



ADAPTATION FUND

United Nations Development Programme

Country: DJIBOUTI

Project Document

Project Title: **Developing agro-pastoral shade gardens as an adaptation strategy for poor rural communities**

UNDAF Outcome(s): Rural communities and Ecosystems are more resilient to climate change

Expected CP Outcome(s):

Expected Output(s): Good adaptation practices of rural communities are strengthened

Implementing Partner: Ministry of Habitat, Urbanism and Environment of Djibouti

Responsible Parties: Ministry of Habitat, Urbanism and Environment of Djibouti

Brief Description

The project **objective** is to improve resilience of rural communities of Djibouti to the recurrent droughts induced by climate change. The project will help the communities of the target regions of Grand and Petit Bara to develop adaptive capacity and embark on climate resilient economic development. The project is comprised of three main components:

1. Sustainable access to secured water resources in the face of climate change;
2. Shade gardens to support diversified and climate-resilient agro-pastoral production system;
3. Access to secured finance for climate resilient agro-pastoral enterprise development.

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I PROJECT BACKGROUND AND CONTEXT:

General context

1. Djibouti lies in Northeast Africa on the Gulf of Aden at the southern entrance to the Red Sea. It has 314 km of coastline and shares a border with Eritrea, Ethiopia and Somalia. The country is mainly a stony semi-desert, with scattered plateaus and highlands. Djibouti has a land area of about 23,000 km², and a population of 818,200 people (Poverty Reduction Strategy Paper (PRSP), Djibouti National Office on Statistics (DISED), 2009) growing at 2.8% per annum, 6.1% considering refugees arrivals. More than 80% of the population lives in urban areas, with 58.1% in the capital city. A Least Developed, low income and food-deficit country, Djibouti has some of the lowest health, education and other social indicators in the world and was ranked 147th out of 169 countries in the 2010 UN Human Development Index.

2. Djibouti's economy is characterised by an extreme dualism: the commercial urban sector, modern and oriented towards exports, and the rural sector, characterized by subsistence economy based on pastoralism, with very limited access to infrastructure, services and markets. The service sector contributes to more than 75% of Djibouti's GDP. Agriculture contributes to a meagre 3%, while the industrial and manufacturing sector accounts for 22% of GDP. Although economic growth has been strong during the last 10 years, it has very little impact on rural population, who even face tougher living conditions with repeated droughts. In fact, Djibouti's economy has shown over the past two decades very mixed performance, marked by the succession of political crises and economic shocks (drought in particular) that have resulted into a continued deterioration of the country's competitiveness. The per capita income has fallen by over 25% compared to its 1984 level, while the deficit of state budget reached 10.1% of GDP in 1995. Unemployment affects around 60% of the active population and the composite index of human poverty in Djibouti is estimated at 42.5%, close to that of the extreme poverty (45%). Recent analysis of the poverty situation shows that it has become a structural problem. Given its scale and its depth, poverty is not just a social issue but has now become a real development challenge for the country. The situation is particularly alarming when it comes to rural communities who bear the brunt of both climatic and economic shocks. While the rural population only accounts for 15% of the total population (Djibouti Strategy for Poverty Reduction, State Secretary on National Solidarity, 2004), the vast majority of rural households, 96.5%, live below the poverty line, while over 80% of them live in a state of indigence, and are not even able to meet their basic needs.

Djibouti's agriculture sector

3. Djibouti's agriculture sector remains very modest and is characterized by its low level of productivity and small contribution to the domestic food supply. The National Strategy for Food and Nutrition Security (2008) estimates that less than 10% of the calories consumed nationally come from domestic production, the remaining 90% being imported from neighbouring countries or from the international market. In both rural and urban areas, households, especially the poorest ones, are overly dependent on the import market to access food and cover their basic nutritional needs. This heavy reliance on regional or international food import makes the country highly vulnerable to external market risks that are often beyond its control (e.g. products availability, abrupt surge in food prices, etc.). The under-development and poor economic performance of the agriculture sector is a direct consequence of the country's inherent aridity and its fragile water and soil resource base that constrain local production. It also results from the low level of investments made so far in modern farming practices, especially in the area of water resource mobilization and management (rainwater harvesting, construction of boreholes, recharge of aquifers, etc.) that are necessary to increase sectoral outputs and productivity in a sustainable and effective manner. Given the predominance of the urban population, the Government of Djibouti has favoured until now the development of the service sector, with the objective of positioning Djibouti as a strategic transit hub that can offer commercial access to the sea to the neighbouring landlocked countries. As a result, few investments were made in agriculture and rural development and productivity levels were stagnant or even on decline, especially during recent dry years. However, because of high poverty rates and limited cash income opportunities in rural areas, agricultural activities do continue to play a critical role in the food supply and daily subsistence of the rural communities involved in production. Though generally insufficient to cater for the food needs of rural dwellers, local agriculture still provides a key contribution and primary means of livelihoods for a vast majority of households, especially those with limited

assets and sources of revenue. Moreover, the sector shows important room for improvement, with a productive potential that remains largely untapped due to the absence of effective and sustainable farming policies and practices.

4. In rural areas, two traditional production systems are present: pastoralism and small-scale farming. Pastoralism is an age-old and deeply entrenched tradition that dominates Djibouti's rural economy. Pastoral activities consist primarily of extensive nomadic herding which often represents the sole source of subsistence for pastoral communities that are estimated approximately at 210,000 individuals. Some 90.5 percent of the country's territory can be classified as pastoral lands that are used for herding. Transhumance is still practiced extensively along grazing routes determined by the presence of water and pasture. Mobility is a highly efficient way of managing the sparse vegetation and relatively low fertility of fragile soils of Djibouti. The country's total herd numbers amount over 1 million head, 89 per cent of these being sheep and goats.

5. Agriculture is a relatively recent activity compared to extensive pastoralism which remains the predominant feature of rural livelihoods in Djibouti. Despite some expansion during the past decades, development of small-scale farming remains very modest in the country, mostly due to the scarce water resources and limited access to reliable water supply in most rural areas. Arable land in Djibouti amounts to 10,000 ha, with 388 ha irrigated (NAPA, 2006). The farmer community is estimated at around 30,000 people who cultivate small agricultural plots generally located on *wadis*' banks, where availability of irrigation water and fertile land is the greatest. Most farmers are involved in fruit and vegetable production, sometimes combined with semi-sedentary livestock production (e.g., sheep, goats, camels). In these agro-pastoral systems, animals usually graze in the nearby rangelands during the rare rainy periods (especially the summer season and "Karan / Karma" rain) and then receive supplement of forage from the sub-product of cereal cropping (corn or wheat bran). In the past years, the Government of Djibouti (GoD) started to diversify local agricultural production by introducing agro-forestry practices through the plantation of drought and salt-tolerant varieties of date palm trees imported from Saudi Arabia.

6. Both nomadic pastoral and farming systems, including agro-pastoralism, have reached their production limit largely due to increasing water stress and land degradation. Over the past 20 to 30 years, pastoralism in Djibouti has undergone profound transformations resulting from environmental and political factors. A volcanic arid landscape, Djibouti is highly susceptible to desertification and pastoral communities relying on natural rangelands have been increasingly affected by a mounting trend of aridity and desertification. More frequent and longer droughts of the past decades have inflicted important and damaging blows on quality, productivity and spatial distribution of natural pastures and water points which are mainly shaped by rainfall and are critical for livestock survival during the dry season. Declining pastoral resources, coupled with demographic growth have rendered access to natural forage more difficult leading to loss of livestock and significant rise in destitution among pastoral groups. At the same time, government policies constraining herd mobility and encouraging sedentarization have been introduced on the assumption that it is too expensive to deliver satisfactory development services (e.g. health and education) to mobile pastoralists. In response to these drivers, many nomadic communities have settled in the last decades, if not migrated to urban areas, concentrating mainly around relatively reliable water sources and exerting enormous pressures over the neighbouring land and limited water resources. The resulting concentration of livestock further contributes to overgrazing and leads to a continuous impoverishment of vegetation and land degradation in pastures. In addition, recent analyses show that animal productivity and health are low, with a resulting impact on food security.

7. Similarly, farmers and agro-pastoralists are experiencing a severe drop in production and a deterioration of their income. Small scale agriculture is increasingly faced by repeated water shortages that result from longer and more severe drought periods. Reduction in water resources during dry seasons also leads to an increase in the salt content of groundwater used for irrigation of cultivated plots, thereby contributing to the salinization of already fragile fertile soil and severe decline in land productivity. New attempts to diversify agricultural production through plantation of drought and salt-tolerant date palm trees is hampered by the poor genetic potential of date palm varieties used so far (varieties of low productivity, excessive proportion of male trees). In

addition to these constraints are the periodic flooding of wadis and subsequent bank erosion occurring during rainy seasons that cause important damage to local irrigation infrastructures and cropland.

Climate change vulnerabilities and risks

8. Djibouti is characterized by a very arid and semi-desert type of climate, which makes it extremely sensitive to climate change-induced drought and water scarcity risks. The country has a fluctuating, low and abrupt precipitation regime with annual mean rainfall of 150 mm, mean temperatures comprised between 17°C and 42°C and extremely high rate of evapotranspiration amounting to 2000 mm per year. The aridity of the climate is further reinforced by a particularly hot and dry West wind regime ('Khamsin') resulting from the warming and drying of the Eastern African Monsoon (Foehn effect) when blowing over Somalia and Ethiopia's mountain ranges. Added to this are the effects of La Niña phenomenon, which in severe La Niña years brings drought to the country and sparks food-security concerns in areas that are already water stressed and heavily dependent on rain-fed agriculture and pastoralism. Under historical conditions, Djibouti climatic context is clearly one of high hydrological uncertainty, frequent dry spell and chronic water stress, features that are likely to be worsened by climate change with wide-ranging implications on the national economy, food security and human development in general.

9. Past records and recent observations tend to indicate that early manifestations of climate change and associated shifts in rainfall and water regimes are starting to being felt across the country. Data analysis conducted under the Initial National Communication and NAPA shows a marked trend towards temperature increase by up to 1,5°C since 1990 and rainfall decrease from 1960 (between 6 and 15% depending on the region). With increasingly low annual rainfall—between 50 and 300 mm per year— the past decades have witnessed an increase in the frequency of drought events (from one in 10 years to one in 2 or 3 years) with longer time spans and shorter recovery periods, resulting in severe impacts on vulnerable populations. Despite important efforts from the Government and the international community in fostering institutional and policy reforms to help Djibouti better prevent and manage climate-related droughts and water shortages, such events are clearly on increase, with a growing number of climate incidents and affected people being observed (Table 1).

Table 1: Top 10 Natural Disasters in Djibouti for the period 1900 to 2011¹

Type of Disasters	Date	Total number of people affected
Flood	Feb. 1978	106,000
Drought	June 1980	145,000
Flood	18/03/1981	102,000
Flood	09/04/1989	150,300
Flood	19/11/1994	120,000
Drought	Feb. 1996	100,000
Drought	June 2001	100,000
Flood	12/04/2004	100,000
Drought	April 2005	150,000
Drought	July 2008	340,000

10. Since 2007, the whole Horn of Africa region and Djibouti in particular have been facing a prolonged drought event that has heavily impacted agricultural production and rural livelihoods, especially animal husbandry, the backbone of the pastoralist way of life. Over the past years, rainfall, although traditionally very

¹ Source: EM-DAT, The OFDA/CRED International Disaster Database, Université Catholique de Louvain, Brussels – Belgium, www.em-dat.net

limited, has been 75% below average in Djibouti.² A total of 206,000 vulnerable people have been identified in Djibouti as now being affected by drought and its impact. The Rapid Drought Impact Assessment³ conducted by the GoD showed that the 2010 drought – the fourth consecutive year of failed rainfall in terms of its quantity and regularity – has had a devastating impact on the water security and livelihoods of the 240,000 people living in rural areas, especially small-scale farmers and herders, with 120,000 (15% of the country's population) being now directly considered food insecure and requiring food distribution.² The recent waves of drought have destroyed the crops of small-scale farmers for two consecutive years and led to further deterioration of water resources and pasture lands. Many traditional surface and sub-surface water sources have dried up whilst the water table level of aquifers in many deep boreholes has drastically decreased. In the south-west region (agricultural region of Gobaab and the plain of Hanlé) gathering more than a third of all agricultural plots, the number of rain-fed and irrigated cultivated plots dropped from 500 to 120 in four years. In many locations, this has also resulted in the deterioration of water quality through increased salinization, posing problems to both human health (the physico-chemical water quality does not maintain WHO standards in many places) and crop productivity (soil salinization). Similarly, due to the lack of pastures, fodder and water, pastoralist households suffered a loss of 70 to 100% of their livestock and are left now with very few options to survive. Livestock-raising activities currently generate 20-40% of the revenues of pastoralist households. Under normal conditions, these activities would represent 60-80% of household revenues. All the segments of the pastoralist society are being affected by the on-going drought which literally leads to the blurring of social boundaries between wealthy and poor breeders. Some pastoralists do not hesitate to describe this prolonged drought as "Isa Sima", which means in Somali language 'the one which equalizes the level of wealth'. On top of that loss, food prices have increased by 50% between 2006 and 2009. The drop in income combined with the food price crisis has forced vulnerable households to allocate a larger share of their revenues to purchase food at the expense of the satisfaction of other basic needs such as health or education. Despite this extra effort, food security of most rural families is far from being secured. A nutrition survey in mid 2009 showed alarming acute malnutrition rates that in some regions (particularly north-west) reached 25%, with children under five being primarily endangered. As a response to these hardships, households are seeking alternative sources of revenue but these are often insufficient, and include increasing dependence on already declining remittances, uncertain food aid and debt accumulation.

11. While drought is no new challenge, the scale and seriousness of the current drought spell in Djibouti and its consequences on local sources of food and income, have clearly surpassed the coping mechanisms and internal support capacity of the affected rural households. Consequently, these detrimental conditions have already prompted and are likely to further force an increasing number of pastoralists and agro-pastoralists to give up their traditional activities and migrate to urban and semi-urban areas, principally in the capital Djibouti Ville, as already observed in the year 2008. Most of the time, these drought-displaced people end up settling into crowded peri-urban slums or makeshift camps where they live in extremely precarious conditions with little employment and income opportunities. In a context of widespread turmoil and social protests across the Arab region, these internal migrations could further exacerbate social tensions in Djibouti and undermine the prospect for peaceful democratic reforms.

12. As reported by the World Food Programme, Djibouti comes across as a 'forgotten country' in terms of international attention and relief brought to handle worsening drought and food insecurity issues. The country is indeed located in a geographical region where millions of rural poor are affected by drought and water shortage, so with 120,000 drought affected people in 2010, the country does not make the headlines. But in terms of the percentage of the population, it is much higher than anywhere else in East Africa and requires as such, priority and immediate action.

13. It is now well established that the on-going climatic changes and related disasters cannot be attributable to historical climate variability alone. There is growing scientific evidence that observed trends of

2 Djibouti 2012 Consolidated Appeal, United Nations Office for the Coordination of Humanitarian Affairs

3 Evaluation rapide de l'impact de la sécheresse en milieu rural (Ministry of Interior and Decentralization, March 2010)

aridification and increased drought events in Djibouti are linked to climate change and are early signs of bigger and persistent climatic disruptions. As such, a recent study from the U.S. Geological Survey and the University of California⁴, determined that the decline in average rainfall amounts and greater frequency of dry spells seen in the Horn of Africa over the past 30 years are linked to an unprecedented warming of the Indian Ocean that is directly caused by global warming. With global temperatures continuing to rise, this trend of increased drought frequency and water scarcity will likely persist and amplify in the future.

14. Although uncertainty in climate projections is important in Djibouti due the coarse spatial resolution of the global models used and unavailability of downscaled estimates, long term climate change scenarios for Djibouti, indicate a likely increase in mean temperatures between 1.7 to 2°C.1°C, and an overall rainfall decrease of 4 to 11% by 2050, combined with increased variability in precipitation pattern, a reduced rain season and higher evaporation rates. Rains during agricultural growing periods and during critical livestock production periods are also predicted to decrease throughout the country, except in Djibouti Ville, which could encounter an increase in precipitation by +3.9%. As demonstrated by the recent USGS research, sea-surface temperatures are likely to continue to increase in the Indian Ocean and an average decrease in precipitation is expected in the Greater Horn of Africa region, especially in the March to June season, when substantial rainfall usually occurs. Indeed, the study predicts that resulting warmer air and increased humidity over the Indian Ocean will produce more frequent rainfall in that region. The air rises, loses its moisture during rainfall, and then flows westward, descending over East Africa, causing further arid conditions in countries such as Djibouti.

15. The combined effect of higher temperature and reduced precipitation (especially at critical stages of plants' growing cycles), will increase the occurrence of more severe and prolonged droughts and further strengthen desertification and water shortage. Water availability is a key limiting factor for the country's well-being and development. Reduced precipitation and run-off are projected to lead to lower rates of recharge of underground aquifers, upon which the country depends for most of its water needs. Water supplies will record a deficit at least equal to the decline in rainfall, causing a reduction in the quantity of water infiltrating into the water reserves and the lowering of piezometric levels. Already with an annual water deficit of 5 to 7 million m³, climate change induced droughts and changes in the precipitation regime are likely to further threaten the livelihoods of many by reducing the potential for agriculture and impacting water availability and supplies.

16. Djibouti's Initial National Communication also indicates that climate change could increase the frequency and intensity of flash floods, which combined with more frequent dry spells, could exacerbate damaging impacts on people, infrastructures, livestock and crops. Several important flood events have already occurred between 1991 and 2004 (see Table 1), causing numerous human casualties and economic losses amounting to billions of Djiboutian Francs.

17. Similarly, accelerated sea level rise resulting from climate change is predicted to vary between 8 and 39 cm, with an average of 20 cm compared to the 1999 baseline. This rise will be accompanied by stronger and more frequent storm surges, acceleration of coastal erosion, extension of temporary or permanent submersions of the low coastal areas (especially in Djibouti city) in addition to increased salt water intrusion in coastal aquifers.

18. Unless adequate and rapid action is taken to reduce Djibouti's vulnerability to climate change, the country will be exposed to large biophysical and socio-economic impacts as illustrated in Table 2.

Table 2: Summary of impacts expected from climate change on key vulnerable sectors (NAPA, 2006)

Key Sectors	Climate change impacts
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⁴ Williams, Park A. and Chris Funk. *A westward extension of the warm pool leads to a westward extension of the Walker circulation, drying eastern Africa. Climate Dynamics.* 4 Jan. 2011.

Water resources	<p>Surface water :</p> <ul style="list-style-type: none"> – Increase in flood frequency (up to 4-5 major floods per year) – Increase in the magnitude of major flooding events – Shift in run-off water regime <p>Groundwater:</p> <ul style="list-style-type: none"> – Reduction in aquifer natural recharge – Reduction in groundwater resources (from 11 650 000 m³ to 9 880 000 m³/year in 2050) and increase in salinity of Djibouti's main aquifer
Agriculture and forestry	<p>Drought:</p> <p><i>Agriculture:</i></p> <ul style="list-style-type: none"> – Depletion of ground water used for irrigation – Increase in salt content of soil and irrigation water – Reduced yields – Loss of agricultural land due to erosion or salinity <p><i>Forest landscapes</i></p> <ul style="list-style-type: none"> – Regression in forest cover – Gradual extinction of flagship endemic species – Overgrazing of shrinking rangelands – Intensified human pressures on forests for firewood and construction – Invasion of <i>Prosopis</i> sp. which is growing very rapidly under increasing aridity, encroaching on cultivated land and competing with other trees and local shrubs (esp. in coastal plain of Djibouti, Tadjourah, and Hanlé Gobaad) <p>Flooding</p> <ul style="list-style-type: none"> – Destruction of farms located near the wadis – Silting of wells or destruction of crops and infrastructure – Multiplication of pests and insects (caterpillars, mushrooms, crickets ...)
Livestock production	<ul style="list-style-type: none"> – Rangeland degradation – Concentration of livestock around water points – Reduced livestock productivity – Low resistance to diseases of livestock
Coastal Zones	<ul style="list-style-type: none"> – Destruction of economic infrastructure (\$ 11.3 million during the 2004 flood) – Destruction of natural habitats and biotopes – Loss of human lives (80 dead or missing during the 2004 flood)
Marine ecosystems	<ul style="list-style-type: none"> – Degradation of coral reefs – Regression of mangrove areas – Changes in fish stocks

19. As mentioned in the NAPA, the most severe and devastating impacts from emerging and future climate change impacts will reside in the greater impoverishment of pastoral and farming communities, families sometimes losing their complete herd or crop because of drought and thus having no other choice but migrating to the cities. Key drivers of growing climate change vulnerability of pastoral and farming communities include the following:

- The rural populations of Djibouti are particularly at risk from aridification and water shortage as they reside mainly in deserts or marginal lands (only 3% of the country's land is suitable for farming), often with highly erodible soils and limited water supply.
- The country does not have permanent rivers and surface water is characterized by a temporary wadi regime, with occasional, sudden and rather violent floods. The Djibouti population and rural communities in particular, therefore rely almost totally on groundwater, which is being depleted by unsustainable extraction. Water tables are lowering and suffering from increasing salinity and pollution. More than 49% of people in rural areas do not have access to a protected source of drinking water. Out of these, at least 30% resort to unprotected sources that do not conform to minimum sanitary requirements. Women are more vulnerable to water scarcity since they would have to travel longer distances to fetch fresh potable water.
- Rangelands and grasslands are being subject to increasing degradation due to overgrazing with livestock numbers exceeding rangeland capacity by an estimated 63% (notwithstanding the fact that only a portion of potential rangelands are exploited due to lack of water in more remote areas, forcing pastoralists to reside longer on one site). Many pastoral communities have settled in the past 3 decades, mostly concentrating around relatively reliable water sources exerting enormous pressures over the land and limited water resources. The semi-settlement of nomadic communities around water points and urban centres increases overgrazing problems and erosion, limiting rainwater penetration into soils and the regeneration potential of surrounding land. The consequences are (i) increased malnutrition of rural populations, (ii) the multiplication of diseases (tuberculosis and anaemia in particular), (iii) rural exodus, (iv) a decrease in groundwater levels, and (v) the degradation of pasture land, pushing herders to use the forest zones more intensively, which are subsequently degrading.
- Agricultural production is mainly located on wadi river banks and faces increasing water shortages, salinization of land and groundwater and damage from flooding and erosion. Technical skills and farming practices are poorly developed and not compatible with the limitations posed by climate change on local production systems.

20. Combination of the above climate and baseline pressures put the pastoral and agro-pastoral systems at jeopardy. There is a need for an exit strategy for pastoralists and farmers most vulnerable to climate change so as to provide them with alternative food production systems and livelihoods while giving them the opportunity to live on their lands. The obvious response to this immediate and long term adaptation need is to develop nascent agro-pastoral systems through establishment of irrigation based, multi-purpose oasis-type shade gardens that provide favourable micro-climatic conditions to support the integrated cultivation of drought and salt tolerant plants, such as improved variety of date palm trees, with local forage species, while offering opportunities to diversify livelihoods both on and off-farm, as a way to spread the risks associated with more frequent climate anomalies. Date-palm-based shade gardens have been traditional in many parts of the region (e.g. Tunisia – date palm shade gardens, Sudan – gum shade gardens, Yemen, Oman etc) and can considerably improve living conditions by allowing to grow forage, vegetables, cereals and some other local varieties resistant to more stringent conditions of aridity and increased soil salinity. Clearly, these multi-purpose agro-pastoral systems will offer the most viable and cost-effective solutions for many rural residents to survive the food insecurity threats posed by climate change. However, there are number of barriers towards this adaptation option that the project is designed to address. These barriers are:

- There is shortage of knowledge or technical capacity to apply advanced groundwater extraction and recharge methods in Djibouti. Despite maximizing rainwater percolation through various technological innovations (such as infiltration dams or gravel packing in special injection wells) is lacking to help rejuvenate groundwater table and save precious water source. The Water Department of the Ministry of Agriculture has already conducted some technical studies about the possibilities to use dams inside wadis in order to create artificial water reservoirs to capture and infiltrate wadis' periodic flows. These country-led studies also recognized the need to explore and introduce other technical solutions for more robust conjunctive surface and ground water management that show strong potential for success and replication in Djibouti. These include techniques such as percolation wells which were partially tested already a few years ago in the context of a geothermal

development project. However, the practical knowledge and capacity to adjust these methods to Djibouti's bio-physical context and requirements of shade-garden development is still missing and will need to be further strengthened with help of the Adaptation Fund.

- As a result of poor surface and groundwater management practice, agro-pastoral practices are underdeveloped in the context of emerging climate pressures, often characterised by poor productivity, offering limited options for excess forage growth for storage or diversification of produce necessary for spreading the risks across seasons or absorb shocks during the severe drought periods;
- Largely pastoral and farming communities lack skills and knowledge for pursuing climate resilient practices such as soil conservation, shade gardens and other essential agronomic measures to improve current productivity levels, an essential first step to build up long term resilience to climatic shocks;
- Even though pastoral communities have been settling in past decades in response to reoccurring droughts that demand greater flexibility and diversification in productive systems they still face shortages in the knowledge, financial capacity, and self-organization needed to adopt more sustainable and risk-spreading livelihood options, including diversification and commercialization of climate smart dryland products.
- Technical capacity necessary to make the extra step from improvement of date palm tree cultivation to widespread development of oasis-type shade garden is still lacking.
- Current set up of micro-finance does not favour pastoral communities that are considered a high risk group and cannot access financing to improve their livelihood, for investing in inputs, productivity and diversification. This poorest and most vulnerable segment of society largely relies on humanitarian and food aid and is offered limited options to build up assets and spread climate risks.

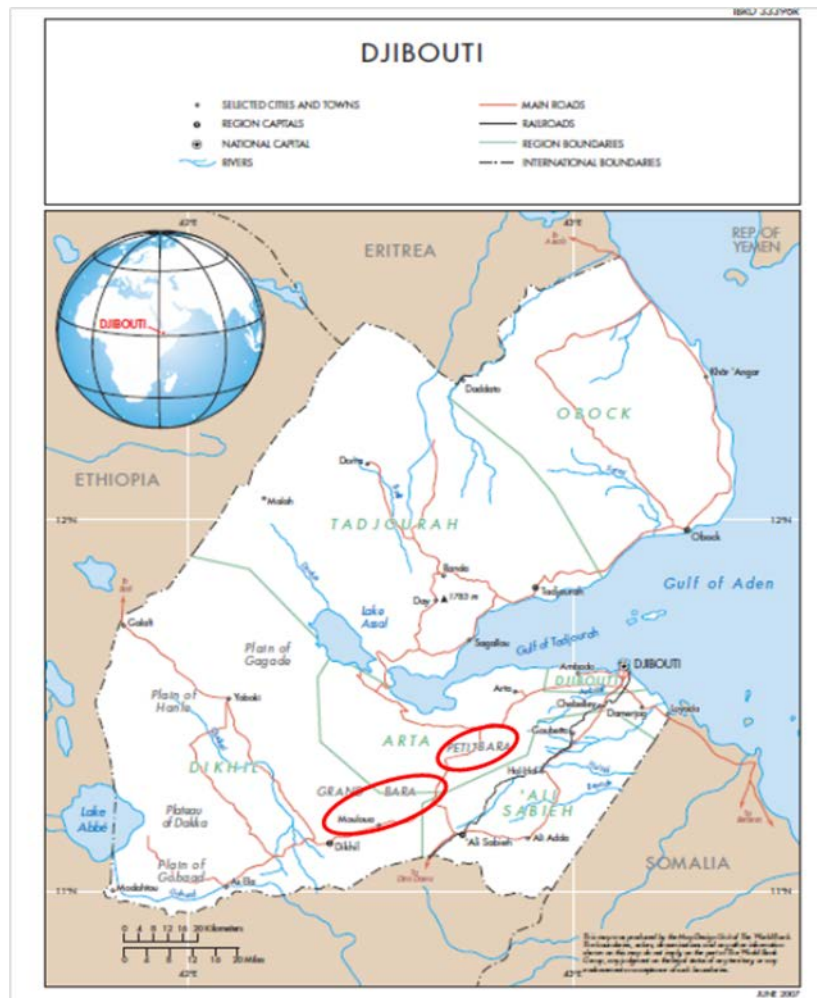
21. The proposed project is designed to address the above barriers. It is also a direct response to NAPA priorities in that it targets rural/pastoral populations and aims to improve and diversify agro-pastoralist production system and thus makes it more climate resilient. The proposed intervention with AF funding has been designed by Government, with the support of UNDP, along three main components: (1) sustainable access to secured water resources in the face of climate change, (2) Shade gardens to support diversified and climate-resilient agro-pastoral production system, and (3) Access to secured finance for climate resilient agro-pastoral enterprise.

Project regions

22. The adverse effects of drought and the increased vulnerability to climate change are high in all rural areas of Djibouti. However, the two large, flat and semi-desertic plains of Petit Bara and Grand Bara, which are important cross-roads for transhumance movements (from the eastern part of the country to the south-west), are particularly exposed to drought and have been prioritized by the NAPA as priority areas that require urgent adaptation interventions to secure water resources and conserve soil related ecosystems on which local communities depend. The targeted area is located in the district of Ali Sabieh (South of the country) and ranges over nearly 30 km long and 12 km wide (see Figure 1 below). The plains are crossed by National Road 1 which is experiencing heavy traffic to and from Ethiopia. The local geomorphologic setting is dominated by closed endorheic depressions that correspond to the bed of ancient dried lakes and that are primarily made up of silty and sandy clay deposits. The population of the area is composed of predominantly pastoralists living exclusively from livestock production, together with some small agro-pastoral and farming communities. Similar to other regions within the country, rainfall occurs predominantly during the Karma (July-August) season which provides an annual average of 150 mm rainfall. Temperature remains usually high throughout the year which, associated with heavy wind regimes, results in a potential evapotranspiration rate of about 2000 mm / year. The plains are not crossed by any significant wadi but collect surface water from the mountains all around, most of it evaporates. The vegetative cover is located at the MARGINS of the desert depressions and is made up of fragile steppes habitats used as grazing grounds by local pastoralists. Food security and sustainability of livelihoods in the two plains rely heavily on the efficient use of water and the conservation of soil and vegetation. However,

local water resources are becoming increasingly scarce as a result of the combined effect of reduced precipitation and over extraction of groundwater that has caused a dramatic drop in aquifer levels. Surrounding rural families frequently need to walk for many hours to reach a single insanitary water point with their animals. Similarly, steppe systems have shown clear signs of degradation over recent years due to increasing aridity and overgrazing, leading to a steep decline in the productivity of natural pastures.

Figure 1: Location map of project's targeted regions



23. Recurrent droughts, disadvantageous hydrological conditions, high evapotranspiration rates, limited availability of water supply and unsustainable landscape and rangeland management are perceived as the main causes of climate change vulnerability in these areas. These factors require the strengthening of alternative agro-pastoral systems which can help alleviate pressures on steppe habitats through integrated crop and livestock farming and maximize water productivity by enhancing mobilization and sustainable management of surface and ground water resources.

24. Because of the nature of their soil (flat surface, sandy clay with few stones), the two plains demonstrate a relatively good agronomic potential, and have been prioritized by the Djibouti government as two of the most promising regions for agro-pastoral development. Very large areas can be easily transformed into agricultural plots, as this has been demonstrated already on a 5 hectare site in Grand Bara (a date palm plantation trial plot). However, current water scarcity has not permitted local populations to develop agro-pastoral plots at a larger scale. The secured access to water is therefore a prerequisite for the sustainable development of viable agro-pastoral systems highly resilient to climate variability and change. This notably means interrupting the seasonal water run-off with land/stone dikes and creating large temporary water ponds to the benefit of surrounding populations and animals. Upon drying, these ponds also permit the development of new large, fertile pasture areas which improve the forage availability for cattle. The multiplication of such water ponds associated with the sustainable use of groundwater resources, can offer

an important vehicle for integrated farming and livestock management. A number of hydro-geological studies conducted recently confirm the favourable conditions of the targeted areas for the development of a sustainable model of surface water harvesting, groundwater efficient extraction and artificial recharge. Surviving pastoral populations would therefore largely benefit from the advanced hydrological infrastructures and improved groundwater management practices that will help in the development of agro-pastoral activities as a risk-spreading strategy for long-term adaptation.

25. The two locations are also easily accessible by road (both are crossed by the Djibouti-Ethiopia main road), which provides a strong advantage for project success and sustainability (in terms of access to markets). In addition, the existing populations have benefited little from previous development initiatives (except for recent grazing management interventions in Grand Bara) while surrounding populations are strongly in need of support for adaptation.

II PROJECT OBJECTIVES AND JUSTIFICATION:

26. The objective of the project is to diversify and promote climate resilient agro-pastoral practices in rural Djibouti.

27. This will be achieved through three outcomes:

- Capacities to mobilize and secure sustainable water resources to agro-pastoral communities developed in the face of climate change;
- Sustainable agro-pastoral systems developed, providing greater forage production capacities, diversifying agricultural productions and creating capacities for replication;
- Microfinance products developed to facilitate and promote diversified and climate resilient agro-pastoral production systems.

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US\$)
<p>1. Sustainable access to secured water resources in the face of climate change</p>	<p>1.1. Rainfall-runoff and groundwater models developed and institutionalized within the Study and Research Center of Djibouti (Centre d'Etudes et de la Recherche de Djibouti, CERD) and the Water Department of the Ministry of Agriculture to project likely climate change impacts on the water availability in the areas of Petit Bara and Grand Bara (US\$ 139,000).</p> <p>1.2. Based on model outputs, controlled groundwater extraction, artificial recharge and climate “smart” management plans that take into account seasonal changes in precipitation as well as long term mean amounts, projections, developed, and benefiting 30,000 people (US\$ 922,000).</p> <p>1.3. Community-based surface water harvesting infrastructures, such as earth dams, percolation basins and subsurface dams which increase surface supply and groundwater tables in support of shade-garden pilot schemes (see 2.2) introduced and related local management rules and structures established (US\$ 743,000).</p> <p>1.4. Good practice guidelines based on knowledge sharing for integrated groundwater and surface water maintenance and use developed through stakeholder-led and participatory processes including community water management teams, government water regulators, Ministry’s technical staff, and agriculture extension services (US\$ 106,000).</p>	<p>Capacities to mobilise and secure sustainable water resources in the face of climate change to agro-pastoral communities developed</p>	<p>1,910,000</p>
<p>2. Shade gardens to support diversified and climate-resilient agro-pastoral production system.</p>	<p>2.1. Six sets of 38 pilot community-managed agro-pastoral shade garden plots (1 ha per family) established that includes date palms, multi-purpose fence trees, local and regional varieties of climate resilient forage, vegetables and fruits (henna, dates, jujube, and mango) benefiting 228 agro-pastoral families -</p>	<p>Climate resilient agro-pastoral systems developed, providing greater forage production capacities, diversifying</p>	<p>1,498,000</p>

	<p>approximately 2,800 people (US\$ 1,146,000).</p> <p>2.2. Improved extension service for shade gardening benefiting 228 agro-pastoral families - approximately 2,800 people (targeted training for extension service personnel and agro-pastoralists designed and delivered on the issues grazing, forage management, cultivation techniques, crop protection, water efficiency, composting methods, etc, in the context of increasing climate change pressures) (US\$ 170,000).</p> <p>2.3. Well-sized feed/forage stocking facilities created in both project locations to allow better management of forage availability over repeated drought periods (US\$ 182,000).</p>	agricultural productions and creating capacities for replication	
3. Access to secured finance for climate resilient agro-pastoral enterprise development.	<p>3.1. A three-tiered adaptation-oriented micro-finance scheme that supports climate-resilient shade gardening practices in the Grand and Petit Bara plains developed through partnership with the Djiboutian Agency for Social Development (Agence Djiboutienne de Developpement Sociale, ADDS) which generates a total value of US\$ 300,000 throughout the project (US\$ 219,800).</p> <p>3.2. At least 300 agro-pastoralists have been organised to form agro-pastoral cooperatives (including women cooperatives) to facilitate training on climate-resilient agro-pastoral practices and to support the development of financial literacy and the diversification of agricultural activities (US\$ 150,000).</p> <p>3.3. At least 4 established agro-pastoral cooperatives develop comprehensive climate adaptation plans incorporating lessons learned on best practices for shade gardens to be integrated into the National Programme for Food Security and the National MF Policy in order to facilitate the replication of shade-garden-based adaptation solutions (US\$ 108,000).</p>	Micro-credit products developed to facilitate and promote diversified and climate resilient agro-pastoral production systems	477,800
4. Project/Programme Execution cost			407,800
5. Total Project/Programme Cost			4,293,600
6. Project Cycle Management Fee charged by the Implementing Entity (if			364,956

applicable)	
Amount of Financing Requested	4,658,556

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	09/2012
Mid-term Review	09/2014
Project/Programme Closing	09/2017
Terminal Evaluation	08/2017

Component 1: Sustainable access to secured water resources in the face of climate change

28. Higher projected temperatures will further increase evapotranspiration rates and redouble water needs for both agricultural production and pasture lands. Given the severity of current and anticipated water shortages and the chronic dependence of populations on food aid, improved management of scarce surface and groundwater resources becomes a critical condition for long-term resilience of local food production systems and associated livelihoods. Over 51% of all extracted water in Djibouti is currently used for agriculture. However, the return value and generated productivity remain low. Moreover, while aquifer recharge in Djibouti does occur during seasonal wadi flow, it is estimated that, due to rapid run-off and high evaporation, only 5% of available water resources actually reaches the aquifers, representing a significant loss of water for both human and agricultural purposes. The same applies to rainfall of which 83% is lost to evaporation from the sun heated ground of the country's vast arid plains.

29. Due to the fact that water availability is the main limiting factor of agricultural productivity and livelihood security in Djibouti, improved and secured access to water is a key requisite for developing agro-pastoral systems highly resilient to increasing climate and rainfall variability. Component 1 will therefore foster sustainable climate resilient water mobilization and management— combined with more efficient and conjunctive use of surface and ground water – as the basis of an integrated approach to support diversified and productive agro-pastoral systems. This is considered by the Government to be a valid alternative response to the hydrological impacts of climatically-induced water scarcity on dwindling rain-fed cultivated and grazing lands and subsequent consequences on food security. The main objective of Component 1 is to provide local communities with the means to fulfil their drinking, livestock and cropping water needs and lay the foundation for the development of shade garden-based agro-pastoral systems under Component 2. This will specifically imply a need to implement a series of water adaptation measures to better capture and manage more erratic run-off water and wadi resources during the wet seasons while improving the use of aquifers as natural water storage infrastructures to secure water supply during dry periods. The additional water produced will be used to improve access to drinking water, to alleviate pressures on degraded pasturelands through the rehabilitation/creation of remote watering points in order to increase accessibility to rangelands currently not being exploited, as well as to support multi-purpose crop and fodder production under new integrated farming and livestock management systems.

30. AF resources will be used to tackle vulnerability to water constraints by implementing a set of no-regret, soft land and water management solutions aimed at maximizing water availability and quality in the context of increasing aridity under expected climate change. To do so, the project will (i) improve the information and knowledge base necessary for adaptation planning by building strong technical and intellectual capacity within the research division of Djibouti (CERD) for water resource assessments and planning, (ii) develop short and long term water resource adaptive management plans and associated portfolios of climate-justified water stress reduction strategies based on modelling outputs, (iii) support investments into controlled ground water extraction, combined with artificial recharge that offer integrated groundwater management solutions which are more resilient to projected water shortages, (iv) invest into more advanced technologies of surface water collection, water harvesting and water extraction using well-proven community-based and resource-friendly approaches and practices, and (v) establish through stakeholder-led and participatory approaches adequate management structures and technical guidelines to effectively implement and manage the climate 'smart' water delivery techniques and services introduced.

31. More specifically, AF funds will first be used to fill current knowledge and capacity gaps relating to the understanding of local hydrological resources (state of the resources, physical functioning and dynamics, etc) through an in-depth study of the water resource potential in the target regions and its actual and expected evolution under climatically induced pressures. This analytical work will provide a better comprehension of the water resource availability in the long term, with the view of climate change, and it will provide the necessary data and knowledge base to support calibration and development of climate impact modelling tools and risk scenarios. Indeed, water managers and users are presently lacking the

technical skill-sets, data and systems to properly conduct climate change impact assessments of local surface and ground waters in order to generate the information required to make scientific evidence-based decisions as they relate to water and agriculture planning, infrastructure development and more generally, identification and design of cost-effective adaptive responses for water management. The project will therefore review the applicability of and introduce specific decision-making tools for adaptation planning, with particular emphasis on rainfall-run-off and groundwater models to promote use and management of scarce resources more consistent with emerging climate threats. These tools will be developed and introduced at the Djiboutian Centre for Studies and Research (CERD – *Centre d’Etudes et de Recherché de Djibouti*) and within the Ministry of Water (MWENR) to assist with the planning and design of water abstraction/storage infrastructure. They will build upon the current practice and systems available at the CERD and within the Ministry of Water, while taking advantage of the latest scientific advances in the use of Geographic Information Systems (GIS)-based hydrological models, such as WEAP 21, that now permit the modelling of physical processes and climate change vulnerability assessments at a high spatial resolution across landscapes. For Petit Bara water resources have been studied well, therefore input data on water potential and aquifer dynamics will be readily available for the models. As for Grand Bara, current data sets are still incomplete which will require the project to support supplementary baseline data collection and gap-filling hydrological assessments. The selected GIS-based risk assessment tools will be coupled with systematic, real-time monitoring tools of discharge, water table levels and water quality (salt content) so as to strengthen the adaptive capacity of local communities and managers in the face of growing uncertainty in the hydrological cycle. This monitoring network and function should enable the generation of first hand data and information on the quantitative and qualitative state of water flows and reserves that can then be analysed, interpreted and disseminated in a way that supports well-informed and responsive water management decision making and help regional and district level officials deliver relevant early warnings to policy makers and local users. The project will support a feasibility study that will detail the technical design, needs for soft and hardware equipment, institutional arrangements, risk indicators as well as rules and protocols best suited for operating and maintaining the established monitoring mechanism in a cost-effective and sustainable manner.

32. Improvement in the modelling capacity of the CERD and within the Ministry of Water will also help develop short and long term impact scenarios on local water resources that in turn will inform the development and feasibility (both technical and economic) of appropriate climate ‘smart’ water management strategies, taking into consideration short term seasonal variability of rainfall as well as long term shifts in mean precipitation. On this basis, the project will support the design of climate-resilient management plans for Grand and Petit Bara’s hydraulic systems, which will incorporate a suite of demand and supply-side management policies aimed at restoring depleted groundwater levels and conserving water balance. In so doing, the project will review and identify good practices of community-based mechanisms for sustainable management of seasonal waters of wadis and groundwater. It will also upgrade local management rules among local communities and enforcement capacity of district level government staff for the application of more responsive and effective monitoring regulations with respect to water access and uses. Participatory approaches will be deployed to develop with pastoral and agro-pastoral communities viable co-management models stipulating the rights and obligations of local users viz-a-viz the resources as well as agreed control mechanisms over water extraction and use. For example, access should be limited to specific entry points, and water be delivered through controlled pumping, avoiding direct contamination from people and animals. This will help to avoid further degradation and pollution from animal manure.

33. The management plans will also clarify technical feasibility and guide implementation of a set of pilot community water harvesting schemes that will help remove some of the climate-driven water-related limitations to resilient agro-pastoral practices. The two sources of water that will be used for shade gardening activities are the water that will be mobilized from wadis’ surface run-off and the groundwater. Comprehensive designs will be required for the earth and subsurface dams. To accomplish this, the project will upgrade existing surface water and run-off collection practices and introduce new methods well suited to increasing water scarcity. In particular, it will consider measures supporting water capture, storage and aquifer recharge under growing seasonal and inter-annual variability. These measures will include small

hydrological infrastructures such as earth dams, percolation basins and injection boreholes that will be installed in different locations of Petit Bara and Grand Bara with the aim of increasing water retention and penetration into soil, developing new large pastureland areas, providing new water points to livestock while supporting agricultural growth and fodder production in shade-gardens for subsequent seasonal storage. Earth dams will be designed to collect and retain run-off water from small watersheds and will serve as barriers that reduce erosion, allow sedimentation and increase aquifer recharge by lowering the speed of water flow during high rainfall events. Inadequate design of dams can increase the risk of flooding in the case of heavy rains. For instance, in Petit Bara an earth dam constructed in the eighties was ruptured by the 1994 flood causing extensive damage in the downstream Djibouti capital. With proper design of infrastructure, such calamities can be prevented and will strongly contribute to the sustainability of the project as well to its cost-effectiveness. In order to support proper designs, technical studies conducted by national institutions like CERD and the Department of Water of the Ministry of Agriculture will assist in detailing optimal water resource and recharge locations. The technicians of the Ministry of Water will be assisted with the design of surface water harvesting and artificial recharge. International and regional good expertise and experience in building wadis dams from countries like Yemen, Morocco and Tunisia will also be brought to this project. Furthermore, dam construction will be monitored by both the Ministry of Water and the Ministry on the Environment to ensure robust construction and the prevention of any adverse environmental impacts.

34. Percolation and retention basins are useful for conservation and storage of supplement water or for recharging the aquifers. While progressively drying, these basins also permit the development of new large pasture areas which provide forage for livestock. Percolation basins will be constructed at appropriate sites selected on geological considerations and designed for supporting artificial recharge and soil moisture conservation. Injection bore wells with gravel packing can efficiently filter rainwater reducing salinity and can help water to infiltrate faster, thereby increasing the groundwater table. These structures will be devised taking full account of emerging and future changes in local hydrological conditions and will be guided by the use of the adaptation decision-making tools described here above.

35. AF resources will also be used to promote investments in modern extraction technologies, with a particular focus on solar-based pumping systems. Solar-powered pumping (SPP) technology was introduced in Djibouti more than 15 years ago and is now practiced at small to medium scale. Currently, there exist around 50 SPP facilities in operation in Djibouti which are used to extract surface and groundwater for both domestic and agricultural purposes. At present, the country's overall experience with SPP is relatively well developed as indicated by the existence of a national market that provides access to a variety of reliable SPP systems and by the availability of local expertise delivered by a growing number of reliable service providers. This technology needs to be further supported in the context of the proposed project on account of the multiple adaptation benefits it can offer for small-scale irrigation, livestock water supply and water supply of remote and water stressed communities such as those living in the project areas. Today, most of the pumping systems utilized locally are based on diesel motor pumps which show high recurrent costs and are often overdesigned, leading to overexploitation of aquifers and subsequent salinization of land and water. In contrast, solar-powered pumping systems provide several adaptation-related advantages in the context of this AF project including, *inter alia*,: a) reduced impact on local groundwater resources due to less aggressive pumping methods, b) low recurrent costs, (in contrast, with motor generators, the cost for fuel is often a financial barrier for ensuring access of the poorest households to reliable water supply), c) reliable and free power sources which are essential to alleviating the current constraints associated with the use of motor engines (i-e. availability of fuel, variation in purchasing power of households, possibility to transport fuel by road) that impede local communities' adaptive capacity and that limit the supply of water when and where it is needed, especially in critical cropping periods or in remote grazing areas; and d) flexibility and scalability, allowing for convenient expansion to respond to seasonal fluctuations in rainfall and water. The project will review the current national practice with SPP and help address the remaining gaps to make it truly work as an optimal and viable solution for building the climate resilience of pastoralists and agro-pastoralists. This will include training the end-user groups on the basic requirements and tools for the O&M of SPP systems, developing appropriate protocols to adequately design SPP facilities in relation to the

amount of water available (through a scalable approach that allows for a gradual and reversible expansion of the systems without undermining the water resources) and establishing appropriate community-based cost/recovery mechanisms to secure the financial resources necessary for the maintenance and upgrading of the system during and beyond the project lifetime (see Cost Effectiveness discussion, Section C).

36. In parallel, the project will help local users put in place adequate management structures that will provide and empower agro-pastoral communities with the organization and functional capacity required to effectively participate in the identification and implementation of adaptation solutions while ensuring long term sustainability of water resources and the new water harvesting services established. The project, through targeted community awareness activities, will concert with existing community-based organizations, such as EDDA (Ensemble pour le Développement du District d'Arta), Omar Jacah and PK51 associations for knowledge sharing, to facilitate community mobilization based on the best practices and experience available internationally and in Djibouti in the field of participatory community-based adaptation and sustainable management of land and water resources. These structures may take the form of community management committees or dedicated associations (such as farmers or water users associations) and will benefit from targeted training and support programmes that will be developed by the project using participatory action-learning approaches and delivered through local agricultural extension services. This community organization work will provide the opportunity to introduce more adaptive and robust scarcity management strategies and protocols for agricultural water management, including flexible water allocation rules to account for seasonal and inter-annual fluctuation in water availability, as well as appropriate and equitable cost-recovery mechanisms. Cost-recovery will entail collecting resources needed to ensure the future maintenance and expansion of the new water systems, including SPPs. The mechanisms to be considered include fee or tariff-based systems that will be designed with full consideration of the contributive capacity of local users. The project will also explore the potential for linking these fees/tariffs to the amount of water effectively used, in order to establish a price-signal, even modest, that could incentivize local households to use water more efficiently and thus contribute to reduced water demand. Through these decentralized water management arrangements, the project will strengthen the adaptive capacity and social resilience of the target groups to prepare and act on time to any changes in their water resources, thereby reducing the risks of drought-induced conflicts amongst local users while increasing the overall effectiveness, robustness and durability of the structural and non-structural risk reduction innovations introduced.

37. Overall, the following outputs and actions for Component 1 include:

Output 1.1: Rainfall-runoff and groundwater models developed and institutionalized within the CERD and the Water Department of the Ministry of Agriculture to project likely climate change impacts on the water availability in the areas of Petit Bara and Grand Bara.

Activity 1.1.1: Initial pedological, hydrological and hydrogeological modeling study including an analysis of current water resource availability and demand and projections of climate change scenarios for water availability in Petit Bara and Grand Bara watersheds

Activity 1.1.2: Detailed Environmental Impact Assessment on the design of dams and the irrigation networks including water quality analyses in accordance with Djiboutian regulations

Activity 1.1.3: Identification of suitable sites for retention basins, subsurface dams and boreholes based on group consensus amongst beneficiaries and Ministries

Output 1.2: Based on model outputs, controlled groundwater extraction, artificial recharge and climate "smart" management plans that take into account seasonal changes in precipitation as well as long term mean amounts projections, developed, and benefiting 30,000 people.

Activity 1.2.1: Training for the technical staff of the Ministry of Water on surface water harvesting, artificial recharge and sustainable water resources management

Activity 1.2.2: Design of artificial recharge and generation of O&M manuals for solar-powered boreholes pumping systems

Activity 1.2.3: Construction of 6 extraction boreholes (4 Grand Bara, 2 Petit Bara) and rehabilitation of 1 borehole for injection

Output 1.3: Community-based surface water harvesting infrastructures, such as earth dams, percolation basins and subsurface dams which increase surface supply and groundwater tables in support of shade-garden pilot schemes (see 2.1) introduced and related local management rules and structures established.

Activity 1.3.1: Design of earth dams, percolation and retention basins and subsurface dams with O&M manuals

Activity 1.3.2: Construction of 6 earth dams with either retention or percolation basins

Activity 1.3.3: Construction of 8 subsurface dams

Activity 1.3.4: Monitoring of dam infrastructure works to ensure robust construction and mitigation of any potential adverse social or environmental impacts

Output 1.4: Good practice guidelines based on knowledge sharing for integrated groundwater and surface water maintenance and use developed through stakeholder-led and participatory processes including community water management teams, government water regulators, Ministry's technical staff, and agriculture extension services.

Activity 1.4.1: Creation and training of community-based water infrastructure management committees to development local cost-recovery mechanisms, management plans and good practice guidelines

Activity 1.4.2: Design of a socially-sensitive water permit and tariff structure to be implemented into a national legal framework for water resource management to raise water efficiency and improve and water infrastructure maintenance

Activity 1.4.3: Development of a standardized system for capturing lessons learned on community mobilization tactics, water management strategies and cost recovery mechanisms to be continually incorporated into good water practice guidelines

Component 2: Shade gardens to support diversified and climate-resilient agro-pastoral production system

38. Although agriculture accounts for only a small part of rural livelihoods, agricultural plots, generally situated around wadis, play an important role in diversifying sources of revenue, improving the health status of vulnerable groups and livestock as well as improving food security of agro-pastoralists. However, traditionally pastoral communities lack sufficient farming skills to maximize benefits of hybrid, agro-pastoral productive systems. Indeed, many pastoral families intend to develop small agricultural plots to diversify their food and forage sources, as well as to create new income sources, as a means to increase their resilience to climate variability. However, those initiatives are frequently failing or remain very limited due to irregular water availability and inappropriate farming systems in the face of increasing aridity as a result of climate change. In a few, limited cases, successful agro-pastoral practices have been demonstrated, such as in Atar and Mouloud (see public consultation information, Section H and Annex C). Based on the success of these projects, former pastoralists that have become sedentary (due to the lack of water for livestock) desire to have the same means to live off the land and lead sustainable, resilient lifestyles. In effect, it is the

Government's aim to assist pastoral communities in developing family and community oasis-like shade gardens with 1 ha plots. Based on a technical report by a national agronomist, the 1 ha plots are required for efficient crop rotation where 0.5 ha is recommended for the cultivation of forage and the remaining 0.5 ha is recommended for fruit trees and market produce cultivation.⁵ This quantity of land is also deemed necessary according to consultations with current agro-pastoralists (see Section H). In light of these assessments, this project will award 1 ha plots to 228 families selected based on the criteria aforementioned in Paragraph 46. The plots will consist of date palm and tree plantations to be supported by locally relevant water harvesting systems (Component 1) so as to create favourable microclimates for forage, fruit, and vegetable growth, replicating the traditional practices imported by Yemeni populations in Djibouti centuries ago. Very well adapted to hot desert conditions, well managed date palms and oasis-type agro-pastoral systems demonstrate excellent robustness to drought and relatively good tolerance to salinity. Particular forage species such as *Moringa Oleifera* and *Tamarix Africana* will serve as multi-purpose plants by providing shade, wind protection and attracting bees for pollination. Similarly, date palm trees have multi-functionalities, including production of dates for food and trade, date stones for feed, palms for feed and handicraft, and activities which together can help spread the risks from drought hazards through a larger portfolio of food production and economic activities. Specific date palm tree production capacities have already been successfully developed in Djibouti and implementation knowledge is readily available at the CERD to technically support rural families for plantation, irrigation techniques, and overall management practices for the development of the shade gardens. Under the Presidential Fund, the CERD started the in-vitro multiplication of date palms in 2005 with technical support from Saudi Arabia, French IRD (Institut de la Recherche pour le Développement) and INRA (Institut National pour la Recherche Agronomique). In 5 years, CERD has already reached a great success rates, has experimented first fields trials and is now ready to start disseminating its young date palm trees and provide the necessary technical support for plantation and management. The research has been particularly focused towards highest value dates (e.g., Majhool, bouffagous, phenix, barhi) that have demonstrated an excellent resilience to drought and soil salinity, critical in the context of climate change.

39. Capitalizing and expanding on the research outcomes and technical capacity available at the CERD, the project will therefore revitalise and improve the national shade gardening practice in the zones of Grand and Petit Bara. It will be preceded by (i) creating a set of 228 date-palm-based agro-pastoral shade garden plots (1 ha each) that can provide more favourable microclimatic and ecological conditions for the development of alternative and productive agriculture-based livelihoods as an exit strategy for the most vulnerable pastoralists, (ii) bringing the knowledge and intellectual capital to the local extension services and target beneficiary groups on the methods and good practices for shade-gardening development, maintenance and expansion, and (iii) creating feed/forage stocking facilities to allow better management of forage especially during actual and anticipated prolonged drought periods.

40. The most vulnerable beneficiaries have been identified through numerous consultations already conducted in the project region. Selection criteria, chosen based on consultations with the Petit and Grand Bara community groups and other successful agro-pastoralists in Mouloud and Atar, have further targeted the most vulnerable families that are willing and capable of leading the development of shade gardens. The targeted families are based on the following selection criteria:⁶

- i. The most vulnerable families that have lost the entirety of their livestock due to drought
- ii. Families that have no other social net assistance in terms of extended family support
- iii. Families that are eager and willing to develop shade gardens

⁵ Sougal, Aden Atteyeh (National Agronomist Expert) 'Projet de développement des périmètres agro-pastoraux comme une stratégie d'adaptation aux changements climatiques des communautés rurales pauvres de la république', UNDP Technical Report, October 2011.

⁶ Sougal, Aden Atteyeh (National Agronomist Expert) 'Projet de développement des périmètres agro-pastoraux comme une stratégie d'adaptation aux changements climatiques des communautés rurales pauvres de la république', UNDP Technical Report, October 2011 .

- iv. Family heads that are communicative and show strong leadership skills to be able to guide others in sustainable shade garden practices in the future
- v. Families that have sufficient means of mobilizing manpower to help cultivate
- vi. Families that have their children in schools or are about to school their children

41. Through application of these criteria, supplemented with stakeholder participation, discussion and agreement, the project has identified the most vulnerable pastoralists that will reap the economic and social benefits in the Grand Bara and Petit Bara regions. Also, the application of specific criterion (outlined above) will ensure that best shade gardening practices will be transferred through good communication and demonstrations of leadership with the rest of the communities. Additionally, more opportunities will be created for non-targeted vulnerable pastoralists to benefit from the shade garden product value chain.

42. While the consultations used to choose the targeted families have been intrinsic to the design of the project, it is critical that stakeholder consultations are not restricted only for the design phase, but continue well into the implementation phase. This is necessary to ensure full participation of communities at each step of the project cycle. Therefore, during implementation, funding for this project planned under Activity 2.1.1 will be used for consultations to inform the population of the various ways the community members can work with the targeted families to build resilience to climate change based on the year-round outputs and the value chain of products from shade gardens. Moreover, the leveraging of additional resources for scaling up project interventions will also entail mobilization of the community to keep them fully involved and engaged as the project evolves.

43. Initial shade garden preparation will include the development of a water irrigation network. See Annex C for an example irrigation scheme. The agro-pastoralists will then seed the land for fodder and fast-growing crops. Subsequently, high quality date palms resilient to current and future climate conditions will be introduced through the provision of a relevant proportion of female species (the only ones producing dates). The project will also assess the water requirements of the shade garden systems to be restored / developed and will cover the additional water needs through a suite of water harvesting and control measures to be established under Component 1. In this regard, enabling biophysical conditions in the two different locations, such as soil quality, salinity and moisture will be accurately characterised and mapped so as to identify the most suitable zones for the development of the pilot shade garden plots. Temporary locations have already been marked during the project development phase but more detailed field studies and tests are required. Similarly, factors such as ecosystem characteristics, water regimes, microclimatic conditions, wind exposure, access to roads, and local population distributions will be duly considered. Other criteria for selecting the most viable sites in the broader territory of Grand and Petit Bara will be the following: (i) the agronomic potential of soils; (ii) possible access to surface and ground water either existing or through new water harvesting techniques under component 1; (iii) protection from floods; (iv) already existing agricultural areas, if any; (v) knowledge of local population and experience with farming practices; (vi) distance from villages, schools and important facilities and (vii) net impact and interaction with traditional grazing areas and transhumance corridors.

44. Plantations and main field works will be ensured by the technical teams of the Ministry of Agriculture, in close collaboration with the mobilized agro-pastoralists. Besides date palms, the gardens will also include (i) fruit and other high value (e.g. henna, jujube, etc.) trees; (ii) forages and vegetables; and (iii) agro-forestry with multipurpose local varieties, enclosing each 1 ha plot to contribute to the creation of microclimate to offer wind protection and provide multiple potential benefits for drought and water scarcity alleviation. The variety of crops to be planted will enable a profit year round as demonstrated in Figure 2.

Figure 2: Possible year-round cultivation of market produce

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Guava												
Jujube												
Citrus												
Papaya												
Dates												

45. Capacity building of rural families in farming techniques will be a key element to the success of this project, and AF resources will be used to propose improved extension services for shade garden development. Rural populations in Djibouti are traditionally herders, not farmers. As a consequence, they do not have the knowledge and experience of farming, and will need regular training including permanent technical support from the project team. The project plans to identify 6 lead farmers in each shade garden region to work along with the specialized United Nations volunteers in order to demonstrate good practice and strengthen the capacity of the local farmers with workshops. These training sessions will allow for seed exchange and possible collaborations across agro-pastoralists. Criteria for the selection of the champion farmers will include (i) good motivation and openness to new and alternative production systems, (ii) strong traditional legitimacy and (iii) well-proven leadership and personal capacities to influence other community members. Regular community meetings, action learning and training sessions, will be organized with support from the trained personnel and lead farmers group, reaching out to at least 228 families, representing approximately 2,800 people, in order to monitor progress, provide assistance and mentoring while maintaining a strong collaborative strategy towards the achievement of project results. Adoption of drought tolerant species and varieties as well as composting and mulching practices, regular break of soil/salt crust and the development of conservation agricultural methods will also be necessary to both reduce the demand for water and increase the natural water storage potential of the soil. These are among the adaptation methodologies / technologies that will be introduced and are hoped to help agro-pastoral communities embark on more climate resilient practices and development pathways.

46. Additionally, the March 2010 Rapid Assessment of drought impacts in rural areas recommends as a medium term adaptation measure, the creation of feed and forage stocks. Such stocks are seen as critical as they will permit rural families to ensure feed/forage self-sufficiency during drought periods. In addition to the necessary infrastructure development (based on small community units), creation of such stocks requires excess forage production during good growing periods. With expected climate change, this desirable condition will be less and less probable. AF resources will therefore be used to increase forage production through two main means: First, forage trees will be planted along the dikes of water ponds constructed under Component 1 due to higher soil moisture levels in these regions. Secondly, the project will support ecologically intensive forage production within the irrigated oasis-type shade gardens. As a result of this combined fodder cultivation, it is expected that excess forage production periods will occur and permit the constitution of stocks. Appropriate capacity building of rural families on forage conservation and stocking techniques will also be delivered, and the AF funds will be used for the construction of community forage stocking facilities, based on local traditional good practice, knowledge and experience in the broader region.

47. The following outputs and actions for Component 2 include:

Output 2.1: Six sets of 38 pilot community-managed agro-pastoral shade garden plots (1 ha per family) established that includes date palms, multi-purpose fence trees, vegetable and forage climate resilient local and regional varieties (henna, dates, jujube, mango, etc...) benefiting 228 agro-pastoral families - approximately 2,800 people.

Activity 2.1.1: Selection of agro-pastoral beneficiaries based on criteria through community meetings with project representatives (see Paragraph 44.)

Activity 2.1.2: Construction of planned enclosure with robust fencing materials in addition to natural trees

Activity 2.1.3: Design and construction of water reservoirs (cisterns) for six 38 ha plots including cost of concrete basin and irrigation network

Activity 2.1.4: Preparation of 6 sites (38 ha each)

Activity 2.1.5: Seeding of plots for fodder cultivation

Activity 2.1.6: Purchase of fruit and vegetable plants/trees including date trees

Activity 2.1.7: Establishment of new tree seedling nurseries for women's organizations

Activity 2.1.8: Supplementary reforestation of climate resilient species (including various Acacia species and other species such as *Salvadora persica* and *Rigozum somalensis*⁷) to reduce evapotranspiration, stabilize soil, and mitigate the loss of vegetation by grazing

Output 2.2: Improved extension service for shade gardening benefit 228 agro-pastoral families - approximately 2,800 people (targeted training for extension service personnel and agro-pastoralists designed and delivered on the issues grazing, forage management, cultivation techniques, crop protection, water efficiency, composting methods, etc, in the context of increasing climate change pressures).

Activity 2.2.1: Training for the technical staff of the Ministry of Agriculture in drought tolerant agricultural practices

Activity 2.2.2: Training of all agro-pastoralist households by specialists in extension services to help them develop sustainable farming production methods, climate resilient farming techniques

Output 2.3: Well-sized feed/forage stocking facilities created in both project locations to allow better management of forage availability over repeated drought periods.

Activity 2.3.1: Sizing and construction of fodder, crop and milk storage facilities (21 m x 9 m) with scale weighing equipment

Component 3: Access to local finance for climate resilient agro-pastoral enterprise development.

48. As explained in the problem and barrier analysis presented in Part I, there is a critical need for pastoral and agro-pastoral populations to enjoy better protection against more frequent and prolonged climate-change induced droughts by spreading the climate risks across more diverse on- and off-farm livelihood activities, including climate-resilient agro-pastoral small enterprises and income generating activities related to shade gardening. It will be equally important to provide a mechanism whereby target groups will be incentivized to move away from risky and maladaptive activities and supported in making the transition towards more resilient sources of income while escaping the spiral of extreme poverty and migration. The project will address these needs by (i) designing and establishing a local adaptation micro-financing scheme which will be geared towards the nomadic population in terms of establishing and maintaining climate-proof shade gardening practices (ii) delivering microfinance services through partnerships with MFIs to at least 300 beneficiaries to support diversified Income Generating Activities (IGAs) compatible with changing climatic conditions, (iii) developing at least 6 cooperatives, including women groups, to facilitate the training of sustainable shade-gardening practices and the development of financial literacy within the rural population, and (iv) creating community-driven adaptation plans to prioritize the needs of agro-pastoralists so that these measures can be incorporated into national strategies to facilitate the use of MF products in future agro-pastoralist projects.

⁷ Republic of Djibouti, Ministry of Habitat, Environment and Urbanism. Summary Report on the Implementation of the Great Green Wall Initiative in Djibouti, Djibouti, June 2010.

49. There is now a growing recognition of the role of microfinance for adaptation. In an influential paper on the subject, OECD (2010)⁸ pointed out the need for efficient delivery mechanisms to direct adaptation financing at the sub-national level, particularly to target the poor who are also often the most vulnerable to the impacts of climate change. The microfinance sector is increasingly acknowledged as one important vehicle in this regard and there is a growing call among the adaptation and development community to use microfinance as an effective additional delivery channel to facilitate adaptation among the poor and the vulnerable, such as those living in the proposed project areas. As such, the OECD review and other recent analyses clearly show that, if properly designed, microfinance can make a valuable contribution to more targeted climate risk reduction and adaptation, to build adaptive capacity for climate change, and to reduce incentives for *mal*-adaptation. This project will address such a need and will support adaptation activities that can be implemented through microfinance, while providing at the same time immediate relief to the targeted populations of Grand and Petit Bara. The adaptation micro-financing scheme proposed for Djibouti will pursue a dovetail objective: (i) setting the incentives through delivery of micro-credit and loans to help the most vulnerable pastoralists and agro-pastoralists build alternative assets and livelihoods more resilient to climate change (the so called ‘vulnerability exit strategy’) while (ii) establishing robust microfinance products which are earmarked for adaptation to climate change and which provide a suite of well-tested and successful agro-pastoral and water management practices that can be offered to all rural populations in poverty beyond the project lifetime. The AF support is needed to meet the additional costs and start-up funding that are associated with the design, training and deployment of such a MF instrument which remains above and beyond the current capacities of the exiting MFI and public sector in Djibouti. AF funding is requested to create essential enabling environment (skills, financial products and legal conditions) that will stimulate priority adaptation solution in Djibouti. That is diversified agro-pastoral livelihood development by means of up-scaling of climate resilient shade gardening.

50. Currently, there are no specific credit schemes geared towards pastoralists for adaptation in Djibouti. The main barrier for this relates to pastoral mobility. Pastoralists (as nomads) move to different areas depending on season and rainfall. Pastoral communities, as a result, have no real possibilities to build up assets and increase income to better absorb shocks and cope with sudden and slow-onset disasters, or with more complex emergencies that combine multiple *inter*-related disasters (food crises, malnutrition, disease outbreaks and human losses). The strongest case for employing microfinance for adaptation is its ability to help low income households to build and diversify assets and thereby expand their range of coping strategies. The project will work towards this solution by offering pastoralists an exit strategy whereby nomadic livestock practices that are now severely impacted and compromised by climate change will be gradually complemented, or even replaced, by semi-sedentary and sedentary agro-pastoral shade-garden-based production systems. The role of microfinance in this project is to facilitate the success of shade gardening by increasing the financial literacy and responsibility of beneficiaries while promoting climate-resilient and diversified farming practices geared towards adaptation.

51. The timing is right for the project to invest in this area as the microfinance sector in Djibouti has recently been restructured to strengthen the rural sector and to reduce poverty in rural environments by supporting agricultural development through the revised National Microfinance Policy 2012-2016 (see Section D). This strategy supports the implementation of more regional MFI offices, additional funds for MF guarantees and risk insurance and the diversification of loan products adapted to the needs of agricultural clients. Such initiatives will promote the use, sustainability and dissemination of MF products for agriculture. Most importantly, the Policy provides a platform for the MF products of this project to be developed in a comprehensive manner so that they can be easily transferred to future agro-pastoral projects and ensure the successful financial support of subsequent adaptation-oriented shade gardening activities.

⁸ Agrawala, S. and M. Carraro and OECD Environment Directorate, *Assessing the Role of Microfinance in Fostering Adaptation to Climate Change*, OECD, February 2010.

52. This Policy builds on the experience and capacity of ADDS, the governmental body responsible for social development, (Agence Djiboutienne de Developpement Sociale). ADDS has managed the micro-credit sector for over 10 years and established a microfinance sector in 2009. ADDS provides administrative and credit advice to its operational arm, CPEC. Three credit and savings offices exist in Djibouti: one in Ali-Sabieh which covers the regions of Ali-Sabieh and Dikhil, one in Tadjourah which covers the regions of Tadjourah and Obock and an office in the Djibouti capital which covers the city and the Arta region. CPEC has 12,000 members including individual and group loans and acts as an autonomous unit under surveillance by ADDS. ADDS provides credit lines to CPEC at a rate of three percent interest to finance independent, start-up MF offices throughout Djibouti. To date, CPEC has distributed 4 M USD worth of loans and has 780,000 USD in savings for all members combined. The sector is regulated by the Cooperative Law and is closely overseen by the Central Bank of Djibouti similar to all other banking institutions.

53. ADDS has also over 10 years of experience in promoting microcredit for agriculture. In 2000, 50 female farmers from Douda and Damerjog were organized into cooperatives to buy grains and fuel, to enlarge agricultural plots and to dig shallow wells with the assistance of the former MFI, FSD. More recently, CPEC organized a group of 12 women in Douda into cooperatives of 3 to 4 people to assist them in buying seeds. Each group received yearly loans of 1,100 USD. Two of the groups had very successful cultivation and were able to receive loans for 1,700 USD the following year. ADDS has also aided 400 farmers by providing them agricultural kits consisting of tools such as hand plows and watering cans to enhance their productivity. From such experiences, ADDS has created a series of 8 training documents on the cultivation of market produce (see an example in Annex D). In addition, ADDS currently provides flexible loan products for Djiboutian farmers who have proven to be well-organized, reliable and credit-worthy. For example, currently ADDS waits 6 months after the first harvest before demanding repayment from some Djiboutian farmers. Clearly, some essential elements are already in place to enable the integration of climate risk considerations into loan packages (through loan eligibility and repayment conditions). These elements will help ADDS, CPEC and other financial service providers to develop loan products that stimulate climate resilient agro-pastoral livelihood development at a larger scale.

54. The credit line for the microfinance system in Djibouti was originally provided to ADDS by the Government of Djibouti. Additionally, numerous lenders provide credit lines to ADDS including the African Development Bank (AfDB), the International Fund for Agriculture Development (IFAD) and the Islamic Development Bank. For example, the Islamic Development Bank is in the process of preparing a credit line for poor households in the region of Balbala. Currently, due to the urgency to reduce the poverty and vulnerability of rural populations, the Government has established credit lines to support agriculture-related projects. These Government supported credit lines are crucial to develop necessary skills and financial products that will support greater climate resilience in the agricultural sector in the context of this project. Such credit lines in future are guaranteed by the National Microfinance Policy 2012-2016 which has mandated that the Ministry of Agriculture provide financial assistance to support rural microfinance. Funding mechanisms have been outlined in the National Microfinance Policy as indicated in Section D and Annex E.

55. The goal of ADDS is to organize its members (particularly in women groups) and provide them tools so that they are more reliable in the repayment of their loans. Cooperatives are preferred clients for ADDS because individuals within the group act as collateral for one another. In fact, guarantees are not required for cooperatives in Djibouti due to the high likelihood of repayment from the group. ADDS aims to accumulate savings accounts for their clients because as clients reimburse their loans, 10% is reclaimed and put into their savings. (CPEC itself transforms 70% of member's savings into loans.) ADDS is also trying to prevent the rural exodus of villagers to the city by putting financial services within proximity of their rural clients and supporting Income Generating Activities (IGAs) associated with agriculture and milk product production.

56. ADDS is currently innovative and flexible in the range of loans and savings accounts it can offer and has expressed sincere interest in creating new products that stimulates adaptation and reduces climate related risks to the target communities. It recognizes that MF is limited within Djibouti because it can typically only be geared towards people who already have resources and lucrative activities, such as to promote better health or education

of children. However, in the context of adaptation needs, the target groups are in poverty and cannot assure their daily living needs. Therefore, ADDS suggests to apply a three-tiered plan for this project due to its success in implementing elements of this scheme in other projects (See Figure 3).

i. First, ADDS will provide safety net loans to cooperatives of between 20 and 50 people who provide labour for projects (such as community members assisting with dam construction) similar to the Food for Work concept. These loans will be quite small (such as 25 cents per week), because they are based on the well-established Myrada concept, where a group will help others within the group due to their values of mutual support, but must pay some fee to secure the loan process.⁹ ADDS has experience in implementing the Myrada concept with other projects. For instance, it has created a safety net programme in the Damerjog area where they have organized a cooperative consisting of twenty female farmers. Each member of this group contributes 5.6 cents per week. To date, the cooperative has saved a total of 500 USD.

ii. ADDS will then offer a second stage of loans categorized as nanofinance which is typically provided after some months (typically 3 to 4) of good performance under the safety net programme. ADDS encourages women, in particular, to initiate their own cooperative. Nanofinance offers very low interest payments and a small management fee which can be repaid after an extended time-frame such as half a year. CPEC (the operational branch of ADDS) provide a nanofinance credit in the amount of 200,000 FD (equivalent to 1,130 \$ US) to a group of 20 female farmers who have demonstrated credit-worthiness as a cooperative.

iii. The third and final stage is the standard microfinance loan for groups or individuals as per business as usual. Current interest rates are 1.5% for groups and 2% for individuals. CPEC offers two types of loans; individual loans ranging between 300,000 and 500,000 FD (1,700 to 2,000 USD) and group loans ranging between 50,000 and 200,000 FD (300 to 1,200 USD) per person for 4 to 6 people. Guarantees are only required for individuals receiving loans. Therefore, the three-tiered MF product plan is geared to organize cooperatives from the start and to transition the beneficiaries gradually to increase their loan amounts with increasing income and experience.

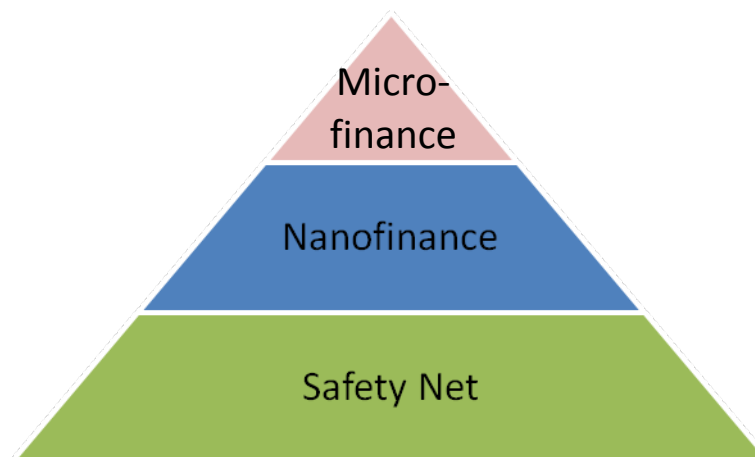


Figure 3: Three-tiered microfinance scheme

57. To develop this three-tiered product, this project will engage a group of experts, including international that has previously developed loans oriented towards adaptation. It will develop a MF product team including national agronomist experts to define loan conditions for activities which support adaptation to climate change which will promote shade garden-based agro-pastoral livelihoods (see adaptation activity list below the following paragraph). Activities acceptable for loans on adaptation will be documented in training materials in order to ensure that the loan conditions are binding and are easily understood by CPEC and their clients. Documentation of the loan conditions and acceptable activities will facilitate the use of the MF products for other agro-pastoral projects.

⁹ Fernandez, A. *Myrada's Organisational Values (In the Context of PAPRO)*, Bangalore, India, November 1997.

58. Loans will be provided for activities which will promote the resilience of the pastoralists / agro-pastoralists to climate change through the support of livelihood diversification for shade gardening practices. Principal categories of the loans for adaptation include the following:

- i. Purchasing date palm varieties to establish multi-tier shade garden for fodder and vegetable production;
- ii. Purchasing hybrid crop varieties which are resistant to salt and water stress;
- iii. Purchasing drip irrigation material after accruing agricultural experience over the course of the project so that significant water resources can be conserved;
- iv. Purchasing productive cows and goats which can withstand water stress so that a limited number of livestock will prevent land and vegetation degradation and;
- v. Developing a value chain of milk products to promote the diversification of livelihoods.

59. The most productive cattle breed in Djibouti is the Prim Holsteing breed which has demonstrated enhanced milk production since 1980. One such cow produces milk quantities equivalent to that of 3 commonly used cows (up to 12 litres of milk per day). Fewer cows needed to produce milk can significantly decrease the environmental degradation of surrounding water, land and air. Due to the productivity and increased revenues associated with this breed, they are currently very sought after by pastoralists. Microfinance will aid the cooperatives to purchase these cows which are approximately 300 USD each or 1.25 times the price of less productive cows. With the financial support of the group, beneficiaries will be expected to repay the loans once profits are accrued from the sales of milk products and market produce. CPEC already promotes the diversification of milk products with its loans for small milk producers in the rural zones outside of Djibouti city. CPEC also provides loans to assist with the conservation of milk products and other activities which promote milk product sales.

60. By having the ability to purchase productive cows and goats, Component 3 will be used to train the (agro)-pastoralists on how to diversify their lifestyles sustainably. Productive goats will be emphasized for micro-credit financing because the milking of goats in Djibouti is the work of women. With climate-adapted productive goats, it will be possible for women to diversify their livelihoods with goat milk products that are highly valued in the Djiboutian market. In fact, Djibouti's markets currently consume 55 tons of milk per day and local milk is particularly appreciated in Djibouti city.

61. With acceptable adaptation-oriented activities outlined, the MF product team will detail how to pragmatically finance agricultural activities based on their intermittent returns. Flexible payment schedules will be detailed for loans based on the seasonal cultivation of forage and market produce as well as the cyclical production of milk products (e.g., different times for milk and cheese production based on the gestation periods for cows). As noted previously, ADDS has already implemented flexible repayment schedules for their agricultural clients.

62. AF funds for this project will not only facilitate the development of adaptation-oriented MF products, but they will also build capacity within the ADDS organization so that they can manage and provide training for the MF products. Training for ADDS personnel must include promoting awareness that the loans be earmarked for adaptation-oriented activities that helps improve productivity and communities to repay the debt. (A similar caveat was reinforced by an IFAD donation to ADDS which demanded that loans be provided for sustainable agricultural tasks only.) Capacity building within ADDS will also ensure that they can effectively organize groups. By initiating stakeholder meetings during the development of the MF products, this will give ADDS a sense of the community's potential and willingness to diversify income-generating activities. Such consultations will then provide ADDS a means to effectively organize cooperatives after the development of the MF products.

63. ADDS will subsequently organize and train the cooperatives on their MF products. They will put an emphasis on creating women's cooperatives, a task in which they have significant experience. Success for the MF products will be supported by the continuous monitoring, evaluation and feedback of the loans throughout the lifetime of the project by ADDS. An independent national expert and UNDP will also monitor the use of funds to ensure that they are being used for activities which increase the resilience of the agro-pastoralists /

pastoralists to the impacts of climate change. This component will be monitored through statistical indicators to determine improvements such as increased coverage of land under shade-garden productive systems and a rise in productivity, credit volumes and repayment rates.

64. To assist in teaching agro-pastoralists, Activity 3.1.3 includes the preparation of technical guides for activities geared towards climate resilient agro-pastoral practices. By preparing guides, they will serve as standard manuals for the CPEC staff. The guides will be produced for each category of adaptation activities for which it is possible to obtain a loan (e.g., seed purchase, drip irrigation). These guides will also explain interest and repayment schedules of loans. By being explicit about the activity and providing guidance on how to successfully perform the activity and finance the loan, CPEC can better ensure repayment. These guides will be revisited throughout the project in order to clarify any confusion from clients and to include guidance on any additional adaptation-related activities. It is envisioned that a guide similar yet more comprehensive to that in Annex D will be created. These guides can be easily applied to other agro-pastoral projects which will effectively yield adaptation elements in these other projects.

65. Furthermore, ADDS will implement mobile banking, a relatively new MF concept used to reduce the costs (Activity 3.1.4). This concept entails using trucks to provide financial services to rural clients who do not have the ability to travel to local offices. This initiative will increase the access of beneficiaries to MF services geared towards adaptation-oriented activities. The idea has significantly reduced MF costs in Brazil by eliminating the need for numerous MFI branch offices.¹⁰ The concept has been noted as one of the most promising methods to reduce the costs of rural banking and has had a great impact on spreading MF throughout rural communities.

66. New agricultural products from shade gardens will offer various possibilities for the development of income-generating activities and community enterprises (e.g. henna jujube products and date palm products of high market value). Djibouti imports 85% of the fruits and vegetables needs, mainly from Ethiopia. Dates are imported mainly from Arab countries. The annual quantity of dates imported is around 3000 tons while the country production is around 200 tons. The gap between demand and supply is particularly high which clearly indicates that there is high market potential for dates and other fruits and vegetables that will be produced as a result of the project. This makes the date and agricultural production approach supported by the project highly relevant and feasible. In addition, the project region is close to an important national road and is situated less than one hour drive from the capital which is the main market outlet. Storage facilities for the market produce will not be necessary given the high demand for the products, the close proximity of the market, and the easy accessibility of the market due to the national road; the produce can effectively be sold in the local market as soon as it is cultivated (the current practice throughout Djibouti).

67. In contrast, storage facilities will be provided for storing forage for use in years when potential drought may hinder grass production (Activity 2.3.1). The storage facility will contain scales to weigh fruits and vegetables for local sales. Also, the chain of milk products (from milk to butter and cheese) will need to be stored and conserved in the storage facilities. The plan of the storage facilities is also to provide a multi-purpose space for the community which will include a group meeting location and potentially a place to read at night (if solar panels are installed).

68. In order to improve access to microfinance, at least 300 agro-pastoralists and potentially 300 pastoralists will be organized in community groups or organizations that will allow pooling of their resources for a stronger asset / property base and chances to qualify for loans. A target of this project is to organize at least 6 cooperatives to facilitate training of the group to provide them with value chain skills which will enable them to perform climate-resilient income-generating products from beginning to end, such as sustainable cultivation practices and diversified food and fodder production in the established shade gardens. These as noted above

10 Meyer, R.L. *Subsidies as an Instrument in Agriculture Finance: A Review*, Joint Discussion Paper, The World Bank, BMZ, FAO, GIZ, IFAD and UNCDF, June 2011.

create more conducive agro-climatic conditions (reducing evapotranspiration and help maintaining soil moisture, compared to open fields and pastures).

69. In order to ensure the sustainability of the MF products, at least 4 established agro-pastoral cooperatives will progressively develop comprehensive climate adaptation plans to outline the priority measures for the establishment of the multi-tier and multifunctional shade gardens. Through biannual workshops, members of the cooperatives will provide their recommendations for each stage of shade gardening development process to ADDS. ADDS technical staff and experts will be part of this planning exercise. The community workshops will focus on how to improve the microfinance products, loan process and training materials to guide the rural population towards climate resilient, income-generating agro-pastoral activities. This can be achieved by elaborating how credit lines should be directed towards stimulating climate resilient practices, including what quantity of financial resources are necessary at specific stages of the shade garden establishment, what kind of flexible payment programmes are required and what loan conditions are feasible. The workshops will also enable the community to promote their views on how to best provide easy-access to local finance which is understandable for the general agro-pastoral population. The main goal of the planning meetings will be to identify the range of measures necessary which can reinforce the resilience of the local rural population and natural resource base to risks from climate change on the agro-pastoral activities. Identified priority measures will be formalized in detailed adaptation plans which fully reflect the communities' priorities for shade garden development that can subsequently be integrated into the National Programme for Food Security and the National MF Policy (see Section D). Both national documents are aligned with recommending the use of microfinance with agriculture to reduce poverty in rural regions, yet neither detail how microfinance for adaptation-oriented activities can be successfully implemented. These community-driven adaptation plans will provide the requirements for the successful design and implementation of microfinance products earmarked for adaptation as recommended by the experiences of the project beneficiaries so that they can be successfully utilized with future agro-pastoral projects and programs.

70. Overall, the following outputs and actions for Component 3 include:

Output 3.1: A three-tiered adaptation-oriented micro-finance scheme that supports climate-resilient shade gardening practices in the Grand and Petit Bara plains developed through partnership with ADDS which generates a total value of US\$ 300,000 throughout the project.

Activity 3.1.1: Development of three-stage MF product including a safety net programme for cooperatives, nanofinance for small, flexible loans and microfinance loans for diversified, revenue-generating activities with the assistance of an international and national experts

Activity 3.1.2: Targeted training for ADDS and CPEC to give them expertise in teaching MF principals for adaptation-oriented products to project beneficiaries

Activity 3.1.3: Preparation of technical guides detailing microfinance principles and sustainable agricultural activities

Activity 3.1.4: Mobile banking development to provide microfinance services to beneficiaries with no means of travel

Activity 3.1.5: Long-term and periodic monitoring and evaluation of adaptation-oriented microfinance

Output 3.2. At least 300 agro-pastoralists have been organised to form agro-pastoral cooperatives (including women cooperatives) to facilitate training on climate-resilient agro-pastoral practices and to support the development of financial literacy and the diversification of agricultural activities.

Activity 3.2.1: Organization of agro-pastoralists and pastoralists in cooperatives and training for cooperatives in terms of loan repayment programmes, savings accounts, sustainable farming practices and the diversification of agricultural products

Activity 3.2.2: Development of diversified women's microfinance groups with emphasis on women empowerment

Output 3.3. At least 4 established agro-pastoral cooperatives develop comprehensive climate adaptation plans incorporating lessons learned on best practices for shade gardens to be integrated into the National Programme for Food Security and the National MF Policy in order to facilitate the replication of shade-garden-based adaptation solutions.

Activity 3.3.1: Organization of agro-pastoralists into cooperatives which will provide recommendations on measures to improve the adaptation-oriented MF products

Activity 3.3.2: Bi-annual workshops organized by ADDS to facilitate the collection and documentation of ideas to promote sustainable MF products for each stage of shade garden development

Activity 3.3.3: Formalization of the community-driven adaptation plans so that they can be integrated into the National Programme for Food Security and the National MF Policy

Activity 3.3.4: Organization, centralization and promotion of lessons learned on best shade gardening practices via written and video reports, workshops and study tours

Analysis of the economic, social and environmental benefits of the project, with particular reference to the most vulnerable communities

71. The proposed intervention follows from the latest scientific studies that show a steep and long-term trend of aridification in Djibouti (see Part I). These changes in Djibouti's climate system and water cycle are predicted to seriously, if not irreversibly, compromise pastoral lifestyle across the country. Under these new climatic conditions, availability and productivity of vegetative cover, land and water resources may become insufficient to satisfy the growing food and economic needs of the dominant pastoral population of the Bara region.

72. Indeed, the long term trend of aridification in Djibouti resulting from climate change is expected to become an irreversible process that makes it urgent to implement an "exit strategy" for pastoralists in areas where extensive rain-fed nomadic livestock breeding will become no longer viable. The AF project will therefore yield significant economic, social and environmental benefits by addressing the long-term needs of the most vulnerable pastoral populations of Grand and Petit Bara by offering them the opportunity to engage into semi-sedentary integrated water management and agro-pastoral shade garden systems that will increase climate resilience for 30,000 direct and indirect beneficiaries. Better water management and 228 ha multifunctional shade-gardens will directly benefit approximately 2,800 "former" herders (228 families in total) and will have indirect positive effects on roughly 27,000 other people including the remaining nomad communities that transit in the region and nearby urban populations. These two categories will either benefit from improved water points and less degraded pastures and/or high quality agricultural products on the local markets, leading overall to improved animal health and productivity, greater sources of income and better food security and diet conditions.

73. The most vulnerable populations (as determined by the selection criteria) have been targeted to receive significant economic and social benefits from this project. They will receive the land from the government and will be trained to develop sustainable shade gardening practices which will facilitate their resilience to drought and promote their adaptation to climate change. With proper training they will be able to become self-sustaining in their capacity to produce crops year round. Additionally, by having access to the safety net or bottom tier of the MF products, they will also receive financial support to increase the profitability of their gardens. Furthermore, by targeting the most vulnerable and forming cooperatives among them, they

will also develop a social support network which can aid their access to the adaptation measures of this project.

74. Downstream uses of water captured under Component 1 and the conceptualization of the shade-garden multi-functional system are based on existing studies and proven experiences. Several studies demonstrated that surface water mobilization is of utmost importance for Djibouti and will build the resilience of the country to climate change either for rural or for urban areas. These assessments include notably:

- The sectoral reports for the GGWI demonstrated that surface water mobilized by earth dams have been used several months (after rainfall) by pastoralists for livestock. Small scale forage production plots have also been developed near the water ponds.
- The report “Master Plan” for agriculture stresses the need to develop water mobilization projects.
- The evaluation report of the African development Bank for the project “Mobilization des eaux à usage domestique et agricole” reported the development of agricultural activities after water mobilization in Djibouti
- Scientific studies on the Djibouti aquifers stressed the unbalance between the current natural recharge and the pumping demand and the need for more water capture and storage for uses such as agriculture.

75. The aforementioned reports also emphasize the need to produce more water for agro-pastoral production and on-farm livelihood diversification such as date palm cultivation, forage production or fruit trees and agro-forestry. Also, it is worth mentioning that, although very nascent in Djibouti, the practice of shade gardening based on date palm production is not a new practice in the country because the Yemeni populations brought this ancient tradition to Djibouti centuries ago and there have been some shade gardens developed already, notably an example in the Tadjourah area which proved very successful. The project will therefore build on these existing initiatives and will expand them further by reviving and enhancing the traditional practice and knowledge of agro-pastoral shade-gardening.

76. The most vulnerable pastoral and agricultural groups targeted by the project are prepared to move out of their traditional activities because a significant portion of them has already started to migrate towards the nearby urban centers or has settled along the National Road 1 that crosses the Bara region to work as daily workers, notably in the quarrying sector. The project is positively perceived by these populations on account of the environmental, social and economic benefits it will offer them to maintain a rural lifestyle. Amongst those benefits is the prospect of living a dignified life on their land and to have access to a decent job, food and income conditions in a way that can meet their basic human development needs and reduce their environmental and economic vulnerability. Furthermore, date-palm cultivation that underpins the shade-garden approach is not a new practice in Djibouti, and the Bara populations are aware of other successful projects (such as in Tadjourah) and the advantages that can be expected from this kind of agricultural system. Local interest, buy in and motivation to engage in this alternative practice is therefore very strong, as confirmed by the stakeholder consultation process undertaken for the project.

77. In terms of economic benefits, the development of 1 ha agro-pastoral shade gardens shall produce sufficient revenues per family after the first 3 months with the cultivation of melons, onions, gumbo, peppers and other fast-growing fruit and vegetables year-round as indicated in Figure 2. For instance, significant profits can be made by selling onions during the winter and melons during the summer. With the production of 2 tons/year of onions and 4 tons/year of melon per shade garden, profits can total approximately 5,300 USD/year. After six months to a year, the introduction of cows to the shade gardens has the potential to provide up to 3,500 USD/year in milk sales. Subsequently, after a few years of date tree cultivation, as much as 1.3 tons/year of dates can be produced per shade garden. Dates sales in the local market have the potential to generate revenues approaching USD 3,500/year¹¹. Furthermore, the demand for quality dates is high in

11 It is estimated that a well-managed shade garden can produce an average of 50 kg of dates per date tree, 2,000 kg of onions and 4,000 kg of melon per year. The project plans 228 shade gardens with 25 date palm trees each. Date production per shade garden is 50 kg * 25 trees = 1.3 tons/yr. The average price of dates in Djibouti is estimated at a minimum of 500 DJF/kg, which results in an

Djibouti (the few tests conducted so far have shown a great selling success¹²), yet have only been able to be satisfied by imports thus far.

78. Other socio-economic benefits will come from multipurpose trees and plants which can be used to reinforce fencing, block winds, provide shade to zero grazing livestock, and provide a source of firewood. Women and children will be less burdened with fetching water or wood due to the close proximity of the new water points and trees. The resulting gain in time will empower women and give them more time to establish sustainable livelihoods.

79. In terms of benefits from MF, the social net programme will help organize the community and instil confidence and support to those in groups. The MF products will enable the beneficiaries to become financially literate and to facilitate the diversification of their livelihoods through its 3-tiered scheme (see Section A). Such products will also be created to support activities which prevent degradation of the environment and which will promote the sustainable use of resources over the long-term. The loans will be offered solely on the condition of usage for activities which enable adaptation to climate change.

80. The Government of Djibouti understands this project to be a unique opportunity for ensuring climate-resilient development pathways in rural areas. Therefore the project will also work at a more systemic level, developing and testing new approaches that will break the desertification/poverty increase trend currently occurring in most Djibouti rural areas towards pro-active reinforcement of resilience and capital accumulation. By setting the base for a large scale replication in other rural regions, the AF project will provide social, economic and environment benefits to a large number of rural communities.

81. This project will ensure that the most vulnerable pastoralists are trained so that they can become independent and self-supporting through i) the creation of community water management committees, ii) the training of lead farmers capable of sharing best agro-pastoral practices and iii) the creation of microfinance cooperatives. By instilling social support systems, the most vulnerable will have a secure means to develop their shade gardens. At the same time, the provision of easy-access MF products to cooperatives will provide significant economic incentives for the vulnerable populations. Furthermore, the provision of loans for adaptation activities will ensure that this project provides environmental benefits by assisting the rural populations in developing shade gardens that will not deplete natural resources and contribute to maladaptation.

82. Currently, the most vulnerable beneficiaries are currently receiving relief aid from the Djiboutian government through the Ministry of the Interior. Food assistance is planned throughout the development stages of this project until crops are first cultivated. During the community level consultations in the lead up to the project, communities discussed the likely need to rely on safety net measures such as the relief aid during the period of design and production of the gardens. This was not considered an issue given the long-term benefits of self-reliance that the AF finance would provide. Also, they are well-informed of successful agro-pastoral initiatives in the Mouloud and Atar regions (see project Consultations in Section H and Annex C) which have made pastoralists in the same situation become more resilient and productive. As a result of these two factors, there is little if any risk of the existing communities within Petit and Grand Bara to not buy into the project. In fact, they acknowledge they have no other viable options for a sustainable livelihood because unemployment in the city is high, government aid is intermittent and the severe shortage of water and its detrimental impact on livestock has already led them to lead sedentary lifestyles.

83. The agro-pastoral projects in Mouloud and Atar have already demonstrated positive results in terms of an increase in productivity in current climatic conditions in spite of the fact that these initiatives were not

annual income reaching 3,500 USD per shade garden per year. Onions and melons are sold in the Djibouti market for 70 DJF/kg and 0.5 DJF/kg respectively.

12 Since 2005, CERD has developed first shade gardens nearby the research station in collaboration with local farmers. The first harvests have been successfully sold in the streets of Djibouti within a few hours which shows that the local demand for such commodity is high. Consumption of dates, through import from the Arabic Peninsula, is also widespread in Djibouti.

focused on long-term climate resilience. However, these pilot projects have lacked financial support and policy mechanisms for large-scale replication. In contrast, this project builds off the success of the productive agro-pastoral initiatives and facilitates the proliferation of the shade garden concept where sustainability and scaling up the concept are emphasized.

84. Sustainability and scaling up of this project are made possible as follows: Through capacity development within CERD and the Ministry of Water, Component 1 of this project will transfer sustainable water resource planning and design knowledge to future water projects (e.g., artificial recharge, subsurface dams). With proper design of water resources, subsequent agro-pastoral projects will have the opportunity to irrigate more hectares of land to increase the rural population's resilience to climate change.

85. Component 2 of this project will also contribute valuable skills to planned agro-pastoral projects such as proper date tree cultivation and crop rotation techniques. This Component will also demonstrate the best means to diversify income-generating crops year-round. Furthermore, the 6 sites for shade garden development will be strategically located so that enough families are in the same region to support one another while the sites will be separated geographically to facilitate the future proliferation of shade gardening within the vicinity of existing plots. With this shade garden design and by securing water resources under Component 1 and planning for future water demands, this project will provide the framework for shade gardening development in Petit Bara and Grand Bara.

86. Component 3 of the project will set a precedent on how microfinance can succeed in supporting sustainable, adaptation-oriented agro-pastoral activities for other projects. Through the MF products that will be developed with AF funds, flexible payment rules will be created and other conditions to stimulate adaptation. The workshops planned under Component 3 of this project will be used to develop capacity within ADDS and CPEC so that they can effectively organize and train the rural populations through their 3-tiered MF product strategy. Furthermore, the safeguards placed on the loans will ensure money is provided for adaptation-oriented activities by first defining required standards for loans and subsequently through monitoring and evaluation. By pre-defining loan structures and requirements through this pilot project and creating community-driven adaptation plans, the National Programme for Food Security can absorb the MF credit structure and products so that they can continue to be used for other agro-pastoralist projects.

87. It should be noted that there is little risk that the rural population will be unable to understand or unwilling to use the microcredit schemes. ADDS has a long history of providing micro-loans and has experience in providing flexible loans to rural farmers. As evidenced by their illustrative farming training guides in Annex D, they have proven capability in effectively relaying profitable farming knowledge to illiterate rural populations. Furthermore, due to the presence of a regional CPEC office in Ali Sabieh, the Petit and Grand Bara populations are aware there is an existing Djiboutian micro-credit loan system. However, these populations have had no financial means to take out loans. The purpose of this project will be to tailor novel MF products so that the most vulnerable will have access to safety net loans. Rural populations unable to travel to the regional office will be assisted by the mobile banking system to be implemented.

88. Furthermore, due to the efficacy of community consultations, beneficiaries are well aware of the development period required for water mobilization and initial land preparation and the success of the agro-pastoral initiatives in the Mouloud and Atar regions. As a result of these two factors, there is little if any risk of the existing communities within Petit and Grand Bara to not buy into the project. In fact, they acknowledge they have no other viable options for a sustainable livelihood because unemployment in the city is high, government aid is intermittent and the severe shortage of water makes pastoralism no longer viable.

89. Funding is ensured for Components 1 and 2 under the National Programme for Food Security which guarantees 10% government funding as a prerequisite for Djibouti to be involved with the Detailed Programme for the Development of African Agriculture (PDDAA). For Component 3, the Government has opened credit lines for ADDS to provide microfinance services for agriculture due to the current drought

crisis in rural regions. The National Microfinance Policy 2012-2016 also stipulates that government funding is available to ADDS for future credit lines to be used for agriculture-related projects. In addition, the Policy establishes funds for guarantees and risk insurance and a financial mechanism to support the most vulnerable populations in rural regions.

90. Component 3 of this project has a great potential to be self-sustaining because after cooperatives are formed and crops are first cultivated, financial support and scaling up of the MF scheme will naturally occur with the addition of beneficiaries to loan portfolios. For example, as the loans are recycled it is conceivable that outside beneficiaries take advantage of some part of the value chain with shade garden products such as the transformation of goat milk into cheese. As such, although these loans will be provided for the restricted use of sustainable activities, the breadth of activities associated with agricultural and livestock products can extend well beyond the beneficiaries actually cultivating. This is in fact the reason why ADDS sees that pastoralists can be beneficiaries to their products as well. The goal of ADDS and this project are aligned in adding beneficiaries to the project; ADDS inherently wants more clients with IGAs added to their portfolios while this project wants more beneficiaries to have access to not only the water component of this project but also to the products of shade gardens for the diversification of their livelihoods.

91. Using the loan pyramid structure, community feedback on loan provisions, and integrating the adaptation measures into the national policies will mitigate risks associated with the sustainability and scaling up of Component 3. The progressive loan structure will serve to provide loans to the most vulnerable while enabling them to become more profitable as they become more experienced with shade gardening. Up until this point, the vulnerable populations could not take out loans due to their lack of financial means or were considered too high risk to repay loans. Through this project, with the loan structure and the formation of cooperatives, Component 3 of this project will increase the resilience of the beneficiaries through safety net structures. In effect, profitable shade gardeners that can sustain themselves in times of climate shock will ensure that the loans are recycled and the MF products are sustained throughout the life of the project and for future shade gardening projects. The focus on profitability in Component 3 of this project will thereby guarantee more long-term uses of the loans for other beneficiaries and will give more confidence in the loan and shade gardening practices for others to use and replicate. Furthermore, regular lessons learned and recommendations from the community will be integrated into the products on how to improve the facilitation of adaptation activities so that they assist rather than hinder shade garden profitability (Activities 3.3.2. and 3.3.4). These activities will minimize the risk that the products lack practicality and utility for shade gardening practices throughout Djibouti. Finally, the National Programme for Food Security which will integrate the adaptation plans is financially secured due to recent national budget allocations for agriculture; in April 2012, the government of Djibouti signed the CAADP (Comprehensive Africa Agriculture Development Program) agreement and thus the government is committed to allocate 10% of the National Annual Budget to agricultural development. Considering the National Budget of 2011 as a baseline, this 10% target is equivalent to 42 Million USD per year. Projects that will be funded are those defined within the National Programme for Food Security which fully integrates the development of new shade gardens. By formalizing the adaptation plans into secured national policies, scaling up of Component 3 of this project will be much more feasible on a large scale.

Analysis of the cost-effectiveness of the proposed project

92. Cost effectiveness is firstly assessed by comparing the shade garden concept with other possible climate change adaptation solutions. In the rural regions targeted by this initiative, no alternative livelihood options (such as industry or mining) exist at the moment. Tourism demand is scarce. It could be developed at a national scale, including some tours in the semi-desert with nomadic populations, but this would be a national effort and requires heavier investment including promotion. In addition, it is not a climate change resilient strategy as many studies demonstrate that increasing temperatures will impact tourism flows from Europe, and decrease the attractiveness of warmer places. For those rural populations, when conditions for living become too harsh, the usual adaptation option is migration to Djibouti-Ville in order to benefit from the current economic growth of the port and related services. However, the unemployment rate in Djibouti is

high (around 60%). For the rural poor, many of them illiterate, no long-term opportunities are apparent. Furthermore, strong demographic growth also calls for alternative solutions in rural regions, as well as an urgent need to improve the country's food security.

93. In rural areas, the population is therefore more or less constrained to primary sector activities. The adaptation alternative supported by the proposed project is therefore seen as a much more cost/effective strategy than migration and resettlement of pastoralists in urban and peri-urban areas. Such alternative solutions would require high level of investments in the development of urban infrastructures and services, especially water supply, whose additional costs are clearly beyond the financing capacity of an LDC country like Djibouti. Similarly, relying almost exclusively on food aid and international assistance programmes to address the impacts of droughts and water scarcity on food production is unlikely to be a cost/effective solution in the near term, given that the extreme drought events underwritten by such international/national solidarity mechanisms are likely to become regular risks under a climate change regime. The most cost effective way to improve the living conditions, food security and climate resilience of the traditional pastoralist communities lies therefore in the enhancement of the arid ecosystem production potential in terms of quantity and value of agricultural products as well as in the diversification of employment and income opportunities for rural dwellers at risk by means of spreading economic incentives for them to remain on their land while accumulating the necessary capital to better cope and recover from more frequent drought. As described above, the restoration/development of oasis-type shade gardens will provide micro-climatic conditions that will enable the optimization of productivity of both soil and water resources in a way that is more resilient to further aridification than the current pastoral practices which rely only on precipitation and are therefore highly sensitive to the vagaries of climate. In combination with improved groundwater use and recharge practice these multi-purpose agro-pastoral systems will provide the most viable and cost-effective solutions for many rural residents to survive the food insecurity threats posed by climate change.

94. In order to ensure that this project is comprised of the most cost-effective options for each specific component and their respective activities, a number of alternative options were assessed during the development of the full proposal. Relative to component one, although costly, the comprehensive hydro-geological and pedological technical studies to be conducted in the Petit and Grand Bara watersheds will ensure the choice of appropriate locations for water sources with the view of climate change impacts. In fact, an essential output of these studies will be models which predict future climate change conditions. Investment in long-lived infrastructure such as dams or irrigation networks must consider the effect of future climate conditions because these impacts will most likely become increasingly relevant over the planned useful life of such infrastructure¹³.

95. With sustainable locations for securing water, different technical options were considered to secure water resources; integrated watershed development was used as the project concept in securing water resources cost-effectively and sustainably. As such, the goal of water resource planning is to achieve higher sustainable production with a number of different options to promote optimal water capture and storage with a combination of surface and subsurface mechanisms. Surface water capture and storage upstream of dams after rain events is the simplest option in Djibouti. Due to the force of runoff during rain periods attributed to the steep surrounding topography, a concrete dam was considered in project conception; however, the cost was approximated to be USD 23.5 million, i.e., more than a hundred times the price of an earth dam. Furthermore, construction materials for concrete dams like reinforced concrete structures, rolled compacted concretes, still structures etc, require sophisticated machineries, international expertise and high capital investment for their design and construction including operation and maintenance.

96. In contrast, earth dams are relatively low-cost with straight-forward designs and required maintenance. To prevent failure of earth dams, small earth barriers will be placed upstream of the large earth dams to reduce runoff forces during flooding, dissipate energy and prevent damage to earth dams from the boulders and large rocks which are transported with the high flows. During detailed design, engineers will weigh the

13 *Climate Change : Helping Poor Countries to Adapt*, Development Co-operation Report 2010, OECD 2010

option of using gabion or a relatively inexpensive, wire lattice to reinforce the dam. A new component for a select few of the earth dams will be to have percolation basins upstream when permeable land exists (typically soils composed of fractured and weathered rock) so that surface water can recharge to the groundwater naturally. From field visits it was also apparent that vegetation grows along the perimeter of basins upstream of existing earth dams which provide shade, reduce evaporation and strengthen the soil with the fixation of plant roots. Earth dams with upstream basins (with or without percolation) are the most cost-effective option because the national engineers have experience with these engineering techniques, the designs require predominantly native materials, and local manpower can be used for construction, thereby creating employment in the affected region for numerous beneficiaries. Representatives from the Ministry of Water and the Ministry on the Environment will also have the role of monitoring the construction of the earth dams to ensure that the construction is robust and sustainable.

97. Desalination of water near the coast and piping to the sites was also considered. However, due to the salinity content of the bay (approximately 35 ppt) and the inherent high water production costs (approximately 0.8 USD/kl or at least 3 times higher than conventional treatment plants considering the high energy costs in Djibouti), neither a multi-stage flash nor reverse osmosis membrane desalination plant will be cost-effective. In addition, the long pipe length necessary for water delivery is also not cost-effective (880,000 USD for 22 km of pipeline at 40 USD/m).

98. Solely surface storage systems are affected by increased evaporation (particularly in this region), increased salinity from evaporation and high turbidity from the entrainment of silty clay particles during water mixing. Implementing complementary groundwater recharge is preferred in this project because there are negligible evaporation losses, the water is not vulnerable to secondary contamination by animals or humans recharge offers seasonal and long-term storage, and recharge can reduce pumping costs by minimizing the required pumping head. The groundwater recharge options considered were recharge basins, vadose injection wells and deep well injection wells. Recharge basins are the most common minimal technology method. This option was rejected because the evaporation losses will be significant in this region. Moreover, this option by itself duplicates the percolation basin concept to be constructed upstream of select earth dams (discussed previously). Vadose injection wells were also considered, however, the vadose zone in this region is quickly depleted due to the high evaporation rate. This has been demonstrated by the numerous shallow wells that have been constructed in the region which at the time of full proposal development in winter 2011 were dry and not functioning. Although shallow wells are inexpensive (3,000 USD each), groundwater at this depth is neither a sustainable water resource nor a good source of recharge because even if water tables rise with the aquifer recharge options proposed, current water demands will also increase with increasing irrigation and projected population growth. As such, it is recommended to use deep well injection and re-convert an inefficient borehole in Aour Aoussa 2 for recharge. Although, there are pumping costs with this option, the solar powered boreholes have had much success in the region and the same pumping technology can be used to reverse the process at times of heavy rainfall. The clear benefit of this option is that water will be recharged to the deep aquifer which will ensure the sustainability of the groundwater resources. Also, as Djibouti relies predominantly on their groundwater supplies (9 boreholes currently exist in the project region), recharging this zone is crucial for the beneficiaries to have a long-term supply which will enable them to adapt to any subsequent droughts. Overall, deep well systems such as proposed in this project allow for the storage of excess surface water during periods of high surface water flow combined with the recovery of stored surface water during periods of drought.

99. A sub-surface dam option was also evaluated as a reliable option because sub-surface storage of water is appropriate under conditions of increasing evapotranspiration, thereby cost-effective in the medium to longer term. This option is also highly sustainable due to the short-lived nature of the seasonal wadi flows which remain on the surface (with the exception of the basins upstream of earth dams). Furthermore, multiple subsurface dams can be built in the various wadis because the cost per dam is relatively inexpensive (approximately 10,000 USD each). In order to ensure that subsurface dam construction is robust, representatives from the Ministry of Water and the Ministry on the Environment will monitor dam development activities.

100. Due to the success of solar-powered boreholes and the great experience of the Ministry of Water and Energy in their design and construction, boreholes will continue to be a viable option for groundwater supply. Boreholes are considered a secure water resource that can sustain the agro-pastoral systems and the surrounding communities who will also benefit from the development of water points. In fact, 2 boreholes will be dedicated to the nomad population.

101. For Component 2, reforestation was originally considered to maintain the pastoral lifestyle such as under the PROMES project. However, pastoral systems will not be viable in the context of future drought or flooding when livelihoods are not diversified. Also, this option becomes expensive when considering that fencing and security is required around the entire reforestation area, as evidenced by Kourtimaléy where a reforestation project failed due to weak fencing materials and no guards on site. The cost to place fencing and security around the region would be USD 200,000 per 200 ha and would thereby be too expensive for such a large region. Nonetheless, this project recognizes that surrounding communities must also benefit from this project. Other than secured water resources, the low cost of complementary reforestation will greatly aid the surrounding pastoralists and improve the surrounding environment for the part-time pastoral activities of the shade garden owners. As this is a low-cost initiative which will increase the number of beneficiaries in the region, it has been included as a cost-effective activity under Component 2.

102. Two agro-pastoral zones were considered as an alternative to reduce the cost of required water retention and irrigation infrastructure. However, a dispersion of sites containing approximately 30 families (the approximate number of families in previous successful shade garden sites such as in Mouloud) will reduce soil degradation due to the prevention of livestock over-grazing in one area and is more likely to enable easier scaling up in the future when communities place shade gardens around the established sites and garner experience from the established agro-pastoralists. Also, with water resources spread throughout the region more surrounding families will also be able to benefit from this project.

103. Another alternative considered for Component 2 was to use basic, natural fencing materials such as trees. However, forbidden animal grazing in the gardens is a main cause of failure for current shade gardens. Only wire fencing or other strong materials is considered robust enough to protect the land from animal degradation with the addition of trees to block winds.

104. In terms of the irrigation schemes selected for Component 2, flood and surface irrigation application methods are considered the most manageable, provide flexibility on the type of traditional cropping pattern practiced, have a low energy requirement, and are not capital intensive. These techniques therefore remain affordable to communities and provide opportunity for regular leaching to prevent salinity - a common problem in this semi-arid region. Drip irrigation was also considered as an alternative because it is the more efficient irrigation technology in terms of water conservation. However, drip irrigation is more capital intensive and emitters are usually permanently spaced, which will not give flexibility on cropping patterns for the novice agro-pastoralists. In addition maintenance support for irrigation equipment, replacement parts, repair service, and skilled labour for system operation is minimal in the region at the moment. However, within the lifetime of this project, it can be reasonably assumed that the farmers will have accrued significant knowledge and expertise in growing crops as well as an asset-base. As such, this project supports the purchase of drip irrigation technologies through the MF scheme developed. From field visits to the CERD agricultural plot sponsored by a joint Djiboutian/Moroccan initiative, drip irrigation has been proven to significantly decrease water usage and to boost production based on its more natural percolation rate in the project region. The budget for MF training includes teaching agro-pastoralists drip irrigation techniques so that water can be conserved in the project regions.

105. To facilitate adaptation-minded behaviour and promote climate-resilient agro-pastoral practices, specific microfinance loan products will be developed by ADDS under Component 3. An obvious alternative is to only maintain components 1 and 2 in the project, however as previously stated, the do-

nothing approach makes it difficult for the agro-pastoralists to be guided into revenue-building activities which will help them diversify their lifestyles and become more risk averse to climate change.

106. An alternative to Component 3 is to allot the government AF funds to support subsidy and grant programmes for agro-pastoralists. Subsidies / grants are one-time donations that are classically managed by government institutions. By their nature, they are neither long-term nor sustainable since they must be replenished. Agricultural subsidies, in particular, can in fact contribute to mal-adaptation. Common examples in developing African countries include reducing the costs of inorganic fertilizers and using agricultural subsidies to improve the production of a staple crop.¹⁴ The former pollutes land and water resources when used in excessive quantities while the latter reduces the incentive for farmers to diversify their crops. 'Smart subsidies' are a more recent option which can include increasing the availability of more productive seeds. However, similar to all grants, smart subsidies are also subject to political implementation challenges.¹¹ In fact, receipt of any grant or subsidy by those in poverty is not ensured due to government failure. The lack of responsibility associated with access to government hand-outs is also detrimental to the success of sustainable shade gardens.

107. In contrast, AF funds will be used to help create an enabling environment, including skill sets and knowledge sharing through targeted training of MFIs who will then provide significant training to cooperatives. The MFI is already familiar with mobilizing experts to teach clients with specific skills such as product diversification and sustainable agriculture. It is also in the self-interest of the MFI to promote diversification amongst its investors to reduce competition among them and guarantee more client profitability. Furthermore, in the context of this project, it will be possible to implement conditions on the small loans so that the money is ear-marked for shade garden based agro-pastoral activities and clients are provided with the financial incentives to move away from climate change maladaptive and threatened pastoral activities. There is little risk that CPEC will resort to business as usual activities since the products will be new and designed specifically to support the shade garden practice. Finally, in order to facilitate the application of these MF products to other agro-pastoral projects, community-driven adaptation plans will be formalized so that they can be integrated into national plans and strategies in order to ensure the success of using MF effectively in promoting sustainable shade garden development and in diversifying livelihoods to increase the resilience of the rural population to climate change.

108. Moreover, one should keep in mind that pastoralists have a business mind-set already engrained in their culture as they were good animal traders before the recent climate change driven drought disasters devastated their livestock. At least four times per year, pastoralists used to come to the capital (main market of the country) and sell their animals with a minimum of 60 USD \$ for an adult animal. The average number of animals sold by pastoralists at the market was around 10, providing significant revenue to the pastoral communities. They would also sell milk, butter and other pastoral products. Currently, they can do this only once a year or not at all since a large number of pastoralists have completely lost their livestock. Even if pastoralists have become extremely poor as a result of the recent prolonged drought period, they still have a good understanding of finance and trade and are very likely to ensure profitability of their activities as well as financial sustainability of the communal infrastructures and systems put in place with the assistance of MF.

109. Several intrinsic characteristics further provide strong justification for the costs-effectiveness of the proposed solution in general. The project will put an important focus on promotion of adaptation measures based on climate-compatible and environmental-friendly agricultural and pastoral practices that will maintain the resource base and ensure conservation, restoration, sustainable management and maximization of arid agro-ecosystems. Inducing a shift from reactive management of climate-change impacts towards preventive planning and development of arid soil, water and pastoral resources, through improved adaptation

14 Dorward, A. *Rethinking Agricultural Input Subsidy Programmes in a Changing World*, Trade and Markets Division, Food and Agriculture Organization of the United Nations, April 2009.

modelling and planning capacity and support tools, will significantly reduce the cost of dealing with climate change and its effects and will strengthen the sustainability of the management systems put in place. On a technological level, the project will promote cheap and simple local solutions/techniques, and avoids to the highest extent any dependence from outside inputs in order to ensure sustainability (for example the dependence on costly fossil fuels will be limited through the systematic investment into renewable energy water pumps).

110. Furthermore, given the level of revenues expected from agro-pastoral gardens for each farmer, the project is seen as highly cost-effective with regards to initial investment from AF resources. Based on the available literature regarding yield rates and economic return potential of date-palm production¹⁵, market produce agriculture and milk product production with shade-gardens in Djibouti¹⁶, the project shall directly yield between 1.2 and 1.8 million USD a year of income for the local populations taking into account the necessary growing time for fruit trees and the necessary gestation period for milking cows. Compared to the approximately 5 million USD investment over 5 years, this means that 1 million USD will be invested every year for 5 years while at least 1.2 million USD can be earned as annual income over the next 20 years during the potential, viable life of the agricultural plots.

111. Based on the productivity of shade gardens in Djibouti, one can reasonably expect a revenue generation between 100 USD to 300 USD per month for the seasonal market products of each shade garden (such as onions during the winter and melon or gumbo during the summer). Date sales can provide an additional 300 USD per month (over an average of 7 months). Revenues can increase with productive cows which can provide between 4 and 11 litres of extra milk per day leading to additional income of approximately 350 USD per month during lactation periods (typically 6 months). Based on the price data and experience available from other projects in Djibouti, each household would pay 3 dollars per month (which is still an affordable contribution for the households as compared to their anticipated monthly revenue flow) and the collected money will serve to maintain the electro-mechanical equipment as well as contribute to the sustainability of the project. This kind of cost recovery mechanism has been used already in several locations in Djibouti, such as the village of Kalaf, whereby a community-based common account (community fund) was created to cover all the costs of the maintenance of a solar-powered water pumping system. The community organization leader is the chief of the tribal group installed in this village and the community fund is considered well-managed and used transparently and efficiently. This experience has been showcased as a good practice on several occasions in Djibouti and will be supported in the context of the proposed project with the assistance of the technical experts in the field.

112. Minimal maintenance and other costs will be paid with the community funds and with MF loans (based on the three-tiered MF product to be created in this project). With both sources, the rural population will have the means to sustain themselves with these cost recovery mechanisms. With either the safety net programme, nano-finance or microfinance loans, the local populations will be able to recycle their capital with loans for resilience-building activities. For example, if the irrigation system needs minor repairs, the cooperatives will have access to MF loans because these repairs can be categorized as a sustainable activity which enables the farmers to continue to adapt to climate change. Moreover, to facilitate good usage of community funds and minimize required MF loan amounts, technical experts in the field will train the communities on 'self-help' repair methodologies such as basic repair of irrigation canals or cleaning of the solar panels.

113. With large-scale water infrastructure, there will be some costs required at the later stages and beyond the project life. The proposed infrastructure consists of earth dams, percolation basins, subsurface dams, a

15 G. Peyron, *Cultiver le palmier-dattier*, La librairie du CIRAD, France

A. Daher, *Détermination du sexe chez le palmier dattier : approches histo-cytologiques et moléculaires*, Ph.D Thesis, University of Montpellier 2, December 2010

16 A. A. Sougal, *Les pépinières ombragées en Djibouti (Shade gardens in Djibouti)*, Report for UNDP November 2011.

re-injection well and boreholes. For additional investment required to maintain and sustain infrastructures (like major repair of the percolation basins or dredging upstream of the earth dam), it will be the responsibility (mandate) of the Ministry of Water and Energy to support the communities both financially and technically to maintain and make it operational. This is the current practice and is expected to continue in the future.

114. Programme implementation was also evaluated to determine the most cost-effective institutional arrangement. Implementation will be almost exclusively undertaken by existing Government structures. This approach is believed to be particularly cost-effective, as it reduces the need for higher costs that would need to be spent on consultant-driven implementation, and it builds the capacity of the government system for ongoing and more widespread implementation of similar climate-sensitive development. The size of the programme management unit (PMU) has been carefully considered, in order to keep costs down while still ensuring effective management of the programme. It is likely that staff for the PMU will be largely selected from existing government staff, thus ensuring that governmental capacity is sufficiently developed through the course of the programme. Alternative implementation arrangements were considered; including having an international Programme Manager in the design, but this implementation option was not further elaborated as it carries higher short-term costs and will generate less long-term sustainability.

Project consistency with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programmes of action, etc.

115. The project idea has emerged as the logical continuation of the cumulated recommendations made in the Initial National Communication to UNFCCC, the Climate change vulnerability study funded by the GEF, the Proposal for funding for the preparation of a National Adaptation Programme of Action and the NAPA itself, as well as the more recent studies implemented within the framework of the Great Green Wall initiative. The AF project is fully in line with the National Adaptation Programme of Action (NAPA) document, which is based on a large consultative process on all levels from governmental authorities to vulnerable communities, including priority stakeholders and the most vulnerable segments of the population. Among other activities, the NAPA formally recommends capacity building activities for agro-pastoralists, the dissemination of performing forage species, the strengthening of cooperative organizations, the introduction of clean water pumping technologies and the protection of agricultural zones from erosion and floods. Activities in this project respond to multiple priorities expressed by vulnerable populations in the NAPA, including the implementation of better water mobilization and management practices, improved forage production and ecosystem regeneration, the development of integrated, oasis-type agro-pastoral production systems, and the structuring of local initiatives within cooperatives and community organizations with access to appropriate capacity building possibilities and financial tools.

116. This region is one of the top priority areas identified in Djibouti's NAPA. NAPA studies were based on a climate change vulnerability assessment and those regions with highly vulnerable people or vulnerable ecosystems were prioritized over others, including urban, rural and coastal regions. The Bara region has been categorized amongst those areas that deserve urgent and immediate adaptation interventions on account of the severity of impacts from climate change-driven drought on local steppe ecosystems and pastoral livelihoods, on the risks associated with food insecurity, including malnourishment and starvation, and massive rural out-migration as well as in light of the agronomic potential of the two plains of Petit and Grand Bara for the development of climate resilient shade garden systems. NAPA and other studies highlighted that the project region has an important concentration of pastoralists and highlighted the fact that the pasture is completely damaged by climate change-induced heat waves and drought. Further, NAPA identified the development of integrated agriculture and pastoral activities as a viable strategy for adaptation to climate change.

117. Some of the top priority interventions and areas flagged in the NAPA have already received funding support such as for example, NAPA's priority number 1 which was to reduce impacts and vulnerability of

coastal productive systems. The implementation of this priority has been funded by the LDCF fund. Similarly, within the PROMES-GDT project, a set of activities on surface water mobilization will be undertaken and this completely falls within priorities 2 and 3 of the NAPA. The policy of the government is to implement projects identified in NAPA gradually as soon as funds become available. The development of agro-pastoral shade gardens is one of the next priority projects for which international assistance is sought. Funds are needed to address the long-term and crucial development needs of the pastoral communities which make up about 80 % of the rural population of the country and because financial resources will respond to a national development policy already in place that calls for the acceleration and scaling up of shade gardening agricultural practices as a long term adaptation strategy for pastoral groups who are most at risk from chronic drought and water scarcity.

118. The fight against desertification and agricultural development are key elements of Djibouti's government development strategy. This is illustrated by previous attempts to diversify the rural economy towards agricultural production, by the development of the Centre of studies and Research of Djibouti (Centre d'étude et de recherche de Djibouti – CERD) date palm reproduction laboratory (with the objective to propose drought and salt tolerant plants and develop shade gardens in Djibouti), as well as by the Great Green Wall Initiative (GGWI) in which Djibouti is strongly involved. The GGWI is a pan-African initiative spearheaded by Heads of State of eleven African countries along the southern border of the Sahara desert and aimed to employ a mosaic of approaches to combat desertification, soil degradation and limit Sahara desert expansion over a 15 km wide and 7,775 km long ecological buffer zone stretching from Senegal in the west to Djibouti in the east. This collaborative action will aim to ensure the planting, natural regeneration and integrated development of economically interesting drought-tolerant plant species, water retention ponds, agricultural production systems and other income-generating activities, as well as basic social infrastructures with a view to achieving protection of natural resources, rural development and poverty alleviation. The GGWI is expected to lead to the sustainable management of land, water and vegetation on up to 2 million hectares of croplands, rangelands, and dry land forest ecosystems per country, protection of threatened arid biodiversity, and the sequestering of 0.5 to 3.1 million tons of carbon per year. The project is receiving increasing support from the international community and has been endorsed by the participating countries and potential bilateral and multilateral donors and international financial institutions in a Ministerial Meeting held in Bonn in February 2011 and co-hosted by the UNCCD and the GEF. The Global Environment Facility expressed interest in supporting the GGWI with what could be up to US\$115 million. Other development partners also made pledges in support of the proposed investments which could ultimately reach US\$3 billion.

119. In this context, Djibouti has conducted detailed studies to identify the most suitable areas to implement the green wall actions, identifying the constraints, risks and key elements of tree plantations and promoting agro-pastoral development. Recently, a National Green Wall Implementation Strategy has been released, setting out the main strategic and operational ingredients of the Djibouti's GGW component. This strategy formally recognizes and retains the development of date palm-based shade gardens as an environmentally and economically-sound approach to overcoming the barriers to agro-pastoral development and achieve the green wall objectives. As such, Petit Bara and Grand Bara have been selected as one of the 5 landscape units retained for the implementation of the GGWI in Djibouti. The proposed project is closely aligned with this national and supra national initiative in that it will pursue the similar objectives of (i) conserving, restoring and enhancing biodiversity and soils, (ii) diversifying production systems, (iii) meeting basic food needs and increase revenues through the promotion of income generating activities (iv) improving / installing basic social infrastructures, in particularly in the area of rural water delivery services.

120. Given the limited water availability, the development of more efficient agro-pastoral systems, is a key national priority for the government, as illustrated by many national development programmes and plans that have underlined the necessity of integrated rural development initiatives based on improved water management and agro-pastoral development. As such, the 2003 Strategy to fight poverty aims to stop rural decline in the country through the rationalization of the exploitation of natural resources and the transformation of the agricultural system to offer a decent exit strategy to drought-prone pastoral

communities while improving agricultural yields and food production. The National Programme of Action for the Environment (PANE) and National Plan to Combat Desertification (PAN) also underline the urgent need to protect the environment and better manage soil, water and pastoral resources. The PANE and PAN three-year Action Plans started in 2006 from the Ministry of Agriculture underscore the challenges posed by drought and water scarcity of pastoral communities and the need to counteract current trends of ecosystem overexploitation in the most fragile arid regions through appropriate investments technological and non-technological solutions. All the actions proposed in this plan enter the economic development law 2001-2010 and the Poverty reduction strategy. The proposed project is deeply embedded in the priorities and objectives pursued by these plans which both support the fight against drought and desertification through community-based water harvesting and management schemes, protective soil and water conservation measures, integration of crop and animal husbandry and agro-forestry using drought and salt tolerant varieties such as date palms with the overall aim to build more favourable microclimatic and ecological conditions for the development of alternative and productive agro-pastoral livelihood systems.

121. The project is also fully consistent with CAADP (the Comprehensive Africa Agriculture Development Programme) – to which Djibouti adheres – that calls for urgent action in areas related to:

- Investment in water and land management;
- Investment in rural infrastructures, in particular roads and food products storage facilities;
- Direct incentives for agricultural production and productivity, and implementation of safety nets for most vulnerable populations;
- Support to science and technology development for long-term productivity.

122. The Framework Law for Environment of the Republic of Djibouti is currently being updated. The natural resources chapter does insist on the protection of soil and sub-soil resources as well as animal and plant resources preservation.

123. Also, the proposed AF project perfectly resonates with a number of additional national development frameworks, such as the poverty reduction strategy, the economic development law 2001-2010 as well as the Strategic document to fight against poverty of the country. These policies set out priorities for the primary sector that consists in the growth of agricultural outputs and increase in the revenues of farmer communities up to an annual minimum of 2 million FD (USD 11,000) from the exploitation of an average 1 ha of land. The agricultural systems developed by the project, especially the production of fruit and milk products will enable revenue generations for agro-pastoralists that fully satisfy the above targets¹⁷. The project will therefore constitute a key instrument in support of the national poverty reduction policy. Furthermore, this project is also in line with the National Initiative for Social Development (l'Initiative Nationale de Developpement Sociale, INDS), 2008 – 2016, which has three strategic goals: fighting against i) social exclusion, ii) vulnerability and iii) regional inequalities.

124. More recently, Djibouti endorsed in 2009 a National Food Security Strategy, backed by the creation the same year of the National Food Security Agency in charge of its implementation and monitoring. These policy innovations marked a major breakthrough in the way Djibouti approaches its food insecurity situation and outlined a comprehensive way forward to more thoroughly address the main root-causes behind it. Acknowledging the mounting evidence on the role of climate change in shaping both structural and episodic food security crises in Djibouti, the Strategy's main purpose is to reduce the dependence of the country on food importations, reduce the cost of food purchase for rural households, ensure self-sufficiency of most households for their basic food needs, reduce the vulnerability of the poorest to external shocks, improve water management practices and mainstream food security concerns into national poverty reduction frameworks. To do so, the strategy specifically supports the increasing of the agricultural production through greater integration of agricultural and livestock production practices, improvement of the productive

¹⁷ 1 ha plots will be planted with 25 date palm trees, yielding 1250 kg of dates per year, at a market price of 3,500 USD/year. Sales from melons and onions can be up to 5,000 USD/yr while sales from milk products can be up to 3,500 USD/year. This will be completed by the sales of other vegetable and fruit products as well as increased meat production, etc. which are also expected to generate additional revenue streams.

potential of dryland ecosystems and restoration maximization of food and water regulation ecosystem functions. It also recognizes the criticality of promoting more diversified and robust economic activities and livelihoods outside the agriculture sector as ‘‘safety nets’’ for the rural poor against climate and economic crises. The AF project fully fits with these orientations and priorities and will offer a strategic opportunity to further operationalize and localise them in the project regions.

125. A recent programme relevant to Components 1 and 2 is the Djibouti National Programme for Food Security (Programme National de Sécurité Alimentaire, PNSS). It is through this Programme where this project will be able to have access to finance beyond completion. As part of this Programme, 39% of the total EUR 130 million budget will be used to provide assistance to vulnerable rural groups and 38% will be utilized to assure food security. The plan includes 8 complementary projects in surrounding regions and other parts of the country which will secure water resources for pastoral and agro-pastoral activities between 2012 and 2017 with the ultimate goal of eradicating food insecurity by 2020/2025. The general aims of the projects included in the National Programme for Food Security are to provide the resources to have more efficient food production cultivation for self consumption and the national market. Overall, the idea of the National Programme for Food Security is aligned with that of this project: to promote and diversify the agricultural livelihood in rural regions by providing them secured water and supporting the use of renewable energies in the context of climate change. It is exactly in the context of this Programme that the government seeks for the additional funding from the AF as to generate on the ground experience and evidence for climate resilient measures to tackle food security in the long term in the face of climate change.

126. The specific aims of the relevant projects in the National Programme for Food Security include the following:

1. To exploit dependable water resources in rural regions throughout Djibouti by constructing deep boreholes powered by solar systems in addition to surface reservoirs, EUR 2,500, 10% government and 90% donor and NGO
2. To rehabilitate existing shallow wells and construct reservoirs in southern rural areas to assist with irrigation needs, EUR 10,000, 10% government, 85% donors and NGOs, 5% private sector
3. To create 50 agricultural cooperatives and water management committees in southern rural regions along with promoting solar energy and the rehabilitation of shallow and deep wells, 10,800 Euro, 10% government, 85% donors and NGOs, 5% private sector
4. To conduct an in-depth feasibility study on building a water conveyance system connecting to Lake Afambo which can benefit regional agriculture (36 ha) and households (2000), EUR 370,000, 10% government, 85% donors and NGOs, 5% private sector
5. To perform an in-depth study on the potential of surface water resources and a feasibility analysis on small and large water infrastructure works geared to assist in irrigation and environment protection in 11 watersheds, EUR 7.5 million, 10% government and 90% donor and NGO
6. To develop and support agro-pastoral activities by bringing secured water resources (10 micro-dams, 30 shallow wells, 10 reservoirs, 15 cisterns) to new and existing agro-pastoralists and farmers, and to reinforce their capacities to have diversified activities which reduce their vulnerability to climate change with the aid of cooperatives, 200 agro-pastoralist households and 1,000 small-scale farmers, USD 18 million.

127. Financing for these projects is approximately 10 % government and between 85 and 90 % donor grants with some private support. As Djibouti is part of the Detailed Programme for the Development of African Agriculture (Programme Détaillée pour le Développement de l’Agriculture Africaine, PDDAA), it must allocate at least 10% of its national budget to the agricultural sector. Overall, financing is assured by the following mechanisms:

- i) Through the beneficiaries themselves, directly by providing manpower for projects or indirectly with the assistance of ADDS.

- ii) Through the national finance plan, either through the normal budget or by borrowing from traditional lenders
- iii) Through external grants which will support all technical studies
- iv) With aid from the Global Fund for Agriculture and Food Security (Fonds Global pour l'Agriculture et la Sécurité Alimentaire (GAFSP))

128. Most recently, the National Microfinance Policy 2012-2016 has been finalized which stipulates the plan of action and strategic goals for the microfinance sector in Djibouti. The context of the plan is to effectively finance projects which reduce poverty in rural, urban and semi-urban environments. The mission of the Policy is to assure the access of poor populations to financial lending services, to coordinate the development of the MFI, to improve management tools and operational capacity of the MFI and to ensure effective control and supervision of MFI activities. The Policy has been developed by incorporating lessons learned from the previous National Microfinance Policy 2006-2010 including why specific actions could not be implemented, weaknesses and strengths in addition to previous audit information and concepts agreed upon during a workshop and consultations with all principal MF actors.

129. To support and develop existing microfinance practices, the National Microfinance Policy plans to implement activities on 4 strategic axes:

- i. Improving the legal, regulatory, institutional and fiscal environment for a secure and harmonious development of the MF sector;
- ii. Development and structuring of the MFI to have a viable and sustainable range of products and diversified services which are innovative and adapted into the needs and the development of entrepreneurial culture;
- iii. Mobilizing sufficient resources adapted to the specific needs of the MF sector and;
- iv. Developing an institutional framework enabling articulated and concerted management of the MF sector and development of the National MF Policy.

130. Relevant to this project, the MF Policy clearly stipulates the need to support agriculture development and the lack of training for proper irrigation and cultivation techniques. It also recognizes the precarious situation of pastoralists who are adversely impacted by the increasing frequency of droughts and progressive desertification. Furthermore, it highlights current climate constraints on agricultural production with given unsustainable farming and irrigation practices which enable only 10% of the national nutritional needs to be met by domestic agriculture production.

131. Specific actions to promote sustainable agriculture under the National Microfinance Policy have a strong synergy with the goals of the Microfinance Component 3 of this project, particularly those associated with Strategic Axis 2. (The action plan for Strategic Axis 2 is included in Annex E.) MFIs will be promoted in the rural regions of Djibouti including with the creation of more MFI regional offices. Specific types of products including savings accounts will be created and adapted to finance the needs of rural populations. Risks to the promotion of MFI services for all levels of the population will be formulated and addressed. Also, funds for guarantees and risk insurance will be established. Similarly, particular attention will be given to developing a financial mechanism to further support the most vulnerable populations with the organization of a round-table of lenders. Under Strategic Axis 3, negotiations with lenders will include finding the best means to mobilize resources for those in need. All of these actions will be monitored and evaluated based on indicators and means of verification as shown in Annex E and with the assistance of expertise groups which will externally audit the MFIs. Coherence on the role of MF between the Ministries (such as the Ministry of Women and Ministry of Agriculture) and the acting MF parties will also be ensured by seminars and workshops to be developed under Strategic Axis 4.

132. The National Programme for Food Security provides an overarching programmatic framework for the proposed project, results of which will be fully embedded into it and corresponding budgets secured for future upscale. Plans for the complementary projects are detailed in Annex F. The planned water mobilization projects are integral to future shade garden development.

Compliance of the project with relevant national technical standards

133. The proposed project will comply with all relevant laws, regulations and existing technical standards relating to hydrological resources mobilization, agricultural and pastoral development. On the socio-economic aspect, the project will duly respect norms and laws applying to labour, and public procurement procedures for investments and works. On the environmental side, the project will obviously respect all current regulations relating to water, biodiversity and soil protection, and work for a better management of natural resources. The strong involvement of the Ministry of Water and the Ministry of Agriculture into the project will ensure that all procedures regarding water mobilization, infrastructure development and shade gardens creation duly respect existing procedures and comply with all regulations in place. The concerned Ministry services, as well as CERD scientific team, have indeed a great experience in water investments and are well-versed with the rules and generally accepted practices in this matter. Currently, the water legislation in Djibouti does not require any particular groundwater abstraction permits or rights to be granted for government-led investments in favour of agro-pastoral development. Similarly, the current water code does not yet include quantitative norms or standards to regulate water extraction and use in the project zones. This project will attempt to facilitate the strengthening of the national legal framework for water resource management as indicated in Activity 1.4.2. The project will seek to create a Water Code to bring in a progressive tariff structure. It will build capacity within the Ministry of Water, Energy and Natural Resources to design appropriate water tariffs that are socially sensitive and consider return value optimization. Well designed water tariffs can yield improvements in water availability to the beneficiaries by raising the levels of water efficiency and freeing essential resources for better maintenance and improved water service delivery to the poor. A technician from the Ministry of Water will work along with the National Programme Manager in gathering ideas on how to implement a framework for legal and policy reform. The general framework should include the following key aspects:

- a fair and functioning system of water abstraction permits with specific requirements on amount, timing, purposes and period of water abstraction
- effective implementation of water laws and policies through institutional capacity building
- decentralised approaches to water sharing, emphasizing regional to local management units
- stakeholder participation through water users associations
- emphasis on scientific studies to quantitatively determine water abstraction impacts for current and future scenarios including climate change effects

134. Furthermore, under Component 1, the project will make a valuable contribution towards the improvement of the national water regulations by demonstrating appropriate water management targets, allocation principles and enforcement protocols that will be established with the local user groups and aimed at securing a controlled and climate-resilient exploitation of groundwater resources. The water resource monitoring procedures and systems implemented in the project will provide knowledge on groundwater 'reaction' to shade-gardens development, and provide lessons to be learned, assisting in the further development of (legal or not) protocols for other projects of this type. This will be further supported by the creation of local water management committees for which Djibouti has very positive track-records and experiences. For example, the villages of Gallamo located in the region of Dikhil have developed promising participatory water allocation rules whereby water is alternatively shared on a daily basis between agricultural and domestic purposes according to a sophisticated community monitoring and decision-making system. Best practices of this kind will be systematically reviewed and fed into the community-based management standards to be developed by the project. Such participatory mechanisms are fully consistent with the social standards prevailing within pastoral and agro-pastoral communities who are already subject to traditional and customary rules as it relates, for example, to the resolution of conflict over land and water resources or community development decision-making.

135. This project will also abide by the National Environmental Impact Assessment Procedures and Guidelines during the feasibility study of this project. The Environment Code was adopted in 1992 and is the basis for mitigation of adverse impacts on the biophysical and socio-economic environment in Djibouti. The

specific Law on Environmental Assessment No. 51/AN/09/6th L was revised in July 2009 to redefine the applicability and mode of execution of an EIA. Any direct or indirect consequences from investments with environmental resources must be subject to an EIA. The goal of an EIA under Djiboutian law is to assure the integrity of the environment under the constraints of the best available technologies and acceptable economic costs. The Ministry on Habitat, Environment and Urbanism (MHEU) is responsible for approving and evaluating the EIAs and Terms of Reference (TORs) for a project. A group of experts concerned with the project's development tasks is mandated by the MHEU to verify the TORs and information contained in the EIA by validating project impacts in the field. The MHEU is also responsible for the project categorization which defines the type of EIA required, i.e., a summary or detailed EIA.

136. In the case of this project, Environmental Impact Assessment (EIA) is required for Project Components 1 and 2. Within Component 1, the construction of subsurface and earth dams in addition to boreholes requires a detailed EIA. Similarly, for Component 2, the use of irrigation on more than 10 ha for an agricultural project larger than 100 ha in total mandates a detailed EIA. Included in the EIA for this project must be a social and environmental management plan (Plan de Gestion Environmental et Social, PGES) which defines the development programme, monitoring and evaluation procedures and a detailed budget. The EIA must also include public participation by consulting the concerned parties affected by this project such as downstream communities of the earth dams. After completion and acceptance of the EIA, the full feasibility study and EIA must be made publicly available. In accordance with the Law on Environmental Assessment, the MHEU is allowed a maximum of 1 month to validate a project's TOR and 1.5 months to validate and accept a detailed EIA.

137. From a practical standpoint, no existing boreholes or earth dams in the project region have required EIAs due to the country's dire need for water harvesting. Other types of projects which have required EIAs include a 500 MW geothermal project and an oil port project. Validation and acceptance of the detailed EIAs by the MHEU for these projects took 1 week and 1 month respectively. Taking into consideration all recent projects which have required a detailed EIA, it can be safely assumed that the 6 month timeframe will be more than sufficient to prepare the TOR, the EIA and allow the MHEU time for validation and acceptance of both documents (if they are in fact deemed necessary). In order to facilitate the EIA process, the technical studies in Activity 1.1.1 and the EIA development in Activity 1.1.2 will be undertaken in tandem so that the technical studies can provide the necessary details for EIA preparation. Such an approach will provide savings in time and reduce the EIA preparation costs because environmental findings will be immediately streamlined into the EIA document. With a considerable safety margin, the proposed project timeline takes into account a conservative estimate for detailed EIA preparation. The total cost and total expected timeline are listed in the Gantt chart in Annex A.

138. The Government of Djibouti fully recognizes that issues of land rights and land tenures, especially under Component 2 is a critical aspect when undertaking agricultural development activities and confirms that this question has been given due consideration when identifying and consulting with the concerned stakeholders on the proposed project concept. In Djibouti officially the rural land is owned by the government in the whole country. However, traditionally several communities live in different parts of the country and these communities use different sets of customary law to deal with issues and disputes related to the use of land and water. In the northern part of the country which is occupied by the AFAR community, the land issue can be very critical as land is traditionally owned by tribes and sub-tribes and the local land tenure situation is still to be clarified and settled with the government in several parts of this region. In addition, there are clear distinctions and systems of access and use rights between the AFAR communities. If a community were to come to the land of another one for herding or access to water, it would have to pay a sort of "access fee", such as one sheep for example.

139. In the southern part of the country, where the Petit and Grand Bara are located, the customary situation is different and land issues are much less critical. The southern region is mainly occupied by the ISSA community whose customary law grants equal access to the land. But, once a project has been developed by an individual or a community, this land is the property of the project developer(s). This *de facto* possession

principle is deeply entrenched within the ISSA traditions and widely obeyed by its community members. However, if land can be appropriated, access to water cannot be prohibited to the rest of the community. This is why the project investments made in water harvesting and mobilization schemes are likely to benefit a portion of the ISSA community that is larger than the sole group of families who will be directly engaged in shade gardening. Also, if water access and use cannot be prohibited, this does not mean either that it cannot be regulated. In a context of increasing water shortages, the potential direct and indirect ISSA beneficiaries are fully aware of the needs to control water withdrawals and uses and are strongly inclined to engage into a mix of customary and modern community water management systems and arrangements that will ensure that water extraction will be sustainable both environmentally and financially and that water allocation amongst the various community uses will be well balanced and efficient, with irrigation of shade garden being widely acknowledged as a top priority use. In addition, the development of the shade-gardens will be led by the government and will fall under a specific land tenure regime which is called “perimètres paysans” that strictly governs and regulates the status of the land while allowing customary rights, such as those mentioned above, to apply. Therefore, land tenure will not be an issue and will be fully secured for the purpose of the project.

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

Coordination of the project with other funding sources, if any.

141. The proposed project for AF funding takes an alternative agro-pastoral development and livelihood diversification approach to adaptation that considers more reliable control and productive utilization of surface and ground water as a fundamental mechanism to respond to the impact of more irregular rainfall on the productivity of traditional rain-fed pastoral and farming systems. Increasing the control of water resources available for agriculture and alternative livelihoods, either through artificial (water ponds, basins) or natural storage (soil moisture and aquifer) reduces vulnerability to climate variability and related water shortage and leads to greater agricultural resilience. Whereas most rural development projects focus on animal husbandry or vegetable production only, this project brings back the concept of integrated agro-pastoral development, based on a long lasting oasis tradition that needs to be protected and revitalised. It consistently links investments in water resource mobilization and management to agro-pastoral development through shade-gardens and improved animal rearing thanks to increased access to water, increased forage production and storage facilities. No duplication with other funding sources has therefore been identified. Instead, potential actions on surface water harvesting and grazing land management from other initiatives in the region may positively complement the AF project.

142. Until now, very limited agro-pastoral development activities have been implemented so far in Petit and Grand Bara (if we except a recent palm tree cultivation trial in Grand Bara). As previously described in Section D, the National Programme for Food Security will complement Components 1 and 2 of this project with their proposed projects involving securing water resources and creating / promoting agro-pastoral activities in surrounding rural regions of Djibouti. The Programme for Food Security to be put into effect between 2012 and 2017 will provide additional funds, both internal and external which will assist with scaling up of this project concept in surrounding areas. The lessons of this pilot project will be incorporated into the Programme for Food Security initiatives. No redundancies are seen with this programme as the

project considers different regional areas. Nonetheless, some of the activities of these projects will be implemented in regions within the same watersheds which will facilitate future shade garden growth.

143. Other projects in regions outside of the proposed sites complement the first and second components of this project. Currently, JICA (the Japan International Cooperation) and the government of China have provided grants to Djibouti to capture more groundwater via borehole construction. The government of Saudi Arabia has offered a grant to build a dam in the northern part of Djibouti. Other potential donors who have already contributed to related projects include the Saudi Fund, the Kuwaiti Fund, the Africa Water Facility, UN partners, the French Agency for Development and IFAD (International Fund for Agriculture development). Between March 2012 and February 2013, the Japanese government is also funding a 1 Million USD agro-pastoral project in the Beyaa-adde and Dhourreh regions of Djibouti (outside of the project locations in Ali Sabieh). This project involves securing access to water and the development of 124 agro-pastoral farms for pastoralists who have lost their livestock.

144. Additionally, an on-going initiative related to rural and agricultural development includes the PROMES-GDT (Surface water mobilization and sustainable land management programme) programme that is focused entirely on pastoralism development. This programme aims to improve grazing land management and animal rearing practices by regenerating and increasing productivity of natural pastures and improving livestock production conditions so as to augment animal nutritional intake and income of pastoral communities. This intervention does not address the long-term adaptation needs of pastoral and agro-pastoral communities, including possible exit strategies for pastoralists in areas where extensive livestock breeding could become no longer viable as the result of climate change driven degradation of natural pasturelands in both quantity and quality. There will therefore be no duplication between the two projects since the AF project's activities address adaptation strategies geared towards increasing forage stock and agro-pastoral diversification through agro-pastoral shade-gardens. In the very short term, the needs for "no-regret" grazing land management improvement around the AF project sites must be tackled given the large population concerned (only part of it will directly benefit from the AF project) and the very large areas supposed to be covered by the PROMES-GDT programme. In the near to medium term, it is urgent for the country to devise innovative and rural resilience solutions that would allow rural populations to gradually depart from problematic and less effective migration 'solutions' to urban centres and to more effectively cope with more intense and chronic aridity. Coordination between the two initiatives will therefore enhance the region's overall adaptation capacity in the face of multi-faceted and gradually emerging climate change threats.

145. Another related initiative is the GGWI that identifies the Bara area as one of its priority landscape units. As explained in paragraph 97, the aim of the GGWI is to counter-act the progress of the desert in Africa across eleven African countries, including Djibouti. Djibouti has already launched its strategic document on GGWI based on sectoral studies conducted by national scientists. The GGWI document of Djibouti has defined three main strategic axes:

- i) surface water mobilization and groundwater resources management for supporting the GGWI activities
- ii) rehabilitation of degraded land and forest cover by tree planting
- iii) implementation of development activities within the poorest villages situated inside the GGW including agriculture and small scale economic activities

146. The strategic axes 1 and 2 include activities that are close to the range of solutions promoted by the AF proposal. However GGWI does not explicitly include the anticipated climate changes in the country and does not plan to conduct climate change risks assessments to guide the definition of appropriate and additional adaptation activities. In addition, the GGWI will cover an area 309 km long from the eastern part to the western part of Djibouti in which the AF project region is only a small part. Also, the set of projects identified in the GGWI are not yet specified clearly at this stage in any particular targeted landscapes. For example, development of agriculture is identified in the strategic document of the GGWI as a key economic activity to be developed within the programme, but it does not focus particularly on a specific region of the

GGWI. The concept was to develop agriculture in each region within the GGW area that has good potential for agriculture. Furthermore, the GGWI is at the moment still at the conceptual stage as no funding has been allocated yet by the government or the international community to start implementation on-the-ground. Hence the two programmes will be complementary in that the AF project will help localize and operationalize the GGWI main strategic priorities by adding a climate layer to the GGWI through supplementary analytical works on the consequences of climate change on local agriculture and by demonstrating how risk from global warming could be better fed into local agricultural strategies and how shade-gardening can prove to be a beneficial long-term rural development strategy both to contain desert expansion and ensure climate adaptation for the most vulnerable populations. Through its broader scope and institutional leverage, the GGWI, once operational, is expected to contribute to promoting and scaling up the knowledge and most successful achievements of the AF project and will generate an important multiplier effect throughout Djibouti and possibly within its partner countries.

147. Other projects under implementation in the country rural areas are listed below. The results of those different projects/programmes will of course be taken into due consideration for the AF project implementation (e.g. using the various water studies results):

Table 4: Complementary Projects in Djibouti

Project name	Source	Estimated budget	Synergy with Project	Status
National Programme for Food Security (NPFS)	Djibouti PDDAA fund and an assortment of other donors, private and public	130 million EUR	The AF project implementation timeline is exactly aligned with the duration of the five year National Programme for Food Security (NPFS). Therefore strong synergies on agricultural development and water resource mobilization are expected. Lessons learned will be shared among the different teams within the core ministries involved in the AF project and the NPFS.	Implementation between 2012 and 2017
Ambouli wadi development	EU	19 million EUR	During the third year of this project, experiences gained during the implementation of the AF project will support the wadi development project in terms of effective surface water mobilization practices.	Procurement process launched
Marsaki (Tadjourah) and Behidleh (Ali Sabieh) watershed development	BID-ADDS	300,000 USD	This project mainly involves engineering studies. Knowledge on best design practices and best available technologies gained by the Water Department will be useful for the implementation of the AF project.	Under finalization
Support to water resource mobilization for households and agriculture	African development Bank	1,937,000 EUR	Water resource design and construction knowledge gained by the Water Department engineers during the implementation of this project will be used in the implementation of this project.	Under implementation since June 2008
Surface water mobilization and sustainable land management programme	IFAD and others	3.6 million USD	A strong synergy between the AF project and the PROMES-GDT project is expected. Knowledge obtained from rainwater harvesting and community mobilisation activities will be valuable for the	Under implementation in Day forest since December 2008

(PROMES-GDT)			design teams within the Ministry of Agriculture and Ministry of Water.	
Drinking water catchments in rural areas	Saudi Fund	3 million USD	This on-going project involves the development of deep boreholes. Through this initiative, Water Department engineers have gained experience regarding locating, drilling and operating boreholes. This knowledge will be useful in developing the six boreholes of this project.	Phase 1 : completed since 2006 Phase 2: under implementation since December 2009 In 2012, the project is closed.
Drinking water catchments in rural areas	Abu Dhabi	800,000 USD	This project also involves the development of deep boreholes. Practical borehole development experience will be incorporated into the AF project.	Under finalization
Fight against thirst	EU / UNICEF	2.06 million EUR	This project involves the distribution of water reservoirs, the repair of shallow wells and the construction of subsurface reservoirs for rainwater harvesting. Engineering skills and lessons learned gained through these activities will be utilized in the AF project.	Phase 1 (EU): completed since December 2009. Phase 2 (UNICEF) implemented since January 2010
PSSA project: water management	BID FAO Djibouti	800,000 USD	Engineering skills on the management of water resources acquired through this project will be useful to the AF project.	Under finalization
Mapping, assessment and management of transborder water resources within IGAD sub-region	IGAD	2.5 million USD	Immediate synergy is not expected.	Phase 1 completed since October 2009 Phase 2 launched
JICA project	JICA	-	This project involves groundwater extraction by the development of deep boreholes. Practical borehole development experience acquired by the Ministry of Water will be incorporated into the AF project.	Started in February 2010
Second National Communication	GEF-UNEP	-	Synergy is not expected.	Since 2009
Identification of saline water: Djibouti watershed	UNESCO	200,000 USD	CERD was the implementing entity of this UNESCO funded project. CERD will use lessons learned from this project for the planning of well locations in Component 1 of the AF project.	2010-2011
Technical assistance for the analysis and monitoring of	World Bank GFDRR	2.5 million USD	Immediate synergy is not expected. However, flood risk assessment knowledge will be useful in the design activities of Component 1 of	2010-2012

natural disaster risks			this project.	
Geophysical study of 44 sites and water management	African development Bank	5 million USD	Geotechnical results will complement the technical studies of Component 1	2008-2010

Source: Etude sectorielle eau, Projet GMV, 2010

148. The partnering and coordination strategy with the above projects, particularly the National Programme for Food Security, PROMES-GDT and the GGWI will occur by using the technical committee of the inter-ministerial “National Commission for Sustainable Development” as a platform to bring together all the line ministries and agencies concerned with the main topics and issues covered by the project. This committee has the official mandate to serve as an institutional platform and mechanism for regular consultation, coordination and joint programming to reduce duplication and maximize synergies between the project and the other related initiatives.

Learning and knowledge management component to capture and disseminate lessons learned.

149. First, the project will launch a large awareness campaign and population mobilization initiative on climate change, organising the participatory design of adaptation strategies around the project’s main components. Current knowledge on climate variability and future trends of change is limited in those rural areas, and there is a strong need to mobilize people around concerted actions which improve their resilience.

150. The project integrates strong capacity building, technical support and technical monitoring (of water resource and agro-pastoral development) components. All related activities will contribute to knowledge management along the project implementation for the different categories of stakeholders: agro-pastors, their organizations (cooperatives, associations), technical support staff, and governmental organizations. The project will systematically document key lessons, good practices and challenges experienced in establishing sustainable water resources management plans and subsequent agro-pastoral oasis gardens development as adaptation measures for rural community resilience.

151. The Government of Djibouti understands this project as a pilot experience that will generate foundational capacities and that will develop basic tools and information to replicate the project water resource mobilization and agro-pastoral development concepts in other regions of the country to increase resilience of rural populations to climate change and food security. A particular effort will therefore consist in close monitoring of a large number of technical and socio-economic parameters, both concerning the water mobilization component and the agro-pastoral development (with particular focus on oasis ecosystem management and date palm development), as well as the capitalization of lessons learned from structuring community organizations and developing income-generating activities through the use of microfinance tools. This will enable knowledge and capacity building among project stakeholders at local and central levels for dissemination and replication.

152. Specifically under Component 1, the main knowledge value to be captured and disseminated is related to the design, applicability and effectiveness of water-related adaptation and resilience building solutions including risks assessment and management tools, climate smart water harvesting infrastructures and technologies as well robust communal management models. Knowledge sharing under Activity 1.4.3 involves the development of a standardized system to document lessons learned from the water component of this project. Knowledge from the experiences of existing community groups in community mobilization tactics will be centralized. Also, the system will include the documentation of effective water management strategies for variable water usage throughout the year. On a local level, it will identify proven cost recovery mechanisms which instill community responsibility and awareness of efficient water usage methods. It is planned that periodic consolidation of local knowledge sharing ideas on cost recovery mechanisms into the

standardized system will aid in the design of a water permit and tariff structure to be implemented into the national legal framework.

153. Within Component 2, the project will look into knowledge issues related to approaches and practices for participatory technological development in the context of date-palm based shade-gardening, livelihood transition as well as tools and methods for local adaptation planning. The activities of Component 2 are generally ground-based in terms of necessary actions and steps to build shade gardens. Lessons learned from the development of shade gardens in Component 2 will be formalized in Component 3 under Activity 3.3.4 by ADDS. ADDS will be responsible for documenting the best practices of shade gardening and associated income-generating activities which contribute to adaptation. Knowledge will be accrued from the training sessions with the lead farmers and will detail the best drought tolerant crops, the best use of soils, and the best crop rotation practices. By centralizing lessons learned from the experiences of the shade gardeners in this project, future agro-pastoralists can immediately develop their shade gardens with the best available proven practices for profitable and sustainable year-round cultivation of crops in order to build a resilient lifestyle.

154. Additionally, under Component 3, during project development, ADDS will learn how to best implement its 3 tiered strategy to assist rural populations in poverty (i.e., safety net, nanofinance and microfinance). By strengthening the capacity of ADDS, opening different CPEC branches regionally (with 6 shade garden areas) and/or using mobile banking, this MF scheme will be able to be easily shared and promoted. Through the development of community-driven adaptation plans, the MF products will be progressively revised according to the experience of agro-pastoralists to ensure their success in promoting adaptation-oriented shade gardening activities. The adaptation plans will be integrated within relevant national policies in order to document and formalize the optimal use of MF products for future agro-pastoral projects.

155. Funds for knowledge sharing under Components 1 and 3 will support written and video reports, radio broadcasts and the creation of a country website to centralize all knowledge sharing from each component of the project. The website will enable a coordination mechanism between relevant departments for sharing lessons. The video and radio projects will promote a public awareness raising campaign on the shade garden concept and its utility in adapting the rural populations to climate change. The knowledge management funds will also be used to conduct workshops and study tours inside the country to promote awareness of the project to government officials and the rural population who did not directly benefit from this project. Study tours are necessary to facilitate sharing between program stakeholders and the regional communities. They are expected to enhance the capacity of the ministries to plan and implement successful shade garden projects in the future. Also, workshops and study tours will provide a feedback loop to facilitate the uptake of lessons learned into policy.

156. The centralization of lessons learned will additionally incorporate the most successful training methods for shade gardening based on the experience of this project. The knowledge sharing mechanisms will have the potential to direct research initiatives in drought tolerant crop varieties and soil and water conservation measures which were successful under this project. From a practical on-the-ground standpoint, the lessons captured through the centralization of knowledge management will be relayed to agro-pastoralists by updating the technical guides prepared by ADDS throughout the project.

157. The main mechanisms and tools to capture and disseminate the knowledge and experience from the project components will be based on the UNDP well-established knowledge management approaches and strategies. This will include a series of activities such as the organization of regular technical and training meetings with farmers' groups, agricultural technicians, professional contractors and representatives of CBOs and NGOs. This will be supported by the delivery of a series of KM products including technical guidance notes and lessons learned papers on climate risks management, water adaptation schemes, adaptation planning etc., and key features and processes supported by the initiative. This will be linked to the organization of stakeholder round tables as part of regular participatory monitoring and evaluation exercises intended to document the main project achievements and to further adjustments and replication. An additional dedicated website will be set up as a virtual knowledge platform to reach out to a wider public.

The Adaptation Learning Mechanism <http://www.adaptationlearning.net> and other relevant networks such as <http://www.weadapt.org> will also be used for knowledge dissemination and experience sharing. Finally, a number of high-level policy events and dialogues will be organized, under the National Commission for Sustainable Development to feed the project outcomes back to the policy level and inform current and future national policy-making processes in the areas of rural development, poverty and food security.

Consultative process, including the list of stakeholders consulted, undertaken during project preparation.

158. The overall consultative process has started years ago with the NAPA process. Various initiatives have enriched initial proposals for adaptation among stakeholders and the proposed strategy for agro-pastoral development based on the development of date palm-based shade gardens has emerged as the most adapted cost-efficient strategy for the project region. During project preparation, the stakeholders including local and governmental representatives, listed in Annex B have fully contributed to the technical/institutional/strategy choices made in developing the AF project.

159. In addition, the project's main components have been discussed at the highest administration levels and specific orientations have been given at these occasions. Other projects/other donors have also been consulted in order to collect information regarding their own activities and their opinions regarding the AF project components: AFD/FFEM, European Union, PROMES-GDT project team, and UNDP. Two field visits have also been used to assess project potential and feasibility in the selected locations.

160. During the first field visit, local pastoral communities were consulted through community workshops and several meetings with representatives of local municipalities, NGOs and CBOs were held. Discussions with communities took place and their problems and difficulties were mapped and recorded. The sense of urgency to move from vulnerable nomadism to semi-sedentary agro-pastoral systems is widely shared by the most vulnerable pastoral groups of the Bara region. These people are already exiting from pastoralism, and they perceive agro-pastoralism as a much more sustainable and decent alternative than migration to the capital or working in non-agricultural sectors such as quarrying. Also, the positive outcomes generated by date palm cultivation in other areas of Djibouti make the proposed oasis-based shade-garden very appealing for the targeted communities, despite the fact that they will have to acquire the necessary skill sets and knowledge to practice farming. Therefore, local interest and buy-in is high for engaging into small-scale integrated livestock and farming agriculture production systems. Furthermore, similar activities supporting the shift from pastoralism to agro-pastoralism have been already implemented in Djibouti. Expertise on how to fill the capacity gaps of pastoralists for them to successfully engage into agriculture and how to ensure a smooth and fruitful livelihood transition already exists within the Ministries of Environment, Agriculture and Water and Energy and their respective technical services.

161. During the second field visit in November and December 2011, existing communities which are the potential beneficiaries were interviewed as well as the populations which have been involved with related pilot projects. Current agro-pastoralists confirmed that 0.5 ha is not sufficient for both cultivation and raising zero-grazing livestock such as cattle. For cultivation, 0.5 ha is sufficient and can guarantee enough revenue per year if water is provided. Female agro-pastoralists recommended the development of MF and cooperatives for women so that they can be trained with effective cultivation techniques and raise revenue for fencing materials and to repair existing water works. In Omar Jagac, a potential project beneficiary site with 250 families, the population is very motivated to become agro-pastoralists since they have lost most of their livestock. Current water supply is insufficient and they hope the nearby earth dam can be rehabilitated. Discussion with the village chief and community members indicated that they have a system to nominate the chosen agro-pastoralists; those most in need or those with existing water infrastructure maintenance capacity will be given priority. Already one civil association exists in Omar Jagac and they plan on creating more associations such as for maintenance. Similarly, in Gabla Kalan, this potential project site with 200 families is very motivated to become agro-pastoralists. They recommend that any new groundwater pumping systems use solar power because their diesel-powered borehole is not reliable and diesel fuel cost is very high.

162. Meetings with the Ministries demonstrated that they have drafts of action plans which complement this project in terms of surface water and groundwater mobilization and promoting agro-pastoralist diversified lifestyles until 2017. Current and future water abstractions in these watersheds were discussed with the Ministry of Water. Engineers within the Ministry of Water demonstrated their significant technical capacity for the design, construction, operation and maintenance of the water mobilization techniques proposed in this project. The national engineers have not only experience but new equipment to construct the water infrastructure. Most importantly, discussion of funding for these long-term action plans revealed that some funds are guaranteed so that scaling up for Components 1 and 2 of the project will transition naturally. Finally, the institutional arrangements were discussed with all the involved ministries.

163. A lengthy, detailed meeting was also held with the Director of Microfinance (MF) and an international MF consultant for ADDS who will be two of the responsible parties in developing the MF products. These meeting clarified the capacity of ADDS and CPEC, the workshops and training needed as well as their flexibility and willingness to create new MF products for the project beneficiaries. Details of this discussion are provided in the Component 3 discussion.

164. During more detailed project preparation, the targeted communities will be consulted further and closely involved in the identification and refinement of the project's activities and implementation strategy for all three project components. The preparatory phase will mobilize a set of community-based and participatory methodologies (such as the MARP or IUCN's CRISTAL approach) to ensure the concerns and voices of the local communities are properly heard and fed into the design of the full-fledged project proposal. To accomplish this, the project will make use of the traditional pastoral structures and governance system. The ISSA communities of the Bara area are organized into tribes and sub-tribes. In a case of conflict or for any major decision, an assembly of sub-tribes chiefs is convened to discuss and decide upon the issue. There are also strong traditional laws called XEER ISSA ("law of ISSAs") which regulate conflicts between local communities. Under this customary system, the chiefs of sub-tribes have strong legitimacy and are vested with large authority and decision-making power. Nonetheless, their decisions are based on a consultative process with their sub-tribes, particularly with the oldest people of their groups. In effect, there exists a functional and permanent local community structure that the project will utilize to organise the consultations with the beneficiaries, using both their traditional governance and decision-making systems along with more direct participatory discussions through appropriate community mobilization tools and events, notably to ensure that female empowerment is also well factored into the proposal approach. Indeed, ISSA women have important workloads and responsibilities in assuring household maintenance in the pastoral communities but generally they do not participate into the decision making process. The project will use adequate gender sensitive consultation methods (such as the UNDP Gender and Climate Change Guidebook) that will not antagonize the traditional pastoral perspective on the decision-making role of women yet at the same time will support women inclusion in all aspects of the project's development and implementation.

Annex 7 lists the main consultees that contributed to the formulation of this project.

Component 1: Sustainable access to secured water resources in the face of climate change

165. Baseline (without AF Resources): Knowledge of water resources has been globally improved and a set of solutions to growing needs has been defined, from expensive desalinization options to improved uses of rainwater and sustainable exploitations of groundwater resources. However, within the rural regions of Djibouti, the intensification of droughts and climate variability, associated with growing water needs and population pressures has resulted in the salinization of many water points, the drying up and silting of shallow wells, and the destruction of water points by erosion and floods. These adverse impacts have been accelerated by climate change and have resulted in a dramatically unsecured access to drinking and irrigation water for the rural poor. In the project area, rural populations must sometimes walk for 4 hours to get access to surface water collected by small earth dams. The time and energy spent walking to often poor quality water sources with insufficient capacity represents a considerable risk and generates a high vulnerability for rural populations. No agro-pastoral development can be envisaged without secured water resources. Furthermore, surrounding pastoralists have very limited adaptation choices due to the lack of

water for their livestock and personal use. Without an exit strategy for people to continue working with the land in the rural regions, a significant part of the population are now leaving their land for industrial jobs or jobs in the capital city where unemployment is 60 percent.

166. Additionality (with AF Resources): AF resources will permit to tackle vulnerability to water by (i) in-depth technical studies of the water resource potential in the target regions in the face of climate change and increasing water demand, (ii) investments into more advanced technologies of surface water collection (iii) investments into controlled groundwater extraction, combined with artificial recharge that offers integrated ground water management solutions that are more resilient to projected water stresses, and (iv) strong capacity development with long-term water resource management plans and associated real-time monitoring plans to track resource management dynamics and needs for adjustments in response to climate change impacts. Detailed guidelines for good practice in surface and ground water management for the communities in the context of sustainable use will also be produced. Moreover, capacity development within the Ministry of Water will enable them to gain expertise in sustainable water management practices and sustainable designs for surface water harvesting and artificial recharge.

Component 2: Shade gardens to support diversified and climate-resilient agro-pastoral production system

167. Baseline (without AF Resources): The country has invested in drought management within a number of donor funded projects in the past, but the approach was mainly dedicated to the multiplication of wells and drillings, which has certainly improved access to water in a first instance, but has also played a role in nomadic population settlement, resulting locally in increased pressure on the ecosystem and unsustainable water abstraction leading to the salinization of soil and water points. Today, most of the rural population still lives almost exclusively from animal breeding so that agriculture is very poorly developed, despite national efforts. In fact, previous rural development efforts have tended to focus either on animal husbandry or vegetable production only, and did not leverage the potential of agro-pastoral systems, based on agro-forestry and more integrated livestock/farming production, to diversify production, increase food security while releasing pressures on dwindling land and water resources. Baseline efforts have been further constrained by intensified climate change-driven heat and drought which is challenging agricultural development in general, including agro-pastoralism. New, innovative solutions therefore need to be introduced to adapt to these new arid conditions and to provide vulnerable rural populations alternate sources of revenue, increasing their resilience to climate change. Promoting the culture of date palm and using it as the cornerstone for the revitalization of climate-resilient oasis-type agro-pastoral systems is a critical strategy in this regard. However, there are important gaps to be addressed in Djibouti towards this solution: (i) plant species demonstrating a greater resilience to drought and salinity, and producing good value products, must be strongly promoted, (ii) agricultural systems must be adapted to more intense climate conditions, and there is a strong need for capacity building of agro-pastoralists, and (iii) tree plantation, being date palms, fruit trees or forest trees, need time to grow and generally do not respond to the most urgent needs. Well aware of those gaps, the government of Djibouti has, as a first step, started to create new capacities for the development of date palm tree with the successful launch of a date palm trees production laboratory in 2005. The country has now the capacity to produce young Djiboutian date palm trees and has developed internal expertise. However, currently there is very limited capacity to support the widespread development of agro-pastoral oasis gardens as proposed in this project.

168. Additionality (with AF Resources):, This project brings back the concept of integrated agro-pastoral development by introducing inter-related irrigated farming and livestock management as a cost-effective alternative to coping with increasing climate-induced drought and desertification. AF resources will be used to create local capacities to develop climate resilient agro-pastoral systems by rejuvenating and upgrading the traditional practice of oasis type shade garden that was imported centuries ago in Djibouti by Yemeni populations. The traditional memory of this model has now been lost as a result of gradual rural exodus and devitalization of areas where it was originally present. Therefore, the project will help build the necessary capacities to restore and expand this practice amongst drought vulnerable rural communities within Grand and Petit Bara who have never been involved in this type of agriculture. These capacities will enable the

development of multi-stage farming systems for growing forage, fruits, vegetables and other high value drought and salinity resistant varieties, such as henna and jojoba. The shade provided in such gardens improves moisture retention in the soil and creates multi-functional, micro agro-ecological systems with improved productivity and diverse benefits. This integrated agro-pastoral system is seen as a viable adaptation strategy for Djibouti, whereby animals can be raised without exacerbating pressures on degraded steppe ecosystems and more diversified agricultural and non-agricultural commodities can be produced through better control and productivity of soil and water resources, thus contributing to the reduction of risks from climate change across a broader portfolio of rural activities and livelihoods. The development of shade gardens is clearly additional as it stems directly from the climate change induced intensification of droughts and aridity across the project areas that render pastoral livelihoods no longer possible or viable for most vulnerable herders and breeders. Under baseline climate conditions, pastoral communities would not require the development of agro-pastoral shade gardens, but rather conventional interventions to improve their living conditions and resource base through targeted investments into pastoral development and integrated natural resources management, such as what the PROMES-GDT project is already doing. Without climate change, expansion of the shade-gardening practice within the Grand and Petit Bara regions would not be justified, which is the reason why these systems have remained so far quite limited and nascent locally and across the rural areas of the country. Now that the manifestations and evidence of climate change risks have gained depth and pace, there is a strong sense of urgency to make a paradigm shift and to offer the most fragile pastoral populations a sustainable and cost-effective “exit strategy” that could help them build new assets and make the transition towards more resilient agricultural livelihoods and sources of income. While this transition process is of strategic importance for Djibouti, it is also a very painful process that cannot happen through autonomous adaptation only and that needs to be actively planned and supported by all forms of assistance (analytical, technical and financial).

Component 3: Access to secured finance for climate resilient agro-pastoral enterprise development

169. Baseline (without AF Resources): Existing MF in Djibouti is geared towards the economically-active poor, i.e., those that have some resources. In the case of the project beneficiaries, they have limited, if any resources and cannot take out loans with banks or MFIs because they do not have the collateral to secure them. Joining cooperatives for the poorest households is also often not an option due to membership contributions they cannot afford and credit conditions they cannot fulfil.¹⁸ Furthermore, being semi-nomads and poorly organised, they do not present a sufficiently reliable profile for microfinance institutions. In addition, no existing MF products are geared towards the irregular repayment schedules of newly formed agro-pastoralists in that they must consider starting with little to no assets followed by seasonal agricultural harvests. The current risk of not having an appropriate MF product for adapting to climate change makes the people more vulnerable; if loans are used for risk reduction in the short-term such as with building repairs or in buying environmentally-toxic fertilizers, servicing these loans or debts may increase longer-term risks by encouraging individuals to inadvertently deplete livelihood assets or to use the loans for practices which do not enable them to be risk-averse in the long-term.

170. Additionality (with AF Resources): AF resources will enable the project (i) to structure involved agro-pastoralists into well established cooperatives and/or associations, with a physical location (concretely represented by the shade gardens) in Petit Bara and Grand Bara; (ii) to foster community responses to climate change impacts and subsequently launch and support adaptation initiatives through income-generating activities; (iii) to closely work with the microfinance institutions in place in order to define a loan offer adapted to agro-pastoralists needs; and (iv) to train and follow-up involved populations so that they learn how to use microfinance and what it can bring to them (particularly easily with the technical guides to be developed). This micro-financing strategy for adaptation is deemed fully additional as it goes over and beyond the current baseline-as-usual micro-credit practices of MFIs in Djibouti that do not pay sufficient attention to the risks posed by emerging and long term climate change on their loan portfolios and how their own support activities could even increase rural dwellers’ vulnerability.

18 Naess, L.O., and M. Sullivan and J. Khinmaung and P. Crahay and A. Otzelberger. *Changing climates, Changing lives, Adaptation Strategies of Pastoral and Agro-pastoral communities in Ethiopia and Mali*, ACF International May 2010

171. A key barrier for adaptation of climate change threatened pastoral groups resides in their difficulties to access the financial means required to move from no longer viable pastoralism towards more diversified and robust shade-garden based activities that would help them better spread and withstand the risks associated with more chronic arid conditions. This project addresses this barrier by using AF funds to properly develop microfinance products which have been proven to reduce the vulnerability of the poor to climate change by diversifying their assets and capabilities in a sustainable manner.¹⁹ For this project, ADDS, has experience developing MF products for agriculture (Annex D), organizing cooperatives, developing flexible and small loans, and creating women's groups. The core additionality of MF for this project comes from using AF funds to develop new MF products which are ear-marked for adaptation to climate change specifically for the type of pastoralist/agro-pastoralist who will benefit from this project. The novelty in this approach is supported by the fact that ADDS has the capacity, will and initiative to develop a three-tiered MF product which provides a progressive means for the beneficiaries to build supportive cooperative structures and gradually gain a diversified asset base which will increase their resilience to climate change impacts.

172. The product will consist of first organizing the beneficiaries in safety net cooperatives so that they can easily access small loans based on the Myrada concept.²⁰ Subsequently, with repayment experience, small cooperatives, particularly for women, will have the ability to access nanofinance for specific diversified tasks with additional training. The final tier will be MF loans which can be obtained once the beneficiaries have an asset base. The concept of the product to be created is therefore to provide credit to the poorest of the poor so that they can develop their asset base over time and increase their financial literacy to eventually access classic microfinance products. Most importantly, in terms of adaptation, conditions will be placed on the loans so that they can be secured for solely activities which enable the beneficiaries to build resilience to climate change impacts such as buying salt and drought tolerant seeds or purchasing productive cows (the latter limits the number of livestock and the risks of overgrazing). In terms of AF funds, a large portion will support initial training and workshop programmes to build capacity within ADDS which will enable them to subsequently train the project beneficiaries on repayment and savings principles as well as non-financial issues such as sustainable farming practices. Through this project, ADDS will also have the financial means to find experts which can train the cooperatives with skills such as the value chain of milk products. Furthermore, the funds for ADDS will empower them to try, mobile banking, a relatively new MF concept which makes the branch offices mobile to bring financial services directly to the rural population who have no means of transportation and are spread throughout the project region. This idea has worked in other developing countries and remains one of the most promising methods to reduce the costs of rural banking.²¹

173. It should be stressed that the MF products will be transferable to other rural community members who do not have an asset base. For example, through MF services, pastoralists will be given the opportunity to develop milk products sustainably. Training of ADDS will enable them to offer products to the rural community in general and provide the same workshops. The technical guides to be developed to assist ADDS in teaching clients microfinance principals and sustainable agro-pastoral practices will be able to be distributed to rural populations throughout Djibouti.

174. The sustainability of the MF concept with the development of properly developed products for rural populations in poverty is ensured with not only building capacity with training but also with the MFI's will to create a literate, healthy client base that is able to manage financial assets and identify and pursue new livelihood opportunities. Such an approach poses fewer risks to MFIs and at the same time helps households reduce their own exposure to risks associated with climate change. Furthermore, the replication of the MF products into other agro-pastoral projects is ensured by the use of AF funds to integrate community-driven

19 Hammill, A. and R. Matthew and E. McCarter, *Microfinance and Climate Change Adaptation*, IDS Bulletin, Vol. 39, No. 4 Sep. 2008

20 Fernandez, A. *Myrada's Organisational Values (In the Context of PAPRO)*, Bangalore, India, November 1997.

21 Meyer, R.L. *Subsidies as an Instrument in Agriculture Finance: A Review*, Joint Discussion Paper, The World Bank, BMZ, FAO, GIZ, IFAD and UNCDF, June 2011.

adaptation plans into the National Programme for Food Security and the National MF Policy. The adaptation plans will detail the necessary measures to facilitate the use of MF products for adaptation-oriented shade gardening practices from the perspective of the agro-pastoralists. Bi-annual workshops with agro-pastoral cooperatives will document the community's priorities for establishing climate-resilient lifestyles (e.g., loan conditions, training material, etc.) at progressive stages of the project's development so recommendations can be incorporated into the plans to benefit future agro-pastoral projects.

175. The MF products to be developed will not include micro-insurance schemes at the moment because there is no capacity or sufficient scale for the schemes to be created cost-effectively within Djibouti. In northern Africa alone, no micro-insurance programmes exist for this reason. High barriers to entry in this market include upfront research and development costs, too few weather stations and initial problems in getting access to international reinsurance. Therefore, in order for micro-insurance schemes to develop within Djibouti, investments must be made in meteorological stations and basic data collection and analysis in order to create the conditions and infrastructure for robust insurance markets.²² Furthermore, micro-insurance is a viable climate risk transfer or management solution in countries and regions that are characterised by high inter and intra annual climate variability. Such conditions occur when extreme years are more common than average and the coefficient of rainfall variability is high. The coefficient of rainfall variability (CV, or the percentage deviation from the norm), measures the uncertainty of rainfall: the higher the CV percentage the more uncertain the rainfall. In such a case weather index-based insurance is a viable solution. However, this is not the case in Djibouti where an overall trend of aridification and decreasing rainfall is a predominant trend rather than high variability.

III Implementation and Management Arrangements

Institutional Context:

176. The Department of Land Management and Environment is the key institution on issues of climate change and the environment in Djibouti. This institution is a department of the Ministry of Habitat, Environment and Urbanism (MHEU). This department co-ordinates all climate-related issues in the country, and works in collaboration with various NGOs and other Government departments. A National steering committee for climate change had been established for the elaboration of Djibouti national communication under UNFCCC and within the NAPA.

177. The Ministry of Environment (MHEU) has a transversal mission in collaborating with and coordinating the work directed by the Ministry of Water, Energy and Natural Resources (MWENR) for project Component 1, the Ministry of Agriculture, Livestock and Fisheries (MALF) for project Component 2, and the State Secretariat for National solidarity (ADDS) for project Component 3. The MWENR and MALF will work with the Centre of Studies and Research of Djibouti (Centre d'étude et de recherche de Djibouti – CERD) to conduct initial scientific studies.

Institutional Arrangements:

178. As a direct request by the Government of Djibouti, the project will be implemented through the United Nations Development Programme (UNDP), in its capacity of accredited MIE to the AF. The project will be implemented in close coordination and collaboration with all relevant government institutions, local communities and NGOs, as well as other related projects in the region. UNDP-CO will support project implementation by, contracting project personnel, experts and subcontractors, undertaking procurement, and providing other assistance upon request of the National Executing Agency. UNDP-CO will also monitor the project's implementation and achievement of the outcomes and outputs and ensure the proper use of

²² Meyer, R.L. *Subsidies as an Instrument in Agriculture Finance: A Review*, Joint Discussion Paper, The World Bank, BMZ, FAO, GIZ, IFAD and UNCDF, June 2011.

Adaptation Fund resources. Financial transactions, reporting and annual auditing will be carried out in compliance with UNDP regulations for national project execution modality.

179. National Execution enables the project to exercise greater national ownership whereby, UNDP will only provide technical backstopping, quality assurance and compliance with fiduciary standards in its capacity of MIE.

180. The **Executing Agency** will be the Ministry of Habitat, Environment and Urbanism (MHEU). The Executing Agency/Implementing Partner will appoint a National Project Director from within its Ministry and choose a National Project Manager through a transparent, public tender process. A summary of the roles and responsibilities of the National Project Director is provided below.

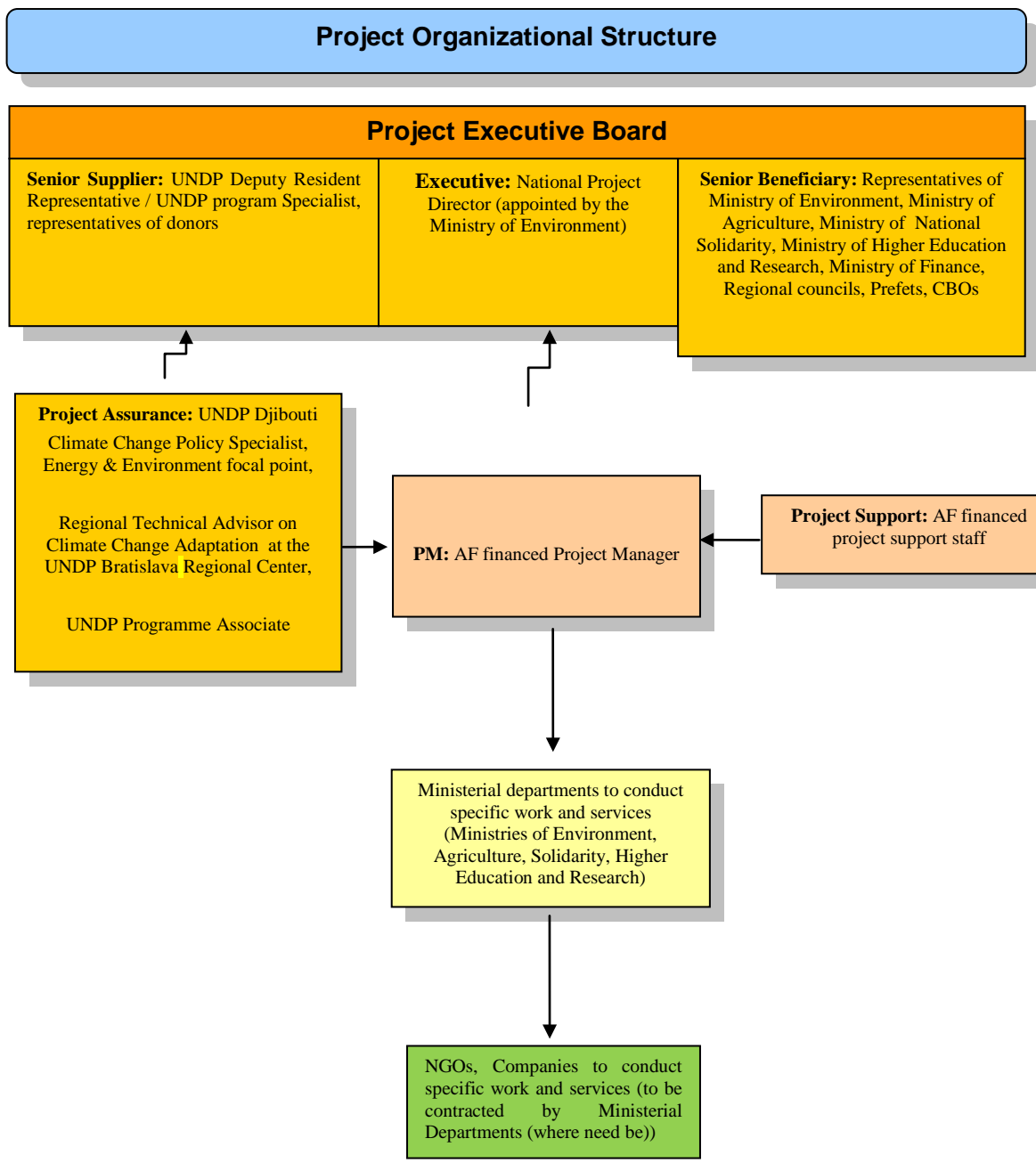
181. **Project Board:** The Project Board will be responsible for steering the activities of the Project Management Unit (PMU). Chairing the project board will be the Ministry of Habitat, Environment and Urbanism (MHEU). Project Board members will include the Ministry of Finance (MoF), the MWENR, the MALF, ADDS, CERD, Prefect representatives from the two concerned regions (Arta and Ali Sabieh), Arta and Ali Sabieh Regional Council Representatives and a UNDP CO representative. Additional members, or occasionally invited members, will be decided during the project inception phase. The Project board will be responsible for ensuring overall political guidance of the project and delivery of its outputs and outcomes.

182. The **National Project Director** will be a high-level government official primarily responsible for overall implementation of the Project. This responsibility includes representing and supporting project objectives at high decision making levels within the Government of Djibouti. The National Project Director also takes the primary responsibility for ensuring that the required government support to reach the milestones of the Project is available.

183. **The Project Manager** will be a local management expert who will assume overall responsibility for the successful implementation of project activities and the achievement of planned project outputs. S/he will work closely with the national and international experts hired under the project, as well as the Project Assistant, and will report to the National Project Director and to the UNDP Country Office. The Administrative and Financial Assistant will provide assistance to the Project Manager in the implementation of day-to-day project activities. S/he is responsible for all administrative (contractual, organizational and logistical) and accounting (disbursements, record-keeping, cash management) matters related to the project.

184. **Management Unit (PMU):** The day-to-day implementation and management of the project will be undertaken by the Project Management Unit, under the overall guidance of the Project Board. During project design, consulted parties have expressed their willingness to limit the costs of personnel under AF resources as much as possible, concentrating AF resources on concrete investments and actions. The PMU will therefore be limited in size, and mostly organise its activities in close coordination with the executing organizations. Furthermore, the PMU team will also include an administrative/financial assistant and two technical professionals: an experienced agricultural expert and a water resources expert transferred and supported financially by the MALF and the MWENR respectively. The team will also be reinforced by two UN volunteers contracted by UNDP-CO (one agro-pastoral/oasis systems expert, and one water resource management expert). The role of the PMU will be to: a) ensure overall project implementation, management and monitoring, b) facilitate communication and networking among key stakeholders, c) organize the meetings of the Project Board, and d) communicate regularly with the local representatives from Grand and Petit Bara. The project will hire short-term national and international experts for specific project assignments. Project activities to be implemented by the private sector will be contracted out on a competitive basis through public procurement. The PMU must coordinate all public meetings and correspondences with the local representatives from Petit and Grand Bara.

185. **Local representatives from Petit and Grand Bara** will be responsible for meeting with the PMU and coordinating all communications and concerns with the Project Management Unit. They also must convey decisions to their respective communities.



IV. MONITORING FRAMEWORK AND EVALUATION

186. Programme monitoring and evaluation (M&E) will be in accordance with established UNDP procedures and will be carried out by the PMU and the UNDP Country Office. The Results Framework noted in Section D below defines the performance indicators for programme implementation at the output level. The means of verification for each of these indicators will involve independent examination of the policies, guidelines, regulations, training materials, technical project interventions, and knowledge management outputs that the project will produce. A Monitoring and Evaluation system for the programme will be established based on these indicators and the means of verification noted below, and will be the ultimate responsibility of UNDP.

Programme Start:

187. A Programme Initiation Workshop will be held within the first 2 months of programme start with those who have relevant roles as defined in the institutional arrangement, the UNDP country office (UNDP CO),

stakeholders and where appropriate/feasible, with regional technical policy and programme advisors. The Initiation Workshop is crucial to building ownership for the programme results and to plan the first annual work plan.

188. The Initiation Workshop should address a number of key issues including:

- a) Assist all partners to fully understand and take ownership of the programme;
- b) Detail the roles, support services and complementary responsibilities of UNDP CO and PMU staff vis à vis the programme team;
- c) Discuss the roles, functions, and responsibilities within the programme's decision-making structures, including reporting and communication lines and conflict resolution mechanisms. The Terms of Reference for programme staff will be discussed again as needed;
- d) Based on the programme results framework, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification and recheck assumptions and risks;
- e) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled;
- f) Discuss financial reporting procedures and obligations. Audits on the project will follow UNDP finance regulations and rules and applicable audit policies;
- g) Plan and schedule Project Board meetings. Roles and responsibilities of all programme organization structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following inception workshop.

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

Quarterly

- Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high.
- Based on the information recorded in ATLAS, a Programme Progress Report (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned, etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually

190. Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since the project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines abides by UNDP reporting requirements.

191. The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward programme outputs and outcomes – each with indicators, baseline data and end-of-programme targets (cumulative);
- Programme outputs delivered per programme outcome (annual);
- Lessons learned/good practice;
- AWP and other expenditure reports;
- Risk and adaptive management
- ATLAS QPR

Periodic Monitoring through Site Visits

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

Mid-term of programme cycle

193. The programme will undergo an independent Mid-Term Evaluation at the mid-point of programme implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of programme implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about programme design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the programme's term. The organization, Terms of Reference and timing of the mid-term evaluation will be decided after consultation between the parties to the programme document. The Terms of Reference for this Mid-term Evaluation will be prepared by the UNDP CO. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC).

End of programme

194. An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP guidance. The final evaluation will focus on the delivery of the programme's results as initially planned (and as corrected after the Mid-Term Evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

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

Learning and Knowledge Sharing

196. Results from the programme will be disseminated within and beyond the programme intervention zone through existing information sharing networks and forums. The programme will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to programme implementation through lessons learned. The programme will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future programmes. Finally, there will be a two-way flow of information between this programme and other projects of a similar focus. See Section G for additional information on knowledge management.

Table 5 M&E workplan and budget

Type of M&E activity	Responsible Parties	Budget USD	Time frame
Inception Workshop and Report	PMU and UNDP CO	3,000	Within first two months of project start up
Measurement of	PMU and UNDP CO	tbd	Start, mid- and end of

Means of Verification of programme results		To be finalized in Inception Phase and Workshop	programme (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Programme Progress Reports on output and implementation	PMU and UNDP CO	tbd To be determined as part of the Annual Work Plan preparation	Annually prior to ARR/PIR and input to the annual work plans
ARR/PIR	PMU, UNDP CO	None	Annually
Periodic status / progress reports	PMU	None	Quarterly
Mid-term evaluation	PMU, UNDP CO and external consultants	25,000	At the mid-point of project Implementation.
Final evaluation	PMU, UNDP CO and external consultants	30,000	At least three months before the end of the project
Programme Terminal Report	PMU, UNDP CO, local consultant	2,500	At least three months before the end of the project
Audits	PMU, UNDP CO	15,000 (3,000 per year)	Yearly
Field Visits	UNDP CO, Government representatives	Minimal	Yearly
TOTAL Indicative Cost (Excluding PMU staff time and UNDP staff and travel expenses)		USD 75,500 (+/- 2% of total budget)	

Note: The above costs relate to expenditures that need to be incurred by the project for monitoring and reporting on project deliverables. UNDP related costs are not included in the above. Such costs are covered by the fee to UNDP as a MIE for this project.

V PROJECT RESULTS AND RESOURCES FRAMEWORK

Objective: To diversify and promote climate resilient agro-pastoral practices in rural Djibouti			
Outcomes and Indicators	Targets and Milestones	Sources of Verification	Outputs and Indicators
<p>Outcome 1: Capacities to mobilize and secure sustainable water resources to agro-pastoral communities developed in the face of climate change</p> <p>Indicator 1.1: Number of planned boreholes, dams and water storage basins with associated solar pumping equipment in place and operational;</p> <p>Indicator 1.2: Water resources secured for shade garden irrigation to</p>	<p>Completion of EIA and pedological, hydrological, and hydro-geological studies after first 6 months of project;</p> <p>All community members have been trained in good water practice guidelines within the first 3 months of water infrastructure development;</p> <p>At least one water management committee is created in each shade garden zone (6 total) after first year;</p> <p>228 ha and at least 30,000 people are</p>	<p>Comprehensive review by PMU after 1 month of implementation;</p> <p>O&M manuals prepared by Month 6;</p> <p>Quarterly maintenance checks for boreholes and pumping systems;</p> <p>Annual reservoir seepage tests by PMU;</p> <p>Quarterly water quality tests;</p> <p>Training evaluation by</p>	<p>Output 1.1. Rainfall-runoff and groundwater models developed and institutionalized within the Study and Research Center of Djibouti (Centre d'Etudes et de la Recherche de Djibouti, CERD) and the Water Department of the Ministry of Agriculture to project likely climate change impacts on the water availability in the areas of Petit Bara and Grand Bara;</p> <p>Indicator 1.1.1: Approved detailed EIA and submission of hydrological, hydro-geological reports indicating expected current and future water demand scenarios for appropriate locations;</p> <p>Output 1.2: Based on model outputs, controlled groundwater extraction, artificial recharge and climate “smart” management plans that take into account seasonal changes in precipitation as well as long term mean amounts, projections, developed, and benefiting 30,000 people;</p> <p>Indicator 1.2.1: Percentage of total hectares of agro-pastoralist's land which is irrigated by boreholes;</p> <p>Indicator 1.2.2: Amount of time spent in search of water from boreholes;</p>

<p>cover 228 ha and serve 30,000 people;</p>	<p>served with secure water infrastructure;</p>	<p>PMU every 3 months;</p> <p>Annual survey;</p> <p>Project terminal evaluation.</p>	<p>Output 1.3: Community-based surface water harvesting infrastructures, such as earth dams, percolation basins and subsurface dams which increase surface supply and groundwater tables in support of shade-garden pilot schemes (see 2.1) introduced and related local management rules and structures established;</p> <p>Indicator 1.3.1: Percentage of total hectares of agro-pastoralist's land which is irrigated by surface water sources;</p> <p>Indicator 1.3.2: Amount of time spent in search of water from surface water sources;</p> <p>Output 1.4: Good practice guidelines based on knowledge sharing for integrated groundwater and surface water maintenance and use developed through stakeholder-led and participatory processes including community water management teams, government water regulators, Ministry's technical staff, and agriculture extension services;</p> <p>Indicator 1.4.1: Number of maintenance efforts on water systems and percentage of successful local maintenance efforts;</p> <p>Indicator 1.4.2: Management plans and good practice guidelines emphasized and enforced by the water infrastructure management committee;</p>
<p>Outcome 2: Climate resilient agro-pastoral systems developed, providing greater</p>	<p>Technical staff of the Ministry of Agriculture and lead farmers from agro-pastoral zones have</p>	<p>Daily surveys of agro-pastoral plots by technical specialists;</p>	<p>Output 2.1: Six sets of 38 pilot community-managed agro-pastoral shade garden plots (1 ha per family) established that includes date palms, multi-purpose fence trees, local and regional varieties of climate resilient forage, vegetables and fruits (henna, dates, jujube, and mango, etc) benefiting 228 agro-pastoral families - approximately 2,800 people;</p>

<p>forage production capacities, diversifying agricultural productions and creating capacities for replication</p> <p>Indicator 2.1: Number of shade gardens developed including irrigation reservoirs, distribution networks, and fencing;</p> <p>Indicator 2.2: % of population who has developed shade gardens resilient to climate change impacts by demonstrating a) the cultivation of diversified, drought resistant grasses/trees, b) crop rotation techniques and c) water efficient irrigation practices.</p>	<p>been trained in drought tolerant agriculture by the end of the 2nd year of the project;</p> <p>228 shade garden owners have been trained in good agro-pastoral practices within the first 3 months of shade garden development;</p> <p>114 hectares of salt and drought-resistant forage established after 6 months of shade garden development;</p> <p>At least one women's tree seedling nursery has been created in each shade garden zone (6 total) by the end of the second year;</p> <p>114 hectares of productive fruit/vegetable plants and trees after 2 yrs.</p>	<p>Monthly reports to PMU by agricultural technical specialists;</p> <p>Quarterly surveys by PMU;</p> <p>Project terminal evaluation.</p>	<p>Indicator 2.1.1: Number of pastoralists engaged in shade gardening, agro-pastoral production;</p> <p>Indicator 2.1.2: Percentage of families who can produce fodder, fruit and vegetables to satisfy their needs with extra to sell in the market;</p> <p>Output 2.2: Improved extension service for shade gardening benefiting 228 agro-pastoral families - approximately 2,800 people (targeted training for extension service personnel and agro-pastoralists designed and delivered on the issues grazing, forage management, cultivation techniques, crop protection, water efficiency, composting methods, etc, in the context of increasing climate change pressures);</p> <p>Indicator 2.2.1: Number of project beneficiaries disaggregated according to gender that have been trained on cultivation techniques, crop rotation, livestock hygiene, etc by specialists;</p> <p>Indicator 2.2.2: Percentage change in beneficiaries' capacities to cultivate their own land and raise livestock autonomously;</p> <p>Output 2.3. Well-sized feed/forage stocking facilities created in both project locations to allow better management of forage availability over repeated drought periods;</p> <p>Indicator 2.3.1: Number of constructed storage facilities per agro-pastoral zone;</p> <p>Indicator 2.3.2: Percentage of project beneficiaries that utilize storage facilities;</p>
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<p>Outcome 3: Micro-credit products developed to facilitate and promote diversified and climate resilient agro-pastoral production systems</p> <p>Indicator 3.1 Number of MF products deployed to agro-pastoralists and pastoralists which provide loans ear-marked for adaptation to climate-change;</p> <p>Indicator 3.2: % of total population using micro-credit products conditioned on establishing shade-gardens and related agro-pastoral activities to enhance their resilience to climate change.</p> <p>Indicator 3.3: Community-driven adaptation plans are</p>	<p>228 agro-pastoralists in cooperatives have received financial education and training on micro-credit principals by ADDS 6 months after shade garden development;</p> <p>At least 300 agro-pastoralists and potentially 300 pastoralists organized in 6 cooperatives using MF products by the end of the project.</p> <p>At least 3 women cooperatives formed by the end of the project;</p> <p>At least 1 mobile banking service provided at the end of the 3rd year of the project.</p> <p>At least 4 established agro-pastoral cooperatives are formed by the end of the 3rd year to develop comprehensive</p>	<p>Quarterly reviews by ADDS;</p> <p>Quarterly surveys by PMU;</p> <p>Yearly reviews (for the last 3 years of the project) on the effectiveness of MF for adaptation by an independent, international specialist</p> <p>Project terminal evaluation.</p>	<p>Output 3.1: A three-tiered adaptation-oriented micro-finance scheme that supports climate-resilient shade gardening practices in the Grand and Petit Bara plains developed through partnership with the Djiboutian Agency for Social Development (Agence Djiboutienne de Developpement Sociale, ADDS) which generates a total value of US\$ 300,000 throughout the project ;</p> <p>Indicator 3.1.1: Percentage of beneficiaries trained in micro-credit principles;</p> <p>Indicator 3.1.2: Number of technical guides prepared detailing how MF can be used for adaptation-oriented activities;</p> <p>Output 3.2: At least 300 agro-pastoralists have been organised to form agro-pastoral cooperatives (including women cooperatives) to facilitate training on climate-resilient agro-pastoral practices and to support the development of financial literacy and the diversification of agricultural activities;</p> <p>Indicator 3.2.1: Number of loans and percentage of payback on loans;</p> <p>Indicator 3.2.2: Percentage of population in each tier of 3-tiered microfinance programme (safety net, nano- and microfinance)</p> <p>Output 3.3: At least 4 established agro-pastoral cooperatives develop comprehensive climate adaptation plans incorporating lessons learned on best practices for shade gardens to be integrated into the National Programme for Food Security and the National Microfinance Policy in order to facilitate the replication of shade-garden-based adaptation solutions.</p>

<p>integrated into the National Programme for Food Security and the National MF Policy</p>	<p>climate adaptation plans</p> <p>6 bi-annual workshops have been conducted to facilitate the collection and documentation of ideas to promote sustainable MF products at each stage of the shade garden development process</p>		<p>Indicator 3.3.1: Percentage of population which has been organized into adaptation plan cooperatives</p> <p>Indicator 3.3.2: Attendance and participation at bi-annual workshops used to document community recommended measures to improve the adaptation-oriented MF products</p>
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I. LEGAL CONTEXT

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

- a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- b) assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document".

ANNEXES

Annex 1: UNDP Environmental Finance – Specialized Technical

Annex 2: Stakeholder list

Annex 3: Detailed breakdown of the budget for the project

Annex 4: Risk Log

Annex 1: UNDP Environmental Finance – Specialized Technical Services

The implementing entity fee will be utilized by UNDP to cover its indirect costs in the provision of general management support and specialized technical support services. The table below provides an indicative breakdown of the estimated costs of providing these services. If the national entity carrying out the project requests additional Implementation Support Services (ISS), an additional fee will apply in accordance with UNDP fee policy regarding ISS and would be charged directly to the project budget.

Category	Indicative Services[1] Provided by UNDP	Estimated Cost (USD) of Providing Services[2]
Identification, Sourcing and Screening of Ideas	<p>Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF).</p> <p>Engage in upstream policy dialogue related to a potential application to the AF.</p> <p>Verify soundness and potential eligibility of identified idea for AF.</p>	18 248
Feasibility Assessment / Due Diligence Review	<p>Provide up-front guidance on converting general idea into a feasible project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme.</p> <p>Verify technical reports and project conceptualization.</p> <p>Provide detailed screening against technical, financial, social and risk criteria and provide statement of likely eligibility against AF requirements.</p> <p>Determination of execution modality and local capacity assessment of the national executing entity.</p> <p>Assist in identifying technical partners.</p> <p>Validate partner technical abilities.</p> <p>Obtain clearances from AF.</p>	54 743
Development & Preparation	<p>Provide technical support, backstopping and troubleshooting to convert the idea into a technically feasible and operationally viable project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme needs.</p> <p>Verify technical reports and project conceptualization.</p> <p>Verify technical soundness, quality of preparation, and match with AF expectations.</p> <p>Negotiate and obtain clearances by AF.</p> <p>Respond to information requests, arrange revisions etc.</p>	72 991

Implementation	<p>Technical support in preparing TORs and verifying expertise for technical positions.</p> <p>Provide technical and operational guidance project teams.</p> <p>Verification of technical validity / match with AF expectations of inception report.</p> <p>Provide technical information as needed to facilitate implementation of the project activities.</p> <p>Provide advisory services as required.</p> <p>Provide technical support, participation as necessary during project activities.</p> <p>Provide troubleshooting support if needed.</p> <p>Provide support and oversight missions as necessary.</p> <p>Provide technical monitoring, progress monitoring, validation and quality assurance throughout.</p> <p>Allocate and monitor Annual Spending Limits based on agreed work plans.</p> <p>Receipt, allocation and reporting to the AFB of financial resources.</p> <p>Oversight and monitoring of AF funds.</p> <p>Return unspent funds to AF.</p>	164 230
Evaluation and Reporting	<p>Provide technical support in preparing TOR and verify expertise for technical positions involving evaluation and reporting.</p> <p>Participate in briefing / debriefing.</p> <p>Verify technical validity / match with AF expectations of all evaluation and other reports</p> <p>Undertake technical analysis, validate results, and compile lessons.</p> <p>Disseminate technical findings</p>	54 743
Total		364 956

[\[1\] This is an indicative list only. Actual services provided may vary and may include additional services not listed here. The level and volume of services provided varies according to need.](#)

[\[2\] The breakdown of estimated costs is indicative only.](#)

[\[i\] This is the total fee for UNDP services provided as Implementing Entity. If the Implementing Partner \(the national entity carrying out the project\) requests additional Implementation Support Services \(ISS\), an additional fee will apply in accordance with UNDP fee policy regarding ISS. Whilst the total fee will be \\$229,500, the breakdown provided is an estimate only.](#)

Service standards:

1. initial response to communication within 2 working days

2. full response to communication (with the exception of a response requiring travel) within 10 working days

Annex 2: Stakeholder list

Person consulted	Institution	Position	Comments and Discussion Topics
Taher Ibrahim Issa	Djiboutian Breeders Professional Association	Agro-pastoralist	-Recommendations and costs for shade gardens and livestock
Dini Abdallah Omar	Ministry of Habitat, Environment and Urbanism	Secretary-general	-Institutional arrangement
Houssein Ahmed Rirach	Ministry of Habitat, Environment and Urbanism	Director of Environment	-Institutional arrangement
Souad Souleiman	Ministry of Water, Energy and Natural Resources	Director of Water department	- Current and future groundwater abstractions / recharges - Department capacity and management practices - Project alternatives - Available funds for scaling-up - adaptation of water resources to climate change
Aouled Djama Ahmed	Ministry of Water, Energy and Natural Resources	Head Engineer	- Design and costs of surface water mobilization projects with recommendations for sustainable infrastructure
Salah Daoud	Ministry of Water, Energy and Natural Resources	Engineer	- Plans for proposed surface water mobilization projects
Ahmed Hassan	Ministry of Water, Energy and Natural Resources	technician	- Costs of boreholes and associated equipment - Pipeline costs - Operation and maintenance costs
Idriss Abdou	Ministry of Agriculture, Livestock and Fisheries	Secretary general	- Institutional arrangements - Action plan for agro-pastoral plots - Importance of water mobilization in Grand and Petit Bara - Pedology in project regions - Alternatives to the project - Available funds for scaling-up - Environmental Impact Assessments
Person consulted	Institution	Position	Comments and Discussion Topics
Abdi Ali Robleh	Attar	Agro-pastoralist	- Revenue of garden is sufficient - 0.5 ha land area is not enough
Asli Adar	Nagad	Female garden owner	- Need more salt-resistant grains, MF and feed for cows - Cooperatives must be created for women
Mohamud Bahouch	Djiboutian-Moroccan agriculture partnership in Attar	Head agronomist	- Drip irrigation works well - fruits and vegetables which are more salt and drought tolerant - Study site shows production of gardens can be high and lucrative
Youssef Robleh	Ali-Fadheen	Agro-pastoralist	- With onions, melon and tomatoes, can

Miguil			make 3500 USD/yr - Agro-pastoral system is more sustainable than pastoral system alone
Loula Ismael	Ali-Fadheen	Female agro-pastoralist	- Interested in having MF loans to sustain shade garden and buy more fencing
Farhan Said Atteyeh	Omar Jagac	Community member	- Region with 250 families lacks sufficient water supply - People are motivated for agriculture since they have lost their livestock - To select future beneficiaries they would choose the families that have completely lost their livestock and are ready to work
Elmi Miguil	Omar Jagac	Village chief	- Agrees with rehabilitation of earth dam reservoir since this is their most important water source - Previous earth dam reservoir near Omar Jagac had too much leakage - Necessary to have robust water infrastructure designs
Ibrahim Omar Robleh	Omar Jagac	Community member	- One civil association exists which promotes community healthcare
Person consulted	Institution	Position	Comments and Discussion Topics
Ali Gouled	Kourtimaley	Community head	- Needs diesel to power pump for reservoir - Grows 30 kg of vegetables/grasses/fruits per season - Seepage and the wind effect are important, combined they result in decrease of water storage
Hassan Gouled	Kourtimaley	Community member	- Community needs better functioning boreholes next to wadi reservoir
Said Miguil	Gabla Kalan	Community member	- One borehole is not enough for 200 hundred families in the Wadi Gabla Qalan - Diesel fuel cost is too high so solar powered pumps are preferable
Hawa Bouh	Mouloud	Female farmer and in charge of milking goats	- An agriculture cooperative exists - Needs more grains and transport - Water is not sufficient since community has grown, can only pump for 12 hrs - Needs MF to repair water works
Adar Abdillah	Mouloud	Female farmer and in charge of milking goats	- Needs more fencing - Women sell milk products but there is more revenue in selling cattle
Amina Aden	Mouloud	Female farmer and in charge of milking goats	- Cultivation between June and September provides 300,000 FD/yr, 1700 USD/yr
Abdallah Houmed	Djiboutian Social Development Agency	Director of microfinance	- Current micro-credit and MF products and potential means to create new MF products

Mohamed	(ADDS)		for agro-pastoralists
Codjo Irénée	ADDS international consultant	MF product developer	-Necessary set-up for developing MF products for agro-pastoralists in terms of developing financial literacy
Zephirin Kapko	ADDS	Staff expert in microfinance	-Rural microfinance
Hawa Djama Idleh	Caisse Populaire d'Epargne et de Crédit (CPEC)	Director of CPEC	-Rural microfinance
Person consulted	Institution	Position	Comments and Discussion Topics
Kadar Ali Diraneh	Djiboutian Agency for Social Development (ADDS)	Director	-Rural microfinance -Institutional arrangement -Adaptation of rural population to climate change
Dr. Jalludin Mohamed	Centre for Studies and Research of Djibouti (CERD)	General Director	-In-depth hydro-geological and pedological studies are necessary for project water and agricultural needs -Costs and duration of studies were provided -Groundwater resources in Petit Bara and Grand Bara -Surface water mobilization in Grand and Petit Bara -Institutional arrangement -Adaptation of rural population to climate change
Ilyas Moussa Dawaleh	Minister of Finance	Minister	-Institutional arrangement -Government is fully committed to project -Adaptation of rural population to climate change
Mohamed Ahmed Awaleh	Ministry of Agriculture	Minister	-Institutional arrangement -Water and soil resources in the project region -Selection of the beneficiaries -Adaptation of rural population to climate change
Fouad Ahmed Ayeh	Ministry of Water	Minister	-Institutional arrangement -Water resources -Water regulation -Adaptation of rural population to climate change
Zahra Youssouf Kayad	Ministry of Solidarity	Minister	-Institutional arrangement -Rural microfinance -Adaptation of rural population to climate change

Annex 3: Detailed breakdown of the budget for the project

Award ID:	00066414
Project ID:	Project 00082602 (PIMS 4683)
Business unit	DJI10
Project title:	Developing agro-pastoral shade gardens
Implementing partner	Ministry on the Habitat, Environment and Urbanism, Djibouti

Project Outcome/Atlas Activity	Implementing agent	Donor name	Budget description	Total (USD)	yr1	yr2	yr3	yr4	yr5	Notes
					2012	2013	2014	2015	2016	
OUTCOME 1: Sustainable access to secured water resources in the face of climate change										
Activity 1.1.1 Initial pedological, hydrological and hydrogeological modeling study including an analysis of current water resource availability and demand and projections of climate change scenarios for water availability in Petit Bara and Grand Bara watersheds	MHEU	Adaption Fund	Operating Expenses	10'000	10'000					1
			National Experts	30'000	30'000					2
			Sub-contracts (including Materials & Equipment)	60'000	60'000					3
			Printing & Publication	3'000	3'000					4
			Sub-Total Activity 1.1.1	103'000	103'000					
Activity 1.1.2 Detailed Environmental Impact Assessment on the design of dams and the irrigation networks including water quality analyses in accordance with Djiboutian regulations			Stakeholder consultations	6'000	6'000					5
			Operating Expenses	2'000	2'000					6
			National Experts	12'000	12'000					7
			Printing & Publication	3'000	3'000					8
Sub-Total Activity 1.1.2			23'000	23'000						
Activity 1.1.3 Identification of suitable sites for retention basins, subsurface dams and boreholes based on group consensus amongst beneficiaries and Ministries			Stakeholder consultations	6'000	6'000					9
			Operating Expenses	2'000	2'000					10
			National Experts	5'000	5'000					11
			Sub-Total Activity 1.1.3	13'000	13'000					
Activity 1.2.1 Training for the technical staff of the Ministry of Water on surface water harvesting, artificial recharge and sustainable water resources management			International Expert	25'000	25'000					12
	Modeling software/IT equipment	22'000	22'000					13		
	Printing & Publication	3'000	3'000					14		
	Sub-Total Activity 1.4.3	50'000	50'000							
Activity 1.2.2 Design of artificial	International Expert	25'000	25'000					15		

recharge and generation of O&M manuals for solar-powered boreholes pumping systems
Activity 1.2.3 Construction of 6 extraction boreholes (4 Grand Bara, 2 Petit Bara) and rehabilitation of 1 borehole for injection
Activity 1.3.1 Design of earth dams, percolation and retention basins and subsurface dams with O&M manuals
Activity 1.3.2 Construction of 6 earth dams with either retention or percolation basins
Activity 1.3.3 Construction of 8 subsurface dams
Activity 1.3.4 Monitoring of dam infrastructure works to ensure robust construction and mitigation of any potential adverse social or environmental impacts
Activity 1.4.1 Creation and training of community-based water infrastructure management committees to development local cost-recovery mechanisms, management plans and good practice guidelines
Activity 1.4.2 Design of a water permit and tariff structure to be implemented into a national legal framework for water resource management to raise awareness of water efficiency and free resources for water infrastructure maintenance
Activity 1.4.3 Development of a standardized system for capturing lessons learned on community mobilization tactics, water management strategies and cost recovery mechanisms to be continually incorporated into good water practice

Operating Expenses	2'000	2'000					16
Sub-Total Activity 1.2.1	27'000	27'000					
Sub-contracts (including Materials & Equipment)	840'000	278'000	562'000				17
Operating Expenses	5'000	2'000	3'000				18
Sub-Total Activity 1.2.2	845'000	280'000	565'000				
International Expert	25'000	25'000					19
Operating Expenses	5'000	5'000					20
Sub-Total Activity 1.3.1	30'000	30'000					
Sub-contracts (including Materials & Equipment)	580'000	145'000	290'000	145'000			21
Operating Expenses	20'000	5'000	10'000	5'000			22
Sub-Total Activity 1.3.2	600'000	150'000	300'000	150'000			
Sub-contracts (including Materials & Equipment)	80'000	26'000	54'000				23
Operating Expenses	5'000	2'000	3'000				24
Sub-Total Activity 1.3.3	85'000	28'000	57'000				
Monitoring by Ministry representatives	21'000	5'000	11'000	5'000			25
Operating Expenses	7'000	2'000	3'000	2'000			26
Sub-Total Activity 1.3.4	28'000	7'000	14'000	7'000			
Training	20'000		5'000	5'000	5'000	5'000	27
Printing & Publication	4'000		1'000	1'000	1'000	1'000	28
Operating Expenses	8'000		2'000	2'000	2'000	2'000	29
National Experts	18'000		4'500	4'500	4'500	4'500	30
Sub-Total Activity 1.4.1	50'000		12'500	12'500	12'500	12'500	
International Expert	18'000				18'000		31
Operating Expenses	4'000				4'000		32
Printing & Publication	2'000				2'000		33
Sub-Total Activity 1.4.2	24'000				24'000		
Workshops	20'000		5'000	5'000	5'000	5'000	34
Printing & Publication	8'000		2'000	2'000	2'000	2'000	35
Operating Expenses	4'000		1'000	1'000	1'000	1'000	36
Sub-Total Activity 1.4.3	32'000		8'000	8'000	8'000	8'000	

guidelines												
			Sub Total Outcome 1	1'910'000	711'000	956'500	177'500	44'500	20'500			
OUTCOME 2: Shade gardens to support diversified and climate-resilient agro-pastoral production system												
Activity 2.1.1 Selection of agro-pastoral beneficiaries based on criteria through community meetings with project representatives	MHEU	Adaptation Fund	Stakeholder consultations	6'000		6'000				37		
			Operating Expenses	2'000		2'000					38	
			Sub-Total Activity 2.1.1	8'000		8'000						
Activity 2.1.2 Construction of planned enclosure with robust fencing materials in addition to natural trees				Sub-contracts (including Materials & Equipment)	300'000		74'000	152'000	74'000			39
				Operating Expenses	5'000		1'000	3'000	1'000			40
				Sub-Total Activity 2.1.2	305'000		75'000	155'000	75'000			
Activity 2.1.3 Construction of concrete water reservoirs (cisterns) and irrigation networks for six 38 ha plots				Operating Expenses	5'000		1'000	3'000	1'000			41
				Sub-contracts (including Materials & Equipment)	374'000		94'000	186'000	94'000			42
				Sub-Total Activity 2.1.3	379'000		95'000	189'000	95'000			
Activity 2.1.4 Preparation of 6 sites (38 ha each)				Sub-contracts (including Materials & Equipment)	26'000		5'000	16'000	5'000			43
				Operating Expenses	6'000		2'000	2'000	2'000			44
				Equipment	199'000		51'000	97'000	51'000			45
				Sub-Total Activity 2.1.4	231'000		58'000	115'000	58'000			
Activity 2.1.5 Seeding of plots for grass cultivation				Materials	6'000			4'000	2'000			46
				Sub-Total Activity 2.1.5	6'000			4'000	2'000			
Activity 2.1.6 Purchase of fruit and vegetable plants/trees including date trees				Materials	160'000			64'000	96'000			47
				Sub-Total Activity 2.1.6	160'000			64'000	96'000			
Activity 2.1.7 Establishment of new tree seedling nurseries for women's organizations				National Agronomist Expert	5'000			2'000	3'000			48
		Materials	16'000			5'000	11'000			49		
		Sub-Total Activity 2.1.7	21'000			7'000	14'000					
Activity 2.1.8 Supplementary reforestation of climate resilient species to reduce evapotranspiration, stabilize soil, and mitigate the loss of vegetation by grazing		National Agronomist Experts	10'500			3'500	3'500	3'500		50		
		Operating Expenses	10'500			3'500	3'500	3'500		51		
		Materials	15'000			5'000	5'000	5'000		52		
		Sub-Total Activity 2.1.8	36'000			12'000	12'000	12'000				
Activity 2.2.1 Training for the technical staff of the Ministry of Agriculture in drought tolerant agricultural practices		International Experts	25'000			15'000	10'000			53		
		Training	40'000			25'000	15'000			54		
		Sub-Total Activity 2.2.1	65'000			40'000	25'000					
Activity 2.2.2 Training of all agro-		National Experts	39'000			8'000	23'000	8'000		55		

pastoralist households by specialists in extension services to help them develop sustainable farming production methods, farming techniques and hygiene			Training	57'000			14'000	29'000	14'000	56
			Printing and publication	9'000			3'000	3'000	3'000	57
			Sub-Total Activity 2.2.2	105'000			25'000	55'000	25'000	
Activity 2.3.1 Sizing and construction of fodder, crop and milk storage facilities (21 m x 9 m) with scale weighing equipment			National Expert	8'000			3'000	5'000		58
			Sub-contracts (including Materials & Equipment)	174'000				77'000	97'000	59
			Sub-Total Activity 2.3.1	182'000				80'000	102'000	
			Sub Total Outcome 2	1'498'000		236'000	611'000	512'000	139'000	
OUTCOME 3: Access to secured finance for climate resilient agro-pastoral enterprise development										
Activity 3.1.1 Development of three-stage MF product including a safety net program for cooperatives, nanofinance for small, flexible loans and microfinance loans for diversified, revenue-generating activities with the assistance of an international and national experts			National Experts	18'000	5'000	8'000	5'000			60
			International Expert	28'000	8'000	12'000	8'000			61
			Stakeholder consultations	5'000	1'000	3'000	1'000			62
			Printing and publication	4'000	1'000	2'000	1'000			63
			Sub-Total Activity 3.1.1	40'000	15'000	25'000	15'000			
Activity 3.1.2 Capacity building for ADDS and CPEC to give them expertise in teaching MF principals for adaptation-oriented products to project beneficiaries			Training	35'000	8'000	19'000	8'000			64
			Printing and publication	10'000	2'000	6'000	2'000			65
			Sub-Total Activity 3.1.2	35'000	10'000	25'000	10'000			
Activity 3.1.3 Preparation of technical guides detailing microfinance principles and sustainable agricultural activities			Printing and publication	28'000		10'000	6'000	6'000	6'000	66
			Sub-Total Activity 3.1.3	28'000		10'000	6'000	6'000	6'000	
Activity 3.1.4 Mobile banking development to provide microfinance services to beneficiaries with no means of travel	MHEU	Adaptation Fund	Supplies	41'800			41'800			67
			Sub-Total Activity 3.1.4	41'800			41'800			
Activity 3.1.5 Long-term and periodic monitoring and evaluation of adaptation-oriented microfinance			National Experts (ADDS)	25'000			5'000	10'000	10'000	68
			International Expert	25'000			5'000	10'000	10'000	69
			Sub-Total Activity 3.1.5	50'000			10'000	20'000	20'000	
Activity 3.2.1 Organization of agro-pastoralists and pastoralists in cooperatives and training for cooperatives in terms of loan repayment programs, savings accounts, sustainable farming practices and the diversification of agricultural products			National Experts (ADDS)	48'000			8'000	20'000	20'000	70
			Training	49'000			5'000	22'000	22'000	71
			Printing and publication	9'000			1'000	4'000	4'000	72
			Misc	9'000			1'000	4'000	4'000	73
			Sub-Total Activity 3.2.1	115'000			15'000	50'000	50'000	
Activity 3.2.2 Development of			Training	18'500			5'000	6'500	7'000	74

diversified women's microfinance groups with emphasis on women empowerment			National Expert (ADDS)	16'500			5'000	5'500	6'000	75
			Sub-Total Activity 3.2.2	35'000			10'000	12'000	13'000	
Activity 3.3.1 Organization of agro-pastoralists into cooperatives which will provide recommendations on measures to improve the adaptation-oriented MF products			National Expert (ADDS)	10'000			10'000			76
			Printing and publication	5'000			5'000			77
			Misc	4'000			4'000			78
			Sub-Total Activity 3.1.5	15'000			15'000			
Activity 3.3.2 Bi-annual workshops organized by ADDS to facilitate the collection and documentation of ideas to promote sustainable MF products for each stage of shade garden development			National Expert (ADDS)	12'000			4'000	4'000	4'000	79
			Workshops	14'000			4'000	5'000	5'000	80
			Printing and publication	3'000			1'000	1'000	1'000	81
			Misc	9'000			1'000	4'000	4'000	82
			Sub-Total Activity 3.2.1	38'000			10'000	14'000	14'000	
Activity 3.3.3 Formalization of the community-driven adaptation plans so that they can be integrated into the National Programme for Food Security and the National Microfinance Policy			National Expert (ADDS)	18'000			5'000	5'000	8'000	83
			Printing and publication	7'000			1'000	2'000	4'000	84
			Sub-Total Activity 3.2.2	25'000			6'000	7'000	12'000	
Activity 3.3.4 Organization, centralization and promotion of lessons learned on best shade gardening practices via written and video reports, workshops and study tours			Workshops and study tours	21'000			5'000	8'000	8'000	85
			Printing and publication	6'000			2'000	2'000	2'000	86
			Operating Expenses	1'000			1'000	1'000	1'000	87
			Sub-Total Activity 3.2.2	30'000			8'000	11'000	11'000	
Sub Total Outcome 3				477'800	25'000	60'000	146'800	120'000	126'000	
Project/Programme Execution										
Project Management	MHEU	Adaptation Fund	In-Country Logistics	60'000	60'000					88
			Contractual Services (Project Management & Administration)	337'800	58'460	55'460	80460	55'460	87'960	89
			Supplies	10'000	2'000	2'000	2'000	2'000	2'000	90
			Sub Total Project Management	407'800	120'460	57'460	82'460	57'460	89'960	
			Sub Total Project/Programme Execution	407'800	120'460	57'460	82'460	57'460	89'960	Advance
TOTAL Project Implementation Costs				4'293'600	865'460	1'309'960	1'017'760	733'960	375'460	
MIE fee for services detailed in ANNEX V (8.5%)				364'956	43'679	66'808	51'906	37'432	19'148	145'983
GRAND TOTAL				4'658'556	1'046'122	1'376'768	1'069'666	771'392	394'608	

Abbreviations:

MHEU - Ministry of the Habitat, Environment and Urbanism
MoWNR - Ministry of Water, Energy and Natural Resources
MoALF - Ministry of Agriculture, Livestock and Fisheries
ADDs - Djiboutian Agency for Social Development, (l'Agence Djiboutienne de Développement Social)
CERD : Centre for studies and research of Djibouti

No

Budget Notes:

- 1 *Travel associated with site surveys*
- 2 *National experts to provide expertise and technical assistance in modeling and mapping*
- 3 *Costs of sub-contracts including IT equipment to perform modeling and field survey equipment*
- 4 *Costs of printing and publication associated with technical studies and recommendations*
- 5 *Costs associated with undertaking stakeholder consultations, including holding workshops*
- 6 *Travel associated with site surveys for EIA*
- 7 *National experts to conduct EIA*
- 8 *Costs of printing and publication to publicly display detailed EIA*
- 9 *Costs of stakeholders meetings to decide water source locations (e.g. printing of information leaflets for raising community involvement)*
- 10 *Travel associated with stakeholder meetings*
- 11 *National experts from all ministries to provide expertise and technical assistance for the locations of water resources*
- 12 *International Expert (3 staff months per year) to provide training to Ministry of Water*
- 13 *Costs of IT equipment to perform modeling for water resource scenarios*
- 14 *Costs of printing and publication for training and design materials*
- 15 *International Expert (1 staff month) to provide expertise on recharge design for the injection well*
- 16 *Travel costs for borehole design surveys*
- 17 *Costs of sub-contracts including materials and equipment to construct groundwater abstraction and injection*
- 18 *Travel associated with construction and monitoring*
- 19 *International Expert (4.5 staff months) to provide expertise on subsurface dams*
- 20 *Field inspection expenses for design evaluation*
- 21 *Costs of sub-contracts including materials and equipment to construct earth dams and retention basins*
- 22 *Travel and monitoring costs during construction*
- 23 *Costs of sub-contracts including materials and equipment to construct subsurface dams*
- 24 *Travel and monitoring costs during construction*
- 25 *Cost of engaging representatives from the Ministry of Water and the Ministry of the Environment to monitor dam construction activities*
- 26 *Costs of travel to sites for monitoring and reports*
- 27 *Cost of undertaking targeted training for national and local authority staff in water resource management planning*
- 28 *Costs of printing and publication associated with the water resource management (e.g. printing of information leaflets for raising community awareness)*
- 29 *Travel costs associated with training local groups on sustainable water management practices*

30 *National expert to provide training on water resource management*

31 *International Expert (3 staff months per year) to provide expertise on water tariff structures*

32 *Meeting costs*

33 *Costs of printing and publication for new water tariff regulations*

34 *Workshops held by PMU to consolidate lessons learned*

35 *Costs of printing and publication of lessons learned*

36 *Operating expenses to meet with local populations*

37 *Costs associated with undertaking stakeholder consultations to determine project beneficiaries*

38 *Expenses of stakeholder meetings*

39 *Costs of sub-contracts including materials and equipment to provide fencing around each shade garden site*

40 *Costs to set-up fencing*

41 *Costs of sub-contracts including materials and equipment to construct reservoirs and irrigation networks*

42 *Costs associated with irrigation network construction*

43 *Costs of sub-contracts including materials and equipment to prepare sites*

44 *Travel costs to sites and delivery costs for equipment*

45 *Cost of farming equipment such as shovels, wheelbarrows and watering cans*

46 *Cost of drought-resistant seeds*

47 *Cost of date trees and drought-resistant fruit and vegetable trees*

48 *National expert to help with design and construction of nurseries*

49 *Cost of drought-resistant seeds*

50 *National expert to help with design and planting of drought-resistant tree/shrubs*

51 *Transport and delivery costs*

52 *Cost of drought-resistant tree/shrub seedlings*

53 *International Expert (4 staff months) to provide expertise on agro-pastoralism, particularly date tree cultivation*

54 *Cost of undertaking targeted training for national and local authority staff in building capacity for agronomists involved in the project*

55 *National experts and lead agro-pastoralists to provide training to project beneficiaries*

56 *Cost of undertaking targeted training for local agro-pastoralists*

57 *Costs of printing and publication for information on sustainable agro-pastoralist methods*

58 *National expert to provide technical expertise on storage design and construction*

59 *Costs of sub-contracts including materials and equipment to construct storage facilities*

60 *National experts to provide expertise on microfinance products for sustainable agriculture*

61 *International Expert (4 staff months) to provide expertise on developing MF products for adaptation*

62 *Costs associated with undertaking stakeholder consultations to help create effective MF products*

63 *Costs of printing and publication for MF products*

64 *Cost of undertaking targeted training for national and local staff with managing and training MF products*

65 *Costs of printing and publication associated with MF products to raise community involvement*

66 *Cost of printing and publication of technical guides on microfinance principals and sustainable agro-pastoral techniques*

- 67 *Cost of truck, fuel and supplies to enable a mobile banking service*
- 68 *National experts from ADDS to perform long-term monitoring and evaluation on the effectiveness of the MF products with recommendations for improvements*
- 69 *Independent international expert to verify that loans are used for adaptation purposes*
- 70 *National experts to provide beneficiaries with knowledge on financial literacy and the MF products and to help create MF cooperatives*
- 71 *Cost of undertaking targeted training for MF cooperatives*
- 72 *Costs of printing and publication associated with MF products to raise community involvement*
- 73 *Miscellaneous costs associated with implementation of the activity*
- 74 *Cost of undertaking targeted training for women to form MF cooperatives*
- 75 *National expert to help create women MF cooperatives*
- 76 *National expert from ADDS to organize cooperatives which will provide adaptation plans*
- 77 *Costs of printing and publication associated with raising community involvement in adaptation planning*
- 78 *Miscellaneous costs such as fuel for vehicles associated with organization of cooperatives*
- 79 *National expert from ADDS to facilitate workshops*
- 80 *Bi-annual workshops to create community-driven adaptation plans*
- 81 *Costs of printing and publication material to facilitate adaptation planning workshops*
- 82 *Miscellaneous costs of workshop meetings*
- 83 *National expert from ADDS to integrate community priorities into the National Action Plan and the National MF Strategy*
- 84 *Printing and publication of adaptation plans*
- 85 *Workshops and study tours to organize lessons learned on best shade gardening practices and promote the shade gardening concept*
- 86 *Costs of printing and publication of lessons learned*
- 87 *Operating expenses to collect lessons learned in the field*
- 88 *Purchase of 2 vehicles for the project region*
- 89 *Contracts for project management and support staff, Monitoring & Evaluation expenses (Inception meeting, Mid-term and Final Evaluations, Meetings)*
- 90 *Cost of office supplies and disposables*

Annex 4: Project Risk Log

Key risks underlying the project have been analyzed and qualitatively assessed in connection with the context of the target sites for the project. Potential risks include:

Risk	Risk Rate	Risk mitigation measure
Reluctance of farmers or pastoralists to engage in agro-pastoralist practices of shade gardens	Low	The agro-pastoral development component will start gradually, with the objective to identify a limited number of 'lead' farmers that will serve as examples and possible success stories to the others. Those lead farmers will also serve as a basis for the organization of technical group meetings with other farmers in order to maintain a strong cooperation between involved families and support their efforts in developing their oasis garden.
Repeated drought	High	Whereas the repeated occurrence of drought is a serious probability, the project has been designed so as to be sufficiently resilient thanks to a diversified and secured access to water resources, combining both surface and ground water, as well as the implementation of adapted cultivation techniques and forage and other crop varieties.
Initial studies reveal insufficient water availability and quality	Low	The risk concerns only the Grand Bara location, the Petit Bara water resources already being well known and defined as sufficient in quantity and excellent in quality. If the combination of surface and ground water uses in Grand Bara do not reveal sufficiently productive and secured, the project will limit agro-pastoral development in Grand Bara and extend activities in Petit Bara, the two locations being close to each other.
Low level of cooperation between executing institutions	Medium	The implementation arrangements have been decided at the State highest-level and accepted by all involved parties. The MHUEAT is strongly willing to coordinate activities with the different executing agencies, and UNDP CO will closely monitor the project's execution, so as to limit any deviation. All involved parties are strongly interested in the project activities and outcomes, and will benefit from capacity building from the project.
Delays in project implementation due to simultaneous construction works for complementary projects	Low	The respective Ministries have already analyzed their resources for implementation of all projects in the National Programme for Food Security. Within the detailed design on this project, any possible bottlenecks in implementation will be identified and dealt with before the commencement of construction works.
Insufficient interest and social cohesiveness amongst sedentary pastoral communities to adhere to the alternative production models proposed by the project	Low	Local populations have already partly settled and the need for technical cooperation will play a critical role in social relations. Consulting services for social mobilization will be appointed during the project course, starting with an initial social study and community mobilization activities and possibly complemented with other activities later in the project. Climate change response workshops will also serve as a mobilization and conflict resolution tool.
Theft of solar panels,	Low	Borehole costs include the construction of protective casings

pump parts or fencing materials in any of the shade garden zones		around the solar panels and pump infrastructure to deter theft and prevent point contamination from grazing animals. Fencing costs are quite high because robust materials will be installed to adequately protect the shade gardens and prevent easy theft of materials.
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1. Over the course of the project, a UNDP risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified. At the time of project formulation, strong political commitment from national as well as municipal authorities is evident which will limit a number of risks from materializing. Consistent involvement of a diverse set of partners, including local municipalities, community organizations and NGOs will further reduce these risks.