapinar	165
	Alhan	1310		Oymali	269
	Kargacı	553		Yesilyurt(M)	2783
	Servili	747		Kesmez	1548
	Turkmen	639		Kazanhuyugu	218
	Akhuyuk	167	Other	Aydinkent (Halkapinar/Konya)	215
	Goktome	132		Isiklar (Bozkir/Konya)	342
	Ozgurler	734		Saraykoy (Yalihuyuk/Konya)	31

Table: Population of the district centres and the villages

The average education levels are lower in the rural areas with except for district centres as there are only primary schools. Therefore, people living in the district centres show a higher education level. Illiteracy rates of the main districts of the pilot site for ages above 15 are as follows: Ereğli 5% and Karapınar 5.6%.

Depending on the agriculture characteristics, the average income level is lower in rural areas in comparison to district centres. It is well-known that the living conditions of some households in the project site are under the average poverty value of Turkey. However, there is no data available to demonstrate that on the village level.

There are limited studies about nutrition status in Turkey and those are mainly concentrated on city and district centres. In Turkey, there is no hunger problem in rural areas as people there are mostly self-sufficient.

In the project site, the main income sources are field crops, animal production and agro-industries. The rate of agricultural employment is higher than in the industrial sector in the pilot site. The share of the service sector is highest only in Ereğli. In the region there are several agro-industry related factories for sugar, fruit juice, textile, dairies, flour and animal fodder as well as cold storage and packing facilities. About 5 631 persons are working in the agro-industry facilities in the project area.

3.3 Natural Resource Management

Main government agencies in the project site are the district branches of MFAL that are present in Eregli, Karapınar and Emirgazi. The main responsibility of the district branches are mainly to follow up the annual plan and programs of the Province Directorate in the district level. Among these, definition of arable lands, monitoring agricultural areas, and monitoring and assessment of subsidies given to the local farmers.

Konya Soil, Water and Combating Desertification and Erosion Research Station (DERS) is another key organization placed in Karapınar. It is responsible for conducting research studies on soil and water use, development of new methods for combating desertification and dissemination of that information. DERS has gained very good background information and experiences on these subjects in KCB. It will be a member of project implementation unit and provide all support on information sharing and training.

In Eregli, there is a local branch of the Directorate of Forestry that is responsible for the management of the forests in the region according to the management plans prepared every 10 years. MFWA has a local office in Eregli, which is responsible for the management of biodiversity related areas, hunting control and management of protected areas.

Provincial agriculture master plan was prepared in 2004 and following the Strategic Agricultural Development Plan has been issued in 2010. These plans are the main structure of agricultural activity planning in the provinces and districts. Moreover, these plans are accompanied with macroeconomic policies of the Ministry. The Province Directorate of the Ministry is then preparing its annual plans upon those macro plans. Besides, cooperation programs are prepared with other relevant ministries for planning, implementation and M&E stages.

Depending on the trainings needs relating to the programs and plans of the Ministry, training programs are prepared and organized in the relevant seasons in province and sometimes in central level.

In Konya and Karaman provinces, besides the personnel working in the province and district levels, there are 350 extension agents of the ministry who are responsible for meeting training needs of farmers in daily life as well as implementing training programs planned by the Ministry. These experts will be a key to the implementation of project activities; however, they will need to be trained according to the project focus area and issues.

In Turkey, forest management plans are prepared for regional enterprises every 10 years. Following the management decisions, local branches of the Directorate of Forestry implement forestry activities. In the project region the management plan was prepared in 1993 and is revised on a 10-year basis.

The management plan for Eregli Nature Conservation Area has been drafted and is currently awaiting ratification. Following that, the local branch of the Ministry and the local wetland commission will implement the management plan in Eregli. For the time being, there is no management plan for the Ramsar Site Meke Maar.

ÇATAK has been implemented since 2006 and total implementation area is 100 hectares annually. Total disbursement is US\$ 2.4 million within the last 7 years.

Activities to combat desertification and wind erosion have been taking place since the 1960's and within these actions oak, cedar, junipers, Black pine, eleagnus and acacia were planted. By using these species sand mobility was limited and stability ensured. During this period wind breaks were established on about 13 000 ha and US\$ 13 million were invested.

A state owned sugar factory is working on the base of a contract farming system in the project site. It is providing technical assistance, input supply and other support to more than 10 000 farmers.

One of the private companies has a manure compost facility in Karapınar. It invested about US\$ 125 000 for this facility in 2005 and the process capacity of the plant is 45 tons per day.

Another activity is on strengthening the ecosystem services of the region undertaken by the Life Plus Environment Program led by a partnership of Coca-Cola Life Plus Foundation, UNDP Turkey and Nature Conservation Centre. Within the project direct seeding and wind breaks are the main activities and it is implemented in the Karapınar district. Project implementation period is from 2013 to 2016.

There are land consolidation activities in 12 villages in the pilot site reaching up to 47 000 ha by MFAL and total investment is US\$ 5 million.

MFWA is undertaking a restoration project in Ereğli Marshes to recreate a small portion of the wetland area in collaboration with the Regional Directorate of DSI.

3.4 Justification for Site Selection

Agriculture is main economic sector in the project site and corresponds to at least 65% of the regional GDP. Field crops and animal husbandry are the main agricultural activities. The total area of cultivation is about 130 000 ha and about 19 000 ha of this stands as fallow areas. The main crops are cereals and sugar beet.

Additionally, GoT has been supporting the production of oil seeds (sunflower, safflower, maize and soy bean), sugar beet, fodder crops (alfalfa, vetch) and livestock during the last 10 years. Most of the farmers switched their farming practices from dryland farming to irrigated farming systems due to these supports. Production of agricultural crops with a high need of irrigation such as sugar beet, maize, sunflower and also horticulture has increased dramatically. As an example, sunflower production is now 4 times bigger than 8 years. Currently about 82 000 ha of land are irrigated which is an increase of 55% within the last decade.

The Ivriz dam is the main water resource in the region. When it was built, the share of wheat in the crop pattern was 80%. After the dam was finalized this changed significantly. Now sugar beet, sunflower and orchards are intensively cultivated. The irrigation demand of this new crop pattern exceeds the potential water capacity in the pilot site where annual precipitation ranges from 250 to 350 mm. Due to the lack of rainfall the dam never reached its full capacity. As a result, more than 5 000 wells exist in the region, of which about 70% are unlicensed. This has led to an uncontrolled use of water resources and, as a result, the ground water level and the quality of available water decreased. The water levels have dropped about 15 meters during the last ten years. Further water loss is caused by the usage of open channels (evaporation and leaks) for irrigation, contributing to the unconscious overuse of water. In the last years, sink holes have occurred due to the low level of ground water and precipitation, as an indicator of the current situation on water resources. The overall salinity has increased as well on about 44 000 ha of pastures and meadows and about 9 000 ha of agricultural fields are affected by severe salinity due to these insufficient water management practices in Ereğli.

Moreover, the intensive agriculture production techniques based on an overuse of inputs (e.g. fertilizer, chemicals, irrigation) and improper mechanization techniques (e.g. intensive soil tillage, field trafficking) have resulted in further degradation of land in the project area. This degradation has also decreased the organic content of the soil and increased its susceptibility to wind erosion. Although farmers are again intensifying the use of inputs such as irrigation and fertilizers for compensation, the approach is not sustainable in the long term.

Wind erosion is another major problem in this area especially affecting the sediments remaining from an ancient shallow lake. The local soil's texture is very sensitive to erosion due to the small particle (grain) size. Fertile soil is threatened to be lost completely and wind erosion also causes further humidity loss from the top soil. This is enlarged by inappropriate land-use techniques, e.g. an

increased ploughing depth to turn moist soil contents to the surface for the seeding bed which also shifts the organic matter to deeper layers.

Land consolidation activities have been intensified and expanded within the last decade in the project site. They create very important benefits for the farmers, such as new and economical cultivatable parcels, wind breaks, field roads, ecological corridors, proper irrigation systems and reduction of input usage (fuel, fertilizer, water, etc.). Furthermore, the existing irrigation schemes are envisioned to be transferred from open channel to pressurized-pipe systems to save and use water resources efficiently in the Ereğli district.

Moreover, MFAL is implementing an environmental project named ÇATAK, which can be extended and promoted within the project site.

For livestock matters, sheep and goat husbandry is one of the main activities in the project site. About 530 000 animals are kept in the area which represents an 80% increase over the last 10 years. As the pressure on pastures has increased, the fodder quality of the pastureland diminished. Moreover, parts of these pasturelands are not suitable for growing grass species due to the aforementioned salinity problems in the soil. The GoT support system for cattle breeding has contributed to an increase in the project site and the number of cattle has doubled over the last ten years reaching up to 145 000 animals. Currently, cattle breeding is managed intensively in barns and it exerts no pressure on pasturelands. In general, this increase in livestock has raised the demand of fodder crops such as alfalfa and maize. These crops are again more water-demanding and contribute to the intensified pressure on water resources in the pilot site. Similarly, the increase in livestock numbers has resulted in higher methane emission levels, too. However, the extent of this situation is not measured yet. As there are no manure storage or processing facilities in the region, the methane release has been a major contributor to the atmospheric greenhouse gas level. Moreover, about 1.8 million tons of animal manure is produced per year. This resource will be available for improving degraded farmlands and producing renewable energy within the project site.

Forests nowadays cover about 76 000 ha in this pilot area and are concentrated around Karacadağ 1 (there is another Karacadağ in Ayrancı-Karaman pilot site) and Ereğli. The majority of the forest is natural and consists of coniferous and deciduous species but it is degraded due to overgrazing by goats. As a result, the forest cover is lower than in the past, site indices have worsened and the productivity of the stands have dropped by 60%. The forest management plans do not foresee any harvesting operations for construction and fuelwood purposes. In order to rehabilitate the forest stands, trees have been planted in this area for at least three decades. However, those rehabilitation activities could not reach their objectives due to the intensive grazing by goats. The trees were also used as fuelwood and branches were cut for livestock feeding by local forest villagers. This has been the main reason for the failure of the original forest rehabilitation program. Due to topographic conditions there is no available land for fodder production outside of the forests. Generally, the government directly disperses fodder material, fuel and construction wood to the villagers to prevent unsustainable use of local forest resources. However, these amounts of support are not meeting their needs and for this reason the villagers have to cut trees illegally. Furthermore, the infrastructure of pastures (roads, shelter, wells, etc.) is very poor and this situation affects in particular the living standards of the people who keep animals. Moving herds from shelters to grazing areas leads to energy losses for the animals. There are no common paths in pastures and through compaction they cause further land degradation in the area. Within the forest they are moved on forest roads twice a day and inflict damage to the trees by grazing of leaves and branches. This uncontrolled grazing of oak, cedar and Black pine has resulted in degradation of the forest stand structure especially in Karacadağ.

MFWA has completed cadastral works in the project site in terms of ownership of land. Within the forest areas, MFWA has been implementing sustainable forest management criteria (6) and indicators (28) at regional level. These criteria and indicators are facilitating the sustainable use of forest resources.

This pilot site is one of the most important regions in terms of biodiversity in KCB. There are two key biodiversity areas (KBA) consisting mainly of wetland ecosystems: Ereğli Plain KBA was once one of the most important wetlands of Turkey but recent dams for irrigation purposes and drainage measures prevented most of the natural flow from reaching those wetlands. Therefore, today the site has lost almost all of its importance for wildfowl and freshwater fish species as most of the wetland habitat is lost. The area of the Ereğli Marshes was about 21 500 ha at the beginning of the twentieth century, now the remaining wetland area is estimated to be about 6 400 ha. The major part of the reedbeds has dried out and bird species such as the globally threatened White-headed Duck and Marbled Teals are no longer breeding in the KBA. The situation of the site endemic fish species, *Barbatula eregliensis*, is not known currently. GoT has been working on restoring the site for the last few years. The restoration activities are expected to be progressing throughout 2014.

Similarly, Karapınar Plain KBA is facing a severe water availability problem. Water is no longer available in the muddy plains of the site during spring season. The effect of this on the breeding bird population is so far unknown. Moreover, heavy grazing pressure and moving herds of sheep harm endemic plant species and, as a result, degrade the sensitive salt steppe habitats. The Ramsar Site Meke Maar is also a part of this KBA. The general water scarcity problem and low ground water levels have resulted in a total loss of the water table in the Ramsar site.

Another key issue regarding the site is the planning of coal mines and power plants that will be bordering the southwestern border of the pilot site. The GoT has declared a particular area as coal rich region and planning to subtract this coal and establish power plants in the region. That can have immediate affects on agricultural lands that will be turned into mining sites, dust and polluting materials affecting the crop production, use of underground water for cooling purposes and as well as producing greenhouse gases. The construction of power plants can have an immense effect on agriculture in the region and hence should be carefully assessed and monitored.

Having considered the above-mentioned facts, the selection of this pilot site was inevitable. The effects of these problems are not only local but in terms of climate also global. The proposed actions and expected outcomes can have a significant impact in the region in terms of land management as well as protection of natural habitats and biodiversity. The result that will be obtained in this site will be appreciated by local stakeholders and can be further disseminated within the region as well as in Turkey.

3.5 Proposed Project Sponsored Activities

In the proposed project, it is planned to rehabilitate 5,000 ha of forests through deep soil cultivation by excavators followed by the plantation of oak, juniper and Black pine in Karacadağ. The state nursery in Ereğli can provide necessary production and processing facilities for seeds and seedlings for planting purposes. In the historic attempts of forest rehabilitation in the region, soil was ploughed by hand and inappropriate tree species were chosen. The depth of ploughing was not enough and the seedlings too sensitive for successful planting. Moreover, the access of goats to the site and illegal cutting of planted trees for fuel purposes prevented rehabilitation attempts in the past. In order to overcome these problems, several protective measures have to be implemented. For instance, rehabilitation sites have to be fenced in order to minimize access by goats and people. The habit of cutting tree branches for fodder has to be prevented through the parallel rehabilitation of degraded pasturelands using qualified species. All these protected areas will be monitored and controlled by the local Forestry Department in Ereğli.

The project activities will demonstrate how the innovative forest rehabilitation techniques can be implemented in degraded forest in the project site.

Within this pilot site, about 13 000 ha of farmland will be rehabilitated through climate-friendly agricultural approaches (e.g. direct seeding, reduced tillage and the use of animal manure). Approximately 1 300 farmers will benefit from these activities. Direct seeding will be carried out on

6 750 ha of fallow lands while reduced tillage approaches will be implemented on 3 500 ha. Vetch and drought resistant safflower will be chosen for production. By successful rehabilitation of fallow lands through direct seeding methods wind erosion will be prevented. Furthermore, there will be a 50-80% reduction in fuel consumption and hence a decrease in CO₂ emissions with a direct positive effect to mitigation efforts. These practices will also increase the amount of water that is kept in the soil. Furthermore, windbreaks will be established in a belt around farmlands in order to decrease the loss of organic soil contents due to wind erosion. For that the aim is to plant about 39 000 trees on 100 ha (length: 198 km; width: 5 meters). On 24 000 ha of land, limited irrigation approaches will be practiced to achieve the saving of 94 million m³ of water. The limited irrigation method works with the principle of supplying less water to the plants for an optimized efficiency in plant production. In this approach, the total cost-savings is higher than the total decrease in income.

About 2,000 ha of pastures will be rehabilitated by planting alfalfa and vetch and implementing a suitable grazing plan that includes rotational grazing and protection measures (fencing) within the pilot site. Additionally, 650 ha of saline pasture land will be reclaimed through the plantation of halophyte plants.

On about 2,750 ha of agricultural land animal manure will be spread to the fields and liquid manure in cereal production. With the number of animals kept in barns in the region increasing, the amount of animal manure rises as well. About 3.5 tons of manure per day are obtained in facilities with 100 cattle. As farmers generally do not have storing facilities, these manures cause environmental pollution. Using these resources as fertilizers on the fields is a benefit in both ways. It can increase the organic content of the soil which is currently less than 1% and has positive effects on the water retention capacity of the soil. Moreover, it will overcome the storage problems of cattle breeders. Similarly, the use of liquid manure can decrease the use of synthetic fertilizers by 35%.

Furthermore, it is planned to reduce emissions of CO₂ eq. by 2,000 tons through methane capture practices. This target will be achieved by reduced stubble burning, crop rotation in sugar beet cultivation, water treatment in dairies, establishing manure storages and by training farmers and dairy sectoral stakeholders.

The project activities will establish and demonstrate sustainable land management and climate smart agricultural activities as well as water resources management in order to achieve sustainability in the use of natural resources by public institutions and community based organizations.

Within the Ereğli Plain, there is an ongoing effort of MFWA towards restoration of parts of the wetland. The constructive phase is expected to finish in 2014 and will be followed by ecological restoration actions. Through the incremental GEF support, this project can establish a biodiversity and hydrology monitoring program and develop an ecological restoration strategy in order to re-establish the quality of wetland habitats and biodiversity values. The Ereğli Marshes will have their management plan ratified soon and these activities will be a valuable supplement to the management plan actions.

Moreover, the project is planning to prepare a conservation strategy for the endemic salt-dependent plant species of the Karapınar Plain. This strategy will help the conservation of sensitive endemic plants of the region which otherwise will be lost.

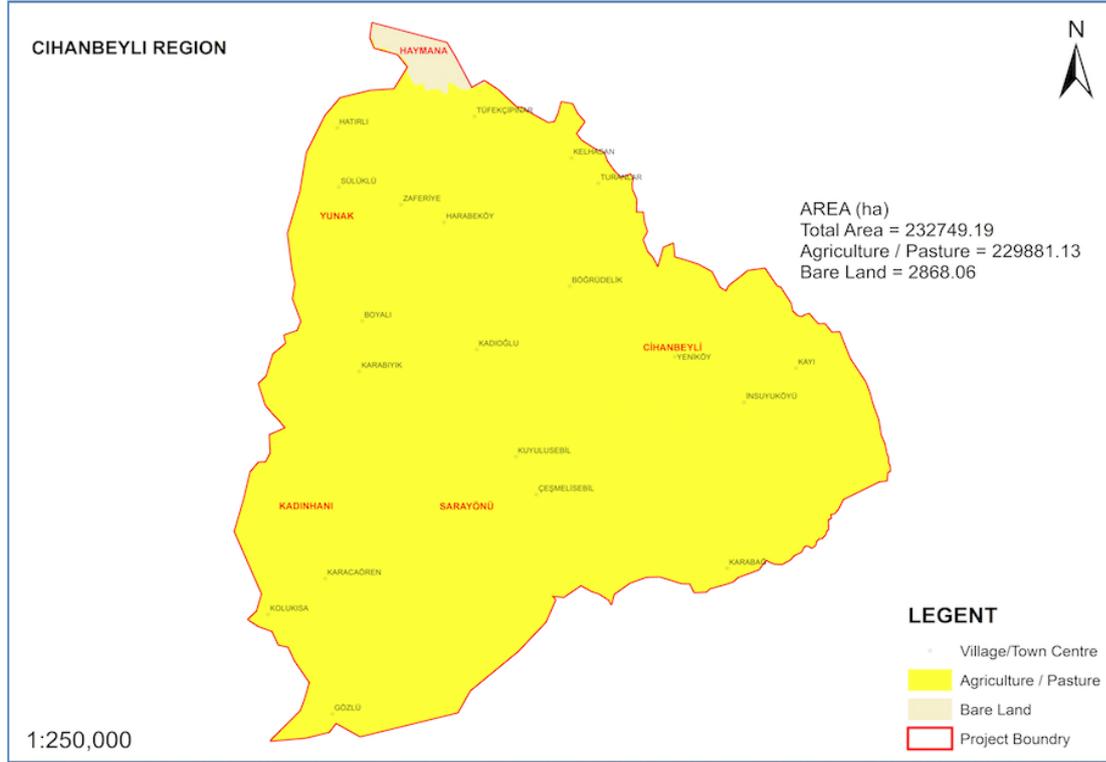
Finally, a biodiversity-mainstreaming plan will be prepared and implemented on 20,000 ha of forest and agricultural land in the pilot site. Biodiversity mainstreaming will be integrated with consistent methodologies throughout the project sites. That will help understanding and adoption of integrating biodiversity into different sectoral plans and strategies.

To improve the capacity of the different target groups to achieve the above mentioned goals, training needs assessment analysis will be undertaken at the beginning of the project, followed by a preparation of a training context. The methodology will be based on the training of trainers approach. The initial

training will be given to trainers from the Provincial Directorate of MFAL, the Regional Directorate of OGM and representatives of local NGOs. The training program will be targeted to the different stakeholders. The project activities will build the capacity to implement targeted activities to raise awareness of the importance and opportunities for sustainable land management and climate smart agriculture in project site.

Pilot Site Four Sarayönü-Cihanbeyli

Map



4.1 General Site Description

The total size of the pilot site is 232,750 ha. The site is located in the northwestern part of the KCB. Sarayönü and Cihanbeyli district centers are in this project site. There are two districts, 8 towns and 19 villages. Average elevation of the project site is around 1,050 meters.

The pilot site covers an area of 232,750 ha. The average elevation is 1,050 meters. There are 15,000 ha of forests, 139,000 ha of arable lands and 57,000 ha of pasture. Gözlü State Farm in Sarayönü is 28,000 ha used as both farm and pastureland. The total population is 21,293. The primary income sources are crops (70%) and livestock (30%).

In the project site, there are 2 key biodiversity areas, namely Insuyu Valley and Sarayönü KBAs. The former site is key for endemic plant and fish species, whereas the latter is holding one of the few breeding sites of globally threatened Great Bustards

The total area of cultivation is 139,000 ha and 85% of this is cereal crops, 10% is for industrial crops. The amount of pasturelands is 57,000 ha and approximately 90% of this is heavily degraded.

The total area of forest areas stand as 15,000 ha. In this pilot site all the forest tenure is public with a percentage of 99. The main tree species is oak, locust, eleanus, cedar, juniper and black pine. In the context of forestry, there are some occupation and farmlands by the private initiatives.

In project site, there is no surface water resource, but there are about 700 wells for irrigation. However, the groundwater resources irrigates 7,250 ha arable land.

4.2 Social and Economic Factors

The total human population of the pilot site is 21,293. Detailed population numbers of the villages and towns are given in the table below.

The population trends in the region are available in the district level only. The population trends have been decreasing in the past decades according to the values of these two districts. Population growth rate in Cihanbeyli and Sarayönü districts between 2011 and 2012 were -0.19%, and -0.36% respectively. The population projections for 2023 estimates further decrease for Cihanbeyli. According to population projections, the population of Cihanbeyli will decrease 25% and Sarayönü will remain the same. Moreover, Average household population is 4.33 for Cihanbeyli and 4.11 for Sarayönü.

The trends have a tendency to decrease for the villages and district centers. Out migration rate is highest for this site among the all project sites (2011-2012 period).

The rate of 15 - 65 age groups that are known as the active population constitutes the 2/3 of the total age group in the site. Moreover, the gender rates stands as 49% for males and 51% for females.

Table: Population of the district centers and the villages

District	Place	Population	District	Place	Population
Cihanbeyli	Turanlar	342		Pınarbasi	180
	Uzuncayayla	106		Zaferiye	349
	Karabağ (M)	3253		Beylioiva	93
	Kusca (M)	2011	Sarayönü	Gozlu(M)	1278
	Kelhasan (M)	1576		Kayioren	142
	Kandil(M)	2097		Kuyulusebil	304
	Korkmazlar	190		Cesmelisebil(M)	1258
	Kayı	151		Karabiyik	227
	Sığircık	130		Ozkent	644
	İnsuyu(M)	1694		Boyalı	311
	Tufekcipinari	250	Others	Alacahacili (Haymana/Ankara)	365
	Yunlukuyu	100		Hatırlı (Yunak/Konya)	289
	Bogrudelik	352		Kolukisa (M) (Kadinhani/Konya)	2669
	Hodoglu	932			

(M) Municipality

The average education levels are lower in the rural areas due to the education opportunities. There are no schools other than primary schools in the villages. Therefore, the education levels are higher in

district centers. Illiteracy rates of the main districts of the pilot site for ages above 15 are as follows: Cihanbeyli 6% and Sarayönü 4%.

Depending on the agriculture characteristics, the average income level is lower in rural areas in comparison with district centers. It is well-known that the living conditions of the some households in project site are under the average poverty value of Turkey. However, there is no data available to demonstrate that in the village level.

There is limited study about nutrition status in Turkey and these are mainly concentrated on city and district centers. In Turkey, there is no hunger problem in the rural areas as the people are self-sufficient in the rural region.

In the project site, main income sources are field crops and animal production. The rate of agricultural employment is higher than that of industrial sector in the pilot site. There are nine Small and Medium Size Enterprises (SMEs) in red meat industry, flour products and animal feed and total employ is only 144 people in Sarayönü district. There are 11 SMEs in Cihanbeyli district that are specialized in dairy products, wheat process and animal feed and they have only employ 161 people. The numbers of the non-agricultural enterprises are 4 in Sarayönü district and 6 in Cihanbeyli district.

4.3 Natural Resource Management

Main government agencies in the project site are the district branches of MFAL that are present in Sarayönü and Cihanbeyli districts. The main responsibility of the district branches of are mainly to implement the annual plan and programs of the Province Directorate in the district level. Among these, definition of arable lands, monitoring agricultural areas, and monitoring and assessment of subsidies given to the local farmers. There are 18 agricultural engineers and 12 veterinarians for extension and animal health services in the project site.

In Konya, there is Regional Directorate of OGM and other local directorates related to this headquarters that is responsible for the management of the forests in the region according to the management plans prepared every 10 years. All these directorates are responsible for the all forest management and protected areas.

There is also Gözlü State Owned Agriculture Farm (State Farm) within the borders of the project site. The organization is responsible for production of high quality field crop seed and breed animals for local farmers needs. Total land resources of the State Farm is around 28,000 ha and of this amount, 55% is agricultural land, 35% is pasture-meadow and 10% is other types of lands. The total cultivated land size of the State Farm is 26,170 ha and of this amount, 55% is used for field crops and 45% is fallow land. About 9% of agricultural lands (2,352 ha) is irrigated. Ground waters are used in irrigations. Sprinkler irrigation is used in 77% of the irrigated land and drip irrigation stands for 23%. Cereal production is performed over 90% of the total cultivated lands; fodder production and legumes are cultured only over 10%. Vegetable and orchard lands are almost extinct in the farm. A total of 1,040 ha are used for orchard culture. Pasture-meadow land of the farm is about 10,210 ha. Almost 98% of pasture-meadow lands are degraded.

There are ca 13,700 sheep and goats in the farm. Cattle breeding activities will begin with about 2,000 cattle in 2014 and reach to 5,000 in few years. There are significant decreases in number of sheep during the last 10 years because of pasture degradation and increasing input prices.

Technical experience and accommodation facilities of the state farm for trainers are very important for the training and capacity building activities of the overall project.

Provincial agriculture master plan was prepared in 2004 in Konya. The Strategic Agricultural Development Plan has been developed in 2010. The Master Plan and Development Plan are the main structure of agricultural activity planning in the provinces and districts. Moreover, these plans are

accompanied with macroeconomic policies of the MFAL. The Province Directorate of the MFAL is then preparing its annual plans upon those macro plans. Besides, cooperation programs are prepared with other relevant ministries for planning, implementation and M&E stages.

Depending on the trainings needs relating to the programs and plans of the MFAL, training programs are prepared and organized in the relevant seasons in province and sometimes in central level.

In Konya province, besides the technical staff serving in the province and district levels, there are 350 extension agents of the ministry who are responsible from meeting the training needs of farmers in daily life as well as implementing the planned training programs of the Provincial Directorate of Agriculture. These experts will be very important in the implementation of the project activities; however, they will need to be trained according to the project focus area/issues.

In Turkey, forest management plans are prepared for regional enterprises every 10 years. Following the management decisions, local branches of Directorate of Forestry implement the forestry actions. In the project region the management plan was prepared in 1993 and was revised in 10-year basis.

In the Gözülü State Farm, a pasture rehabilitation project will start with covering an area of 500 ha in 2014 and its total cost will be US\$ 100,000. Moreover, in the State Farm, wind erosion prevention implementations have started in 1950 and continued till 2003. Many tree corridors have been established during these activities with 250 m intervals. This plantation has created a protection for 3,000 of land.

The ÇATAK project applied during the last few years in the project site and is the total cost is around US\$ 337 000 and the cost of no-tillage agriculture project, supported by MEVKA, is about US\$ 117 000.

MFAL has been support to the farmer to improve mechanization level since 2010 and a total of US\$ 330 250 machinery-tool support was provided to 87 farmers in the project site.

The GoT is leading a project under the IPARD program that is also focusing on Great Bustard friendly agricultural activities. The project activities will be carried out in Polatlı State Owned Farm and in the surrounding villages, which is placed in northern part of the pilot site. Subsidizing the farmers for the conservation of species will be applied in the same line with the EU subsidy programs for biodiversity. Although the project is in outside the KCB, the continuation of the IPARD program can include Sarayönü Gözülü Sate Farm and/or lessons learned from this project can directly feed into the conservation/management of Great Bustards and their habitats as well as subsidy mechanisms.

4.4 Justification for Site Selection

Agriculture is the main economic sector in the project site and corresponding at least 70% of the project site's GDP. Main activities in the agricultural production are farming (70%) and livestock husbandry (30%). The total area of cultivation is 139 000 ha and ca 44 784 ha of this stands as fallow area due to insufficient rainfall and limited irrigation opportunities. Stubble burning is practiced on ca 5 500 ha in the project site. The main crops are cereals and sugar beet.

Additionally, GoT has been supporting main oil seed production (sunflower, safflower, maize), sugar beet and fodder crops (alfalfa, vetch) as well as livestock during the last 10 years. Most of the farmers have switched their farming practices from dryland farming to irrigated farming due to these supports. Although the amount of irrigated area covers 7 250 ha land with an increased of 60%, this number stands for only the 5% of the total arable land. In this period, sugar beet, maize and sunflower production has increased 3 times within last 3 years. Another aspect of this increase is that as the sugar beet production increased over the past years that also increased the amount of methane emissions from sugar production factories in KCB.

There are no surface water resources in the project site. Therefore all of the irrigation water is subtracted from the underground water table. The number of wells has doubled in the last ten years reaching up to 700 wells of which 20% are unlicensed. Most of the irrigation is applied with pressurized irrigation techniques.

Existing crop pattern does not fit with the potential water capacity of the pilot site where annual precipitation ranges around 300-350 mm. This has led to uncontrolled use of water resources and, as a result, the ground water levels and the quality of available water decreased. The water levels have dropped ca 30 meters in the last ten years.

Moreover, intensive agriculture production techniques such as over use of inputs (fertilizer, chemicals, irrigation etc.), non-proper mechanization techniques like intensive soil tillage, field trafficking have resulted in degradation of land in the project area. This degradation has also triggered the wind erosion and decrease in organic content of the existing soil texture. Although the farmers are using more inputs such as more irrigation water, fertilizers and etc. for compensation, this approach is not sustainable in long term. Stubble burning, having large areas of fallow lands and intensive soil tillage and wind erosion are the main factors that are triggering the erosion in the region.

The pace of land consolidation activities in the project site is increasing. These activities create very important benefits such as, establishing windbreaks, field roads, ecological corridors, proper irrigation systems and saving of the input usage (fuel, fertilizer, water, etc.). In Sarayönü, land consolidation activities have been finalized in Karatepe village and wind breaks were established following that. However, some of the trees used have died due to wrong species selection and lack of irrigation during the first years.

Wind erosion is the major problem in this area too. The local soil texture is very sensitive to erosion due to the small particle (grain) size. The major threat is loss of fertile top-soil through wind erosion. The wind erosion causes humidity loss in the topsoil. The situation is worsen by inappropriate land-use techniques, e.g. increased plough depth to turn the moist soil content to the surface for the seed bed which also removes the organic matter from the top layer.

In KCB, Sarayönü region is the best place in terms of direct seeding applications. The local people of Sarayönü are quite open to changes and adoption of new techniques. Many farmers purchased direct seeding machines and started non-tillage farming for many years now. In whole of the KCB, this region is the place where most advanced agricultural technologies are used in terms of using direct seeding machines. The amount of farmlands that are under the program of Leader Farmers Union has reached up to 2 400 ha. In 2013, for instance, 40 farmers asked for direct seeding machine support from the MFAL but 11 of those could be financed by the Ministry. Today, there are already 26 direct seeding machines only in Sarayönü region. However, there is still a long way to go in terms of widespread use of these machines in the region.

MFAL is implementing an environmental project, the ÇATAK. There are many projects supported by ÇATAK in the region. ÇATAK will continue to support the environmental friendly agriculture activities in the region.

Moreover, the project site contains the Gözlu TIGEM State Farm that covers an area of 28,000ha. 20,000 tones of cereals and 1,530 tones of fodder crops are produced annually. 71% of these products are sold as seeds in more than 40 cities of Turkey. The innovative agriculture practices in the State Farm have played a key role in terms of training the local farmers of the region. The State Farm will support the training and experimental research activities for the project as well as providing training opportunities. Moreover, the State Farm is building a biogas plant that will contribute to the emissions levels target of the project.

As the need for input usage is rising in order to compensate for the negative impacts of the land degradation, the unit cost of the agricultural production is rising as well. For instance, ten years before the organic content of the soil was ca 1.5%, now this amount is less than 0.7%. Farmers are using more and more fertilizers to fill this gap. Moreover, as the water table level is getting lower, the costs associated with subtracting this water is also increasing. In the region, irrigation costs are roughly 5 times higher than 15 years ago. For example, only in Sarayönü the level of dry land farming has decreased by 2% in the last decade due to land degradation phenomenon. This has resulted in migration of young population from villages.

Sheep and goat husbandry is one of the main activities in the project site. Already there are 93,294 heads of animals with an approximately 10% increase in the last 10 years. Main reasons of this limited increase in the numbers of goats and sheep is the degradation of the pasturelands due to insufficient precipitation, overgrazing and erosion. The water scarcity has been a serious issue for animal husbandry too. The 57,000 ha pastureland has been degraded due to this scarcity as well as overgrazing. This is the main limiting factor of increasing the animal numbers. I

With the support of GoT, cattle husbandry has become important. Being relatively close to Konya city center is another reason of this increase. Although the number of cattle has increased 10% and reached to 15,000 in the last 10 years. Indeed, this increase was lower than what is expected. The main reason of that was the limited number of irrigated lands that has resulted in limited amount of fodder crops.

On the other hand, an increase of 10% in the livestock numbers has resulted in greater amounts of methane emission levels too. However, the extend of this situation is not measured yet. As there are no manure storage/processing facilities in the region, the methane release has been a major contributor to the atmospheric greenhouse gas level.

Most important slaughterhouse of Konya, namely the YILET, is operating in the pilot site. It is important to prevent indirect methane emissions from this facility. Moreover, MFAL is constructing a biogas facility in the Gozlu State Farm in order to generate electricity. The total capacity of the facility will be 250 kWh. The major input of the facility will be the cattle manure that is produced in Gozlu State Farm. This is expected to contribute to the project goals. Moreover, the local farmers and the local branch of MFAL are open to demonstrate village base digesters to benefit from new approaches regarding methane.

Approximately 200,000 tons of animal manure is produced annually in the pilot site. This resource will be used for the improvement of the degraded farmlands. Moreover, in the project site there is chicken-manure facility. It was established in 2011 with US\$ 1,000,000 investment. There is also a methane capture processing in the facility.

The forest structure of the pilot site is mainly in artificial character and consisted of coniferous and deciduous species. In the past, some of the agricultural lands have been converted into forest by the decision of the government. Current forest cover is approximately 15,000 ha and this includes 5,000 ha degraded oak, juniper and black pine that is also including pasturelands. Most of the forests of the region are degraded due to lack of fodder production that is not matching the needs of local people. Furthermore, the infrastructure of pastures and forests (roads, fire security roads, paths and fencing, etc.) is not in desired level and shape and this situation is affecting in particular the success of the plantation efforts.

In order to rehabilitate the forests stands in the region, coniferous and deciduous species have been planted in the area for at least 20 years. However, afforestation and rehabilitation activities carried out in the region could not reach the main management targets most of the time due to the inappropriate species selection and wrong soil plough techniques. Illegal occupation of forestlands by local people to open agricultural lands has also contributed to this degradation. The major threat was loss of

seedlings due to water scarcity, bad soil conditions and ineffective plantation techniques. Moreover, the seedlings used were not drought-tolerant ones.

New and innovative plantation approaches are adopted and started by the MFAW in the recent past. For instance, Cihanbeyli afforestation implementations were carried out with drought tolerant species in 2012 on 66 ha land and is still continuing. During these plantations 58,610 seedlings were used. The aim of the plantation was to protect the soil and prevent erosion in Büyükbeşkavak, Karşiyaka, İnsuyu, Yeniceoba villages.

Two key biodiversity areas (KBA) partly overlap with the boundaries of the pilot site. The İnsuyu Valley KBA extends along the İnsuyu Stream, west of Cihanbeyli and the KBA. The site covers almost all of the KBA and is important for two endemic plant species *Achillea sieheana* and *Astragalus kirsehehiricus*. Moreover, there are four different endemic freshwater species that inhabit the stream: *Pseudophoxinus crassus*, *Cobitis (Bicanestrinia) turcica*, *Aphanius anatoliae anatoliae* and *Gobio gobio insuyanus*. There is no data or trend available about the statuses of those species.

The other site is Sarayonu KBA and the pilot site overlaps with the northern part of the KBA. The site gains its KBA status due globally threatened Great Bustards (*Otis tarda*). Over 40 individuals are estimated to breed in the region, however there is no extensive study on the species. The population and the trends of the species might have changed. The Great Bustards breeds only in few sites in Turkey and hence Sarayönü is in utmost importance for the species. Illegal hunting of Great Bustards is the main threat besides the impact of extensive farming practices. The use of pesticides and harvesting timing are thought to affect the breeding success of the species too. The officials of Gozlu State Farm indicates that as there is no hunting allowed in their farms during the last years, the number of Bustards using their fields are increasing. The site is providing a refuge to the species and also indicates that controlling hunting can improve the status of the species. The species is highly dependent on the agricultural activities. In many European countries, adoption of several agricultural methods and precautions has demonstrated that their numbers can increase in relatively short time periods. The project can make a significant change in terms of Great Bustard populations and demonstrate biodiversity-focused agricultural practices. These results then can be repeated elsewhere in Turkey. Lastly, the provincial directorate and Sarayönü branch of MFAL have identified the Great Bustards as flag species and willing to work on the species towards its conservation. That will be another asset to help achieving the target for the species.

The existing will of the provincial directorate and Sarayönü branch of MFAL towards the conservation of Great Bustards is a key opportunity. Moreover, existence of a related NGO, Başak Ekolojik Yaşam Derneği (Başak Ecological Life Association) and their previous project will be another positive asset. The organization can play a key role in supporting the Great Bustard conservation strategy as they are very well organized among the local farmers. The project itself will complement the previous actions on awareness rising among farmers about Great Bustards. In the recent past, the association led a project on the species with the support of GEF Small Grants Program. The project mainly focused on awareness-raising activities among farmers.

The pilot site is a key region in KCB in terms of the rate of land degradation. Unsustainable farming practices are causing irreversible loss of soil quality as well as consumption of water resources. For instance, almost 20% of the erosion occurring in the KCB is present here. The pilot site is a crucial one to demonstrate prevention of wind erosion and saving the water resources. Wind erosion in the pilot site causes the top soil loss, sediment accumulation, humidity loss and consequently degradation.

In order to maintain and even increase the current levels of crop production capacity, intensive agricultural approaches are used in an unsustainable manner. Use of high input materials and technologies are not compatible with the existing natural resource structure and availability. Currently, the farmers are trying to overcome this problem via use of highly mechanized approaches in an increased manner with an ignorance of its negative impact on soil, water and biodiversity resources. In

case the situation continues in this way, it will be impossible to achieve sustainable land management goal in the region and the results will be irreversible.

The existence of State Farm is an important asset for the project. The site and methods implemented present good opportunity of trainings for the project. Moreover, the biogas plant that is under construction can contribute to the project's emission targets.

In terms of forests landscape, the pilot site includes specific peculiarities in context of topographic, climatic and socio-economic conditions. The planned rehabilitation approaches that will be implemented in this project can be achieved in the pilot site due to these special conditions of the region in terms of combating erosion, rural employment, income generation and water economics.

Moreover, the site is significant in terms of urban forests. These forests are established next to the cities and towns and also include recreational activities for local people. The project will work in those urban forests too with a focus on recreational activities.

4.5 Proposed Project Sponsored Activities

In the proposed project, it is planned to rehabilitate 4,000 ha of forests through deep soil cultivation by excavators followed by plantation of oaks, junipers, eleagnus, locust, cedar and black pines in the pilot site. The state and private nurseries will be providing the necessary production and processing facilities for seeds and seedlings for plantation.

In the historic attempts of forest rehabilitation in the region, soil was ploughed by hand and the seedlings that are non-resistant were chosen. The depth of the soil plough was not enough for successful planting. Moreover, the selected species were not the appropriate for the rehabilitation. In order to overcome the problems that were faced in the previous rehabilitation activities, several protection measures will be practiced within the project. For instance, in order to prevent the access people to the rehabilitation sites the area will be re-fenced and fencing improvement.

The project activities will demonstrate how the innovative forest rehabilitation techniques can be implemented in degraded forest in the project site as well as provide good examples of urban forests with recreational activities.

In the project site, 15,000 ha of farmland will be rehabilitated through climate-friendly agriculture approaches, such as direct seeding, reduced tillage and the use of animal manure. Approximately 1,500 farmers will be benefited from these activities. Direct seeding implementation will be carried out in 9,400 ha fallow lands. Reduced tillage approaches will be implemented in 3,750ha that. Safflowers (a drought resistant species) and vetch will be chosen for production

By cultivation of fallow lands through direct seeding methods, wind erosion will be prevented in the pilot sites. Furthermore, there will be a 50-80% reduction in fuel consumption and hence drop in CO₂ emissions with a direct positive affect to mitigation efforts. These practices will increase the amount of water that is kept in the soil.

In 1,850 ha of land animal manure will be spread to the fields as well as in cereal production liquid manure will be used. In the project site taking into consideration of cattle numbers the total manure production is 525 tonnes per day. As the farmers generally don't have storing facilities, these manures create environmental pollution problems too. Use of these manures in fields is a benefit in both ways. It can increase the organic matter in the soil that is less than 0.6% in the region, and also increase the

water retention capacity of the soil. Moreover, it will overcome the storage problems of the cattle breeders. Similarly, the use of liquid manure can decrease the use of chemical fertilizers with a 35%.

In the proposed project, it is planned to rehabilitate 8 000 ha of pasture rehabilitation through the rehabilitation of degraded pasturelands by using qualified species. All these protected areas will be monitored and controlled by the Regional Forestry Directorate.

About 8 000 ha of pastures will be rehabilitated by using alfalfa, vetch on the project site and suitable grazing plan that is including rotational grazing and protection measures (fencing) will be prepared and implemented within the project site.

It is planned to reduce emissions of CO₂ eq by 4,000 tones through methane capture practices in the project. This target will be achieved through biogas facility (Gözlü), preventing the stubble burning, crop rotation in sugar beet cultivation, water treatment in slaughterhouses establishing manure storages and by undertaking trainings to farmers and sectoral stakeholders.

The project activities will establish and demonstrate sustainable land management and climate smart agricultural activities in order to achieve sustainability in the use of natural resources by public institutions and community based organizations.

The project will undertake a package of activities to achieve conservation of Great Bustards in the pilot area. In the first step, the current status of Great Bustard will be identified through baseline surveys; population, trends, threats, relation with agriculture. Then, a conservation strategy will be prepared and implemented. The lessons learned will be shared to other regions where Great Bustards inhabit.

In the project site, a biodiversity-mainstreaming activity will be implemented in agricultural areas covering a 22,000 ha of land. The Biodiversity mainstreaming will be held in all of the project sites with a consistent methodology. That will help understanding and adoption of integrating biodiversity into different sectoral plans and strategies.

The above-mentioned facts, related to natural resource use and management in the pilot site have several costs and impacts in terms of socio economy and ecosystem degradation.

Appendix 11: Globally Significant Biodiversity

Konya Basin lies within the junction of two major phyto-geographic regions: Mediterranean and Irano-Turanian. Therefore the biodiversity of the region is characterized by species and habitat compositions from both of these phyto-geographic regions. High Taurus Mountain Ridge in the south and southeast, flat plains all around the basin, numerous wetland systems, salty steppes and sedentary volcanic mountains rising in the middle of the plains further supports the existence of high biodiversity richness in Konya Closed Basin.

The KCB lies within “Mediterranean Forests, Woodlands and Scrubs Eco-Region” under the “Global 200 Eco-regions” (priority areas for conservation) defined by WWF International. These are defined as the regions of highest and unique biodiversity on Earth. Moreover, KCB lies within the Irano-Anatolian Biodiversity Hotspot that is one of the 35 hotspots of the World identified by Critical Ecosystem Partnership Fund (CEPF) (see. http://www.cepf.net/where_we_work/Pages/hotspot_facts.aspx). Hotspots are places, which contain at least 1,500 species of vascular plants (> 0.5 percent of the world’s total) as endemics and have lost at least 70 percent of its original habitat. Being under these internationally important regions, Konya Closed Basin is an important area in global level in terms of biodiversity richness and conservation priority.

Furthermore, KCB is very rich in terms of number of Important Bird Areas and Important Plant Areas, of which their inventories were completed in the recent decades. Key Biodiversity Areas of Turkey, a publication of the year 2006, is summarizing information on all of these in one inventory. According to the inventory, in KCB there are 24 KBAs and that is bit less than 10% of the all KBAs in Turkey.

General biodiversity characteristics

Several regions of the Konya Basin are covered with forests. Forests in the southern mountains are characterized by Black Pine *Pinus nigra* and Taurus Fir *Abies cilicica* with further existence of oaks and juniper. Volcanic mountains rising from plains are covered with fragmented oak forests with several rangelands within some of them. These oak forests are found in Karacadağ, Hasandağı and Melendiz Mountains. Most of the time, these oak forests are supported with other shrub and tree species.

Steppe habitats dominate the Konya Basin. There are three main types of steppe in the region. Mountain steppes are present in the lower parts of the southern mountain ranges and in the volcanic hilly landscape where the forests are mainly degraded. Although plain steppes are mostly converted to arable lands, some patches of them can be found throughout the basin. Remaining plain steppes are left as they are neither not suitable for agriculture nor they are used for grazing purposes. Lastly, the salty steppes are found around Tuz Lake and plains of Ereğli, Çumra and Karapınar. The salty steppes around the Tuz Lake have a special importance as this unique habitat is home to various narrow range endemic plant species that are not found anywhere else in the World but this region. Among 34 endemic plants growing here, 5 of them are endemic to their sites.

Once, the Konya basin was one of the most important regions in Turkey in terms of wetlands. Extensive water usage, construction of reservoirs, drainage of wetlands have caused to the loss of several wetlands completely and degraded the rest. Freshwater wetlands include Eşmekaya Marshes in the north, Ereğli Marshes and Hotamış Marshes in the south are almost totally dried. Among other freshwater lakes, Beyşehir Lake in the southeast and Kozanlı Lake in the northwest of the Basin are still in place.

Key species

The Konya Closed Basin is home to several key species of national and global importance. One of the world’s biggest breeding colonies of Greater Flamingos is present in Tuz Lake. Every year, thousands

of them lay their eggs in the southern part of the lake. The birds use surrounding wetlands for foraging. Thus the wetland system around Tuz Lake has an utmost importance. During 2007-2008 droughts Flamingos suffered due lack of water in the lake and most of the juveniles of colony have died accordingly. As the underground water levels are getting lower and lower each year, flamingos depend on the rainfalls. Flamingo's future lies parallel to that of water in the basin.

Great Bustard was a common species of steppe habitats in Turkey but due to intensive agricultural practices and poaching, their breeding numbers have dropped a lot in last decades. Currently there are a handful of sites in the country having breeding populations of the species and several of them lies in the Konya Basin. They breed mainly around Tuz Lake and there is a small population around Sarayönü-Cihanbeyli region.

A subspecies of Lesser Short-toed Lark *Calandrella rufescens niethammeri*, a central Anatolia endemic bird species, is the key biome-restricted bird species found in the region for salty steppes and is a key indicator for healthy steppe habitats. Some scientist claims that it stands as a species but further research is needed.

Konya Basin hosts several key inland fish species. Among many endemic fish, several are endemic to one site only and hence have a critical priority for conservation. These are *Gobio hettitorum* in Yeşildere, *Cobitis evreni* in Kozanlı Lake, *Barbatula eregliensis*, *Alburnus akili*, *Chondrostoma beysehirense*, *Cobitis bilseli* and *Pseudophoxinus battalgili* in Beyşehir Lake.

Another endemic species is a mammal called Anatolian Vole *Microtus anatolicus*. The range of the species is restricted to Tuz Lake only.

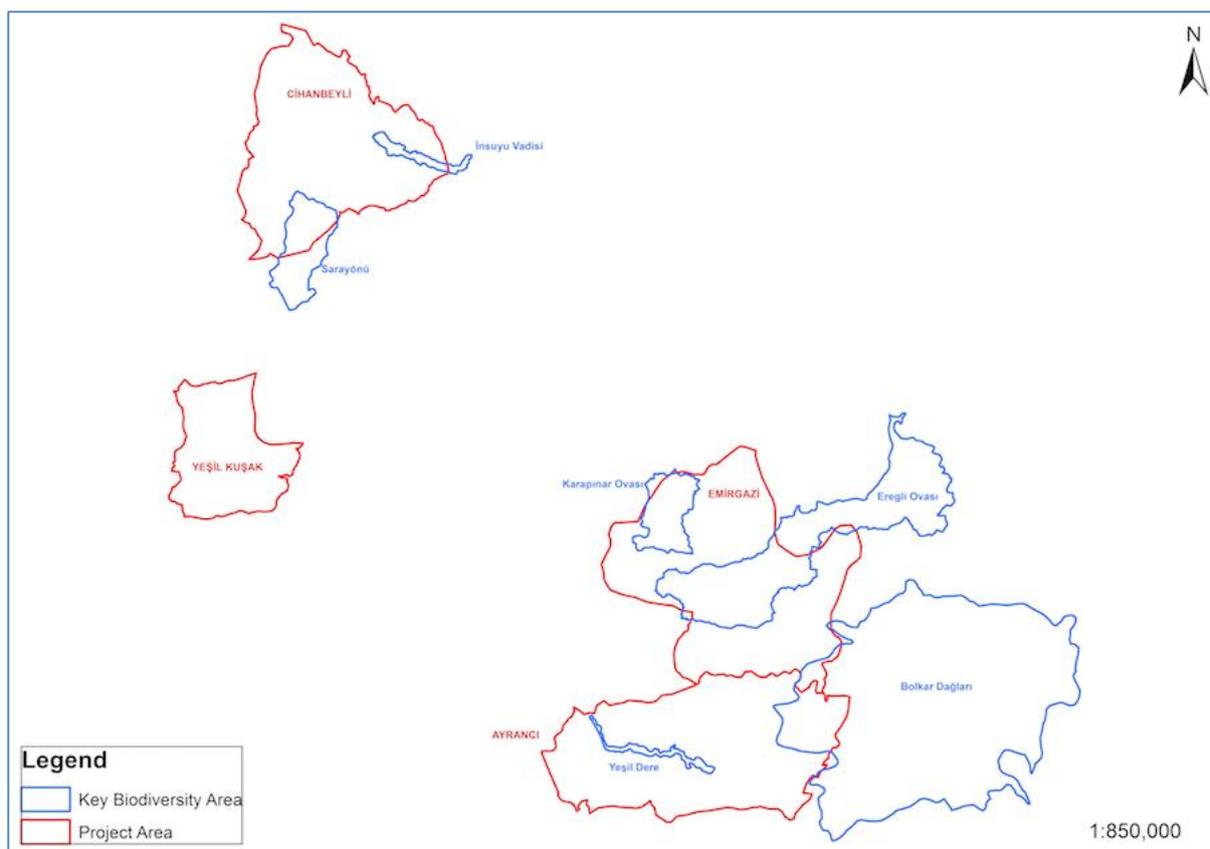
The Konya Closed Basin is also important place for narrow range plant species, which are growing in the salty steppes of the region and exists only in those sites. There are 1 species in Tersakan, 3 species in Tuz Lake and 1 species in Karapınar Plain.

Study of Biodiversity

There have been several studies in Konya Basin regarding biodiversity. One of these comprehensive efforts was undertaken by Turkish Society for the Protection of Nature (Today's WWF-Turkey) during 1998-1999. The organization have undertaken researches on birds and plants of the region and summarized the existing literature on other taxa.

The same organization has undertaken the studies of Important Bird Areas and Important Plant Areas and those were published at 1997 and 2003. Later, Turkish Nature Association (Doğa Derneği) updated the IBA inventory in 2004 and published the Key Biodiversity Areas Book in 2006. Key Biodiversity Areas Book summaries all of the information on key taxa including birds, mammals, plants, reptiles, amphibians, plants, butterflies and dragonflies. (See references for the details of these studies.)

In Konya Basin there are 24 Key Biodiversity Areas. Some of these key biodiversity areas (KBA) are partly in Konya Basin and other parts are extending to other basins. Detailed information about those sites is given in the table below.



The key biodiversity areas with respect to the pilot sites (KBAs are shown in blue.)

Table 6: Key Biodiversity Areas in Konya Basin

Site	Key species	Size (ha)	Conservation status
Sarayönü	Great Bustard, breeding: 40-60 individuals	35 349	No data
Akyay Plain	8 endemic plants.	17 435	Urgent
Hodulbaba Mountain	Anatolian wild sheep. Golden Eagle and Steppe Eagle, breeding.	79 589	Monitoring needed
Hotamış Marshes	Wetland birds including White-headed Duck, Dalmatian Pelican, Marbled Duck. One endemic fish species.	17 406	Restoration needed
Yeşildere	Gobio hettitorum. Endemic fish to this KBA.	6 359	Very urgent
Çöl Lake and Çalıklüzü	2 endemic plants. Many bird species including White-headed Duck, Lesser Kestrel.	42 181	Conservation dependent
Uyuz Lake	Breeding birds including White-headed Duck.	1 077	Monitoring needed
Kozanlı Gököl	3 endemic fish species, one restricted to this KBA only. Breeding wetland birds including White-headed Duck and Lesser Kestrel.	3 139	Conservation dependent
İnsuyu Valley	2 endemic plants and 5 endemic fish species.	7 523	No data

Bolluk Lake	9 endemic plants. A breeding colony of gulls and terns.	10 517	Very urgent
Tersakan Lake	8 endemic plants, one is restricted to this IBA only. Important for waterfowl.	11 961	Very urgent
Kulu Lake	Many wetland birds including breeding White-headed Duck	2 442	Very urgent
Tuz Lake	34 endemic plants, 3 of them restricted to this KBA only. Breeding colony of greater flamingos. Great Bustards. <i>Microtus anatolicus</i> , endemic to this KBA only.	533 565	Very urgent
Eşmekaya Marshes	Endemic plant. 3 endemic fish. Wetland birds including White-headed Duck and also Lesser Kestrel.	7 939	Restoration needed
Obruk Plain	Endemic plant. Steppe biome birds.	27 538	Very urgent
Karapınar Plain	17 endemic plants, one restricted to this KBA only. Wetland birds.	28 386	Conservation dependent
Ereğli Plain	8 endemic plants. Wetland birds including many globally important ones. 5 endemic fish, one of them restricted to this KBA only. One endemic turtle subspecies.	137 020	Restoration needed
Hasan Mountain	3 endemic plants. 2 endemic fishes.	199 181	Monitoring needed
Akkaya Lake	White-headed Duck. Endemic fish.	705	Monitoring needed
Dedegöl Mountain	37 endemic plants, 2 of them restricted to this KBA only. 3 endemic butterflies. Endemic fish species.	138 568	Monitoring needed
Beyşehir Lake	9 endemic fish species, 3 of them restricted to this KBA only. 3 endemic plants. Wetland birds. Endemic frog. Endemic butterfly.	91 947	Conservation dependent
Akseki İbradı Forests	22 endemic plants, 3 of them restricted to KBA. Forest birds. Endemic salamander. 2 endemic reptiles.	134 492	Monitoring needed
Geyik Mountains	Many endemic taxa, including 3 narrow range endemics to KBA.	251 601	Monitoring needed
Bolkar Mountains	Many endemic plants, 10 endemic to KBA. Several key birds of prey.	399 366	Urgent

Protected areas in Konya Basin

Site	Status	Date	Size (ha)
Beyşehir Lake	National Park/Natural Sites	1993	88 750
Bozdağ	Wildlife Reserve Area	1967	59 269
Uyuz Lake	Natural Sites*		
Tersakan Lake	Natural Sites*		
Bolluk Lake	Natural Sites*		
Kulu Lake	Specially Protected Area/	2000	(SPA under Tuz

	Natural Sites		Lake)
Meke Maarı	Ramsar Site/ Natural Sites	2005	202
Akgöl (Eređli Marshes)	Nature Reserve Area / Natural Sites	1995	6 680
Kozanlı Lake	Natural Sites*		
Samsam Lake	Natural Sites*		
Tuz Lake	Specially Protected Area	2000	741 440
Eřmekaya Marshes	Wildlife Reserve Area/ Natural Sites	1994	4 500

* Information on the sizes and declaration dates of natural sites are not widely available as they are declared through local councils.

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Appendix 12: Summary of Climate Change and the KCB

Turkey's First National Communication on Climate Change from 2007 indicates the impacts of climate change in Turkey as the following: increasing summer temperatures, decreasing winter precipitation in western provinces, loss of surface water, increasing frequency of droughts, land degradation, coastal erosion and floods. This is expected to have negative impacts on water and soil resources necessary for food production and security and therefore directly on development in rural areas and the severity of these impacts will gradually increase. It is for example anticipated that 50 % of the surface waters in the central (KCB) and western parts of Turkey will be lost by the end of the century and that water scarcity will be faced in agricultural, domestic and industrial usages.

Although the impacts of climate change in Turkey seem to pose a serious threat, it is also envisaged that these impacts will bring with them some opportunities if addressed carefully. It is crucial that any action reduces the pressure on water and natural resources in general and targets bottlenecks and opportunities in the development of climate-dependent sectors.

Forest fires, drought, desertification, ecological degradation and diminished water resources are the impacts of climate change evident in KCB. Climate forecasts indicate further noticeable temperature increases and a change in precipitation regimes which already affect water resources, agricultural production, public health and climate-related natural disaster risks; all ecosystem services that form the basis of economic activities. In the current situation in the region until the year 2080; in mean annual temperature (1960-2000 compared with the period) increased approximately 3-4 °C, about 1 mm/day reduction in average rainfall, agricultural production is projected at approximately 2.5% decline.

The National Climate Change Adaptation Strategy and Action Plan focused on five important fields which are supported by technical and scientific studies and participatory processes:

- Water Resources Management
- Agricultural Sector and Food Security
- Ecosystem Services, Biodiversity and Forestry
- Natural Disaster Risk Management
- Public Health

Water Resources Management

Increasing temperatures in Turkey as a result of climate change would lead to increased summer temperatures, reduced winter precipitation (especially in the western provinces, KCB), loss of surface waters, more frequent dry spells, degradation of soil, erosion in coastal regions and floods all of which are direct threats to water resources.

Projections for the year 2100 suggest that precipitation patterns in KCB will change and that snowfall will be more and more replaced by rain during wintertime as a result of increasing temperatures. The snow cover would also melt faster and increase surface runoff. This would lead to water shortages in elevated areas where urban and agricultural water requirements and supply are regulated on the basis of 'snow load' throughout the year. Shortages would hit at times when water demand is highest. The alteration of the water-cycle will lead to considerable changes in the supply and quality of water resources and impact many climate-dependent sectors, e.g. food production for which water is vital.

Agriculture Sector and Food Security

As mentioned before, climate change will lead to shifts in water cycle and temperatures and to seasonal alterations. These changes will inevitably have direct impacts on the agriculture sector. As a result of changes in temperature and precipitation patterns, the distribution area of agricultural pests will expand and the number of species concerned will increase. Climatic changes will affect production, production sites and stockbreeding activities. The volume and the possibility of increased occurrence of these changes will lead to a higher risk of reduction in agricultural yield. All these are directly related to food safety.

The impact of climate change on the agricultural sector in KCB is decisive for food security because it is the priority sector in socio-economic terms and population's main source of food supply (12 % of the arable lands in Turkey lie in KCB). Nearly 3 million people live and 25% of them live in rural area and approximately 175 000 farmers have been registered to the Ministries' database in KCB. The main

economic sectors for the region are agricultural production (both animal and crop production) and food industry. The average (annual) income per capita is estimated as US 11 387 for urban households and US 8 648 for rural households (2012). In the total income of Turkey, KCB supplies 9.2% income from cereals, 6.2% income from leguminous seeds and 8.5% income from industrial crops like sugar beet.

At least 40 % of the local arable land is subjected to water and wind erosion (water erosion in hilly areas, wind erosion mainly in plain areas). The amount of water available for agriculture will diminish, water quality will decrease, biodiversity and ecosystem services will be lost, agricultural production patterns will change, pastures will degrade, stockbreeding activities will be affected and farmers will find themselves incapacitated in terms of adaptation to climate change; and all these will ultimately risk sustainable production of food.

Ecosystem Services, Biodiversity and Forestry

In addition to the ever-growing losses of productive surfaces, climate change will also result in loss of biodiversity. These losses will significantly affect ecosystems and their services which are crucial for the society. Ecosystems have a direct role in the formation of the carbon-storing topsoil, wetlands and regulation of climate.

Climate change is already causing alterations in the geographical distribution of tree species, amplified by changes in forest health and fertility. This alteration in the geographical distribution of tree species emerged in approximately 150 000 ha. The various forms and shapes of the same tree, such as magnolia etc. exposed to the alterations depending on climate change because of microclimatic conditions in KCB region. Apart from changing precipitation patterns, desertification and soil erosion will increasingly affect productivity in the forestry sector.

Natural Disaster Risk Management

Changes in frequency, magnitude and geographical distribution of natural disasters like floods and droughts are expected. Surging surface water in winter due to increased runoff will necessitate additional measures against floods and improvement of existing infrastructure. Similarly, there are regions where the impact of precipitation will increase and flood risks will grow. A change in climate will increase the frequency, scope and duration of forest fires in certain parts of Turkey, depending on the length and severity of the warm and dry seasons.

Forest fires are considered to be a threat in the KCB throughout the year, especially in the south where the number of forest fires has steadily increased. Forest fires have been effecting 10 000 ha forest area in the KCB region annually. Increasing trends of forest fires are being seen in the fire numbers as well as surface fired by years, already there is a fluctuation on forest fire as an area and numbers, but also given as an estimation of increasing ratio on forest fires in context of both number and surface is 10% yearly. These disturbances account for a spread of invasive species, which in return lead to increased flammability through unused fuel material. The invasive plant species in the region mainly are *Leucaena leucocephala*, *Schinus terebinthifolius*, *Morella faya*, *Rubus ellipticus*, *Clidemia hirta*, *Mimosa pigra*, *Acacia mearnsii*, *Ligustrum robustum*, *Tamarix ramosissima*, *Euphorbia esula*, *Caulerpa taxifolia*. Adaptation actions for forest fires are based on identification and mitigation of these risks. Even though in lesser measures, the steep mountainous geography of Turkey, the irregular regimes of its rivers and land utilization practices make floods important threats to river basins as well. In KCB, this is amplified by the local characteristics of arid soil and erosion problems.

Public Health

Changing climatic conditions are already having a significant impacts on human health. The more frequent extreme climate events become, the more diseases linked to weather conditions will be observed and fatalities will increase. Increases in the number of consequent very hot days will directly affect the elderly and cause acute health problems for people with chronic cardiovascular diseases. The growing flood risk will also increase the risk of contagious diseases and affect their spatial distribution. Wind erosion and dust storms have become one of the main daily environmental problems of the people living in KCB.

Climate change is perhaps the predominant over-arching threat to ecosystem health in KCB by exacerbating land degradation processes both directly and indirectly. Although Konya's steppes and

forest ecosystems are adapted to extreme conditions, they are also highly sensitive to changes in the climate. Observed and projected changes in the climate, especially rising winter temperatures, early springs and drying wetlands are some early signs in Konya of climate change which is expected to exacerbate other environmental challenges such as overstocking and overgrazing in forest and steppe habitats. Those challenges are already having dramatic effects on ecosystems and biodiversity. More frequent wildfires, insect pests, larger and more frequent dust storms and greater water stress are among the major factors of degradation accompanying climate change.

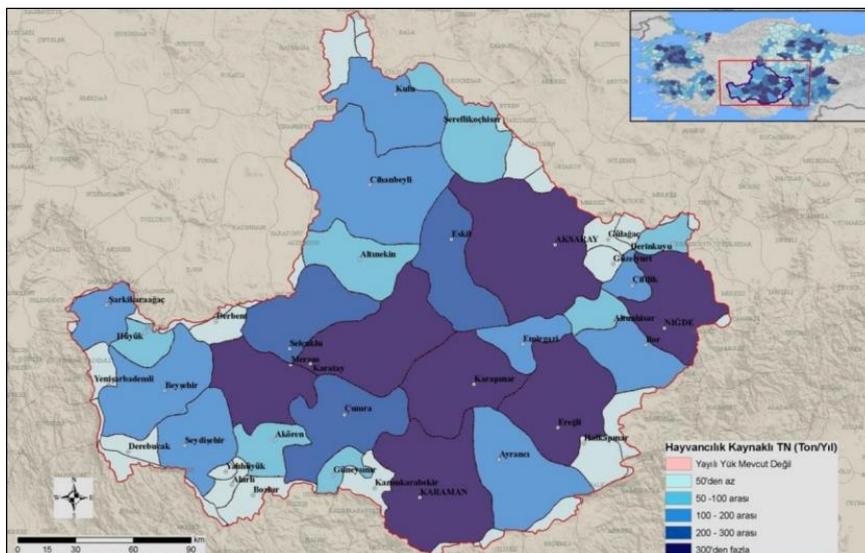
Increasing temperatures raise evapotranspiration rates and reduce soil moisture. In conjunction with shifting rainfall patterns, this will affect vegetation patterns and the growing period for crops. Prolonged dry spells and erratic climatic conditions may lead to short-term coping strategies such as deforestation and overgrazing. Inappropriate agricultural practices and overgrazing reduce above-ground organic carbon, leading to a decline in soil carbon. This decline in organic matter leaves the land even more vulnerable drying and to erosion caused by more intense rainfall that is becoming more and more common as the climate changes. It also affects adversely several physical, chemical, and biological soil properties that impact land productivity, biodiversity, and ecological function.

Land cover changes can also lead to changes in local climatic conditions due to different surface reflectivity and water transpiration. Indeed, according to the climate change scenarios, Konya Closed Basin will be one of the most negatively affected regions in the country by climate change. These risks posed by CC in the KCB currently are not understood well and are not incorporated into afforestation and agricultural activities, and specific species action plans.

The primary factor threatening biodiversity in the KCB is habitat degradation. Steppe ecosystems and associated wetland areas are particularly threatened. The inappropriate conversion of pasturelands to forests through industrial afforestation measures degrades ecosystem health and fragments steppe habitats. Inappropriate agriculture practices, including overgrazing and excessive tilling can trigger erosion and a reduction in health of steppe plant community diversity, which reduces habitat complexity and thus species diversity.

Pollution of surface and ground water from the inappropriate disposal of agricultural waste degrades aquatic and wetland habitats. Excessive use of water resources undermines the ecosystem health of wetland systems and contributes to a cycle of depleting water resources, increased salinization, dust storms and reduced land resilience.

Nitrogen (N)-based as contaminants in Konya Closed Basin with 66% of animals, 25% with the use of fertilizers and 7% with the use of land-based pollution (forest, meadow-pasture-grazing, urban and rural areas of shallow streams) are activities. Reaching a total diffuse nitrogen (TN) load is 86 239 tons/year in 2010 in KCB. Resulting from livestock activities in Konya Closed Basin map of the distribution of the total nitrogen load is presented below:



The amount of erosion in bare areas is 134,140 kg/m²/year. However when cultivated, the amount of erosion in these bare areas decrease to 164 kg/m²/year in KCB. In KCB, crop production in conventional applications throughout the season total CO₂ emissions of 31 tons/ha, while about 30% of direct seeding applications decreased 22 t/ha.

Adaptation/Mitigation Practices and Opportunities

(i) **Adaptation** can generally be defined as the development of institutional and financial structures, plans, programs, policies and more importantly of a fundamental strategy that guides the uncertainties related to climate and the risk stemming from them.

(ii)

(iii) **Mitigation** refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behavior. Protecting natural carbon sinks like forests or creating new sinks through silviculture or green agriculture are also elements of mitigation.

(iv)

Despite the non-realization of direct adaptation planning resulting from findings of studies on climate change impacts in KCB, some adaptation measures were identified and activities undertaken towards their realization. These measures mostly tackled issues like the development of modern techniques in the usage of water resources, the multiplication of research on the efficient irrigation management systems due to the increasing needs in water caused by climate change or the development and cultivation of plant species resistant to drought and salinity. Considering the agricultural sector in KCB, it can be noted that a transition has started from traditional irrigation methods to modern irrigation systems which minimizes water losses (through sprinkler and drip irrigation applications). Appropriate financing supports are made available to agricultural producers wishing to use these methods.

The fast growing population in Konya, the increasing urbanization and the priorities of economic policies complicate the realization of efficient adaptation policies and their implementation. Nevertheless, one should not ignore the fact that the current sustainable development policies and objectives already support the adaptation efforts to climate change. Latest policies applied in several sectors in Turkey support the adaptation to the impacts of climate change. The most important ones entail modern approaches to the management of water resources and rural development policies such as sustainable forest management, wise use of water in agriculture or integrated basin management.

Priority was given to water scarcity problems in KCB in adaptation policies. Droughts are the main climatic disasters in that region. Early warning policies and systems and information flow are being developed and improved in this particular field. Many efforts are aimed at creating realistic water policies relying on sound strategies, laws and scientific research. These policies need to be rapidly brought to life in order to prevent serious water scarcities due to climate change. Nevertheless, further scientific studies and research on the potential results of global climate change in KCB are needed.

Details for the main target fields of the National Climate Change Adaptation Strategy and examples for adaptation and mitigation activities in KCB are described below:

Water Resources Management: KCB, one of the important water basins of Turkey has 280 to 350 mm of annual precipitation (semi-arid climate) in most parts. Water resources of the basin are insufficient to meet the crop water requirements. The available water potential is lower than 1000 m³/person. Agriculture currently consumes almost 90 % of the annually available water. The present agricultural practices have resulted in excess water extraction from groundwater resources, about 1.4 billion m³ per year. The actual irrigation technique used by farmers has very little effect on excess water use. The reasons for excessive water use are an increase of irrigation areas with water-demanding crops and adding new crops to the basin crop pattern. Irrigation areas have expanded unplanned and resulted in about 70 000 unregistered wells. The total, arable land in KCB is

approximately 2.2 million ha, including at least 427 000 ha of irrigated area (when taking into account illegal water use, the actual figure would be much higher) and 1.8 million ha rain-fed agriculture (fallow) area. The high water use in the basin has resulted in significant problems, such as wiping out of groundwater resources, declining water levels in lakes and complete drying of some water-ecosystems.

As an example, irrigated agriculture in the Karaman plain in KCB has resulted in excessive water extraction of 347 million m³ per year. Possible adaptation activities are the following:

1. The main reason of excess water use is the area open to irrigation. By considering the available water potential of the plain, the irrigated area should be around 45 000 ha but is actually much higher, around 75 000 ha.
2. In 86 % of the cases, groundwater wells are used to irrigate the 75 000 ha open to irrigation with a low irrigation efficiency, estimated at 64.6 %. It is possible to increase the efficiency up to 75 % by improved management of sprinkler and drip irrigation methods. This could save about 70 million m³ of water.
3. Further necessary steps would be to establish manageable and sustainable irrigation plans and subsidize deficit irrigation programs. Similarly, the introduction of rainwater harvesting must be supported.

Agriculture: KCB, located in the middle of the Central Anatolian Plateau, is comprised mostly of plains between 900 to 1 050 m in altitude. The Basin encompasses a wide range of degraded forest lands, pastures/rangelands, agricultural lands, rock, sand dunes and lakes. The surface area of the Basin is 5.3 million ha with a distribution of: 41 % agricultural lands, 34 % pastures/rangelands, 13 % forest lands, 4 % rock and sand dunes, and approximately 8 % wetlands and water bodies. Land degradation, amplified by climate change, poses high risks for agricultural production in the KCB by reducing the productivity of arable lands and pastures. In addition, the reduced vegetative cover has led to marked reductions in soil moisture content, making agricultural lands more vulnerable to drought as evidenced by the decreased underground water table, increased salinization in arable lands and more frequent sinkholes.

Land Types in Konya Closed Basin (hectares)

Land Type in KCB	Total Area (ha)	Degraded Area (ha)	Degraded Area (%)
All Land	5 307 942	4 402 369	83
Forestry	733 760	675 152	92
Arable land	2 229 000	2 000 000	90
Pasture and Meadow	1 877 410	1 727 217	92

The main crops in KCB are cereal, sugar beet, animal fodders, fruits, vegetables and legumes. This agricultural production capacity, together with government subsidies, is also the basis for intensified livestock farming in the Basin. KCB harbours over 500 000 cows kept in feedlots and large farms for dairy and meat finishing. Waste from these animals is estimated to release between 80 - 110 kg/year of methane into the atmosphere, in addition to polluting surface and ground water resources. This represents a total potential emission level of 920 - 1 265 tCO₂ eq./year. In addition, agricultural waste from the region's large sugar beet sector currently generates a significant amount of methane. This indicates a high potential for energy production through methane capture. Furthermore, agriculture and related land-use types have a large potential to act as sinks of carbon which can be increased by changes in simple management approaches, like tillage practices and efficient residue management.

On the other hand, projected biogas plants, with the help of 5% may reduce methane emissions. With the present situation reflects the distributed load in the load of pollution from livestock operations, with the measures proposed in 2020 to 20% in 2030 and 30% for the year 2040 are expected to decrease by 40%. The project targets methane attitude will provide support to achieve the intended purpose.

Approximately 250 000 ha of new land for agricultural activities have begun production. Considering that emissions from traditional practices that increasingly values are observed. Approximately 35% of the total production area is fallow land in KCB and these fallow fields using innovative farming techniques (direct sowing, etc.). Using new farming techniques (for example, direct sowing, etc.) provided a total of 22 750 hectares fallow land through vegetative cover will keep 133 224 tons of CO₂ in the KCB.

Forestry: The KCB encompasses a wide range of degraded forest lands as a result of deforestation/forest degradation processes originating from illegal cutting, overuse and overgrazing. Currently, the total forested land in the KCB is 733 760 ha including 98 608 ha of productive forests with a canopy cover of greater than 40 % (high forests 85 % and productive coppice 15 %) and 675 152 ha of degraded forest and forest lands (including 72 % degraded coniferous forest and 28 % degraded coppice). About 20 % of degraded forests are considered to be “fragmented” forest with 10 % - 40 % canopy cover, older than 50 years and a height of more than 5 meters. The remaining 80 % are considered to be “degraded and open forest lands” with less than 10 % canopy cover, a height of less than 5 meters, including shrubs and maquis flora. The main tree species are black pine (31 %), oak (24 %), juniper (20 %), fir (9 %) and red pine (8 %). These figures demonstrate the significant potential to increase the C stocks and to enhance the global role of Turkey’s forests as a carbon sink. Rehabilitation activities of 15 000 - 20 000 ha of degraded forest lands by planting drought-resistant species could sequester carbon at an annual rate of 50 000 - 65 000 tonnes.

Overall, the Climate Change Mitigation Strategy of the proposed project has four objectives:

1. Promote the demonstration, deployment, and transfer of innovative low-carbon technologies;
2. Promote investment in renewable energy technologies;
3. Promote conservation enhancement of carbon stocks through sustainable management of land use, land-use change, and forestry; and
4. Support enabling activities and capacity building.

Allocated to forestry, land-use/land-management (agriculture and pastures) and biodiversity the following specific mitigation actions are targeted by the project:

Forestry:

- (a) Reforestation of degraded forest lands, improvement/rehabilitation of rangeland in/around forests;
- (b) Use of wind breaks, water harvesting techniques, drought-resistant and salt-tolerant local species;
- (c) Limitation of grazing in forests;
- (d) Valuation of ecosystem services valuation; and
- (e) Capacity building for improving integrated and participatory management.

Land use/management (Agriculture and Pastures):

- a) Conservation agriculture (reduced tillage, crop residue management, vegetative cover, crop rotation, mulching, direct seeding, habitat enhancement);
- b) Introduction of drought-resistant and salt-tolerant species and varieties;
- c) Rehabilitation of degraded arable lands;
- d) Integrated land rehabilitation to increase soil fertility, including agro forestry trails, wind breaks;
- e) Water harvesting and water-saving systems to reduce water logging and soil salinity;
- f) Improved conjunctive water management reduces pressure on natural habitats and biodiversity;
- g) Demonstration of methane capture practices from wastes of livestock and agro-processing;
- h) Capacity building for SLM and its integration into farming and rangelands activities and role in GHG balance and biodiversity conservation; and
- i) Reduced and/or rotational grazing to reduce pressure on vegetative cover. Improved vegetative cover on rehabilitated pastures including agro-silvo-pastoral systems; soil conservation measures including erosion control, improvement of soil fertility, water accumulation/preservation, windbreaks, and buffer strips.

Biodiversity:

- a) Development of monitoring and assessment system for biodiversity conservation;
- b) Increasing soil fertility, water retention capacity and biological activity for the conservation and improvement of above and below-ground biodiversity; and
- c) Introduction of certification for production landscapes.

Summary:

The objective of the GEF funded alternative is to improve the sustainability of agriculture and forest land use management through the demonstration and adoption of low-carbon technologies with win-win benefits in LD, CC and BD conservation and increased farm profitability and forest productivity while enhancing ecosystem resilience to CC. The project will introduce a shift from the current unsustainable practices to SLM practice that will generate significant global benefits, as detailed in the table below:

Current Practices	Improved practices introduced by project	Selected Global Benefits
<p>Degradation of forest lands through heavy grazing, agricultural intrusion, and soil erosion.</p>	<p>Improved management of degraded forest lands:</p> <ul style="list-style-type: none"> -Reforestation of degraded forest lands, improvement/rehabilitation of rangeland in/around forests, -Use of wind breaks, water harvesting techniques, drought-resistant and salt-tolerant local species -Limits on grazing in forest - ecosystem services valuation, -Capacity building for improving integrated and participatory management. 	<ul style="list-style-type: none"> -Rehabilitation of 20,000 ha of degraded forest lands with a mitigation target of 50-70,000 tons of CO₂ eq/year sequestration, -Improved management of 733,760 ha forest lands, -Less damages from floods and landslides, -Decrease in soil erosion in degraded forest lands (baseline will be determined in preparation stage).
<p>Degradation of agricultural land through inappropriate farming practices result in the loss of vegetative cover, soil and soil carbon. Inadequate management of agricultural waste results in significant GHG emissions, and an inadequate level of soil replenishment.</p>	<p>Improved agricultural land management:</p> <ul style="list-style-type: none"> -Conservation agriculture (reduced tillage, crop residue management, vegetative cover, crop rotation, mulching, direct seeding, habitat enhancement), -Introduction of drought-resistant and salt-tolerant species and varieties, -Rehabilitation of degraded arable lands, -Integrated land rehabilitation to increase soil fertility, including agro forestry trails, wind breaks, - Water harvesting and water-saving systems to reduce water logging and soil salinity, - Improved conjunctive water management reduces pressure on natural habitats and biodiversity, -Demonstration of methane capture practices from wastes of livestock and agro-processing, -Capacity building for SLM and its integration into farming and rangelands activities and role in GHG balance and biodiversity conservation. 	<ul style="list-style-type: none"> -Improved management of 2,229,000 ha arable lands, - Avoided emissions of: 18-22,000 t CO₂eq/year in 40-50,000 ha of arable land using conservation agriculture practices, -Decrease in soil erosion in arable lands (baseline to be determined in preparation stage), -Improvement of water harvesting and uses, -Improvement in soil organic content, fertility and moisture and increase in vegetative cover, - Contribution to mitigation in at least 50 methane capture diffusion sites with a mitigation target of 8-10,000 t CO₂eq/year.
<p>Degradation of Pasture lands through</p>	<p>Improved pasture management:</p> <ul style="list-style-type: none"> -Reduced and/or rotational grazing to 	<ul style="list-style-type: none"> -Improved management of 1,877,410 ha rangelands and pastures, -Contribute to carbon storage in

Current Practices	Improved practices introduced by project	Selected Global Benefits
<p>overgrazing on hilly and plain pastures resulting in degradation of vegetative cover, increased erosion, loss of soil carbon.</p>	<p>reduce pressure on vegetative cover. - Improved vegetative cover on rehabilitated pastures including agro-silvo-pastoral systems; soil conservation measures including erosion control, improvement of soil fertility, water accumulation/preservation, windbreaks, and buffer strips.</p>	<p>30,000 ha of degraded rangelands and pastures with a mitigation target of 78-105,000 t CO₂eq/year, -Decrease in soil erosion in rangelands and pastures (baseline will be determined in preparation stage).</p>
<p>Biodiversity Habitat degradation as a result of intensive agriculture, heavy grazing and land degradation, lack of monitoring and assessment.</p>	<p>Improved mainstreaming biodiversity conservation into production landscapes: -Development of monitoring and assessment system for biodiversity conservation. -Increasing soil fertility, water retention capacity and biological activity for the conservation and improvement of above and below-ground biodiversity. -Introduction of certification for production landscapes.</p>	<p>-Biodiversity conservation mainstreamed in least 80,000 ha of production landscapes (20,000 ha forest land; 30,000 ha pasture 30,000 ha arable land), - Certification of at least 10,000 ha land that incorporates biodiversity conservation measures, -Populations of endemic fish (<i>Barbatula eregliensis</i>) and oak tree (<i>Quercus vulcanica</i>) remain the same or increase, -Restoration of natural habitats essential for threatened biodiversity.</p>

Appendix 13: The Nature Conservation Centre/Coca Cola Foundation Grant

Project Background

Climate change is one of the most important challenges facing the world today. Scientists are extensively studying the effects of climate change, not only on the environment, but also in many other fields including agriculture, food, health, economy, industry, energy and social life. As such, considerable efforts have been made by many countries to assess the impacts of and vulnerabilities to climate change, as well as to integrate adaptation into their policies at all levels.

In this regard, it is agreed that maintaining and restoring healthy ecosystems play a key role in mitigating the effects of and adapting to climate change through biodiversity conservation, as well as sustainable land use and management that yield multiple environmental, economic and social benefits.

In agriculture, for example, land use and management practices have numerous impacts, primarily on the land itself and the direct land users along with their surrounding environments and ecosystems. These impacts include effects on land productivity, changes in water cycle, soil erosion, movements of nutrients and chemicals, and contamination by wastes.

It is also evident that within an ecosystem, there are manifold living and nonliving elements, such as soil, water, tree cover, crops and livestock, all of which have multiple functions and interact in numerous ways.

Therefore, there is a need to address these complex interactions in a way that benefits both the conservation of biodiversity and the sustainable land use practices and objectives in a wider perspective. However, experience so far has shown that the use of sector-by-sector approaches has not provided optimum results. Hence, there is a greater need for a more integrated approach.

This is precisely why the “*ecosystem approach*” (EA) is endorsed by the *Convention on Biological Diversity (CBD)* and the *Millennium Ecosystem Assessment (MA)*, as the best means to tackle the impact of climate change in agriculture and related ecosystems.

The CBD defines the *ecosystem approach* as *a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way*. All benefits that humans receive from ecosystems are recognized as *ecosystem services*. These benefits can be direct (e.g. food, fresh water) or indirect (e.g. soil fertility, water cycling) emanating from the functioning of ecosystem processes.

With a view to putting this internationally acclaimed approach into practice in Turkey, this project aims to introduce EA in the proposed project area (Karapınar, Ereğli, Cihanbeyli, Sarayönü) where land rehabilitation, biodiversity and climate-friendly agriculture practices will be implemented through sustainable land/water use and management.

The agricultural practices that will be implemented throughout the project will also be in line with the basic principles of “conservation agriculture” promoted by the FAO: to minimize soil-disturbance in order to stabilize soil structure, increase fertility and balance the ecosystem.

Project budget: US\$ 1,600,000

Project purpose: To promote the use of ecosystem approach and improve climate change adaptation in agriculture.

Project objectives: To improve water holding capacity of soil; ensure the efficient use of land and water and increase the capacity for ecosystem based adaptation,

Project duration: 3 years

Project location: Karapınar, Cihanbeyli, Ereğli, Sarayönü (Konya closed basin)

Project partners:

- The Ministry of Food, Agriculture and Livestock – GD of Agricultural Reform
- Coca Cola Life Plus Foundation
- Nature Conservation Centre

Objective 1: To improve water holding capacity of soil with agricultural practices; ensure efficient use of land and water.

To promote and spread direct seeding; To plant and promote windbreaks; To prepare crop rotation strategy adopted to climate change; Pasture improvement; To promote the use of animal manure and green manure

Objective 2: To increase the capacity to use the ecosystem services in agriculture.

To map ecosystem services and to determine the vulnerabilities resulting from climate change; To monitor the effects of project implementation on ecosystem services and biological diversity for adaptive management; To adopt crop calendar to climate change

Achievements to Date:

- Implementation started in September 2013.

September 2013:

- Drawing the project activity schedule: with The Ministry of Food, Agriculture and Livestock (MFAL) and DKM.
- Trip to Konya to meet the stakeholders: MFAL Konya Provincial Directorate, MFAL Karapınar District Directorate, Research Station of Soil Water And Combating Desertification (RSSWC), Karapınar Provincial Administration, Karapınar Chamber of Agriculture, Bahri Dağdaş International Agricultural Research Institute (BDIARI)
- Project Informational Meeting in Karapınar Provincial Administration: including all above stakeholders and the Irrigation Cooperative of Demiryali Plateau (a village of Karapınar).
- Two direct seeding machines were purchased: with the technical guidance of MFAL Sarayonu District Directorate, Provincial directorate, Sarayonu Leading Farmer's Association, and the Selcuklu University Agricultural Machines Department.
- Training on Direct Seeding: 20 farmers from Karapınar were taken to Sarayonu, where farmers had been practicing direct seeding for a few years. Four trainers from two different institutions (RSSWC and BDIARI) taught the seeding techniques on the ground, and how to use the machine. The farmers visited the lands that were seeded with the direct seeding machines.

October 2013

- Direct Seeding of 125 hectares of non-irrigated land in Karapınar: as a result of the above training, all 20 farmers adopted the direct seeding techniques on their return to Karapınar, with a total of 125 hectares of direct seeding as the first year's trial. The resulting production rate is equivalent to

neighboring areas that were seeding in the traditional way. However the farmers experienced lower production costs.

- Water Replenishment Workshop: two experts on protection and replenishment of water from LimnoTech, a company consulting for Coca-Cola's on environmental issues from the USA visited the project area, instructed on how to collect soil samples and collected information to analyze the water protection capacity of the project in the area. Later, through a Water Replenishment Workshop, the experts drew the method to follow for best possible water retention. The soil sampling protocol was also set in the workshop. The project will from now on conduct soil monitoring following the sampling protocol.

January 2014:

- Workshop on 2014 Budget, Calendar and Work Plan: MFAL, DKM and Coca-Cola drew the activities and budget plan for the duration of the project in general and for 2014 in particular. Roles and responsibilities of stakeholders were defined. The project management modality was finalized with 3 management units: 1) Project Steering Committee to develop strategies which includes the project partners being MFAL, DKM and Coca-Cola, 2) the Field Coordination Unit to facilitate communication between stakeholders and monitor achievements which include MFAL and DKM, and 3) Local Implementation Unit to support the implementation of activities which include the Provincial and District Directorates of MFAL, farmers, farmers' associations and local NGOs. Additionally a decision was made to evaluate the project every 6 months.

February 2014:

- Three meetings were held to disseminate and discuss the results of the workshop: with RSSWC, BDIARI and the Konya Chamber of Agriculture.
- Workshop on wind breaks: tree species adapted to local ecology and that can serve as wind breaks were identified with the help of RSSWC, DKM, MFAL and academicians. Wind break locations were identified through participatory approaches to ensure success. Interviews with farmers identified the farmers most willing to benefit from wind break plantations and thus best potential pilot sites were chosen. These are also the farmers viewed as leaders in their communities, whose actions are mostly replicated. Soil analyses were conducted on the identified sites and wind breaks are ready to be implemented.
- Reaching out to other potential stakeholders: the project team contacted the Konya Plateau Project (KOP), a unit of the Ministry of Development. Potential areas of collaboration were identified as the KOP is also working on promoting direct seeding and water conservation.
- Direct seeding on irrigated land: Because of the drought through the winter of 2013-2014, direct seeding on irrigated land was un-advised by the experts of the project as the potentially lower production might be mistaken as a fault of the technique rather than lack of water. However as spring rains have been plenty, a direct seeding for the second seeding period that will start in June will be implemented.
- Planned Partnership with Lund University on systems modeling: Associate Professor Deniz Koca at Lund University is an expert on systems modeling. Possible models that will be developed for this project through this partnership include: 1) integration of traditional solutions to the problems caused by climate change and drought, 2) modeling of the worries of stakeholders, 3) the relationship among stakeholders and their perception of each other, 4) the effects of climate change to agriculture and the socio-economic structure of the area.
- Potential Partnership with the Gold Standard Foundation on Agricultural Carbon Standards: the project team met with Jacqueline Gehrig-Fasel who is in the committee of the Gold Standard Foundation responsible for developing a Carbon Standard for agriculture projects. The project team is sharing the experiences so far on potential carbon emission reductions of the project with the expert and this project will likely become a pilot project for the first agricultural carbon standard certification.
- Replication of the project and its results: while implementing the project, the team continues to look for additional funding to replicate the activities and results to other districts of the Konya Basin.

- A new governance model as the strength of the project: aside from the ongoing on-the-ground activities, most time and energy is spent to harmonize the different working cultures and points of views of relevant stakeholders working for this project. Although ad-hoc bi-lateral cooperation was made before among some of the stakeholders, this is the first time that all above-mentioned stakeholders are working together in the same project. A majority of the project's activities is still geared towards finding a working modality suitable for all parties involved. However, this background work is extremely important as a successful partnership of public, private and non-governmental sectors achieved in this project will constitute a model for more to come.

Appendix 14: Letters of Co-Financing

Appendix 15: Tracking Tools

Please complete any necessary scorecards and/or tracking tools.

The following scorecards will be required for completion by FAO and/or GEF. Please download these and be familiar with them.

- GEF Biodiversity Tracking Tool;
- GEF CC Mitigation Tracking Tool;
- GEF CC Adaptation Tracking Tool;
- GEF LD Tracking Tool;
- GEF Sustainable Forest Management (SFM)/REDD+ Tracking Tool

The tracking tools may be found at:

http://www.thegef.org/gef/tracking_tools

Appendix 16: Estimation of GHG emissions

A- EMISSIONS FROM CHANGES IN LAND USE

Estimates of CO₂eq emissions sequestered or avoided were obtained using FAO's EX-ACT model. The model was developed choosing conservative assumptions in terms of the impact strength of each activity. This will help ensure that the estimated GHG reductions will be achievable during project implementation. Forest and pasture rehabilitation can lead to very different amounts of carbon sequestration based on the effectiveness of re-establishing a higher tree density and vegetation cover (pasture) as well as the consequently following rehabilitation of soil carbon levels. Concerning the targeted number of hectares, the model assumes that the project will achieve the targets provided and did not conservatively discount the number of hectares that the project will impact.

The EX-Ante Carbon Balance Tool

The Ex-Ante Carbon-balance Tool is an appraisal system developed by FAO providing ex-ante estimates of the impact of agriculture and forestry development projects, programmes and policies on the carbon-balance. The carbon-balance is defined as the net balance from all GHGs expressed in CO₂ equivalents that were emitted or sequestered due to project implementation as compared to a business-as-usual scenario. EX-ACT is a land-based accounting system, estimating C stock changes (i.e. emissions or sinks of CO₂) as well as GHG emissions per unit of land, expressed in equivalent tonnes of CO₂ per hectare and year. The tool helps project designers to estimate and prioritize project activities with high benefits in economic and climate change mitigation terms. The amount of GHG mitigation may also be used as part of economic analyses as well as for the application for additional project funds. The tool can be applied on a wide range of development projects from all AFOLU sub-sectors, including besides others projects on climate change mitigation, watershed development, production intensification, food security, livestock, forest management or land use change.

Model assumptions

The project will implement 3 types of interventions that will either sequester or avoid the emission of greenhouse gases. These are: (i) rehabilitation of degraded forests, (ii) implementation of conservation agriculture activities in arable land, and (iii) establishment of improved management systems in rangelands and pastures. The parameters and assumption used in EX-ACT for each of these interventions are described below. The estimated amounts of GHG emissions avoided or sequestered are presented in the section following the parameter descriptions. The amount of GHG avoided due to methane capture are discussed below.

(i) Rehabilitation of degraded forests

Forests in the area of influence of the project are classified as subtropical dry forests based on FAO's Global Ecological Zones (FAO, 2001). This classification is based on observed

climate and vegetation patterns. Data for GIS are available at www.fao.org. These types of forest have, on average, an above-ground biomass, of 61.1 tons of carbon per ha (tC/ha). The below-ground biomass, litter, deadwood and soil carbon are, respectively, 17.1, 24.3, 0, and 38.0 tC/ha, respectively. Land degradation at the project site is considered to be low (i.e. approximately 20% of the biomass has been lost), and it is assumed that by the end of the project intervention, the level of degradation would be reduced to very low (i.e. 10% of the biomass is lost). It is further assumed that without project intervention (baseline), the level of degradation would remain at a “low” level. Fires are not considered an important factor, and as such are not included in the simulations. The project is expected to rehabilitate 20,000 hectares of degraded forests.

(ii) Arable land implementing conservation agriculture

Conventional cropping in project areas is described in Section 1 and in Annex 10. It is expected that the project will implement conservation agriculture in 50,000 ha. This includes 40,000 ha that will be put under conventional CA—this is, improved agronomic practices and no-till/residues management practices—and 10,000 ha under CA plus manure application. In such a way we thus differentiate between a larger area that will only benefit from lower to intermediate levels of organic matter inputs, while only a smaller target area will benefit from high levels of organic matter inputs, and the associated more relevant benefits for soil carbon sequestration.

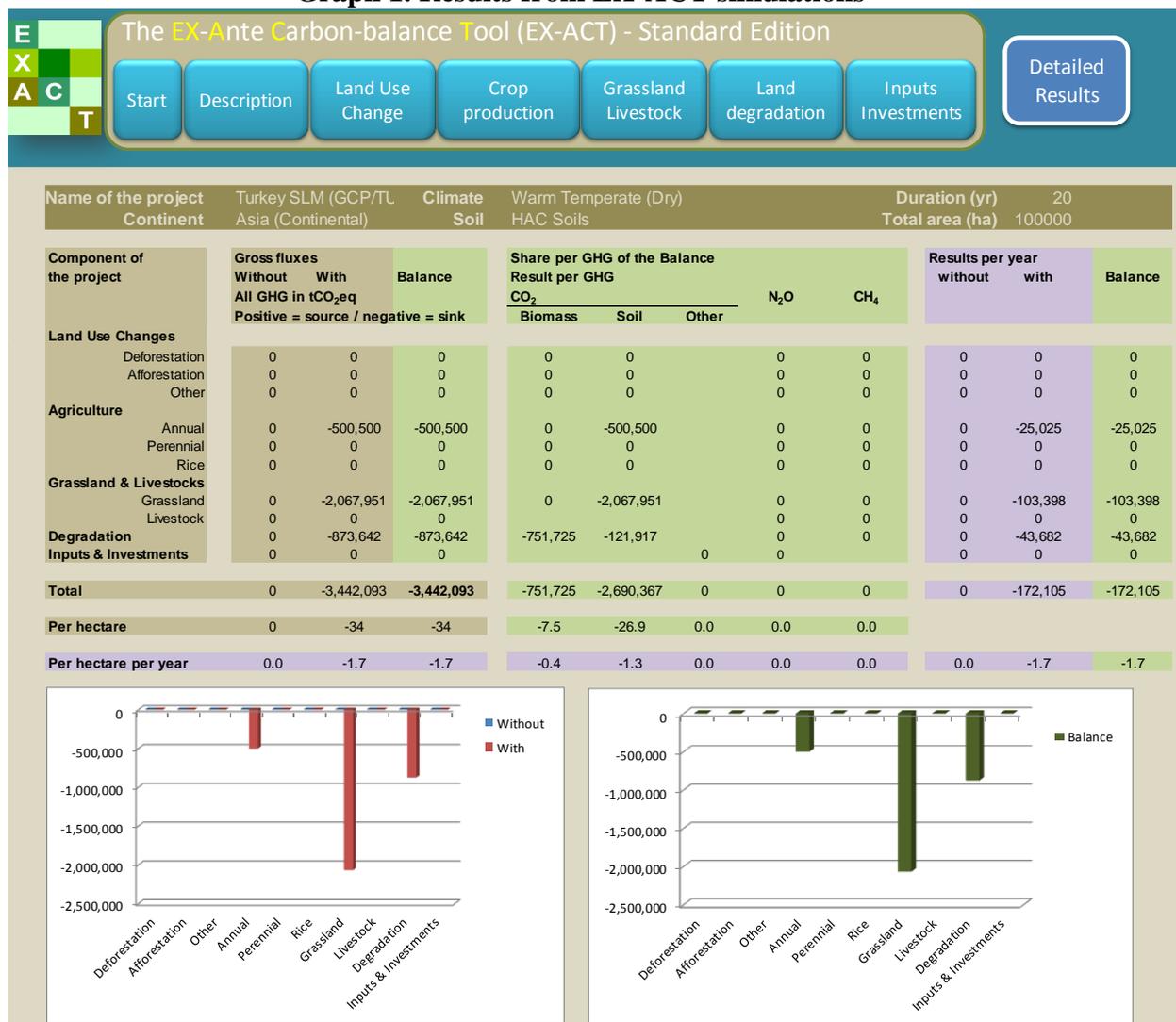
(iii) Rangelands and pastures under improved management systems

As stated in the project document, rangelands in the project area are highly degraded. Under the EX-ACT simulation, we assume that rangeland systems will go from a “severely degraded” state (i.e. soil stocks of 26.6 tC/ha) to an improved status (i.e. soil stocks of 43.3 tC/ha) due to the project intervention. This will require a lot of effort given the resource constraints in the region (mainly water due to current rain patterns and limited irrigation). Nonetheless, the goal of the project is to try to have a significant impact on the ground. The baseline scenario assumes that rangeland systems would continue to be degraded in the absence of the project. Above ground biomass is estimated at 1.6 tons of dry matter per ha (t dm/ha). As in the case of degraded land above, fires are not considered an important factor, therefore their impact is not included in the simulations.

Results

The project leads to an overall carbon balance of 3.4 million tons of CO₂-equivalent (CO₂-e) that are sequestered throughout the full duration of analysis of 20 years (see Graph 1, below). This is equivalent to the sequestration of 1.7 tons of CO₂ per hectare annually and can thus be characterized as a project with intermediate to strong impacts for climate change mitigation. The three main activities of forest rehabilitation (874,000 tCO₂-e), pasture rehabilitation (2.1 million tCO₂-e) and conservation agriculture/sustainable land management practices (500,000 tCO₂-e) provide all relatively balanced, sizable contributions to the mitigation benefits. Forest and pasture rehabilitation measures have thereby the potential to also provide impacts of a clearly higher impact strength as assumed here, when leading to stronger increases in forest density and pasture quality with the associated benefits for soil rehabilitation.

Graph 1. Results from EX-ACT simulations



Use of EX-ACT to monitor GHG emissions

As mentioned in Component 3, the project is expected to develop a carbon monitoring system based on EX-ACT. The project implementation unit, government officials and other interested stakeholders will be trained on the use of EX-ACT. The project team is expected to prepare an annual monitoring report using EX-ACT detailing the project’s impact in terms of the tons of CO₂eq avoided or sequestered by each of the interventions mentioned above.

Improvements and outlook

Estimates of pasture and forest rehabilitation can be refined by tacking stock of the current carbon stocks in soil and above- & belowground biomass and a refinement of the estimation how much is realistic to be rehabilitated based on project actions during 5 years and vegetation regrowth during 20 years. Project officers are very well placed to engage in these estimations as the project is implemented.

B- EMISSIONS REDUCTIONS FROM BIOGAS

The targeted emissions reduction from biogas interventions were estimated based on a study contracted by FAO for the Global Methane Initiative.¹ Potential for methane emissions reductions is discussed in detail in chapter 4. In particular, section 4.1.1 refers to “Direct emissions reductions from digestion of manure”, and section 4.1.3 refers to “Indirect GHG emissions reductions”. The assumptions underlying the estimations are described in detail in the document referenced.

Regarding direct emissions reductions, the following equation was used:

$$CH_{4(M,P)} = [VS_{(M)} \cdot H_{(M)} \cdot (365 \text{ days/year})] \times [B_{0(M)} \cdot \delta_{CH_4} \cdot MCF_{(AD)}]$$

Where	$CH_{4(M,P)}$	—	Estimated methane production potential from manure, in kg per year
	$VS_{(M)}$	—	Daily volatile solids excretion rate for livestock category M, in kg of dry matter per animal per day
	$H_{(M)}$	—	Average daily number of animals in livestock category M
	$B_{0(M)}$	—	Maximum methane production capacity for manure produced by livestock category M, in kg volatile solids excreted
	δ_{CH_4}	—	density of methane, equal to 0.67 kg CH_4/m^3
	$MCF_{(AD)}$	—	Methane conversion factor for anaerobic digestion (percentage)

The project will target 6 to 10 reactors.

Description	National level ²	Project (per digester)
Daily volatile solids excretion rate	2.80	2.80
Average daily number of animals in livestock	104,138.00	1,000.00
Days in a year	365.00	365.00
Maximum methane production capacity	0.13	0.13
Density	0.67	0.67
Methane conversion factor	0.80	0.80
Methane emissions reductions from manure	7,415.98	71.21
GWP	21.00	21.00
Carbon emissions reductions from manure	155,735.48	1,495.47
Indirect emissions reductions	25,000.00	240.07
Project target: 6 reactors		8,972.83

FAO is currently updating the EXACT model to include biogas calculations. It is expected that this new module will be available by December 2014. Once it is available, the project will use this module to track emissions from biogas annually as part of the GHG monitoring system.

¹ https://www.globalmethane.org/documents/ag_turkey_res_assessment.pdf.

² These are the results reported in table 4.1 of the report.