



ADAPTATION FUND

# **REQUEST FROM THE GOVERNMENT OF ETHIOPIA FOR PROJECT FUNDING FROM THE ADAPTATION FUND**

## **FINAL DRAFT**

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax. Complete documentation should be sent to:

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## ADAPTATION FUND

# PROJECT PROPOSAL TO THE ADAPTATION FUND

## PART I: PROJECT INFORMATION

Project/Programme Category:	Regular Project
Country/ies:	Ethiopia
Title Of Project/Programme:	Climate Smart Integrated Rural Development Project
Type Of Implementing Entity:	National Implementing Entity
Implementing Entity:	Ministry Of Finance And Economic Cooperation (MoFEC)
Executing Entities:	Ministry Of Agriculture And Natural Resources, Ministry Of Livestock And Fisheries Development, Ministry Of Water, Irrigation And Electricity, Ministry Of Environment, Forests And Climate Change
Amount of Financing Requested:	9,987,910 (in U.S Dollars Equivalent)

### 1 PROJECT BACKGROUND AND CONTEXT

*Provide brief information on the problem the proposed project/programme is aiming to solve. Outline the economic social, development and environmental context in which the project would operate.*

#### 1.1 Socio-economic and development context

Ethiopia is a large, landlocked and diverse country, with an area of approximately 1.1 million km<sup>2</sup> and a population of over 90 million. It is one of the world's least developed countries, ranking 173 out of 186 countries in the UNDP 2015 Human Development Index. However, the country has committed to rapid and sustainable development, with a stated ambition to build a lower middle-income economy by 2025, increasing the per capita income of citizens so that it reaches over USD \$1,000 by this time. Ethiopia is now one of the fastest-growing economies in Africa and in the world and aspires to achieve a lower middle-income status by 2025, without increasing its net greenhouse gas emissions and while protecting itself against the negative impacts of climate change.

To deliver this vision, the Government of Ethiopia has produced the Growth and Transformation Plan (GTP)<sup>1</sup> and a succession of medium-term development plans spanning three five-year planning periods (2010-2015; 2015-2020 and 2020-2025) (FDRE, 2010). The vision is to deliver average annual economic growth rate of 10% by building a modern and productive agricultural sector, strengthening the industrial base and growing exports. The GTP was intended to leapfrog the nation to a lower middle-income economy by 2025. The plan was informed by the 1991 Agricultural Development Led Industrialization (ADLI). The ADLI was complemented for its efforts to promote light manufacturing to support structural transformation and exports in the 2000s. ADLI is considered as a national policy basis for Ethiopia's development, in which *land and people* are considered as key factors, followed by *water* as a third pillar for development.

The GTP underlines the role of agriculture as continuing to be the major source of economic growth, and intends to intensify production of domestic and export markets through smallholder farmers and private agricultural investors, focusing on: *high-value crops; development of small-, medium- and large-scale irrigation schemes; scaling-up of best-practices of model farmers; strengthening Government services for better support; development of new technologies; promotion of multiple cropping, adaptation to climate variability and ensuring food security through intensified use of water and natural resources; watershed management; water and moisture retention; conservation and management of natural resources; and commercial horticulture.*

The GTP strategically gives weight to the agricultural sector, as it is the means to increase the adaptive capacity of the country's people against climate change as well as the springboard for structural transformation to supplying inputs necessary for industrial growth. This proposal is designed to be coherent and aligned with GoE's national policies and picks out and integrates most of the proposed schemes recommended in the GTP (*in italics above*) and will be an instrument to support the implementation of the CRGE strategy on the ground.

Ethiopia has shown solid socio-economic progress over the last decade. Progress under the first GTP (GTP-I) period was commendable, with average GDP growth rate of 10%<sup>2</sup> and this high level of growth is expected to continue going forwards. This growth has contributed to significant poverty reduction in urban and rural areas<sup>3</sup>, as well as improving education, health, services and infrastructure. The introduction of a social safety net system has also targeted the poor and marginalised, with the introduction of the Drought Resilience and Sustainable Livelihoods Program (DRSLP) and the Productive Safety Nets Programme (PSNP).

Nonetheless, Ethiopia remains a highly climate vulnerable country and future climate change has the potential to significantly reduce future growth trajectories<sup>4</sup>. Indeed, the country has been heavily affected by the 2016 El Niño, experiencing a major drought which has led to a major humanitarian response to support over 10 million

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1 FDRE (2010). Growth and Transformation Plan (GTP) 2010/11-2014/15. The Federal Democratic Republic of Ethiopia. Ministry of Finance and Economic Development (MoFED). September 2010. Addis Ababa.

2 See NPC (2015), An assessment of performance of GTP-I, Addis Ababa (Amharic version).

3 Rapid economic growth led to a fall in income poverty. Poverty incidence (or headcount poverty index) decreased from 38.7% in 2004/05 to 23.4% in 2014/15, a reduction of 15.3 percentage point for the last ten years. Similarly, Ethiopia has achieved six of the eight MDGs-the two exceptions being maternal mortality and gender equality.

4 World Bank (2010). Economics of Adaptation To Climate Change: Ethiopia. Washington DC.

people. This vulnerability centres on agriculture, livestock and water management. Agriculture underpins the Ethiopian economy and the majority of livelihoods. It accounts for approximately 40% of GDP (in 2015); nine of the top ten exports and 73% of all employment<sup>5</sup>. Agricultural production is dominated by small-holders and is predominantly rain-fed, making it very sensitive to climate variability and shocks. Similarly, a large proportion (around 60%) of the land area of Ethiopia is arid and is dominated by pastoral farming, which is highly sensitive to climate extremes in general and drought in particular.

Recognising these challenges, Ethiopia is moving towards a low carbon and climate resilient economy. Indeed, it has one of the most advanced climate policy landscapes in Africa. A Climate Resilient Green Economy (CRGE) vision was launched in 2011 which set out that the economy should be resilient against the future impacts of climate change and be delivered with similar greenhouse gas emissions relative to today.

To fully mainstream climate resilience and green growth into development planning, the CRGE strategy has been mainstreamed into the second Growth and Transformation Plan (GTP-II), which guides development planning for the period 2015-2020.

The historically high exposure to climate variability has created strong awareness about current and future climate impacts in Ethiopia. In its national development plan, the Ethiopian Government explicitly identified climate variability and climate change as a threat to its development goals, and hence called for plan of action, strategies, laws, standards and guidelines to lessen the effect of forecasted climate change.

To this end, Ethiopia is already making substantive climate change-relevant investments across its sectors. Climate change-relevant spending from the national treasury between 2008 and 2012 was estimated at an average of USD 440 million per year, or 15% of total Government expenditure over these four years. However, lack of finance has been identified as one of the three constraints (in addition to technology and capacity) that pose a major challenge to effective implementation of the CRGE strategy. Preliminary estimates indicate that building the green economy will alone require total expenditure of around US\$ 150 billion over the next 20 years. This therefore underscores the need to mobilize significant amounts of new and additional finance from international, domestic, public and private sources in order to fully implement the CRGE strategy on the ground.

In parallel with the CRGE vision, a Green Economy Strategy (GES)<sup>6</sup> was launched, which detailed the pathway for delivering this low carbon middle-income ambition. The GE Strategy is built on four pillars:

1. Improving crop and livestock production practices for higher food security and farmer income while reducing emissions (agricultural and land use efficiency measures);
2. Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks (increased GHG sequestration in forestry);

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<sup>5</sup> CSA (2014), National Labour Force Survey, Addis Ababa.

<sup>6</sup> FDRE (2011). Ethiopia's Climate-Resilient Green Economy: Green economy strategy. The Federal Democratic Republic of Ethiopia. November, 2011. Addis Ababa.

3. Expanding electricity generation from renewable sources of energy for domestic and regional markets; and
4. Leapfrogging to modern and energy-efficient technologies in transport, industry, and buildings.

In translating these pillars to implementation, six priority sectors have been identified: agriculture, livestock, urban, transport, industry and energy. Work is underway to produce detailed climate resilient (CR) sector strategies for all CRGE sectors, with CR strategies already in place for:

- Agriculture and forestry;
- Water and Energy; and
- Transport

The CRGE and the sector strategies are also a key component of Ethiopia's proposed activities in the Intended Nationally Determined Contribution (INDC)<sup>7</sup>, which is focused on increasing resilience and reducing vulnerability of livelihoods and landscapes in three pillars; drought; floods and other cross-cutting interventions.

Against this background context, this proposal aligns to the objectives of the second Growth and Transformation Plan (GTP II) and the CRGE strategy.

## **1.2 Environmental context**

Given Ethiopia's extremely large landmass (1.1 million km<sup>2</sup>), agricultural production and agro-climatic zones are very varied, though much of the agriculture is characterised by mixed type farming systems.

The country also has one of the most complex and variable climates in the world, driven by the varied terrain and its location with respect to global weather systems. Within a few hundred kilometres, the climate ranges from the hot arid Danakil desert, up to cool wet alpine highlands, and down to wet humid lowlands. There are also large differences in topography, with elevations that vary from below sea level to above 4000 metres. These differences in elevation account for the large variations in temperature across the country, from the hot low lands up to the cooler central ridge of the country. Ethiopia's rainfall patterns are particularly complex. Mean annual rainfall varies dramatically, from desert levels up to 2000 mm/year, with a strong gradient across the country (with more rainfall in the west). There are also large monthly variations.

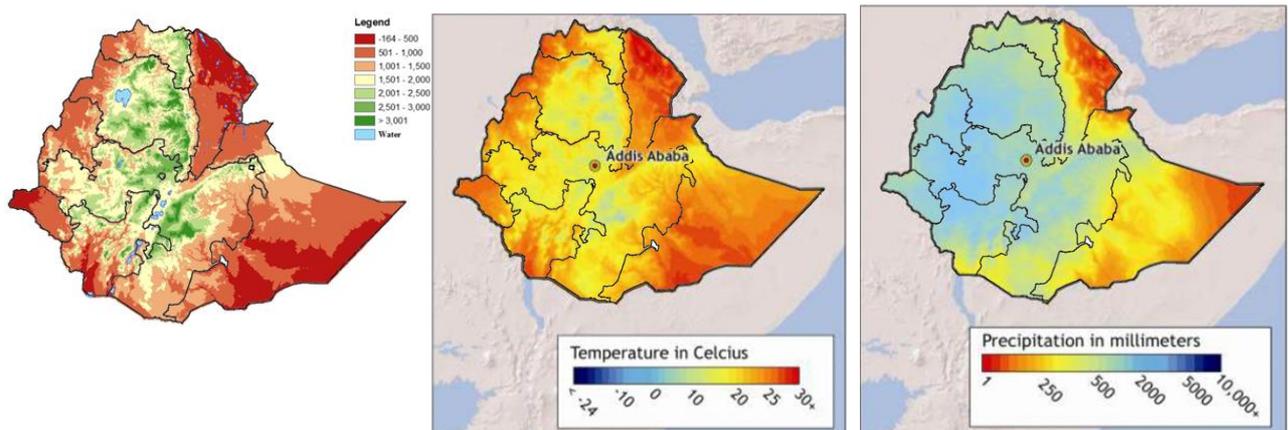
Ethiopia's rainfall is determined mainly by seasonal changes in large-scale global circulation systems, particularly the seasonal north–south movement of the Inter Tropical Convergence Zone (ITCZ). This leads to the bimodal rainfall season experience in southern Ethiopia and the uni-modal season in the North. These seasonal rainfall patterns have a major influence on agricultural production, as rainfall is highly varied across the months of the year and across the country. Other global climate systems also play a role in Ethiopia's weather, often by influencing the

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<sup>7</sup> FDRE (2015). Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia.

position and strength of the ITCZ. Unlike much of East Africa, there is no simple relationship between global circulation patterns such as the El Niño/La Niña – Southern Oscillation (ENSO) cycle and Ethiopia’s climate. ENSO events can lead to changes in precipitation in some regions of the country, but this is specific to the time of season.

**Figure 1. Ethiopia’s Elevation Profile (metres above sea level) (left), Annual Average Temperature (centre) and Rainfall (right).**



These factors lead to the high variability in annual and seasonal rainfall in Ethiopia between years (and even between decades). Yearly variation around mean rainfall levels is 25% and can increase to 50% in some regions. This also leads to the periodic droughts and floods regularly experienced. One result of all this complexity is that the understanding of Ethiopia’s climate - and future climate change - is at an early stage.

Related to the variations in climate, Ethiopian agriculture and land-use activities are extremely diverse. This reflects the variation in climate, soil type and cultural practices. This is important as unlike other countries, adaptation policy planning needs to be designed very much with the local context in mind. At the highest and simplest level of aggregation, the combination of elevation and climate. Simple classifications split the country into lowland (<1500 meters) and highland areas (> 1500), or use traditional classifications, such as the Kolla (the hot, arid lowlands), Dega (mid-altitude highlands) and Wurch (high altitude). In practice there is much more variation and the Ministry of Agriculture currently works with 32 Agro-Ecological Zones<sup>8</sup>.

Ethiopia has rich natural biodiversity and ecosystems, with extensive forests, though natural cover has been declining in recent decades. These forest ecosystems are also important habitats for diverse wildlife (Ethiopia ranks 5th in terms of its forest biodiversity in Africa). There are an estimated 4.1 million hectares (ha) of natural high

<sup>8</sup> Georgis, K. Ministry of Agriculture on agro-ecological zones, 2000.

forests, 55.6 million ha of woodlands and shrub lands and 0.5 million ha of planted forest<sup>9</sup>. Together forests cover 3.6% of the total land area.

Finally, Ethiopia is often referred to as the “water tower” of East Africa, holding significant but distributed water reserves. It receives an estimated 980 billion meters<sup>3</sup> of rain annually. 14 major rivers rise in the Ethiopian highlands and estimates of the potential irrigable land are for 3.7 million hectares of gravity-fed surface water, 1.1 million hectares from groundwater and 0.5 million hectares from rainwater harvesting<sup>10</sup>. Nonetheless, this water is unevenly distributed and subject to the high annual variability, discussed above, which means that water availability often is insufficient (both geographically and temporally). The critical issue thus relates to the management of water, to ensure constant availability of supply and to manage the fluctuations across the seasons and especially between years.

## 1.3 The Problem

### 1.3.1 Definition of the problem

Agricultural production in Ethiopia is dominated by small-scale subsistence farmers (about 8 million households) who practice traditional farming methods, accounting for 95% of the total area under production, more than 90% of total agricultural output<sup>11</sup> and around 40% of national GDP. These small-holders have an average of less than 1 hectare per holding. The high proportion of rain-fed crop production makes the sector very sensitive to rainfall variability. Indeed, water is the central production factor affecting sustainability and food security, especially in the drylands, and thus the wider drivers of soil water status, water use and water management are critical<sup>12</sup>. The proportion of irrigated land in Ethiopia is currently low, with more than 95% of land cultivated without irrigation<sup>13</sup>. Productivity has historically been constrained by rainfall variability and extremes, low soil fertility and land/soil degradation. Erosion of topsoil and failure to return organic matter contributes further to soil deterioration.

Ethiopia also has a large livestock population (the largest in Africa) and this is important for the GDP of the country and also an important source of exports. Statistics report an estimated 53 million cattle and approximately 26 million sheep and 23 million goats. Livestock is also a source of local income in the highlands (where mixed farming systems are often used) and in lowlands/pastoral farming systems, where livestock are a critical part of livelihoods and the principal capital of farmers. Indeed, over 80% of agricultural holders practice mixed systems. However, the

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9 WBISPP, 2004. A strategic plan for the sustainable development, conservation and management of the woody biomass resources. Final report. Federal Democratic Republic of Ethiopia, Ministry of Agriculture. 60 pp.

10 Awulachew, S. B., Erkossa, T., and Namara, R. E. (2010). Irrigation potential in Ethiopia. Constraints and opportunities for enhancing the system.

11 MoA (2011). Agriculture Sector Programme of Plan on Adaptation to Climate Change. Federal Democratic Republic of Ethiopia. Ministry Of Agriculture. Ayana Salehu, Beyene Sebeko, Nebil Miftah, Sertse Sebh, Tefera Tadesse. Sep 2011. Addis Ababa.

12 Georgis, Kidane. 2003. Land degradation adoption, low soil fertility and water stress: the major issues for improving crop production and food security in the dryland areas of Ethiopia, In the Proceedings of the food security conference 2003, challenges and prospects food security in Ethiopia, UNCC, Addis, August `3-15, 2003. pp 201-216.

13 Araya, A., and L. Stroosnijder (2011), Assessing drought risk and irrigation need in northern Ethiopia, *Agricultural and Forest Meteorology*, 151(4), 425-436.

existing livestock resource is characterized by low productivity and the sector is heavily impacted by the climate, which impacts livestock directly, as well as the availability of fodder. As with crop production, livestock numbers and production are heavily affected by the climate, particularly in drought years.

Critically, both agriculture and livestock sectors are heavily impacted by the frequent major droughts (and floods) that arise in Ethiopia, which occur frequently and lead to large impacts, affecting millions of livelihoods, with high economic costs that affect farmers right through to the national economy.

Drought is a critical climate related hazard in Ethiopia, frequently occurring in many parts of the country. A large part of Ethiopia (~70% by area) is dryland, where annual rainfall is low and seasonal and inter-annual variability is high. These areas are highly vulnerable; desertification and drought have been a persistent problem throughout history, with associated food shortages and famine. Major droughts occurred in 1983-1984, 1987-1988, 1990-1992, 1993-94, 1999-2000, 2002-2003 with major events in 2008/09 and in 2015-16<sup>14</sup>. The economic costs of the largest droughts have been estimated to be up to 4% of GDP<sup>15</sup>.

Floods are the other major climate related hazard in the country. Major floods – leading to loss of life and property – have occurred in different parts of the country in 1988, 1993, 1994, 1995, 1996 and 2006, although there are much more common smaller events. The costs of floods are more localised but have high local costs.

The other major climate related hazard is soil erosion, linked strongly to rainfall in the hills and highlands. Around 63,000 km<sup>2</sup> of land is potentially at high risk of soil erosion (around 6% of the country). Estimates indicate erosion rates of around 12 tons/ha/year nationally, and a total loss of 1.5 billion tons of soil/year. Previous studies have indicated that water induced soil erosion in Ethiopia is likely to cost 2 - 3% of agricultural GDP per year<sup>16</sup>. These climate hazards have a different geographical profile, shown below.

The drought hazard maps compile the historic frequency of droughts over the past decade. This shows the higher risks in an arc round the East of the country. For floods, the risks are more widespread. The main risks from soil erosion have a different geographical profile as it arises in the central areas where there are steep slopes, high rainfall and certain management practices related to underlying habitat and agriculture.

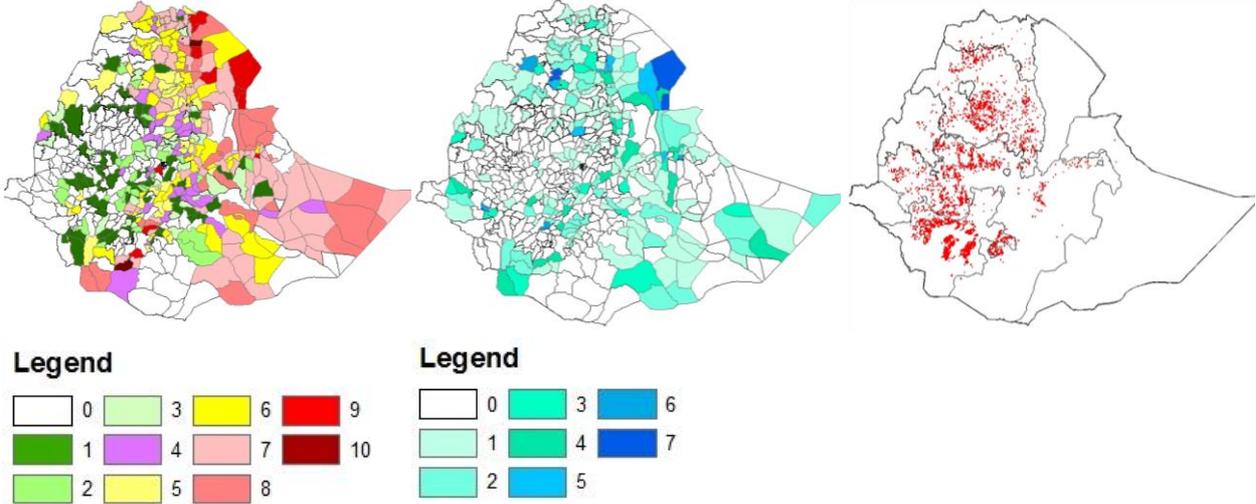
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14 DRMFS (2011), Ethiopia Disaster Risk Management Country Plan Project, Phase I, 14 June 2011

15 Conway, D. and Schipper, E.L.F., 2011. Adaptation to climate change in Africa: Challenges and opportunities identified from Ethiopia. *Global Environmental Change*, 21(1), pp.227-237.

16 Yesuf, M., Mekonnen, M., Menale, K., and J. Pender, (2005). Cost of Land Degradation in Ethiopia: A Critical Review of Past Studies. Published by the Environmental Economics Policy Forum in Ethiopia and International Food Policy Research Institute.

**Figure 2. Drought Frequency (left) Flood Frequency (center) and Soil Erosion Risk (right).**



Source CRGE Agriculture Strategy. Data for droughts and floods for period 2000 - 2009

This climate variability and extreme events have a major impact in Ethiopia. The World Bank (2006) estimates that hydrological variability costs the Ethiopian economy 38% of its potential growth rate and causes a 25% increase in poverty rates<sup>17</sup>. More recent analysis has estimated the cost to Ethiopia from current climate variability and extremes is, on average, \$500 million a year or 2.5% of GDP<sup>18</sup>. Reducing these impacts is therefore an economic priority as well as a necessity for safeguarding people and livelihoods.

Rural communities in Ethiopia largely depend on rain-fed agriculture which is characterized by low input and low output; agricultural productivity has remained stubbornly low, due largely to land degradation and lack of appropriate farming technology.

Frequent drought or erratic rainfall results in crop damage, loss of livestock and pastures, water shortage (for humans and livestock), malnutrition (due to lack of food), and migration of households and wild animals. Deforestation, poor environmental conservation practices, conflict over grazing land and water points, and overgrazing are the major factors aggravating the impacts of drought. Crop pests and diseases such as partinum, striga, white grub and stock borer are common, caused by poor farm management and lack of pest-resistant seeds. The number of livestock has been decreasing over the last decade in the target Woredas, mainly due to livestock diseases such as Newcastle Disease (chickens), Anthrax, Trypanosomiasis, Lymphangitis, Foot and Mouth Disease (FMD), Sheep Pox, Faculiasis and internal and external parasites. Malaria is the main reported human health problem, followed by diarrhoea.

In the project target Woredas, vulnerability of livelihoods is mainly attributed to a combination of factors including small farm size, low income, lack of drought-tolerant

17 World Bank Ethiopia Managing Water Resources to Maximize Sustainable Growth. 119 (2006).  
 18 FRDE (2012). Ethiopia's Climate Resilient Green Economy. Climate Resilience Strategy: Agriculture.

seeds, limited access to irrigation water, use of low-yield livestock varieties, limited access to weather information, lack of access to value chains, limited access to credit facilities, low overall literacy rate, fragile ecosystems and ecosystem degradation, and weak institutions at the Woreda level to prepare climate-responsive plans and budgets. These factors reflect the unavailability of the required characteristics identified by the IPCC (2001) to be essential for a community to become climate-adaptive<sup>19</sup>.

Climate change further exacerbates residents' already-vulnerable livelihoods and manifests its effects through increased school drop-out rates, animal and crop disease, crop failure, livestock loss, malnutrition, human disease, loss of biodiversity, and increased over-exploitation of natural resources such as forest, woodlands, wetlands and pasture.

### **1.3.2 Vulnerability analysis**

The climate related hazards above act with other non-climatic drivers to drive vulnerability in Ethiopia. The country's geographical location, climate, and socio-economic indicators make it particularly vulnerable to natural and anthropogenic risks. Indeed, the adverse effects of climate change are considered to be significant in the country due to its high vulnerability and low adaptive capacity<sup>20</sup>.

Because of the importance of subsistence farming, and the key role that agriculture and livestock plays in livelihoods, particularly in rural areas, the analysis of the agricultural sector extends beyond production to the wider consideration of livelihoods, food security, disasters and its contribution to the national economy. The starting point for this is the different livelihoods in Ethiopia. There has been extensive work to map and monitor livelihoods and their vulnerability. The Atlas of Ethiopian Livelihoods<sup>21</sup> sets a comprehensive baseline. At an aggregate level, this identifies three livelihood zones: pastoral, agro-pastoral and cropping. These fall into specific geographical areas of the country. Previous works has considered how climate vulnerability affects these three different livelihood areas, considering 18 current climate stresses for Ethiopia. This revealed that the key climate shocks and stresses are floods, droughts and soil erosion, but also highlighted the strong livelihood and geographical differences across the country. For example drought is potentially a catastrophic risk for lowland pastoralists and mixed cropping systems in the transitional/agro-pastoral zone, but less of a risk in the highlands.

Alongside this, there is a need to take other non-climatic stressors into account. Many of these relate to the underlying structure of the agricultural and livestock sectors, and the land-use and socio-economic pressures on forestry, as well as socio-economic factors such as population growth, access to services and current incomes.

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19 According to the IPCC (2001), the main factors that determine a community's adaptive capacity include economic wealth, technology, information and skills and infrastructure, institutions and equity. This underlines the fact that all characteristics for a community to become adaptive need to be met, which informs the design of the project.

20 For example, Ethiopia receives a high vulnerability and low readiness score in the ND-GAIN Country Index, a project of the University of Notre Dame Global Adaptation Index (ND-GAIN), summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience, <http://index.gain.org/>.

21 LIU (2010). An Atlas of Ethiopian Livelihoods: The Livelihoods Integration Unit. USAID and Government of Ethiopia: Disaster Risk Management and Food Security Sector, MOARD

These factors are particularly relevant as they act alongside (or exacerbate) the effects of climate variability and extremes.

The vulnerability of the country to these stresses is aggravated by a host of interrelated factors including the predominance of traditional agricultural and livestock practices, the fragile and degraded natural environment, high levels of poverty, undeveloped infrastructure, high population pressure and uneven settlement patterns, inefficient markets, variable and changing climatic conditions, and competition over scarce resources, especially in the pastoral areas.

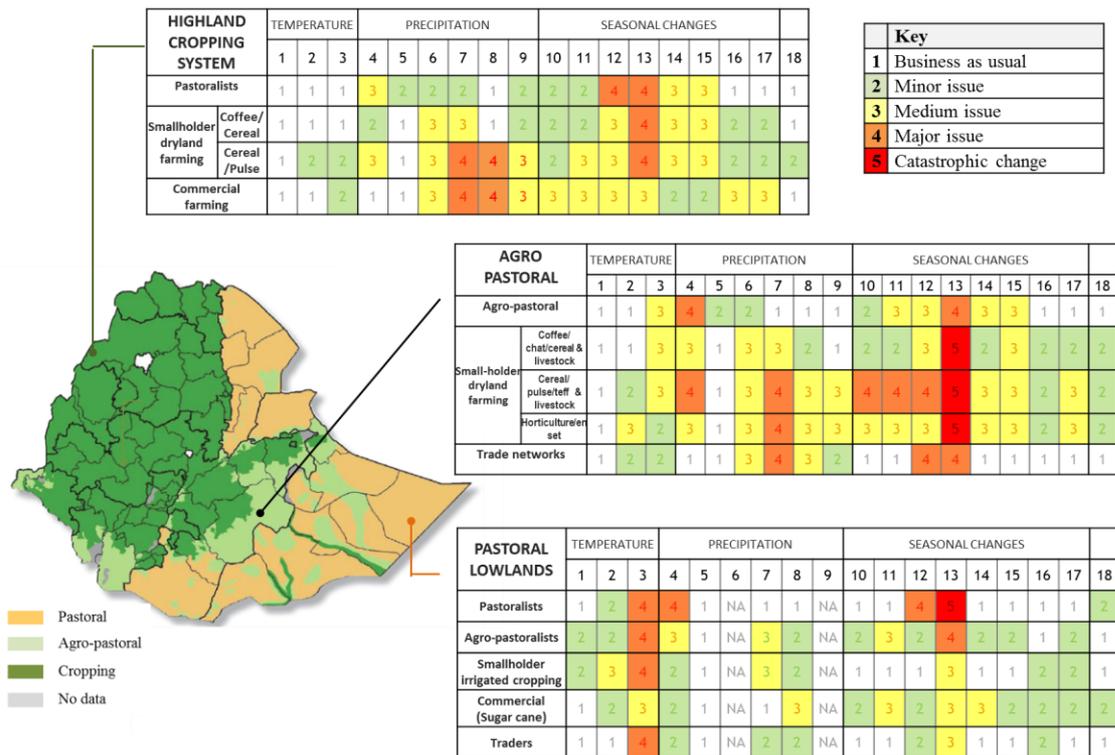
Ethiopia has existing problems of soil fertility, soil degradation and soil erosion. Issues of low soil fertility have long been a problem in the drylands<sup>22</sup>. The proportion of arable land to the total area is low (4-11%) and soil fertility is a declining asset, due to the increasing human and livestock population and the demand for the basic natural resources such as land, water, forest and other agro-biodiversity resource and their products<sup>23</sup>.

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22 Georgis, Kidane. 2003. Land degradation adoption, low soil fertility and water stress: the major issues for improving crop production and food security in the dryland areas of Ethiopia, In the Proceedings of the food security conference 2003 (Ed. 13-15), challenges and prospects food security in Ethiopia, UNCC, Addis, August `3-15, 2003. pp 201-216.

23 Georgis Kidane. 2010. Food Security and Agricultural Technology Options in Pastoral Areas of Ethiopia, paper presented in InterAfrica Group Symposium on Agrarian Technology Options and Food Security in Pastoral Area Thursday, 07 October 2010 Harmony Hotel, Addis Ababa, Ethiopia.

**Figure 3. Livelihood exposure to climate stresses and threats**



Climate stresses, threats and opportunities		Key impacts
1	Mean temperature increases over 5-10 yrs	Shifts in agro-ecological zones;
2	More days with a max temperature above 35 °C	Heat stress for some crops
3	More days with a max temperature above 40 °C	Leads to heat stress on people & livestock
4	Mean rainfall over 5 yrs decreasing	Shifts in agro-ecological zones; plus drought regimes
5	Mean rainfall over 5 yrs increasing	Landslides, damage to crops and livestock
6	Mean rainfall over 5 yrs increasing plus large scale floods	Damage to crops, livestock, infrastructure and people
7	3-day rainfall intensity increasing leading to flash floods	Local damages to crops, livestock, infrastructure, people
8	1-hour rainfall intensity	Soil erosion and landslides, some local damages to crops
9	More heavy hail events	Crop damage at certain times in the growing season
10	Changes in rainfall distribution within the season	Significant impact on some crops
11	Number of 10-day dry spells increasing	Significant impact on some crops
12	Higher frequency of seasonal droughts	Significant impact on most crops
13	Higher frequency of consecutive seasonal droughts	Significant impact on livelihoods and economic growth
14	Later onset of rainfall season	Shortens growing period - impacts on crops, fodder
15	Earlier end date of the rainfall season	Shortens growing period - impacts on crops, fodder
16	Decreased predictability of the rainfall season	Less reliable forecasts affects some enterprises
17	Increased uncertainty in rainfall distributions	Increases risk, important for some enterprises
18	Increases in cloudiness & humidity	Reduces radiation, increases thermal stress for people

Small scale subsistence farmers have low levels of technology, limited farm inputs, low access to finance/credit services<sup>24</sup>, limited extension services, inadequate transport networks and face high transport costs and a lack of market information. They also have poor access to information on climate variability, forecasts, etc. noting these also sit within broader issues of level of education and dependency ratio, and wider coping capacity in relation to non-agriculture-related activities, such as income diversification. There are also underlying risks from pests and diseases, reducing

24 Di Falco, S., Veronesi, M., and Yesuf, M. (2011). Does Adaptation to Climate Change Provide Food Security? A Micro-Perspective from Ethiopia. American Journal of Agricultural Economics, 93(3), 829–846. doi:10.1093/ajae/aar006

crop production and increasing storage losses, and disease is an important issue for livestock, especially in relation to livelihoods. Many of these pests and diseases are also climate sensitive. These issues also affect resilience. As an example, in household surveys, access to credit is identified as a major reason why adaptive efforts, such as irrigation schemes or change in crop varieties are not made and further that poor climate information is a significant barrier for farmers in Ethiopia in adapting<sup>25</sup>.

Forests contribute an estimated 4% of GDP through the production of timber, honey, and forest coffee. Forests are essential to rural livelihoods through the provision of wood, fuel-wood and non-timber forest products (NTFPs) and forest and tree resources provide over one-third of rural household total cash income<sup>26,27</sup>, as well as many non-cash benefits. Forests also provide wider ecosystem services, notably through their role in watershed management, helping to reduce run-off, flooding and soil erosion, regulating water flow and reducing siltation. Given the increasing emphasis placed by the Ethiopian government on irrigation development, the watershed protection effect of forests and vegetation should be given a high priority. They also have a major function in carbon sequestration. Many communities use forests as a form of adaptation during climate stress such as droughts, due the income diversification and food<sup>28</sup>. These forests are also critical to Ethiopia's biodiversity. However, forest cover has been declining over recent decades, falling from around 15 million ha in 1990 to 12 million ha in 2010. Forests are also vulnerable to existing climate related hazards in Ethiopia including frequent and extended drought periods, floods, strong winds, frost, fires and heat waves (high temperatures). Managing forests and their ecosystems is therefore important in enhancing resilience and community coping strategies. Forests and woodlands of Ethiopia present a large stock of carbon and high sequestration potential. Importantly, these forests will assist the green economy development strategy of the government of Ethiopia by sequestering and buffering the greenhouse gases emitted from the growing and expanding economy.

Putting this altogether, when designing adaptation responses, it is necessary to tackle the multiple stresses that drive vulnerability in Ethiopia. It is also necessary to differentiate the adaptation interventions according to risk and livelihood type, to make sure that the appropriate risks are targeted with the right adaptation options. To help address this, the CRGE produced Adaptation Planning Zones, shown below.

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25 Di Falco, S., Veronesi, M., and Yesuf, M. (2011). Does Adaptation to Climate Change Provide Food Security? A Micro-Perspective from Ethiopia. *American Journal of Agricultural Economics*, 93(3), 829–846. doi:10.1093/ajae/aar006

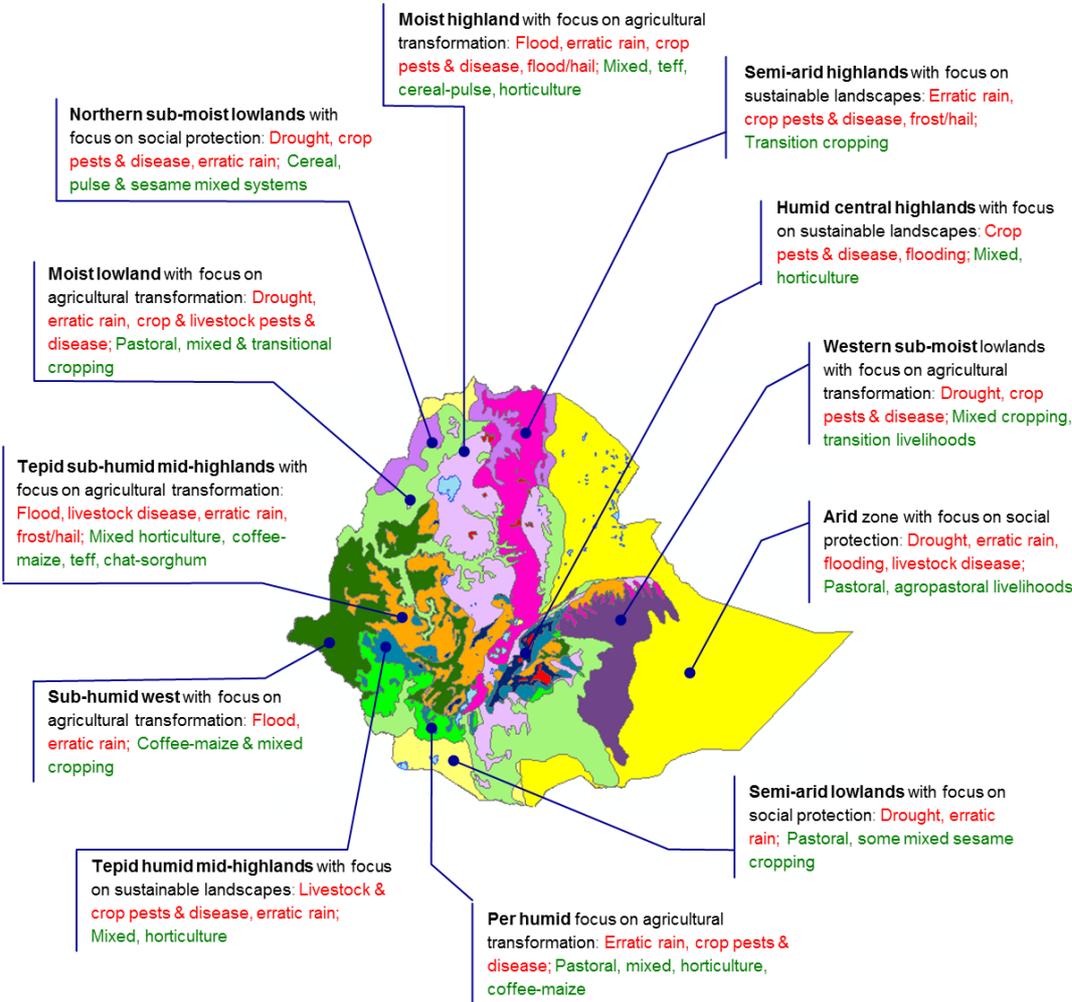
26 Lemenih, M. (2011). The role of forests in rural livelihoods and climate change adaptation. In: Ensermu Kelbesa and Abenet Girmna (Eds.), *Multiple Uses of Forests in Ethiopia vs Associated Challenge: Maximizing Benefits while Curbing Limitations*. In commemoration of 3rd National Mother Earth Day and 2011 International Year of Forests. Forum for Environment, Addis Ababa. Pp. 95-110.

27 Tesfaye, Y., Roos, A. and B.M. Campbell and Bohlin F. (2010). Forest Incomes and Poverty Alleviation Under Participatory Forest Management in the Bale Highlands, Southern Ethiopia. *International Forestry Review*, 12(1):66-77.

28 Garede, E. (2010). *Land-Use and Land-Cover Dynamics and Rural Livelihood Perspectives, in the Semi-Arid Areas of Central Rift Valley of Ethiopia*. PhD Dissertation, Swedish University of Agricultural Sciences, Umea, Sweden.

These provide a useful categorisation for this proposal, especially in relation to the adaptation options proposed for different areas.

**Figure 4. Risk Profiles for Adaptation Planning Zones.**



**1.3.3 Barriers**

In looking at the implementation of adaptation, it is important to consider the existing constraints in place. There are a number of barriers to current adaptation that make it harder to plan and implement and lead to the high vulnerability in Ethiopia. These include a range of economic, social and institutional factors, including market failures, policy failures, governance failures and behavioural barriers. These factors can make it difficult to make decisions or take action, even when it is apparent that some form of action is needed. These barriers result in less efficient or less effective adaptation, missed opportunities or higher costs. Addressing these barriers is critical to successful adaptation.

Many of these barriers arise from the high vulnerability and high levels of poverty highlighted above at the community level. The main factors that determine a community’s adaptive capacity include economic wealth, technology, information and skills and infrastructure, institutions and equity. For a community to adapt, these

characteristics have to be met. In particular, households in the target Woredas are characterized by small and degraded farm size, low income and limited income diversification, lack of modern agricultural inputs including drought-tolerant seeds, limited access to irrigation facilities, shortage of potable water, shortage of low-yield livestock varieties, limited access to weather information, lack of access to value chains, limited access to credit facilities, low overall literacy rate or educational attainment, fragile ecosystems and weak institutions at the Woreda level to prepare climate-responsive plans and budgets. Climate change further exacerbates residents' already-vulnerable livelihoods and manifests its effects through increased school dropout rates, animal and crop disease, crop failure, livestock loss, malnutrition, human disease, loss of biodiversity, and increased over-exploitation of natural resources such as forest, woodlands, wetlands and pasture.

In order to cope with drought, the primary coping mechanism is to sell existing assets. The declining asset base at the household level forces individuals to engage in a more aggressive search of available resources, which causes deforestation and forest degradation leading to high degree of soil nutrition depletion directly affecting agricultural output for the next rainfall season as well as contributing to a reduced ground water recharge leading to drying out of rivers and streams. The effect of climate variability is greatest in the most vulnerable communities and pushes them into extreme poverty and puts them in a downward spiral of increased poverty. In extreme cases, drought leads to migration of the most vulnerable households, leading to the complete loss of assets and livelihood

Understanding these baseline barriers provides key information on how to enhance the uptake of adaptation, and the success of this proposed project, and these factors are therefore built into this proposal.

Furthermore, farmers in Ethiopia do already use a wide variety of practices to deal with climate variability. Studies show that these practices are changing in response to changing risks and trends in climate and analysis<sup>29</sup>. At the farm level, methods used by farmers to adapt to climate change include use of different crop varieties (the most common approach), tree planting, soil conservation, early and late planting and irrigation. However, around 42 percent of the surveyed farmers had not taken any adaptation measures and furthermore, some of the responses taken were not beneficial for long-term resilience or led to high welfare costs, such as from the loans from money lenders, sale of assets such as livestock and agricultural tools or reduction of consumption levels. Farmer surveys highlight that the key barriers to climate adaptation are a lack of information, money, labour or land that prevent them taking any action.

Finally, there are also important **gender** inequalities in the current agricultural system, which need to be taken into account given the important role of women in agriculture, and conversely the importance of agriculture to women: as an example, in the

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<sup>29</sup> Deressa, T., Hassan, Rashid M and Ringler, C., 2008. Measuring Ethiopian Farmers' Vulnerability to Climate Change Across Regional States. IFPRI Discussion Paper 00806, (October).

drylands, women obtain a large share of their income from livestock. Women are more vulnerable to climate change impacts because they have less financial resources, lack alternative income opportunities and because they depend more directly on primary natural resources<sup>30</sup>: the mortality rates from natural climatic hazards for women are higher than for men. Women headed households comprise 26% of the population in Ethiopia. Women experience a disproportionate burden of climate change impacts due to their social roles, poverty and intra-household inequity. Men and women do not have the same adaptive capacity due to differentiated power relations and unequal access and control over assets.

There is still a wide knowledge gap concerning gendered impacts of climate change in Ethiopia which means that the much-needed evidence remains unavailable to policy makers. Climate change interventions are often assumed to be gender neutral and ignore gender risks and opportunities. This leads to the exclusion of women and their knowledge from decision-making on responses to climate change exacerbating gender inequality and poverty. For example, gender relations can determine who receives inputs for adaptation strategies. Frequently new agricultural technologies bypass women farmers, despite women's knowledge and their important role in agriculture<sup>31</sup>.

Recognizing and addressing these gender issues is a key area for tackling broader vulnerability, and for building the resilience of households and communities. Research based on gender-disaggregated data has shown that men's higher level of risk aversion in Ethiopia compared to that of women has a negative impact on adaptation such as the adoption of soil and water conservation practices.<sup>32</sup> In contrast, female-headed households are more likely to take up adaptation options.<sup>33</sup> In developing appropriate responses to climate change, it will be important to consider the different needs, roles, responsibilities, preferences and capabilities of men, women, boys and girls, and the social processes that shape these. The project will specifically address gender inequalities related to climate change and support women's full participation in decision-making and technical activities associated with climate adaptation as well as ensuring both men and women benefit from markets, technologies and asset inputs for climate change adaptation.

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30 Bekele, M. 2011. Forest plantations and woodlots in Ethiopia. African Forest Forum, working paper series, Volume 1, issue 22, Nairobi, Kenya.

31 Gender-Responsive Strategies on Climate Change: Recent Progress and Ways Forward for Donors  
Agnes Otzelberger June 2011 BRIDGE/IDS

32 Berga, H., and E. Bryan. 2014. "The Role of Gender in Climate Change Adaptation: Evidence from the Nile Basin of Ethiopia." Unpublished, International Food Policy Research Institute, Washington, DC.

33 Nhemachena, C. and Hassan, R., 2007. Micro-Level Analysis of Farmers' Adaptation to Climate Change in Southern Africa. IFPRI Discussion Paper 00714, (August).

## 1.4 Current climate variability and future climate change

### 1.4.1 Recent Climate Trends

There is a clear and observable positive trend in temperature observations in Ethiopia, with a strong warming trend and observations of increasing minimum and maximum temperatures over the past fifty years. The NAPA<sup>34</sup> reported average annual minimum temperatures rising by 0.2 – 0.4°C per decade and average annual maximum temperature by 0.1°C per decade, thus at an aggregate level temperatures have increased by an average of around 1°C since the 1960s. The recent second national communication<sup>35</sup> reports a temperature increase 0.1-0.4°C per **DECADE**, resulting in an average temperature increase of around 1°C (0.25°C per decade) since the 1960s.

Strong increases have been experienced over the entire country, with slightly greater increases in the Nile valley. There are also reports of increasing trends in the frequency of hot days, increasing trends in the frequency of hot nights, and decreases in the frequency of cold days and nights. The observed temperature increases are expected to lead to increased evapotranspiration, and reduced soil moisture content.

It is difficult to pick out trends in precipitation observed at the national level over the past sixty years, as Ethiopia has one of the highest levels of inter-annual and inter-decadal variability worldwide. The recent second national communication indicates a slightly declining trend, indicative of a decrease in total annual rainfall over the years. Perhaps more usefully, there are some underlying trends which emerge when specific regions and seasons are considered. Recent analysis of satellite and gauge data shows a decline in spring and summer rains – by as much as 15-20% since the 1960s in south-central Ethiopia<sup>36</sup>. Some locations, e.g. in the Bale mountains, may therefore have seen a decrease in average rainfall of over 100mm between 1970 and today (against average annual totals of approximately 750mm), though this is still within the inter-annual variability (annual rainfall ranges between 550mm and 950mm from year to year). Crop yields and pasture conditions in these heavily populated areas are already likely to have been affected in these areas and could be heavily affected if trends continue over future decades. These trends are attributed to warmer sea surface temperature in the Indian Ocean, which are expected to persist over the next decade at least.

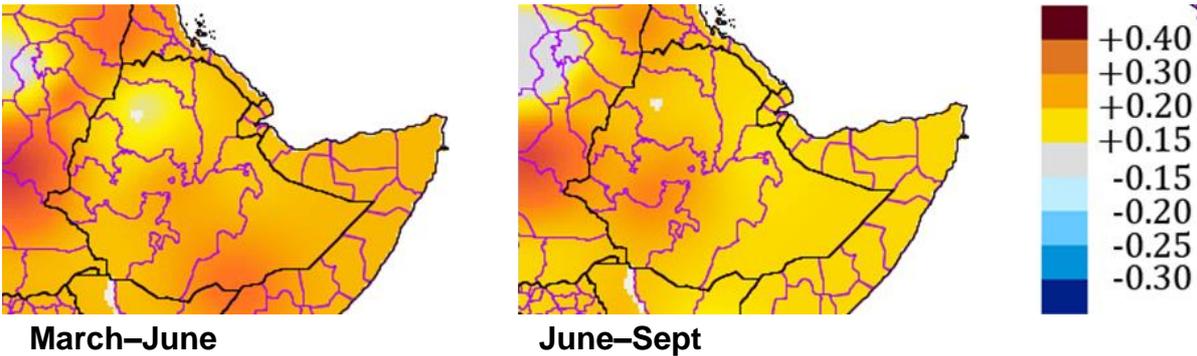
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34 FDRE (2007). Climate Change National Adaptation Programme of Action (NAPA) of Ethiopia. Federal Democratic Republic of Ethiopia. Ministry of Water Resources/National Meteorological Services Agency. June 2007. Addis Ababa, Ethiopia.

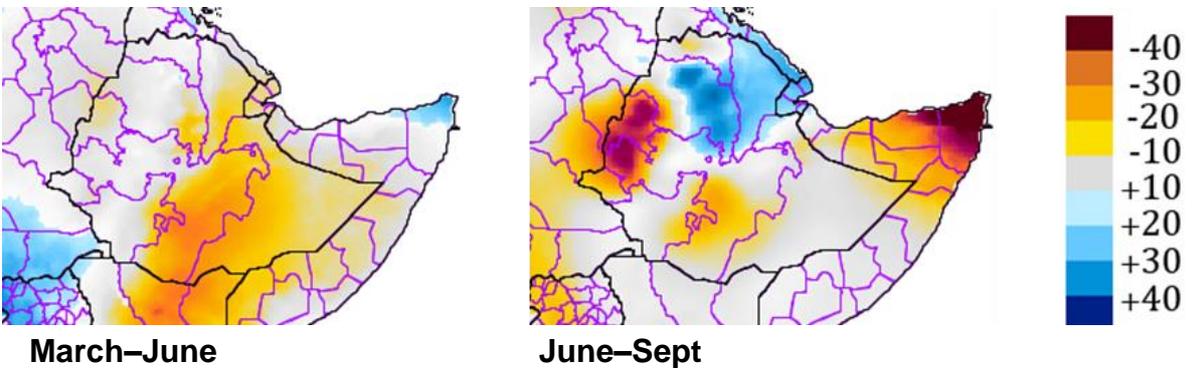
35 FRDE (2015). Ethiopia's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC). May 2015. Ministry of Environment and Forest.

36 Funk, C. et al., 2012. A Climate Trend Analysis of Ethiopia, Available at: <http://pubs.usgs.gov/fs/2012/3053/>.

**Figure 5. Temperature trends (°C per decade)<sup>37</sup>.**



**Figure 6. Rainfall trends (°C per decade).**



For other changes that are important for agricultural systems, notably the timing and onset of the rains, it is more difficult to pick up trends, because of the historically high levels of variability. Nonetheless, several studies report farmer perceptions of changing trends, with increasing variability and unpredictability of the rainy season, particularly during the Belg season.

While both drought and flood data show some higher frequency of events in the last decade, and trends of increasing frequency have been reported, particular care needs to be taken in interpreting these data, because of the improvements in reporting over time and the high levels of inter-decadal climate variability in Ethiopia.

Nevertheless, the recent national communication reports a pronounced increase in the projections of the total rainfall occurring in “heavy” rainfall events, indicative of an increase in the potential for floods.

Finally, it is important to consider the underlying year-to-year variability in rainfall, as this is very high in Ethiopia. This inter-annual variability is much larger than the long term trends, thus it is possible that trends could be eclipsed by the existing variability. In terms of adaptation, this means that farmers are now experiencing rainfall climates similar to those that they might face in the future. Therefore this highlights the need to help the sector better cope with climate variability as an important part of adapting to future change.

**1.4.2 The 2015-2016 El Niño**

37 Funk, C. et al., 2012. A Climate Trend Analysis of Ethiopia, Available at: <http://pubs.usgs.gov/fs/2012/3053/>.

As highlighted above, Ethiopia is frequently hit by large scale weather extremes, notably droughts, which are often linked to global weather patterns. One such event has happened recently, with the large global El Niño weather extreme that built up over 2015 and continued into 2016. This was one of the largest events on record (initially estimated as a 1 in 20 year event or more) and this has had major impacts on Africa, including in Ethiopia.

Driven by the on-going El Niño, the consecutive failure of two rainy seasons in 2015 has had profound impact on the lives and livelihoods of millions, especially impacting rural households engaged in the agriculture sector<sup>38</sup>. Several pastoral areas have recorded significant rainfall deficits – up to 50 percent below average – with the most extreme drought conditions are in the northern regional states. Many have been forced to sell their production assets and abandon their livelihoods, and more than 10.2 million people are now food insecure in Ethiopia. This has triggered a humanitarian crisis<sup>39</sup>, with an estimated response plan costing of \$1.4 billion.

### 1.4.3 Future Climate Change

The modelling of climate change in Ethiopia is very challenging and any results are characterised by high uncertainty.

There is a high level of confidence that Ethiopia will get warmer in the future, but low confidence on the ‘central’ estimate of what the degree of will be. Climate models project that temperatures will continue to rise in Ethiopia, with 0.5 to 1.5°C of warming by the 2020s and 1.5 to 3°Cs by the 2050s, relative to the baseline 1961-1990 period<sup>40</sup>. This implies much higher rates of change than seen historically. There will also be increases in the number of days considered hot and very hot, impacting on evapo-transpiration and soil moisture.

The projections of precipitation are much more complex to understand, and great care must be taken in interpreting model outputs. Rainfall is a more difficult climate parameter to model and Ethiopian climatology is more complex and challenging than for most countries.

This makes it difficult to project future rainfall, even in terms of the sign. While some studies report that there may (on average) be a small increase in the annual precipitation over the country (e.g. as in the 2<sup>nd</sup> National Communication) – and especially in the south - these results should be treated with extreme caution. The change projected from the climate models is within the range of current inter-annual variability, thus making it extremely difficult to detect. Furthermore, the pattern of rainfall changes from climate change varies by across the country, reflecting the different climatic zones. Of critical importance, analysis of multi-model ensembles shows that there is a very large range of projected change for Ethiopia, with the models reporting an envelope of +/- 30% change in future annual rainfall over the next 30 – 40 years<sup>41</sup>.

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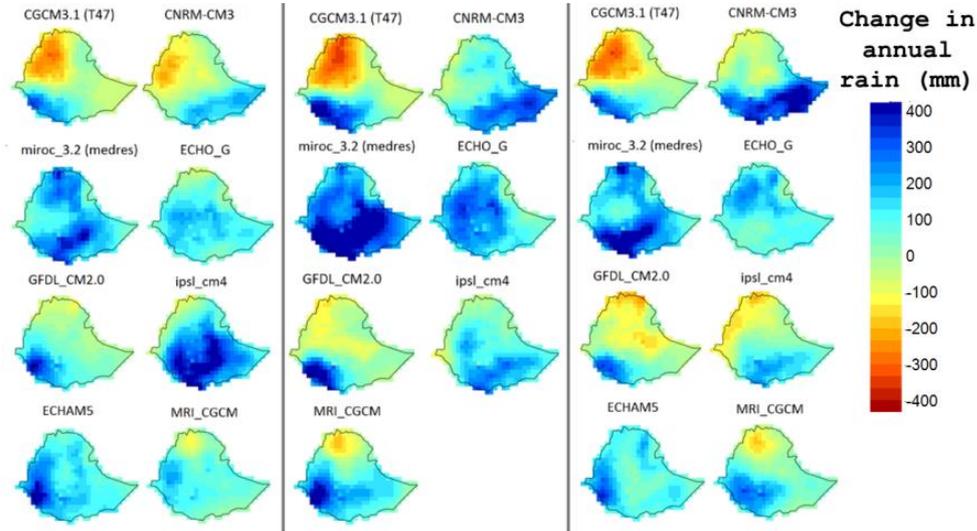
38 FAO in Ethiopia. El Niño Response Plan 2016

39 Ethiopia. 2016 Humanitarian Requirements Document.

40 FRDE (2012). Ethiopia's Climate Resilient Green Economy. Climate Resilience Strategy: Agriculture.

41 Conway, D. and Schipper, E.L.F., 2011. Adaptation to climate change in Africa: Challenges and opportunities identified from Ethiopia. *Global Environmental Change*, 21(1), pp.227-237.

**Figure 7. Rainfall trends (mid-century) climate change for low, medium and high emission scenarios showing model and scenario uncertainty. CRGE Agriculture.**



This uncertainty is critical in the design of this proposal. There is a very wide envelop of future change from climate change in Ethiopia, from warm, wet to dry, hot futures. These will lead to varying degrees of impact, but at the current time is not possible to ascertain which outcome is likely to emerge. To illustrate this point explicitly, while nearly all the climate change models indicate that rainfall will increase in the south of the country (see Figure 7) – this is the one part of the country where observed rainfall trends indicate a drying signal, i.e. a decrease (see Figure 6).

As a consequence, this proposal has not focused on predicting the future (given this is impossible) but instead has provided a proposal design that operates with this uncertainty in mind, i.e. to advance decision making under uncertainty, and to put in stronger elements of monitoring and learning to help understand how the climate is affecting Ethiopia and to feed this back into informing future decisions.

**1.4.4 Future Climate Change Impacts**

Agriculture is a highly climate sensitive sector and climate change has the potential to lead to major effects<sup>42</sup>. While the issue of water availability is critical, linking to the earlier section, there is a much wider set of risks. This is based on many potential climate variables, which can impact directly and indirectly on crop production, agricultural supply and value chains. They involve potentially negative effects (e.g. from lower rainfall and/or increasing variability) but also potentially positive effects (e.g. from CO<sub>2</sub> fertilization and from extended growing seasons), as well as complex changes from the changing risks of extreme events, the range and prevalence of pests and disease, etc. These lead, in turn, to changes in production and thus trade. These are also potential effects from climate change on horticulture, viniculture, industrial crops and livestock, and on the multi-functionality role of agriculture. There

42 IPCC (2014) [Porter, J.R., L. Xie, A.J. Challinor, K. Cochrane, S.M. Howden, M.M. Iqbal, D.B. Lobell, and M.I. Travasso]. Food security and food production systems. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 485-533.

are also important impacts on individual livelihoods, e.g. from subsistence farmers up to national economies: in the most extreme cases, there are potential risks to food security and the breakdown of food systems, possibly leading to socially contingent effects.

The patterns of potential impacts of climate change on agriculture vary across time and location. For temperature increases of 2°C, negative impacts on yield are projected for major crops in tropical and temperate regions (without adaptation), although individual locations may benefit below this<sup>43</sup>.

Livestock are already affected by climate variability, particularly drought, though some of the prevalent species (in pastoralist lands) have been bred for resilience. Climate affects livestock production and productivity both directly and indirectly. The direct effects include temperature and other climate factors (humidity, wind speed) on animal growth, milk production, wool production, reproduction and general animal health, while the indirect effects include climatic influences on availability of water and the quantity and quality of feedstuffs such as pasture, forage, grain and the severity and distribution of livestock diseases and parasites. These may lead to effects such as mortality (from heat stress), declining productivity or quality (value) or affect production costs, and they may even affect the viability of existing livelihood systems (from changes in the suitability of areas due to bioclimatic shifts) that rely critically on these animals. Climate change may also alter the prevalence and frequency of many livestock pests and diseases.

There have been several studies that have considered the future risks from climate change to agriculture and livestock in Ethiopia, including analysis of costs. The World Bank EACC study in Ethiopia<sup>44</sup> assessed the impacts and economic costs of climate change from impacts on major crops and livestock. Large impacts on crop yields were projected under dry scenarios due to the frequent occurrence of droughts. The study also projected a decline of approximately 30% in livestock productivity by 2050. The overall economic impact depended on the scenario, but for the most negative outcomes, the study estimated losses of up to 7% of agriculture GDP by 2050.

There have also been several farm level economic studies (Ricardian assessments) that have also been undertaken in Ethiopia on climate change. One study<sup>45</sup> reported that increasing temperature during summer and winter would significantly reduce crop net revenue per hectare and found negative impacts from climate change. Another study<sup>46</sup> report similar findings, with the increase in seasonal temperatures decreasing crop net revenue per hectare for summer and winter seasons. When put into a wider economy model (CGE), the study found farm incomes (GDP per capita) could be 30 percent lower under future climate change (compared to the baseline).

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43 Rosenzweig, C., et al (2013). Assessing agricultural risks of climate change in the 21st century in a global gridded crop model intercomparison. PNAS(ISA-MIP Special Feature). PNAS.

44 World Bank (2010). Ethiopia - Economics of adaptation to climate change. Washington, DC: World Bank.

45 Deressa, Temesgen Tadesse, 2007. Measuring the Economic Impact of Climate Change on Ethiopian Agriculture: Ricardian Approach. SSRN eLibrary.

Deressa, T., Hassan, R. M., et al., 2008. Analyzing the Determinants of Farmers' Choice of Adaptation Methods and Perceptions of Climate Change in the Nile Basin of Ethiopia. IFPRI Discussion Paper 00798, (September).

46 Gebreegziabher, Z., Alemu Mekonnen, Rahel Deribe, Samuel Abera (2010, revised 2012). Crop-livestock inter-linkages and climate change implications on Ethiopia's agriculture: a Ricardian approach

Gebreegziabher, Z., Jesper Stage, Alemu Mekonnen, and Atlaw Alemu (2011). Climate Change and the Ethiopian Economy: A Computable General Equilibrium Analysis. Environment for Development Discussion Paper Series October 2011. EFD DP 11-09.

Climate change is also expected to affect food security. Under drier scenarios, there would be an increase in humanitarian needs. Analysis<sup>47</sup> indicates that for the driest scenarios, there would be significant increases in the number of beneficiaries needing assistance under the programme for future dry scenarios (a 32% average increase in the number of people needing assistance under the PSNP under extreme dry scenarios by the 2020s, with a potential doubling of beneficiaries in extremely dry years), and possibly even higher relative increases in costs under these scenarios.

Climate change is also likely to exacerbate the existing problems of soil erosion in the wetter and steeper parts of the country. While the projections of average rainfall in Ethiopia are unclear, projections indicate with more confidence that there might be an increase in the intensity of high rainfall events<sup>48</sup>. A major scientific theory underpinning this result is that a warmer atmosphere will be able to hold more water, thus more will be available for a given rainfall event. In East Africa, studies<sup>49</sup> report that a large proportion of Ethiopia might experience increased rainfall intensity increasing the risks of flooding and soil erosion. An analysis of the potential change in monthly rainfall, and the potential increases in heavy rainfall events from climate change could see increases in intensity of around 10 to 20%. This could lead to additional costs from soil erosion of 1 -2 t/hectare/year, or at an aggregate scale, up to 1% of agricultural GDP.

There are a large number of potential effects from climate change on forests and associated ecosystem services. While tree growth may be enhanced by some processes related to climate change (including CO<sub>2</sub> fertilization, longer growing seasons), forests are potentially negatively impacted by others, notably from changing ecological zones, the potential for high temperatures, reduced rainfall and increased variability including extreme events such as drought. Indeed, forests are potentially very vulnerable because of the long life-times and slow growth rates involved, and the fact that existing stocks have evolved to the current climate over millennia. There are also potential effects to forests through changes in soil conditions and hydrology, pests and diseases, wider forest ecosystem (health) and a potentially greater risk of fires, etc.

The most likely impacts are a shift in altitudinal distribution of vegetation types. This will result in the expansion of tropical dry and very dry forests, and a shrinking of forests in moist and alpine ecosystems. Such studies<sup>50</sup> in Ethiopia indicate reductions in the areas of forest coverage, fragmentation of forest life zones, the disappearance of montane and lower montane wet forest and subtropical desert scrub, but with the appearance of tropical moist forest and expansion of tropical dry and very dry forests projected. There is already a high level of forest fire incidence, with reports of

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47 Conway, D. and Schipper, E.L.F., 2011. Adaptation to climate change in Africa: Challenges and opportunities identified from Ethiopia. *Global Environmental Change*, 21(1), pp.227-237.

48 Allan, Richard P, Brian J Soden, Viju O John, William Ingram, and Peter Good. 2010. "Current Changes in Tropical Precipitation." *Environmental Research Letters* 5 (2) (April 9): 025205. doi:10.1088/1748-9326/5/2/025205.

49 Shongwe, Mxolisi E., Geert Jan van Oldenborgh, Bart van den Hurk, Maarten van Aalst, 2011: Projected Changes in Mean and Extreme Precipitation in Africa under Global Warming. Part II: East Africa. *J. Climate*, 24, 3718–3733. doi: 10.1175/2010JCLI2883.1

50 Mamo, N. (2001). Vulnerability and adaptation of Ethiopian forests to global climate change, a report submitted to NMSA under the GEF/UNDP supported Climate Change Enabling Activities Project (ETH /97/G31) of Ethiopia.

increasing severity and frequency of forest fire in recent decades<sup>51</sup>. Climate change is likely to increase the potential for forest fire in the future, particularly under drier future scenarios.

Finally, climate change will impact on the water supply and demand for Ethiopia. The World Bank economics study<sup>52</sup> identified potential water conflicts under climate change, affecting irrigation and in turn crop yields, as well as potentially affecting other water users.

## 1.5 Project Context

### 1.5.1 Project location and background context

Ethiopia is constitutionally formed by a federation of nine ethnically-based regional states and two chartered cities. These regions of Ethiopia are administratively divided into 68 or more zones. In turn, these zones are comprised of districts, known as woredas (also spelled weredas), and each of these in turn comprised of wards (kebele) or neighbourhood associations, which are the smallest unit of local government in Ethiopia. This project is directed at the kebele level. It will target seven highly vulnerable woredas, and within each of these, implement the project in 2 of the most vulnerable kebeles.

**Table 1. Proposed Woredas for the Project**

SNO	Region	Woredas selected
1	Oromia	Adama Alelitu
2	SNNP	Lok Abaya (Lake Abaya)
3	Harerri (Harari)	Harerri (Erer)
4	Dire Dawa	Wahil cluster
5	Tigray	Raya Azobo
6	Amhara (Amahara)	Tenta

These woredas have been selected based on their vulnerability to climate hazard (e.g. increasing variability of rainfall and increasing frequency of drought/flood), vulnerability to climate change (e.g. limited income diversification and crops) and adaptability, i.e. availability of water and physical access to markets. The target Kebeles have also been selected in close consultation with stakeholders with the Woredas, and represent diverse agro-ecological conditions, access to markets, and extent of vulnerability to drought.

In each case, the woredas (and kebeles) have also been selected because they have not been included in existing programmes of support. A relatively large number of woredas (7) has been included in the proposal to capture the different adaptation planning zones in Ethiopia, i.e. to reflect the large differences in vulnerability, and thus to be able to test integrated solutions and climate smart planning in varied areas representative of the country. This will provide critical information for learning and subsequent scale-up, i.e. on what works well in different agro-ecological zones. For

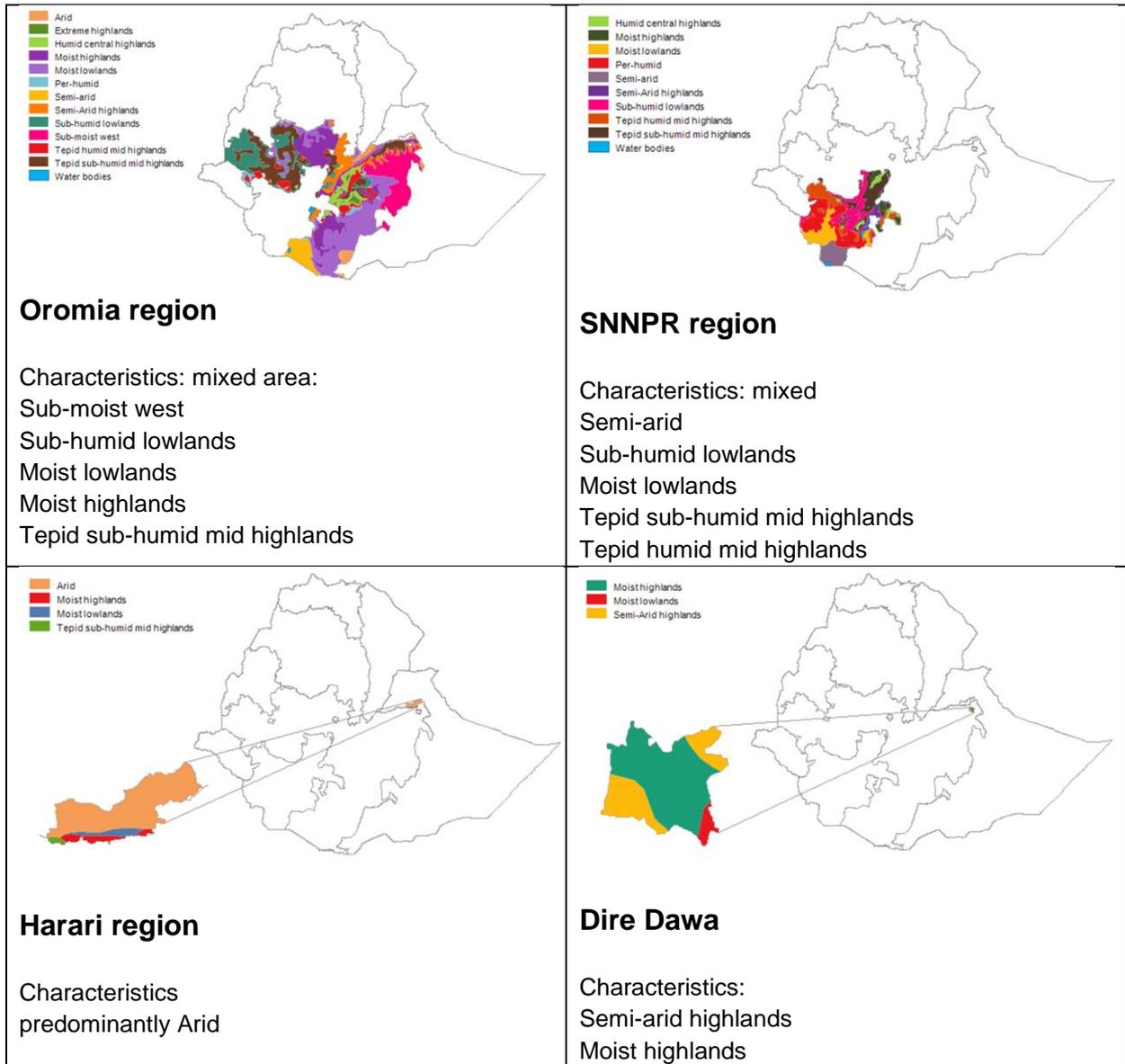
51 Bekele, M. 2011. Forest plantations and woodlots in Ethiopia. African Forest Forum, working paper series, Volume 1, issue 22, Nairobi, Kenya.

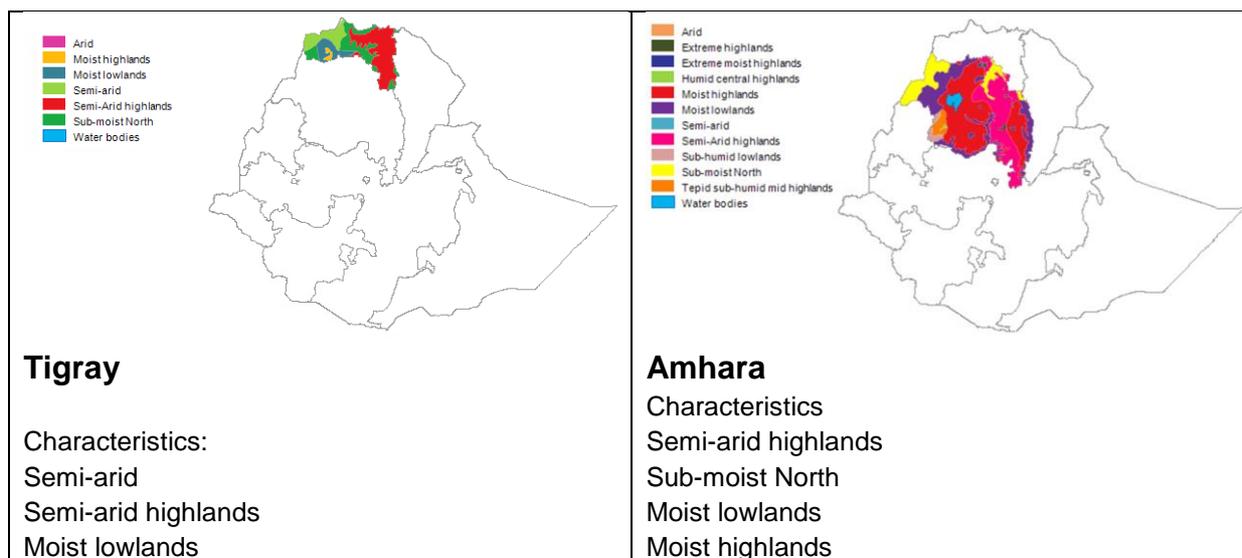
52 World Bank (2010). Ethiopia - Economics of adaptation to climate change. Washington, DC: World Bank.

this reason, the proposal has a strong focus on evaluation and learning, to ensure lessons are captured and used for scaling up and future programming.

The location of the regions and an analysis of the Adaptation Planning Zones are shown below. In line with the proposed approach to capture the different risk profiles and enhance learning, they include some arid areas (notably Harerri), semi-arid areas (Dire Dawa and Tigray), and mixed areas (Oromia and SNNP and Amhara).

**Figure 8. Location and Adaptation Planning Zones for these regions.**





Socio-economic information has also been gathered for the relevant regions. Regional trends indicate that poverty reduced in the target regions; but the rate of decline of poverty varied across regions and rural–urban area. In most cases rural poverty reduction was greater than that of urban. Note that poverty is still high in all regions.

**Table 2: Poverty head count indices over time across regions.**

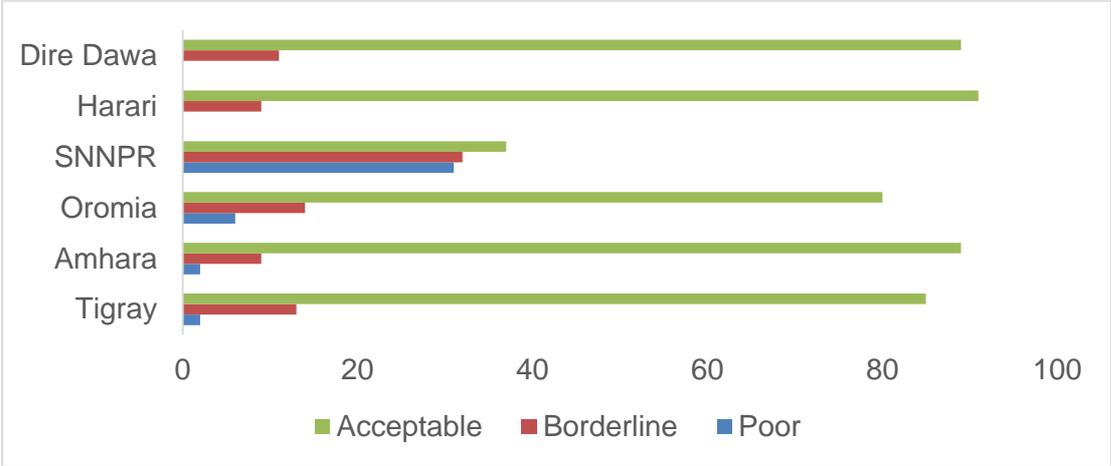
Region	1995/06			1999/2000			2004/05			2010/11		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Tigray	0.579	0.457	0.561	0.616	0.607	0.614	0.510	0.367	0.485	0.365	0.137	0.318
Amhara	0.567	0.373	0.543	0.429	0.311	0.418	0.404	0.378	0.401	0.307	0.292	0.305
Oromia	0.347	0.276	0.340	0.404	0.359	0.399	0.372	0.346	0.370	0.293	0.248	0.287
SNNPR	0.565	0.459	0.558	0.517	0.402	0.509	0.382	0.383	0.382	0.300	0.258	0.296
Harari	0.133	0.291	0.22	0.149	0.35	0.258	0.206	0.326	0.270	0.105	0.117	0.111
Dire Dawa	0.366	0.246	0.295	0.332	0.331	0.331	0.398	0.329	0.352	0.142	0.349	0.283

Source: MoFED (2014)

According to the Food Consumption Score, more than one in four households (27%) consumed less than acceptable diets; 10% of households had poor and 17% borderline food consumption levels.<sup>53</sup>

<sup>53</sup> See CSA and WFP (2014), Ethiopia: Comprehensive food security and vulnerability analysis.

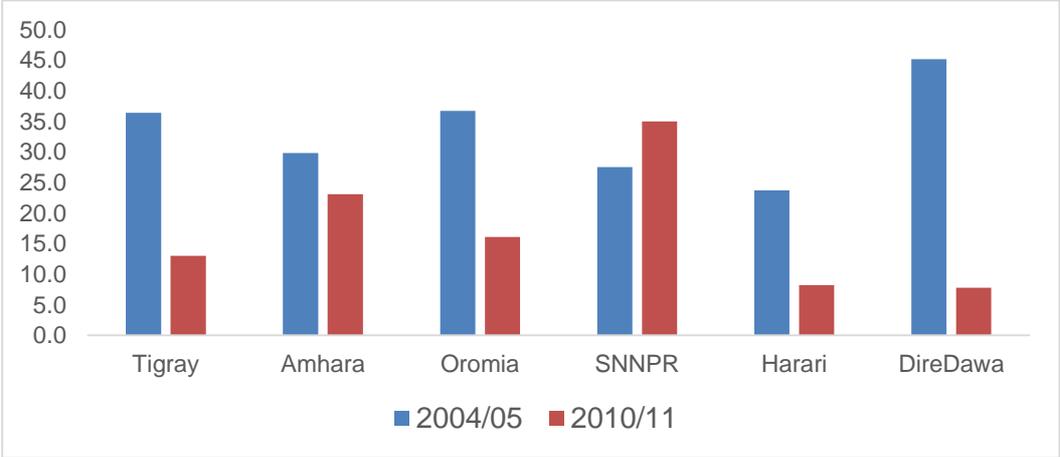
**Figure 9. Proportion of households with poor, borderline and acceptable food consumption, by region.**



Source: CSA and WFP (2014)

The regional distribution of food deficient households indicates that SNNP experienced an increase in the proportion of food insecure households in 2010/11<sup>54</sup>. On average 21.5% of households have experienced food shortage for 3.2 months of the year in 2010/11. While this is an improvement over the level of 2004/05, this is still high.

**Figure 10. Percentage of households with food shortage.**

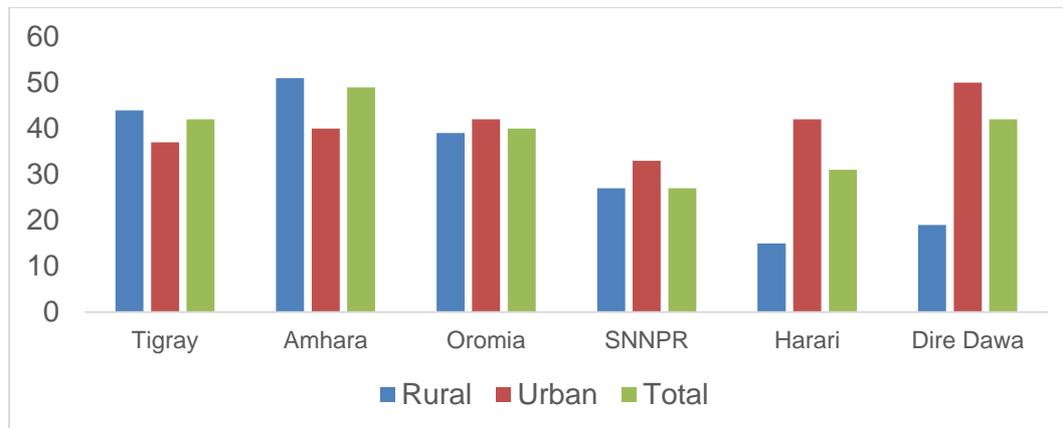


Source: MoFED (2014)

In 2011, close to 40% and 42% of rural and urban households were food energy deficient, respectively. In terms of the regional distribution, the Amhara region experienced the highest food energy deficiency, followed by Tigray and Dire Dawa regions.

<sup>54</sup>MoFED (2014), Development and Poverty in Ethiopia 1995/96-2010/11, Addis Ababa.

**Figure 11. Percent of food energy deficient households (<2,550 kilocalories/adult equivalent/day) by region.**



Source: CSA (2011)

### 1.5.1.1 *Vulnerability profiles for the project areas*

Ethiopia has invested heavily in improving the baseline disaster risk and climate vulnerability and a national risk mapping exercise has been undertaken (the Woreda Disaster Risk Profiling (WDRP) Programme). This provides key information on risk profiles of the proposed project implementation areas. The full risk profiles for the Woredas are presented in the Annex. These include:

- Livelihood summary;
- Risk profile;
- List of major disasters;
- Accessibility data;
- Vulnerability information;
- Level of Awareness and Institutional Development; and
- Community Capacity to Cope.

*A summary is presented below.*

#### a. **Adama Woreda**

Adama Woreda is located in the Oromia Region of Ethiopia, located in the Great Rift Valley. The altitude of this woreda ranges from 1500 to 2300 meters above sea level. Notable local landmarks include the Sodere and Gergeddi hot springs, and Boku Femoral. A survey of the land in this woreda shows that 30% is arable or cultivable, 6.5% pasture, 5.2% forest, and the remaining 58.3% is considered swampy, degraded or otherwise unusable. Fruits, vegetables and sugar cane are important cash crops.

The 2007 national census reported a total population for this woreda of 155,349, of whom 79,013 were men and 76,336 were women. Of the total population of the Woreda, about 26,322 or 16.94% of its population were urban dwellers.

Given that the Woreda is located in Rift Valley areas, the average rainfall in the Woreda is generally considered inadequate for crop production and the area is often vulnerable to recurrent drought.

**b. Alelitu Woreda**

Alelitu is one of the woredas in the Oromia Region of Ethiopia. It was part of former Berehna Alelitu woreda. It is part of the Semien Shewa Zone. The 2007 national census reported a total population for this woreda of 53,414, of whom 27,109 were men and 26,305 were women.

The Woreda is located in the highland mixed livelihood system. Rainfed production of a wide range of highland cereals including teff and wheat and pulses using deeply entrenched, traditional crop and livestock husbandry practices under temperate climatic conditions in the highlands. Long years of extractive forms of production, high population and livestock densities have led to advanced levels of natural resources degradation characterize the system of production.

**c. Lok Abaya Woreda**

Loka Abaya is one of the woredas in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia. It is part of the Sidama Zone located in the Great Rift Valley, with total area of about 1190 km<sup>2</sup>. The land use in this woreda shows that about 20.2% is cultivated land, and 42.6% is under forest. The total population of the district is estimated to be 116,000 people. In terms of agroecology, it can be characterized as lowland/highland, with mean annual temperature in the range of 17 to 20 degree Celsius. The altitude of this woreda ranges from 1500 to 1768 meters above sea level. Mixed farming is the main livelihood system. In particular, agriculture is the main source of livelihood for the Woreda. The main crops include both perennial crops (e.g. coffee and enset), cereals and root crops. The major agriculture and food security related challenges include degradation of natural resources, frequent droughts and increasing population.

Based on the 2007 Census conducted by the CSA, this woreda has a total population of 99,233, of whom 50,603 are men and 48,630 women; 1,059 or 1.07% of its population are urban dwellers.

**d. Harari Woreda**

Harari region includes a single woreda (population 183,000) and the project focus is on Burka and Sofi kebeles. The area is predominantly arid and thus a kolla livestock zone, although it includes mixed agriculture production including crops.

The main climate stress arises from water stress, and droughts in particular, which affect health, crops and livestock, although it is sometimes affected by flooding and soil erosion. Human vector and water borne disease is an acute problem and there is also a major problem from livestock and crop pests and disease. Major climate induced disasters have been recorded over the past five years, and many households have reported damages from droughts and crop damage. The risk profile highlights the need for livelihood diversification and improved water access.

It is also a food deficit area reflecting small landholdings and erratic rainfall. The effects of climate are compounded by wider stressors, including inadequate access to

drinking water, shortage of pasture and water for livestock, deforestation, lack of access to infrastructure (roads and energy), a shortage of health facilities and access, and low educational attainment levels, all of which increase the vulnerability of the community. 13% of households are female-headed. Household surveys reveal a large proportion have participated in food/cash for work programmes and received food aid, and there is evidence of low recovery levels after shocks.

**e. Wahil Woreda, Dire Dawa region**

The Wahil Woreda is situated in the East and comprises of semi-arid highlands and moist highlands, an agro-pastoral livelihood zone. The main climate stress arises from moisture and water stress, and periodic failures of the rains and droughts in particular, which affect health, crops and livestock. However, flooding also occurs and there is soil erosion due to the terrain. Crop and livestock pests and disease also are a problem. Major climate induced disasters have been recorded in all kebeles over the past five years, and around two thirds of households have reported crop or livestock damage. The risk profile highlights the need for improved water access, as well as soil and water conservation.

The area is a food deficit area, reflecting the low income levels (with the main source of income being agriculture), small land holdings and erratic rains. The effects of climate are compounded by wider stressors, including deforestation, inadequate access to water, poor agriculture management and information, lack of access to infrastructure (roads and energy), a shortage of health facilities and access, and low educational attainment levels, all of which increase the vulnerability of the community. 16% of households are female-headed. Household surveys reveal a large proportion have participated in food/cash for work programmes and received food aid, and there is evidence of low recovery levels after shocks.

**f. Raya Azebo Woreda**

The Raya Azebo Woreda (population 136,000) lies in the kola agro-ecology and plains, and undulating mountains dominate the terrain. It is one of the more productive of the areas considered, and produces enough food (from crops and livestock), due to fertile soils and relatively high rainfall. Nonetheless, periodic drought is a recurring problem, and there have been reports of increase in rainfall variability in all kebeles over the last decade and this has affected the livelihoods of much of the population. Flooding and soil erosion are also issues due to the terrain. Human, crop and livestock pests and disease are also a problem.

The effects of climate are compounded by wider stressors, including deforestation, low transport access, although access to agricultural extension support is reasonable. However, household surveys reveal a large proportion (55%) do not have adequate assets to cope with major shocks: and in recent droughts, many have participated in food/cash for work programmes. The risk profile highlights the main problem is around water and recommends the construction of dams, water harvesting, and development of water sources are among the major interventions required, as well as enhanced natural resource conservation activities.

### **g. Tenta Woreda**

The Tenta Woreda is comprised of mixed livelihood zones (population 166,000). It includes some livestock and some crop production zones.

The main climate stress arises from droughts, which affect health, crops and livestock, although it is sometimes affected by flooding, landslides and soil erosion. Human disease is a problem and there is also a major problem from livestock and crop pests and disease. Major climate induced disasters have been recorded over the past five years, and many households have reported damages from droughts, crop and livestock disease. The risk profile highlights the need for soil and water conservation as well as irrigation.

The effects of climate are compounded by wider stressors, including inadequate access to drinking water, shortage of pasture and water for livestock, deforestation, lack of access to infrastructure (roads and electricity), all of which increase the vulnerability of the community. 15% of households are female-headed. Many parts of the woreda suffer from chronic food insecurity, due to the erratic rains and small land holdings, as well as due to degraded land. Household surveys reveal participation in food/cash for work programmes and food aid.

A summary of the Woredas and Kebeles is presented below.

**Table 3. Summary of Woreda Characteristics.**

<b>Woreda selected</b>	<b>Population</b>	<b>Agro-climatic / Livelihoods</b>	<b>Key risks</b>
Adama	155,349	Mixed	Drought, insufficient rainfall
Alelitu	53,414	Highland mixed livelihood system	Drought, insufficient rainfall
Lok Abaya	116,000	lowland/highland mixed	Drought, insufficient rainfall
Harerri (Erer)	183,000	Predominantly Arid kola livestock zone, although mixed production	Drought, though also flooding and soil erosion
Wahil cluster		Semi-arid highlands and moist highlands agro-pastoral livelihood zone	Drought, though also flooding and soil erosion
Raya Azobo	136,000	Kola agro-ecology and plains, and undulating mountains	Drought, though also flooding and soil erosion
Tenta	166,000	Mixed	Drought, though also flooding and soil erosion

**Table 4. Summary of Kebele Characteristics.**

Region	Woreda	Selected kebeles
Oromia	Adama	<ul style="list-style-type: none"> <li>▪ Bati Bora (HH=336 male headed; 90 female headed; Total population; M=996, F=902; Land size=1025 ha)</li> <li>▪ Bati Germama (Male headed HH=580; Female Headed=187; Total population; M=1911, F=1554)</li> <li>▪ Land size (1818 ha)</li> </ul>
	Aleltu	<ul style="list-style-type: none"> <li>▪ Sadeni Segeda - Both Sexes 1,923; Male: 993; Female: 930; Number of HH:386</li> <li>▪ Tulu Fati - Both Sexes: 3,852; Male:1,885; Female: 1,967; Number of HH: 782.</li> </ul>
SNNP	Lock Abaya	<ul style="list-style-type: none"> <li>▪ Desse (Population: M=1533, F=1544; Total=3075; HH=612 (Male headed=569; Female headed=43); Area=1000 ha)</li> <li>▪ Sodo-Simita (Population: M=3515; F=3300; Total=6816; HH=888 (male headed=812, Female headed=76); Area=1188 ha)</li> </ul>
Harari	Sofi	<ul style="list-style-type: none"> <li>▪ Burka (Population: M=2539; F=2643; Total=5182; HH=1329; Area=1806 ha)</li> <li>▪ Sofi kebele (Population: M=3766; F=3919; Total=7685; HH=1971; Area=1342 ha)</li> </ul>
Dirdawa	Wayil Kilaster	<ul style="list-style-type: none"> <li>▪ Wahil (population: 5,835 persons or 1269 hhs)</li> <li>▪ Legeodagudunfet (population: 7253; 1543)</li> </ul>
Tigray	Raya Azebo	<ul style="list-style-type: none"> <li>▪ Hawelt (7840 ha; population: 12439 persons)</li> <li>▪ Mechare (15600 ha; 11,011 persons)</li> </ul>
Amhara	Tenta	<ul style="list-style-type: none"> <li>▪ 03 Abamella (Population: M=2103; F=2024; Total=4127 Area=7543.75ha)</li> <li>▪ 09 Tena Population; M=1879; F=1858; Total 3737; Area=3616.5 ha)</li> </ul>

## 2 PROJECT OBJECTIVES

*List the main objectives of the project/programme.*

### 2.1 Project Objectives

The overall objective of the project is to increase resilience to recurrent droughts in 7 agro-ecological landscapes in Ethiopia. An integrated water, agriculture and natural resource management approach will be adopted to achieve two outcomes:

1. increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes; and
2. enhanced and secure access to potable water supply, and small-scale irrigation in drought affected areas.

The objective and outcomes of the project are aligned with the Results Framework of the Adaptation Fund and directly contribute to four fund level outcomes:

**Outcome 2** - Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses;

**Outcome 3** - Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level;

**Outcome 5** - Increased ecosystem resilience in response to climate change and variability-induced stress; and

**Outcome 6** - Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.

The project targets highly vulnerable smallholder farmers in fourteen Kebeles. The communities residing in these Kebeles dwell on subsistence rain fed agriculture and have low capacity to cope with the high levels of annual and inter-annual rainfall variability. This directly affects their productivity and access to potable water, which increases the burden on women and girls. The programme aims to address the main barriers contributing to high vulnerability to climate change (outlined in the Theory of Change in figure 12) which include a high dependence on rain fed subsistence agriculture, absence of potable water in the vicinity, degraded land and limited adaptive capacity.

## 2.2 Project Components and Financing

*Fill in the table presenting the relationships among project components, activities, expected concrete outputs, and the corresponding budgets. If necessary, please refer to the attached instructions for a detailed description of each term.*

The five components of the project are outlined below:

Component 1: Awareness and ownership of adaptation planning at the local level;

Component 2: Water security;

Component 3. Climate smart agriculture – land – water - forest integration;

Component 4: Climate resilient livelihood diversification; and

Component 5. Capacity building, monitoring, evaluation and learning.

The project components relate to the main Outcomes and the Outputs identified to achieve them (see table below). The proposed Outcomes contribute to the overall objective, while the Outputs are the deliverables of the project produced by its proposed activities.

**Table 5. Project Outputs and Outcomes**

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
<b>1. Awareness and ownership of adaptation planning at the local level</b>	Output 1.1: Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels Output 1.2: Climate smart development plans developed Output 1.3: Climate resilient water plans developed Output 1.4: Climate smart agriculture and land – water - forest integration plans developed Output 1.5: Climate resilient livelihood plans developed	Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	367,510

<b>2. Water security</b>	Output 2.1: Potable water supply increased in target areas Output 2.2: Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change	Enhanced and secure access to potable water supply, and small-scale irrigation in drought affected areas	4,736,667
<b>3. Climate smart agriculture – land – water - forest integration</b>	Output 3.1: Climate smart agriculture implemented at the farm level Output 3.2. Integrated watershed management approach used to restore and protect degraded watersheds	Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	1,590,227
<b>4. Climate resilient livelihood diversification</b>	Output 4.1: Improved knowledge, understanding and awareness of livelihood opportunities Output 4.2: Increased capacity of target households to participate in climate resilient, market-oriented enterprises	Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	527,371
<b>5. Capacity building, monitoring, evaluation and learning</b>	Output 5.1: Increased capacity and knowledge transfer Output 5.2: Project results monitored and evaluated and lessons captured Output 5.3: Results and lessons communicated to key stakeholders and mainstreamed in local planning processes	Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	1,799,288
6. Project/Programme Execution cost			465,404
7. Total Project/Programme Cost			9,486,468
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			501,443
<b>Amount of Financing Requested</b>			<b>9,987,910</b>

## 2.3 Project Calendar

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

Milestones	Expected Dates
Start of Programme Implementation	01/04/2017
Mid-term Review (if planned)	01/10/2018
Project/Programme Closing (6 months after completion)	01/10/2020
Terminal Evaluation	31/4/2020

## PART II: PROJECT JUSTIFICATION

### A. Project components

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

The project design is based on mapping the factors critical to addressing key vulnerabilities and building sustainable resilience. The barriers identified justify the need for an integrated approach to bring about the desired paradigm shift and build resilience to climate change.

Generation of climate related information is currently being implemented in the country through other national programs. Specifically, conventional hydro-meteorological stations are found in many parts of the country, and the target communities will benefit from adjacent existing hydro-met stations. In addition, the Ethiopian Government has planned to cover all Woredas with automatic weather stations (AWS) in the coming five years. This will generate localized climate information across these target communities, which will enable early decisions to be climate informed. Furthermore, this project will provide training to the communities on how to use the information received from AWS stations and national programs to productive purposes. Development Agents (DA) that will receive training from this program will relay the required information to the farmers and livestock producers.

The principal aim of the project is to positively reverse the downward poverty spiral that the community is locked into and increase their productivity in a changing climate. To this end, this project will first increase the productivity of the smallholder farmers by decoupling their dependence from rainfall through the provision of various technological and infrastructure inputs. Cognizant of the fact that an economically empowered community is more resilient to climate change and also contributes more to the national economy, the project will support the communities to diversify their livelihood through various schemes and increase their net HH income as well as ensure HH's are Food Secure. This project will also work on managing the natural resources that provide natural climate resilience.

It is expected that the sum of all results from on-going initiatives including this project will increase the forest coverage, soil nutrition and ground water recharge at the Woreda level, which will directly address climate risks and help increase the productivity of the community. The sustainability of multifaceted initiatives to be implemented by this project is dependent on the surrounding environment and also capacity. Capacity will be built at all levels of governance, stakeholders and the community; and stronger linkages established to existing Development Agents and Micro Finance Institutions at the Woreda level.

The project has a strong element of learning, expanding the monitoring and evaluation components to provide capacity building at various levels, and to move towards local climate smart planning. In this regard, the proposed project will provide key information for the subsequently scale-up for Ethiopia's medium to long-term adaptation objectives. Lessons learned and best practices from program implementation in the different agro-zones will be used to learn and then scale-up in other areas

The project incorporates a number of key concepts and innovations, derived from the latest thinking in the literature on adaptation<sup>55</sup>. First it targets low regret adaptation options that address the impacts of current climate variability and build resilience to future climate change. Second, it adopts an iterative climate risk management framework, as recommended in the IPCC WGII report<sup>56</sup>. This leads to a focus on portfolios of options, i.e. on combining options to deliver higher effectiveness and efficiency, combined with a strong monitoring and learning component to improve future decisions as well as providing benefits today. Third, it advances the concepts of mainstreaming, looking at the existing local plans and considers how climate smart planning could be integrated into these to build resilience.

Finally, the interventions proposed within this proposal are aligned to the Intended Nationally Determined Contribution (INDC) and focus on increasing resilience and reducing vulnerability of livelihoods. Indeed, the activities included in this proposal are specifically listed in Ethiopia's INDC. Overall the project will increase climate resilience through local level adaptation, while aligning and contributing to the implementation of national policies and programmes in line with the national CRGE strategy.

The project is structured around five innovative components that combine to deliver these objectives:

- Component 1: Awareness and ownership of adaptation planning at the local level;
- Component 2: Water security;
- Component 3. Climate smart agriculture – land – water - forest integration;
- Component 4: Climate resilient livelihood diversification; and
- Component 5. Capacity building, monitoring, evaluation and learning.

These components will be applied in each of the project locations, but with a strong initial element to bring together this information as part of an integrated assessment. This is complemented with a strong focus on learning throughout the project, to take the lessons from the information produced from the project across the sites.

A description of the options is included below. The rationale for the choice of these options (the prioritisation) is set out in section C. They are also based on the results of the stakeholder consultation with the project communities.

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55 Watkiss and Cimato (2016). The economics of adaptation and climate-resilient development: lessons from projects for key adaptation challenges. Working Paper from London School of Economics.

<http://www.lse.ac.uk/GranthamInstitute/publication/the-economics-of-adaptation-and-climate-resilient-development-lessons-from-projects-for-key-adaptation-challenges/>

56 IPCC (Intergovernmental Panel on Climate Change) (2014), Climate Change 2014: Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge and New York.

## **Component 1: Awareness and ownership of adaptation planning at the local level**

Historically, climate relevant projects have typically been implemented as stand-alone projects at the local level in Ethiopia, and have had a strong sector orientation, e.g. a water project, a soil conservation project, etc. While this has implemented interventions on the ground, there has been a lack of integration across the land, water, energy and livelihood areas, which misses the opportunities for important synergies and fails to capture key trade-offs.

The focus on stand-alone projects is also separate from the existing development agenda and the woreda level planning process. This has meant that opportunities to build resilience into existing plans and activities, i.e. climate smart planning, have not been fully realized. This project aims to address both these issues through the use of integrated climate smart planning, with multi-sectoral approaches, which are grounded in local community development plans and views. The project also adopts the use of community development officers ('community animators') to embed the project within the local community, i.e. within each Kebele. To advance this, a series of activities are proposed that build the integrated planning approach.

The project starts with an initial phase of climate smart planning, effectively the finalisation of the design and feasibility activities. These would take place during the first 3 – 4 months of the project and would embed the project within local development plans and governance, deliver the integrated approach across the team and co-develop the final activities with the local communities. As part of the initial project design and planning stage, the project will also conduct a gender analysis to identify the gender dimensions<sup>57</sup> of vulnerability to climate change and develop strategies to address specific gender inequalities, risks and opportunities. This will ensure that there is a good understanding of gender roles, and a disaggregation of women's and men's specific interests, needs, and priorities as they relate to the project to maximise the effective participation of women in project interventions.

### ***Output 1.1: Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels***

The project involves a greater degree of collaboration than typical projects, thus it is important to start the project with an orientation session to advance the project objectives. It is also important for the project to have a common set of information that is shared across the project areas, to enhance consistency and efficiency. The project will therefore start with a series of orientation activities.

- Activity 1.1.1. National level meeting between CRGE facility and PMU, the four implementing Ministries, the Regions and the technical team, convened by the CRGE Facility AND to collect meteorological data (temperature and precipitation) for the relevant project sites (national consultant)
- Activity 1.1.2. Meeting /consultation with PMU, the Regions, Woreda and Kebele representatives, and local Ministry representatives, convened by the CRGE Facility AND collate future climate projections for the relevant areas, capturing uncertainty (national consultant).

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<sup>57</sup> roles, preferences, needs, knowledge and capacities of men and women, boys and girls

- Activity 1.1.3. National desk based study.

This task will ensure all actors have a common understanding of the study. The national desk based study will ensure all teams are working with a common set of data, collecting meteorological data (temperature and precipitation) for the relevant project sites and collating future climate projections for Ethiopia, capturing uncertainty through the analysis of multi-model ensemble data.

### ***Output 1.2: Climate smart development plan designed***

There is also a need to build climate resilience into local development planning, and this is particularly important given the localised nature of climate risks and vulnerability. A focus only on a national, sector and regional planning would omit some of the most vulnerable groups, and also not fully capture the preferences or responses of affected communities.

Related to this, a key issue of the recent focus on climate mainstreaming is to look to embed climate smart (or resilience) activities within existing plans and policies. At the national level, the Government of Ethiopia has mainstreamed the CRGE strategy in its second five year Growth and Transformation Plan (GTP-II). At the regional level, Ethiopia is mainstreaming through the CRGE initiative and the plans of the regions. In light of this, the proposal is aligned with the existing national development plan in the context of adaptation.

However, there are also local development plans (Woreda level plans) in Ethiopia although mainstreaming of CRGE strategy has not yet been advanced due to limited capacity. A key innovation of this project is to investigate how to translate national CRGE plans and mainstreaming into local development planning. This activity therefore will compile the information and look for opportunities for integrated climate planning and seek to make existing Woreda plans climate smart and aligned with the national GTP II targets. Working with each of the 7 woredas of the project, this activity will look to advance integrated planning. The study would include the following activities:

- Activity 1.2.1. Undertake review of existing local development plans in view of climate smart development;
- Activity 1.2.2. Conduct a gender analysis to identify the gender dimensions<sup>58</sup> of vulnerability to climate change and develop strategies to address specific gender inequalities, risks and opportunities;
- Activity 1.2.3. Develop locally appropriate climate mainstreaming framework (tools, methodologies and guideline); and
- Activity 1.2.4. Conduct consultation with the Regions, woredas and communities on climate smart planning.

Following this, the study will focus down on developing integrated plans in the key project component areas 4).

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<sup>58</sup> roles, preferences, needs, knowledge and capacities of men and women, boys and girls

### ***Output 1.3: Climate resilient water plans developed***

These activities will also include more detailed planning in specific areas. The first of these will be to develop climate resilient planning for water management. This will adopt an integrated climate-smart water planning approach, which will include some local analysis in each of the Kabeles (i.e. for each of the 14 project sites). The project will ensure that water planning interventions are gender responsive and consider the specific needs of men and women as well as the gendered inequalities that may prevent women from benefitting from these interventions. The study would include the following activities:

- Activity 1.3.1. Collect regional and local watershed information for the relevant project areas. This will include hydro- meteorological data, groundwater information (using the hydrological and feasibility study to provide an indicative analysis of water availability (supply-side) ;
- Activity 1.3.2. Estimate current water demand (household level and for other users) and future for the relevant project area, considering existing plans including a gender-sensitive analysis of estimates (crucial given women's responsibility for collecting water);
- Activity 1.3.3. Undertake a scoping assessment on the potential influence of climate change on future water demand and develop a comprehensive ground water management plan;
- Activity 1.3.4. Provide an indicative water balance (supply-demand) in each Kebele with consideration of current and future risks;
- Activity 1.3.5. Develop an integrated water - agriculture-land-ecosystem and livelihood diversification plans with the communities;

These activities will feed into the geophysical studies to determine site characteristics (see component 2). These activities will help to build climate resilience, by augmenting the usual hydrological studies with a targeted climate change orientated assessment. It will also be linked to awareness raising, monitoring and learning components – outlined later – to ensure this approach is developed and implemented with the local community, and that sufficient learning elements are put in place to ensure the results of activities can help inform future planning.

### ***Output 1.4. Climate smart agriculture and land – water - forest integration plans developed***

The project will develop climate resilient and gender responsive planning for integrated agricultural development, with a focus on climate smart agriculture and integrated land-water-ecosystem management. The main activities would include:

- Activity 1.4.1. Collate information on agricultural production, management systems, practices and the specific needs of women and men in the project areas, including a gender disaggregated analysis;
- Activity 1.4.2. Undertake survey and analysis of local soil and water conditions and environmental degradation;
- Activity 1.4.3. Assess the potential portfolio of options for each relevant adaptation-planning zone, considering elevation, precipitation and soil suitability;

- Activity 1.4.4. Develop locally appropriate and gender sensitive tools and methodologies to support the uptake of climate smart agriculture and watershed rehabilitation by women and men.

The outputs of this task will subsequently feed into the studies for implementation (see component 3).

### ***Output 1.5: Climate resilient livelihood plans developed***

The project will develop livelihood diversification options for women and men, supporting a transition from highly vulnerable existing livelihoods towards alternatives that are climate resilient (and also low carbon, in line with national CRGE objectives). This will include:

- Activity 1.5.1. Collate existing socio economic data for the project area and conduct vulnerability assessment of the community, including a gender disaggregated analysis of the specific needs of men and women;
- Activity 1.5.2. Consult with women and men in the local community to understand the available livelihood options and foster innovative adaptive practices;
- Activity 1.5.3. Sensitize the community and discuss current climate variability and future climate change risks to better understand vulnerability;
- Activity 1.5.4. Identify appropriate options and develop a comprehensive gender responsive livelihood diversification plan for the project area.

The outputs of this task will subsequently feed into the studies for implementation (see component 4).

## **Component 2: Water security**

This component is designed to enhance climate smart integrated water management, providing a reliable source of clean water for potable supply (reducing current health impacts) and reducing the climate risks from rain-fed subsistence agriculture, but doing so in a way that introduces green technologies and ensures long-term climate resilience, i.e. consistent with Ethiopia's national CRGE strategy and INDC which seeks to build resilience and at the same time reduce GHG emissions.

One of the factors that makes the case of rural water supply is the strong gender interest that is involved. In most of the rural areas women are the primary water carriers and users. Women spend many hours each day fetching water. Often the sources of their water are unprotected springs, or polluted streams or ponds. By virtue of their household functions they use more of this polluted water than the rest of the household, and therefore they are most vulnerable to water-borne diseases. Thus the development of safe water supply is of particular benefit to women. Access to safe water within easy reach of the household means women can save time, labour and effort, which they can employ in more productive agricultural and income generating activities. Safe water will also mean they and their children will be protected from many water related diseases.

A key element of this proposal is that it will build on the climate smart planning from component 1, which considers the supply, demand, and supply-demand balance, now and with future climate change. Women will therefore be involved in the planning,

operation and maintenance of rural water supply schemes as well as have a say in the choice of technology, and will be trained in the basic maintenance of the technologies involved.

It also has chosen interventions to enhance water availability for potable water supply and irrigation for agriculture and livestock that are climate resilient, i.e. which will perform well under future climate change as well as current climate variability.

For potable water supply (output 2.1), the project is therefore adopting the use of groundwater rather than surface water, as the latter suffers from interruption of supply and in extreme cases, could increase risks (e.g. in drought years).

For irrigation (output 2.2) the choice of supply has been made very carefully, as irrigation – when there is insufficient rainfall and droughts - can actually increase risks (especially under future drier climate scenarios).

Similar to all the activities under the various components in this project, implementation of activities to achieve the outputs stated below, will be conducted through existing government structures. The MoWIE at the federal level and the bureau of water and irrigation and its assigned experts at woreda and kebele levels will be the key actors in implementing this component. The bureaus have the mandate and responsibility to be fully engaged and follow up water related developments including monitoring of groundwater. This project will introduce groundwater monitoring equipment's in the intervention kebeles along with the required technical trainings to enable stakeholders collect data for further analysis and use. Key information on the effect of climate change on the country's water resources and interventions required to address possible risks are expected to be gained through this monitoring process.

Working through the existing government bodies will sustain the various outputs beyond the project life-time. The trained manpower will not only have the responsibility to monitor groundwater and other related activities but also to maintain the various infrastructures developed through the project. Therefore, beyond supporting implementation of innovative and climate smart activities, this project will have a key role in strengthening institutional capacity to scale up and continue implementation of actions that will address the country's CRGE strategy.

### ***Output 2.1. Potable water supply increased in target areas***

In all of the Kebeles selected, the majority of the population accesses drinking water from ponds and rivers, and thus almost all households use water without any treatment. Collection of water is usually assigned to children, especially girls, and this reduces schooling as it usually takes three to four hours each day. Furthermore, the existing water supplies are often sources of water borne disease. Rainfall variability – and the potential increase from climate change – exacerbates these impacts by drying up local water sources, often forcing families to rely on sources further away or to access contaminated water sources. All of the target Kebeles experience periodic droughts, and water supply is a critical issue during these times.

This activity therefore seeks to enhance potable water for vulnerable households from supply sources that are resilient to current climate shocks and future climate change trends. The proposal is for a climate resilient and green potable well to be installed in each of the 14 Kebeles. The activities include:

- Activity 2.1.1. Conduct hydrogeological and geophysical studies and provide support in terms of appropriate satellite imagery analysis in the project areas;
- Activity 2.1.2. Prepare design and tender document with hydrogeological assessment, design all works and yield tests, drawings, Bill of Quantities, Specifications, Conditions of Contract and all other required documentation prepared;
- Activity 2.1.3. Drill shallow wells
- Activity 2.1.4. Construct elevated water reservoirs and water points;
- Activity 2.1.5. Install solar powered submersible water pump systems, Solar PVs, including all electro-mechanical works procured; and
- Activity 2.1.6. Install pump and electro-mechanical fixtures.

There are also two further related activities here, which are presented in component 5. First, to install ground water monitoring equipment and second, to use the equipment's for water management planning and establish the nexus between ground water and climate change. The equipment's will also be instrumental to introduce awareness raising on ground water availability, efficient use of it (reuse, recycling, rationing) and linkages to the eco-system so that supplies are able to withstand fluctuations in recharge. The Ground Water Monitoring devices<sup>59</sup> "Divers" will be key in effectively managing available ground water resources, and will be part of the existing array of divers that have been installed and managed by the MoWIE in the various regions of Ethiopia. Divers continuously capture both qualitative and quantitative data over a set period of time before they are pulled out of the borehole and reprogrammed again. The data captured includes physical data vis water temperature, dynamic water level, the analysis of which will result in understanding safe aquifer yield and maximum ground water abstraction rate, that will be used by planners to efficiently use and manage ground water systems. Analysis of the chemical data serves to understand the presence of contaminants, fluctuations in major ion concentrations that could pose health hazard to the community as well as toxicity levels for the farms. Triangulation of data collected from the divers helps to understand the cone of depression, that is directly tied to placing a safe drilling distance between wells – to avoid over abstraction and or irreversible aquifer porosity closure, and hydrologic ground water flow within the district which can help to demark safe boundaries for safe water supply. Long-term, systematic measurements of water levels provide essential data needed to evaluate changes in the resource over time, to develop ground-water models and forecast trends, and to design, implement, and monitor the effectiveness of ground-water management and protection programs. The divers are also instrumental in predicting on coming drought, so that early disaster risk preparedness and prevention can take place which is fundamentally important to increase the resilience of the community. Federal and Regional level experts will be trained (Component 5) on data acquisition and analysis, the synthesis of which will contribute to the planners as well as the academia. The divers will contribute to the GoE efforts in addressing most pressing water policy adjustments through a

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59 Ground Water Monitoring using Smart Sensors, 2005, Drought Notification Systems in Texas Monitors Groundwater Levels to Trigger Action, InSitu, 2012

stronger integration of groundwater development and land use planning, selection of target areas for intense groundwater development and combining groundwater development – both recharge, retention and reuse - with other water resource programs, such as the watershed programs, drainage and flood plain development.

***Output 2.2: Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change***

The communities within the kebeles targeted are all dependent on rain-fed subsistence agriculture for their livelihoods and are highly vulnerable to climate change. Following from 1.2 above, all of the target Woredas selected suffer from periodic droughts, and this affects crop production, livestock and food security, and often results in the sale of key assets (notably livestock), which reduces longer-term income. There is therefore a need for a multi-purpose approach for providing water for irrigation, mixed use and pastoral areas. The Climate Resilient (CR) strategy for Water and Energy has outlined accelerated irrigation plans using off-grid energy as one of eleven strategic priorities. This activity therefore seeks to provide water to enhance resilience to climate shocks. The proposal is for a well to be installed in each of the 14 Kebeles where surface water is not available. The activities involved include:

- Activity 2.2.1. Prepare detailed design and tender document including, construction of hand-dug wells, shallow wells, check dams (sand dams), canals and irrigation systems;
- Activity 2.2.2. Construct hand dug wells or check dams (water harvesting for rivers);
- Activity 2.2.3. Install hand pumps;
- Activity 2.2.4. Upgrade traditional irrigation schemes for hand dug wells;
- Activity 2.2.5. Complete sets of solar powered surface water pump systems, Solar PVs, including all electro-mechanical works;
- Activity 2.2.6. Construct sand dams;
- Activity 2.2.7. Construct Irrigation canals;
- Activity 2.2.8. Install pump and electro-mechanical fixtures;
- Activity 2.2.9. Install systems procured.

A key consideration here has been to choose investments that are climate resilient and sustainable, on both the supply and demand side.

First, the choice of water supply for irrigation has been made carefully to ensure it is climate smart. This includes the use of check dams (sand dams)<sup>60</sup> which are a water

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<sup>60</sup> A sand dam is a partially subsurface dam build in a dry and sandy riverbed onto bedrock or an impermeable layer. It is constructed across a river to block the subsurface flow of water, hence creating a reservoir upstream of the dam within the riverbed material. Sand storage dams have several important advantages over surface water dams, resulting in a higher water quality and improved environmental conditions. These offer: Protection against evaporation; Reduction of contamination (by livestock and other animals); Filtration of water flowing through the riverbed sand (disinfection); Unsuitable for breeding of

harvesting technique that provide the means to address rainfall variability using natural collection systems. In cases where these are not possible, the study is looking at the use of groundwater wells with solar surface water pump systems to avoid reliance on surface water.

Second, the proposal has included enhanced efficiency (e.g. drip irrigation, water management advice) to reduce water use.

This approach therefore provides much greater climate resilience than more traditional irrigation methods.

### **Component 3. Climate smart agriculture – land – water - forest integration**

This component focuses on climate smart agriculture, as a low regret adaptation option that helps reduce current climate vulnerability and builds resilience to future climate change. This component is key to integrate existing favorable national policies to address the linked challenges of climate change, unsustainable agriculture, degraded environment, water and food insecurity. A key innovation, however, is the introduction of CSA from the perspective of land-water-forest integrated solutions. This component thus focuses on managing the watershed through physical and biological interventions such as bunds, trenches, terraces and afforestation and reforestation practices. It also targets afforestation/reforestation, aligning to the national CRGE strategy and the priority in this area. This includes planting diversified native trees in marginal lands, establishing shelter belts (native tree species, etc.), patches of forests (in unproductive lands), rehabilitation of degraded land and prevention of sheet erosion, micro-basin, trenches and inter farm ponds. By doing so, the component supports the sustainability of agricultural practices (soil and water), controls runoff, reduces environmental degradation, and creates an enabling environment for soil, nutrient recycling, organic matter, increased ground water recharge and water retention in the target Woredas. Furthermore, this component will support farmers to manage their resources in ways which protect ecosystems and reduce agriculture's contribution to climate change.

#### ***Output 3.1: Climate smart agriculture implemented at the farm level***

All of the Woredas in the proposed project have reported high agriculture losses in recent years, as a result of climate variability and shocks, and in many cases this has necessitated humanitarian responses due to food insecurity. Addressing the risks of current and future climate change to agriculture is therefore critical in enhancing resilience. A key focus of the CRGE Strategy, which is also include within the INDC is to do this through the application of soil and water conservation – a major component of climate smart agriculture. There are a set of options at the farm level that can improve soil water infiltration and holding capacity, as well as nutrient supply and soil biodiversity. This reduces current risks from rainfall variability and soil erosion, increases soil organic matter and soil fertility, increasing productivity, and

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mosquitoes (malaria) and other insects; Inexpensive structures with a high level of community involvement; Mitigation of climate change by creating water security; Support disaster resilience by creating a buffer against drought and enabling vulnerable people to improve food production.

reduces greenhouse gas emissions. Increasing productivity is expected to directly influence the food security of the community. The activities include:

- Activity 3.1.1. Construct physical moisture and soil conservation structures;
- Activity 3.1.2. Build biological conservation measures (e.g. grass strips, hedges, planting of physical measures);
- Activity 3.1.3. Treat farmland gully;
- Activity 3.1.4. Introduce and enhance agroforestry scattered trees on farmlands (Faiherbia, Croton, etc.) and introduce homestead multi-storey agro-forestry and soil conservation measures with targeted women and men headed households;
- Activity 3.1.5. Establish wind breaks/shelter belts and farm boundaries.

There is also a set of capacity building measures for this component, detailed in component 5.

### ***Output 3.2. Integrated watershed management approach used to restore and protect degraded watersheds***

While tackling climate risks at the farm level is important, it is also important to consider the adaptation response from a community and watershed level. This recognizes that implementing options at the farm level alone will often not be sufficient to build the necessary resilience. Indeed, it is often the case that degradation of watersheds and deforestation actually increases the risks at the farm level and thus an integrated approach that seeks to implement climate smart activities at the community level is needed. The project will ensure the equitable participation of women and men from vulnerable households in these activities. This activity implements such measures, including:

- Activity 3.2.1. Improve upper watershed management with soil and water conservation measures;
- Activity 3.2.2. Implement physical and biological soil and water conservation (SWC) measures;
- Activity 3.2.3. Implement rangeland management practices in pastoral watershed areas;
- Activity 3.2.4. Undertake area closures for enhanced natural regeneration;
- Activity 3.2.5. Undertake upper watershed gully treatment;
- Activity 3.2.6. Establish new or upgrade existing nurseries seed, produce seedlings, and plant;
- Activity 3.2.7. Afforest/reforest degrade forestland;
- Activity 3.2.8. Purchase and produce seedling tree and grass seeds;
- Activity 3.2.9. Establish community based systems for grazing land, efficient feed conservation management systems and practicing stall-feeding.

There are also important capacity building activities for this component, discussed in component 5.

#### **Component 4 Climate resilient livelihood diversification**

As identified in the risk profiles, all of the target Woredas are vulnerable to climate shocks, and in most cases, three-quarters of households have experienced major impacts over the past five years. This is compounded by the low resilience of households, in terms of their ability to withstand and subsequently bounce back after these events. These pressures are likely to increase under the changing climate and this component seeks to help communities that have high climate vulnerability to diversify their current production methods and indeed their overall livelihoods. A key innovation is that this diversification is targeted towards activities that are consistent with climate resilient (but also green economy) activities, so they align with the priorities identified in the national CRGE strategy, and link bottom-up community diversification with national policy. In looking at these diversification strategies, a key innovation will be to take a value chain approach, to ensure investment in production is complemented with efforts to ensure access to markets etc.

In addition to engaging Development Agents (DA), activities under this component will be conducted in close collaboration with woreda cooperative promotion offices and the kebele level promoter. The kebele level promoter will be closely involved starting from the identification of households that will become part of the livelihood support project, and facilitate the process to establish the various enterprises. Once the groups are legally registered, the promoter has the responsibility to follow up the enterprises at the kebele level and provide technical back stopping through regular visits and cross checking of documents to ensure proper business transactions and bookkeeping. The woreda cooperative office, on the other hand, has the mandate to evaluate feasibility of businesses and give legal recognition to enterprises. It will also provide the required technical and legal support through trainings, annual audits, facilitation of linkages with MFIs and market chains, and provision of support to any administrative and marketing challenges.

The role of this project will be catalyzing the establishment of cooperatives and providing much needed financial resource to obtain inputs for businesses and mobilizing human resources to carry out the activities. The project will also further strengthen the already existing structure through trainings on and exposures to up-to-date climate smart livelihood options and tools such as gender mainstreaming that will further ensure sustainability of activities on the ground. The role of the private sector will also be closely analyzed through this project in the establishment of linkages of market chains with community based organizations. Establishment of strong linkages between the private sector and community based organizations are expected to provide a strong base in sustaining local businesses.

Therefore, even though the enterprises are expected to sustain themselves, where issues such as market failure or technical and legal challenges are faced by the communities, there is a support system in place that is strengthened through this project. Strengthening these existing structures through the project is crucial as they are the means to ensure lessons are shared within and among different sectors and regions to support further scaling up of good practices.

This component is therefore designed to help farmers boost their incomes (also included in Component 3 – increased agricultural productivity) by also supporting business growth and the development of stronger value chains. By promoting diversification and the growth of cash crops, vegetables and fruits, amongst others, this component will encourage agricultural intensification, increased food security and income. By promoting new methods and technologies, this component will also help to build resilience against future changes in weather patterns.

***Output 4.1: Improved knowledge, understanding and awareness of livelihood opportunities***

The CRGE strategy identified the high climate vulnerability (droughts) and high GHG emissions from the existing reliance on cattle, and recommended a strategy towards poultry as more resilient. The Climate Resilient (CR) Strategy for Agriculture also identified the potential for greater resilience through diversification into other agricultural products (e.g. land fruits and vegetables), as well as goats and sheep, for strengthening resilience. The role of beekeeping was also identified in both strategies as a critical activity for ecosystem based livelihoods: in this case around forests. These components are included for all Kebeles, though the mix of diversification strategies will be chosen based on the study feasibility results from a livelihoods analysis. A market assessment and value chain analysis will also be carried out to research and understand new markets before there is investment into new enterprises. The analysis will inform investment and support for existing and new value chains and ensure that only the most viable sectors are developed. The project will also conduct a review and an analysis of access to finance to better understand existing market barriers and opportunities within the financial services market in each area. Activities will include:

- Activity 4.1.1. Identify and assess local livelihood opportunities through livelihoods analysis
- Activity 4.1.2. Conduct market assessment and value chain analysis of options identified under 4.1.1
- Activity 4.1.3. Conduct analysis of existing access to finance for target households
- Activity 4.1.4. Build awareness of livelihood options among target households

***Output 4.2: Increased capacity of target households to participate in market-oriented enterprises***

This output will enhance the capacity of target households to diversify into market-oriented enterprises based on the market research and centred on key value chains assessed to have potential for further development (under output 4.1). The focus is not on grants but on the facilitation of alternative viable livelihood activities, and increasing access to existing local micro-finance institutions. Complementing these activities, a study will be carried out (nationally with consideration of the Woredas involved) to provide support for market systems value chain development. These activities will be targeted at the most vulnerable households living in the target areas. The project will also facilitate institutional linkages between savings groups, MFIs and Banks to increase financial inclusion among target households. Linkages between

established or formalized financial institutions and less formal or informal financial systems will enhance access to finance for target households.

In essence, this component of the project will facilitate the extension of credit to targeted beneficiaries to enable them purchase inputs needed to diversify their livelihood and be more resilient to the shocks of climate change. In particular, women will be encouraged to benefit from credit and saving services, where this project will organize them into social cooperatives or joint venture associations. Credit will be made available to the beneficiaries through Micro-Finance Institutions (MFI) and cooperatives via a revolving fund scheme. The Revolving Loan Fund (RLF) is a USD 500 Million scheme that is established by the Government of Ethiopia in all Woredas as Credit and Saving Institutions, the fund of which is managed by the Commercial Bank of Ethiopia (CBE). In Ethiopia, the RLF was established with the objective of expanding job creation and wealth generation opportunities to the youth as a primary instrument in mobilizing communities out of poverty, decreasing dependence on aid and increase the innovative capacity of the community. The RLF is managed by the Commercial Bank of Ethiopia and has been inscribed within the GTP as one of the elements amongst others to reach a middle income country by 2025. To this end, this component will create awareness and give training to the farmers to ensure that they are applying for the pertinent credit type; advisory services on credit access, use and saving mobilization will be given to the beneficiaries through the DAs, and skill enhancement training that focuses on livelihood diversification as per the experience, knowledge and preference of that particular beneficiary. Targeted interventions include improved seeds, fruits and vegetable, modern farm beehives, improved hybrid of sheep, goat, poultry, forage and other non-farm inputs. This component will facilitate for the communities to fulfill the requirements needed to be eligible to have access to credit from the MFIs and subsequently support them to repay their loans and apply for an additional and increased amount of loan. Procedurally, it is required that;

- Beneficiaries, mainly women and youth will be organized in groups along selected activities as identified in the project and the Kebele in context;
- Existing cooperatives and or cooperatives that will be established through this project will be supported to align and fulfill the requirements of the CBE regulations and have access to credit from the financial institutions (e.g. the Development Bank of Ethiopia (DBE), MFIs, and credit cooperatives); and
- Beneficiaries that have been created through this project will be supported to fulfill the requirements outlined by the cooperatives as per the regulations of the CBE and MFIs to have access to credit (in kind).

Catalytic inputs (improved seeds, fruits and vegetable, modern farm beehives, improved hybrid of sheep, goat, poultry, forage and other non-farm inputs) shall be provided to the cooperatives that shall be established by this project to serve as an asset so to facilitate access to credit from the financial institutions. Following existing practices, cooperatives and project staff will be involved in the management of revolving fund to ensure the successful implementation of the scheme. Once the revolving fund is initiated and targeted beneficiaries pay back loan, they will be eligible to apply for an increased credit portfolio. This will directly lead to the

cooperatives having an increased asset base making the case to include increased number of beneficiaries in the revolving fund scheme. Activities will include:

- Activity 4.2.1. Facilitate collective and individual access to support services for women and men to increase producer output and productivity;
- Activity 4.2.2. Facilitate better access to market information and develop gender responsive interventions to address market failures.
- Activity 4.2.3. Purchase and adopt lowland fruit trees and promote vegetable production in vulnerable households;
- Activity 4.2.4. Provide women and men from target households with relevant fruit management tools;
- Activity 4.2.5. Facilitate improved access to forage seed supplies;
- Activity 4.2.6. Promote small chicken-egg hatcheries with women and men from target households;
- Activity 4.2.7. Facilitate access to financial services and products especially credit for women and men to support the purchase and dissemination of hatchery units, modern farm beehives, seed of bee flora, veils, gloves, smokers, boots, brushes, chisels and sprayers for beekeepers; and
- Activity 4.2.8. Introduce improved varieties of sheep and goat and along with distribution of imported (more resilient) sheep and goat breeds to target households.

Implementation of the alternative livelihood diversification component will be done by supporting farmers and pastoralists in various ways to implement improved practices that will help them diversify their livelihood, increase their income and improve resilience. The project will provide skill training on business development and management, marketing and financial literacy. It will provide support to farmers to access credit services from micro-finance institutions, saving and credit associations, cooperatives to buy improved crop varieties and animal breeds.

Based on existing strategies of the government and using relevant institutions, the project will under take the following activities, which will contribute towards solving problems related to limited access to credit, low repayment rates and diversion of loans to unintended purposes:

- Voucher system/lending in-kind (to reduce diversion of loans to unintended purposes);
- Supervision by relevant government bodies, cooperatives, staff of financial institutions (credit administrators) and project staff (to reduce possibility of resale);
- Training of borrowers (on financial literacy, focusing on credit and savings);
- Training of borrowers on benefits and uses of the various inputs such as technologies that reduce risk and improve yield/incomes;
- Revolving fund to be used to facilitate access to credit (which will be complemented by resources from financing institutions such as commercial banks and micro-finance institutions); and
- Group lending to reduce risk of low repayment rate as the group will be jointly accountable (this will help share the risk and encourage group monitoring).

These arrangements and mechanisms will create incentives for MFIs to lend as the various activities (such as group lending, training, supervision) will reduce the risk of repayment and diversion of loans to unintended purposes.

Farmers and pastoralists will also have an incentive to borrow and repay because of;

- The additional support provided to them in terms of training both on financial literacy and related issues as well as
- On technical issues associated with the specific activities which include technologies that reduce risk and improve incomes; and
- Benefits from other aspects of the project could also be linked to performance of repayment of loans as an incentive for farmers and pastoralists to repay on time.

The project will provide the inputs such as drought tolerant crops, fruits and vegetable seeds; improved livestock breeds through a revolving fund scheme. This in effect will attract beneficiaries to access credit from the facilities as well as encourage the communities saving culture, which will be a leverage to access additional credit.

In addition to project staff and consultants to be employed to facilitate project implementation, Development Agents (DAs) will be actively involved to support the farmers and pastoralists. The DAs will be fundamentally important to ensure that the farmers and pastoralists receive pertinent information on how to diversify their livelihood by giving them an array of options such as growing of fruits and vegetables, animal production including poultry, and apiculture practices. This is in addition to activities in other components of the project that involve crop production and natural resource management. Training will also be delivered to the DAs in addition to the farmers and other stakeholders. This is also another key aspect to ensure that the project will be supported after it is terminated to ensure sustainability.

Existing farmer training centers (FTCs) will be used to showcase the outcome of all proposed livelihood diversification packages and increased linkages will be facilitated between the farmers, DAs, and relevant government offices by this project through the assigned Project Woreda Based Facilitators. Since the project includes two Kebeles per Woreda, these Facilitators will have a focused work in increasing the linkages amongst others. This specific component will benefit over 8000 households (assuming one individual per household) from the different aspects of training and other support provided on livelihood diversification.

Große-Rüschkamp (2015)<sup>61</sup> calculated the gross margin in livelihood diversification activities based on a recent survey of households that participated in projects similar to the proposed project for financing by the Adaptation Fund and those that did not participate but are similar in other respects. The following are results of comparison of gross margin and income relevant for livelihood diversification showing expected changes in income due to involvement in the various activities:

1. Sheep rearing (gross margin of USD 23.3 per sheep for non-participants compared with USD 61.81 per sheep for participants; the net gain is USD 38.48 per sheep)
2. Eggs per hen ranged from 129 to 149 for non-participants compared with 171-327 for participants (the difference ranges from 42 to 178)

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61 Große-Rüschkamp, Alois 2015. Productivity and Income Contribution of Family Farm Enterprises: A Gross Margin Study on the Sustainable Land Management Program—Summary Report, GIZ, Addis Ababa.

3. For milk production gross margin increased by USD 39.4 per cow (an improvement of 89%)
4. For a person that switches from 3 traditional hives to the same number of modern hives, the incremental income will be in the range of USD 429 per year (4.5 times more than the income from 3 traditional beehives)
5. For potato production a 71% increment in yield is reported for participants compared with non-participants

Große-Rüschkamp (2015) also shows effects of participation by a household in different aspects of such projects on household income. For a smallholder involved in animal production enterprises (with 3 sheep, 5 hens, fattening a bull once a year and keeps a dairy cow of the local race) the additional income is estimated at USD 277.7.

### **Component 5 Capacity building, monitoring, evaluation and learning**

This component will focus on capacity building, and implementing the monitoring and evaluation components. A particularly innovative additional element will be to add an explicit learning component to the project. Finally, it will bring together the lessons from the overall project and communicate these. There are three main outputs:

- Capacity building and knowledge transfer;
- M&E including Iterative learning (adaptive management); and
- Communication and outreach.

The CRGE Facility will handle the implementation of the M&E and communications outputs by directly involving its staff members and also through the consultants that will be recruited to conduct the required assessments and research.

There is no doubt that the ambitious national strategy to become a middle income country with zero net GHG emission will require a lot of support both financially and technically. It is for this purpose the Government of Ethiopia has established the CRGE facility as a catalytic platform to continue attracting funds. The facility is currently engaged in discussion with various international funds and bilateral agreements that are keen to support the CRGE initiatives. Therefore, the Government is confident that it will continue to attract funds through the facility to achieve its target while at the same time direct national funds to activities that will enable it to efficiently and effectively achieve its targets. The project also encourages the engagement of the private sector in promoting climate smart businesses in close working relationship with community based organizations.

Lessons captured through this and other similar projects will therefore be carefully analyzed and communicated to ensure incoming funds will be allocated to scale up those activities that have resulted in high impact in increasing adaptive capacities and resilience of vulnerable communities. The facility will ensure the replication of lessons to different part of the country as indicated, below, under the learning and knowledge management section.

### ***Output 5.1. Building capacity and knowledge transfer***

A critical factor in the success of the project will be the local ownership, which will be enhanced by capacity building and knowledge transfer. This component therefore undertakes a series of activities to ensure the effectiveness, efficiency and sustainability of the components above. It also has strong linkages with component 1, with support to communities to better understand climate risks and develop adaptation strategies. Activities will include:

- Activity 5.1.1. Provide training to women and men from target households on the operation and maintenance of Solar PVs and hand pumps at the community and Woreda level;
- Activity 5.1.2 Provide training for local planners and community representatives (50% women) on the integrated community plan;
- Activity 5.1.3 Conduct training at the community and Woreda level on implementing the climate smart development plan;
- Activity 5.1.4 Conduct training at the federal and regional level on data extraction and re-programming of ground water monitoring devices;
- Activity 5.1.5 Increase the skills of women and men at the community level to diversify and strengthen livelihood strategies and outcomes;
- Activity 5.1.6 Build awareness of the results framework of the adaptation programme, the CRGE facility M&E system as well as safeguards frame work, and operations manual, and
- Activity 5.1.7 Enhance institutional capacity at various levels in terms of logistics and office furniture and equipment.

### ***Output 5.2: Project results monitored and evaluated and lessons captured***

Monitoring and evaluation (M&E) of climate change adaptation faces a number of challenges, due to the influence of baseline climate variability, other underlying factors (growth, other drivers) and behavioural and cognitive factors. These challenges have been considered in designing the project's M&E methodology. The monitoring and reporting system of the proposed project will follow guidance from the AF, ensuring that the project maintains a simple and interactive monitoring system allowing for regular reporting and learning at all levels and the disaggregation of data by socio-economic group and gender.

The GTP II, which is the overarching national mid-term development plan for the period 2016-2020, has targeted to link all nationally registered drought monitoring and early warning systems (including the Ground water monitoring Devices that will be installed by this project) with the national Food Security Disaster Prevention and Preparedness (FSDPP) systems. It has given priorities to agro-meteorological (for agriculture sub-sector); hydro-meteorological (for water sub-sector) and bio-meteorological (for health and disease control sub sectors) forecasting and early

warning services<sup>62</sup>. The federal government has planned to cover all Woredas (including the project target woredas) with automatic weather stations (AWS) in the coming five years, which eventually will improve generation of localized climate data across the target communities and improve decisions. To this end, the Federal Government has already installed AWS in the Woredas of Raya and Adama, which are also target woredas for this project. The data collected from the WMD will essentially contain both physical and chemical ground water data. This information when looped with the above ground surface hydro and met data will yield valuable analysis on the interaction of the local hydrologic cycle and how this is influenced by weather and climate change. One of the primary indicators of an oncoming drought is the dynamic level of the ground water and concentration of main Anion and Cations within the ground water system which are directly monitored by the WMD. This project will provide much required data from the ground water monitoring devices to the national efforts on drought monitoring as it will draw a better understanding of the local context. It will provide training to the communities on how to use the information received from AWS stations and national programs to productive purposes. Development Agents that will receive training. As part of the monitoring and evaluation, the project will closely follow up how local level information and skills will be integrated to inform the community and local level decision makers for improved disaster risk prevention and control. These ultimately will feed into the national level early warning techniques as reflected in the GTP-II.

The overall M&E activities for the project will be managed by the PMU in the CRGE facility, with a dedicated staff member on M&E. The activities will include:

- Activity 5.2.1. Develop gender disaggregated baselines for the project;
- Activity 5.2.2. Document regular progress reports and results;
- Activity 5.2.3. Undertake annual Performance Assessment or review workshops;
- Activity 5.2.4. Organize Joint Monitoring Missions;
- Activity 5.2.5. Conduct Mid-term and End of Project Evaluations; and
- Activity 5.2.6. Conduct annual financial Audits.

However, an additional feature of this proposal is the adoption of an iterative climate risk management approach, extending from M&E to MEL (monitoring, evaluation and learning) by including defined components for learning, over and above M&E activities. These are designed to provide information to improve future decisions (and scale-up of activities) as part of an iterative adaptation pathway.

This includes a strong focus on enhanced physical monitoring of climate risks and trends, which is considered alongside the project M&E and performance above. It also seeks to provide information that will inform future planning and decisions (adaptive management).

The project therefore includes a number of explicit learning components to maximise the lessons from the study.

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<sup>62</sup> See National Planning Commission (2015), Growth and Transformation Plan II (GTP II) (2015/16-2019/20), Volume I: Main Text.

The activities include:

- Activity 5.2.7. Analysis of meteorological station data and satellite data for the period of the study for the relevant sites to build up climate risk parameters and trends;
- Activity 5.2.8. Ground water monitoring devices will be inserted in one well per each kebele targeted for this project. The data that will be captured from the devices will be used for analytical and research purposes to understand the ground water – climate linkages and provide information for future scale-up
- Activity 5.2.9. Analysis of the outcomes of the climate smart agriculture pilots (productivity) against the climate information, with analysis of the resilience of the measures and also their performance across years (variability) as well as an analysis of differentiated outcomes for women and men headed households;
- Activity 5.2.10. Performance of the resilient livelihoods among women and men headed households against annual climate variability.

A key issue here will be to look at the specific weather and climate information for the different Kebeles and look how this compares to effectiveness of the components, e.g. to identify the differences in performance of water measures, variation in the performance of climate smart agriculture, and the variations in resilient livelihoods. This will allow a mapping of the agro-climatic suitability of different components in the project, which will be critical in learning what works best in each type of area, for the key climate risks.

The data gathered will be used by decision makers for planning and monitoring purposes on the effective use of the natural resource to enhance adaptive management at the Woreda and regional level. The information will be fed back to the project learning events. It will also be used to help inform subsequent Woreda level planning, ensuring the lessons from the project is fed into the next planning period.

### ***Output 5.3: Results and lessons communicated to key stakeholders and mainstreamed in local planning processes***

The final activity relates to the communication and outreach from the project. The activities will include:

- Activity 5.3.1. Develop a gender sensitive communication strategy and knowledge management strategy.
- Activity 5.3.2. Periodic update of the CRGE Registry website on project status.
- Activity 5.3.3. Conduct awareness and education campaigns using a variety of communication tools (participatory videos, learning platforms, posters, media, training and workshops/seminars, business roundtables);
- Activity 5.3.4. Organize workshops and learning events (mid term and final)
- Activity 5.3.5. Synthesize, prepare, document and disseminate communication and knowledge materials, examples will include case studies and policy briefs.

These activities will be promoted by the CRGE facility and its communication section.

## Inter-linkages amongst Project Components – Theory of Change

Drought has been and is the dominant climate change-induced shock that frequently affects rural populations and one of the major causes of the widespread poverty and food and nutrition insecurity in Ethiopia. Given the multi-faceted effects of climate change-induced hazards on rural livelihoods and environment, a holistic and coordinated approach is required to build community capacity that will enhance: (i) absorptive capacity (e.g. coping strategies, risk management and savings); (ii) adaptive capacity (e.g. use of assets, attitudes/motivation, livelihood diversification and human capital); and (iii) transformative capacity (e.g. governance mechanisms, policies/regulations, infrastructure, community networks and formal safety nets)<sup>63</sup>. In light of this, the project has been designed in the context of climate-smart and landscape-based framework combining improved water access and resource rehabilitation and management with livelihood diversification to enable the most vulnerable communities to adapt to frequent drought and anticipated increases in variability from climate change. The project addresses this with a holistic set of integrated activities, which aim at achieving adaptation impacts, and are fully embedded in Ethiopia's national climate change strategy as well as the medium-term development plan (e.g. Growth and Transformation Plan (GTP-II, 2015/16-2019/20).

Building resilience is often multi-dimensional and encompasses economic (e.g. assets), technological (e.g. improved agricultural/livestock practices, low-emission technologies, etc.), environmental (e.g. resources, natural resource management practices), infrastructure-related (e.g. roads, information system, etc.), safety nets and institutional (e.g. governance/leadership, regulation, etc.) resources and capabilities. In the process, asset levels and quality can be improved and/or repaired, landscapes can be restored, soils improved, new skills and abilities can be learned, and new markets can be developed or accessed. Taken together, these changes result in improved livelihood security and income. This combination will develop increased resilience, with climate-vulnerable communities building resilience during and after the project is finished, having become able to adapt not only to the current but also future climate risks, breaking the drought cycle. For this to happen, inter-linking pathways of change are required.

The project features cross-cutting and achieves strong synergies among the components and enables local and national administrations to strengthen their capabilities to mainstream climate change considerations in rural planning. Specifically, the project activities will affect the livelihoods of those households vulnerable to climate change-induced hazards. The interventions will enhance agricultural productivity. Soil and water conservation structures will protect fields from excess water and retain water for dry spells. Afforestation/reforestation activities will prevent surface runoff and soil erosion and increase ground water recharge and soil nutrient content. Beneficiary households may also acquire techniques and skills, while working on the project activities, which they can then use on their own fields after the project. The project is expected to enable rural households to increase investments, translating into higher yields, assets and incomes in good seasons, and therefore

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<sup>63</sup> Food Security Information Network (FSIN), Resilience Measurement Principles:

[http://www.fsincop.net/fileadmin/user\\_upload/fsin/docs/resources/1\\_FSIN\\_29jan\\_WEB\\_medium%20res.pdf](http://www.fsincop.net/fileadmin/user_upload/fsin/docs/resources/1_FSIN_29jan_WEB_medium%20res.pdf).

improved food security and livelihoods in all seasons. In addition, the proposed components and activities are fully aligned with the relevant Sustainable Development Goals (SDGs) which have been designed with an attempt to reflect some of the synergies and links between different goal areas through relevant targets<sup>64</sup>.

The project envisages a mix of interventions within a particular resilience context which need to be tailored to a given agro-ecological zone to build sustainable and resilient rural livelihoods. The Theory of Change portrays how a combination of interventions will yield maximum benefits in terms of transforming the target communities through a low-carbon and/or climate-resilient development pathways. In the rural context, providing improved agricultural technologies and services (e.g. seeds, irrigation facilities, improved animal breeds) alone does not lead to rural resilience building as it also requires interventions in other areas such as integrated water management, market support, training, etc. In agrarian communities, sustainable agricultural production and food security require supply of irrigation water, which in turn depends on appropriate technologies for productive use of water for both crop production and livestock use. Note that sustainable water supply for both irrigation and potable also requires effective management of water resources through soil and water conservation, afforestation and reforestation, restoration of degraded lands, etc. Soil and water conservation activities through tree planting, terracing, water harvesting, area closure and bamboo planting will support the recovery of degraded land and help provide greater resilience to climate variability. Improving natural resource management (reforestation and rangeland management) will reduce soil erosion and support agricultural productivity. These activities ensures stability of water resources. Improving natural resource management (reforestation and rangeland management) will reduce soil erosion and support agricultural productivity.

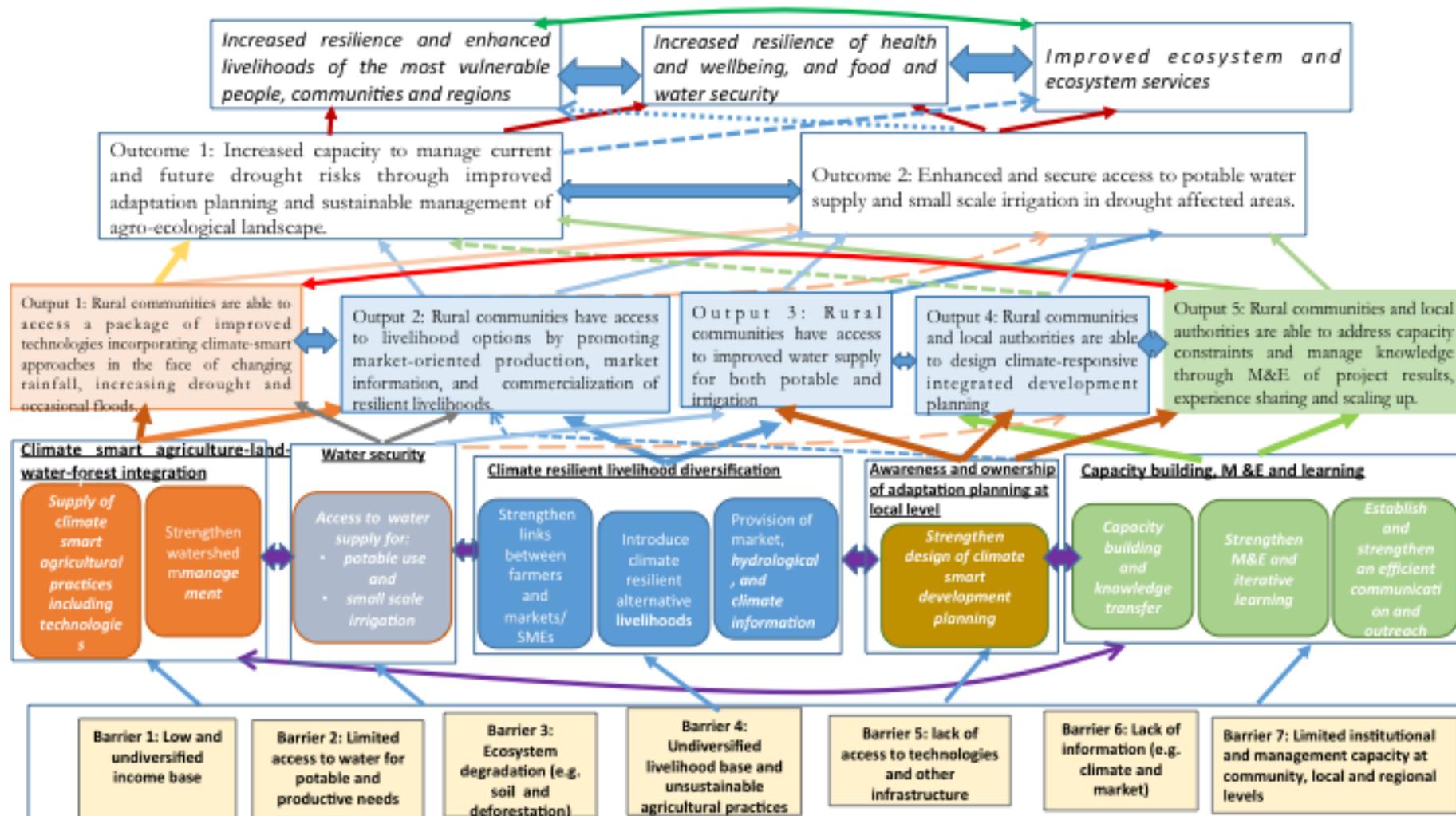
All the above interventions need to be supported by capacity building within local and national government to plan and address rural development in a holistic way, giving high priority to climate change impacts and other environmental concerns. The project will develop integrated planning that will enable the formulation of climate-responsive approaches tailored to circumstances. A vital aspect of the participatory approach will be the involvement of women in all aspects of the project. Thus creating a conducive environment will ensure long-term sustainability of project components. Overall, no single interventions will help break the cycle of drought; rather a combination of interventions matters to build residence capacity in a sustainable way.

The long-term sustainability of the project requires diversification of productive activities within the context of the natural habitat and ecosystems of the direct and indirect beneficiaries. The “capacity building, monitoring and evaluation and learning” components of the project has been designed to increase cross-linkages amongst the various thematic activities and develop appropriate governance mechanisms to reinforce project sustainability and also extract valuable lessons that will help replicate the project in other Woredas.

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<sup>64</sup> The various of activities of the project contributes directly to relevant SDGs and targets such as goals 1, 2, 6, 8, 12, 13 and 15.

Figure 12 – Theory of Change



## **B. Economic, social and environmental benefits**

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

### **Economic and social benefits**

The project will provide increased resilience and enhanced livelihoods of highly vulnerable people and communities, and improved health and well-being, food and water security, and enhanced ecosystems and ecosystem services.

The main beneficiaries of the project are the 65,360 individuals located in the 7 woredas where project interventions take place. The Project is designed to target the most vulnerable communities and households.

The introduction of climate resilient integrated water management will have major environmental and social benefits, by increasing access to clean potable water for communities and reducing health impacts directly (clean water). The provision of irrigation supplies will enhance agriculture productivity and local incomes, thus providing high economic benefits, as well as greater food security/health. The reduced risk of extreme events, notably droughts, will provide health, social and economic benefits.

The introduction of climate resilient and green livelihood diversification provides high economic benefits (income), but because of the shift to more sustainable activities, it also provides high environmental benefits, as well as reducing greenhouse gas emissions. It will increase the food and nutrition security of the most vulnerable, increasing the production and productivity of food and promote additional food sources (horticultural produces, poultry food and dairy products) that are rich in nutrition, as well as sources of income.

Further information on the economic benefits of the project are included in section C. The evidence provided indicates the project will deliver a high benefit to cost ratio, and high net positive economic benefits.

### **Environmental benefits**

The introduction of climate smart agricultural portfolios at the farm level will improve soil water infiltration and holding capacity, as well as nutrient supply and soil biodiversity. They thus have large environmental benefits. These reduce current climate related risks from rainfall variability and soil erosion, increase soil organic matter and soil fertility, increasing productivity, and reduce emissions by reducing soil emissions or preventing more emission intensive activities. These contrast with more traditional measures to increase productivity, such as fertiliser use or increased irrigation, which lead to environmental impacts (externalities). These climate smart options are win-win for food security (economic benefits), as well as providing mitigation (reduced GHG) benefits.

The focus on integrated water management at community and watershed level, with afforestation and land rehabilitation will provide ecosystem service benefits, notably through their role in watershed management, helping to reduce run-off, flooding and soil erosion, regulating water flow and reducing siltation. They obviously have major environmental benefits including from carbon sequestration and reduced greenhouse gas emissions. These have economic as well as environmental benefits, the latter

including biodiversity benefits. They also provide additional livelihood income streams through the provision of wood, fuel-wood and non-timber forest products (NTFPs) helping to enhance household total cash income. Many communities also use forests as a form of adaptation during climate stress such as droughts, due the income diversification and food.

### **Impact on gender**

The project interventions contribute to narrowing gender inequality by improving opportunities for women to participate in planning, implementation, monitoring and evaluation of the project with clearly identified gender sensitive indicators, building the resilience of female-headed households and women in male headed households; and alleviating conditions that have adverse consequences on the health and safety of women in the project area. It also recognises that women are not only victims of climate change but have a strong body of knowledge and lived expertise that can be tapped in planning for climate change adaptation and mitigation strategies. By specifically targeting vulnerable women in all of its interventions, the project will build their resilience, expand economic opportunities and reduce poverty as well as harness their knowledge and understanding of local conditions in developing adaptation interventions.

To address specific gender inequalities that could impede women's participation in project interventions, the initial climate resilient planning stage of the project will include a detailed gender analysis to identify the gender dimensions<sup>65</sup> of vulnerability to climate change as well as analysing and addressing gender inequalities, risks and opportunities in the context of the planned responses to climate change.

This analysis will ensure that there is a good understanding of gender roles, and a disaggregation of women's and men's specific interests, needs, and priorities as they relate to the project. It will also ensure that adaptation efforts are gender responsive and consider the gendered inequalities that may exacerbate the impacts of climate change for poor women in particular, or prevent women from benefitting from adaptation interventions.

The project will assign a Gender Coordinator to work with men and women, and boys and girls to promote equal access to decision-making processes in adaptation planning and to ensure that the project targeting and capacity building processes are transparent and accessible. S(he) will also train women's organisations to take part in and lead these processes. The project will also ensure gender equity in its recruitment process so that women are fairly represented in the project management structure and at the community level with a 50% quota for women recruited as Local Community Promoters.

The project will establish a monitoring and evaluation framework that disaggregates participation in adaptation planning and implementation by gender and measures the impacts of climatic variations as well as adaptation on gender relations. The project will ensure the use of sex-disaggregated indicators in its monitoring to track the delivery of gender equality outcomes in all of its interventions.

The proposal has also considered the following potential gender inequality risks and assessed measures to mitigate against these.

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<sup>65</sup> roles, preferences, needs, knowledge and capacities of men and women, boys and girls

**Table 6. Anticipated risks and mitigation measures**

Risk	Level	Mitigation
<ul style="list-style-type: none"> <li>• Socially accepted cultural beliefs, norms and attitudes that define women as subordinate to men undermine a woman's right to access credit, income generating activities, new technology and limited women's productivity.</li> <li>• Women are usually considered as victims of climate change instead of being agents for climate change adaptation interventions.</li> <li>• Decisions about natural resource management are frequently community led but women's lack of assertiveness, their under-representation in community leadership and reluctance to publically voice their views means that their issues and concerns may not be considered.</li> <li>• Illiteracy and low levels of education prevent women from accessing and using facilities such as extension services and inputs but it also hinders their participation in community forums and group leadership. Participation in extension programmes is higher among female-headed households but married women, young women and youths are mostly omitted..</li> <li>• The knowledge and skills to generate sex-disaggregated data , conduct gender mainstreaming and gender budgeting are not widespread across all vertical and horizontal implementation entities.</li> <li>• Most data on women focuses on female-headed households who represent only 26 per cent of all households in Ethiopia; married women who are farmers/ pastorlaist are entirely overlooked with the result that little is known about their roles, participation in household and collective decision-making or access to resources and services.</li> <li>• Women endure a disproportionate burden from domestic chores and child care which could preclude their effective participation in project activities.</li> <li>• Women have limited access to credit facilities to support enterprise development.</li> </ul>	<p>Medium</p>	<ul style="list-style-type: none"> <li>• Changes to discriminatory attitudes, customs and beliefs will be achieved through training and awareness with both women and men. The project will ensure gender equity in its recruitment process.</li> <li>• Planning, budgeting and monitoring mechanisms will be gender responsive.</li> <li>• The project will actively support women to assume leadership roles in adaptation planning and implementation. Women will be involved in Kebele committees including water committee and a 50/50 membership rule will be promoted.</li> <li>• Women farmers are not a homogenous entity and need to be considered according to household composition, livelihood type and age as well as other critical socio-economic variables. The project will use, where possible, tools that support the participation of women in community forums.</li> <li>• The project will engage a Gender Coordinator with specialist knowledge in these areas to build capacity of the implementing entities.</li> <li>• The project will conduct a gender analysis in the initial planning stages to improve understanding of the roles of married women in household decision making across the different project areas.</li> <li>• The project will promote the establishment of community child-care facilities to assist women with child-care responsibilities. The establishment of improved water supply in target areas will reduce the time women and girls spend fetching water.</li> <li>• The project will provide rolling funds</li> </ul>

•		to improve women's access to credit and enhance their productivity.
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The project will decrease social inequality by improving the wealth and income of the most vulnerable, mostly the poor and women. As an example, it will reduce the need for women travelling long distances for fetching water and collecting fuel-wood. Increases in household income and improved access to water sources will also result in improved access to education particularly for girls and children.

A description of how the project will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund, is set out in section E.

### c. Cost-effectiveness of the proposed project

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

#### Approach to ensuring cost-effectiveness

The project has been designed to maximise the benefits to beneficiaries, identifying the most cost-effective options for the anticipated risks.

The project interventions have been prioritised using an approach that has considered the cost-effectiveness and cost-benefit analysis (including wider economic, social and environmental consequences) of options. A number of principles have been adopted in this approach, which is centred on recent literature.

**Low regret options.** The analysis focuses on low-regret adaptation options<sup>66</sup> that address the impacts of current climate variability and build resilience to future climate change. These interventions were recommended as a priority for early adaptation in the IPCC 5<sup>th</sup> Assessment Report.

**Non-technical and community based adaptation.** There is a strong focus on including non-technical (soft) as well as technical (hard) adaptation options. This reflects recent thinking<sup>67</sup> that has identified a shift away from infrastructure based hard resilience to preparedness and systemic interventions, with a much greater focus on soft resilience. Community based interventions are also highlighted in studies that analyse costs and benefits of current and future adaptation to current variability and natural weather disasters in developing countries<sup>68</sup> and have been found to be cost-effective than hard measures.

**Iterative risk management.** This identified the timing and sequencing of adaptation, building pathways that capture the transition from current climate variability to future climate change, and addressing the problem of uncertainty through options that seek to introduce flexibility, robustness, within a strong framework of learning.

66 DFID (UK Department for International Development) (2014), Early Value-for-Money Adaptation: Delivering VfM Adaptation using Iterative Frameworks and Low-Regret Options, DFID, London. Available at [www.vfmadaptation.com](http://www.vfmadaptation.com)

67 Mechler, R (2012). Reviewing the economic efficiency of disaster risk management Review Commissioned by Foresight Project: Reducing Risks of Future Disasters. Priorities for Decision Makers. IIASA, 2012.

68 Moench, M., Hochrainer, S., Mechler, R., Kull, D., Linnerooth-Bayer, J., Patnaik, U., Singh, G. (2009). Rethinking the costs and benefits of disaster risk reduction under changing climate conditions. In: Moench, M., Fajber, E., Dixit, A., Caspari, E., Pokhrel, A. (Eds.), Catalyzing Climate and Disaster Resilience. ISET-Nepal, Kathmandu, Nepal.

To assess the most cost-effective options, the proposal has built on available literature reviews on the benefit to cost ratios of adaptation interventions, using both the international literature and field studies from Ethiopia. The starting set of options were selected from the international literature from a recent inventory and appraisal of 1000 studies on the economics of adaptation, compiled as part of the ECONADAPT project and recently summarised in an OECD publication<sup>69</sup>. These were then filtered down using an analysis of the most relevant and cost-effective options for Ethiopia, drawing on international and local studies.

**Alignment with national Climate Resilient (CR) strategies.** Ethiopia has already undertaken detailed agriculture and water resilience strategies and these have prioritised options, using extensive technical and economic analysis as well as stakeholder analysis. The options in this proposal are taken from these strategies. They include:

- Small-scale irrigation;
- Climate smart agriculture (soil and water conservation);
- Livelihood diversification;
- Rangeland rehabilitation / management;
- Ecosystem based adaptation (conservation and rehabilitation);

#### **Analysis of possible options to address climate risks**

Climate change is projected to disrupt global and regional water cycles, though these changes will not be uniform, with differences between wet and dry seasons and between season, arising from changes in precipitation, temperature and evapo-transpiration, etc.<sup>70</sup> Climate change is likely to intensify a number of potential risks, including more frequent and/or intense floods, and changes to the water supply-demand balance including potential water deficits and water quality.

The analysis has identified a number of promising low regret options for address water management and droughts, drawing on the existing risk reduction and water management literature. This literature indicates that the costs and benefits of investing in climate risk management (with low regret options) led to an average benefit to cost ratio of around 4 to 1<sup>71</sup>. Options with high benefit to cost ratios include enhanced information and monitoring, integrated planning, and ecosystem based adaptation, all of which have been included in the proposal.

The identification of options has been complemented with Ethiopian studies. This is important as the costs and benefits – and thus effectiveness of options – can vary widely depending on the specifics of the situation, reflecting the large differences among regions, agro-ecological conditions, pre-project land uses, household asset endowments, and the differences in cost structure of the various types of activities considered.

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69 OECD (2015). 'Climate Change Risks and Adaptation: Linking Policy and Economics'. OECD Publishing, Paris.

70 IPCC, 2014: Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1-32.

71 ECONADAPT (2015). "The Costs and Benefits of Adaptation, results from the ECONADAPT Project, ECONADAPT consortium, <http://econadapt.eu/>.

### **Options for adaptation for water availability: components 1 and 2**

Adaptation to reduced water availability is often presented in terms of management of supply and demand. Supply measures include increasing water storage capacity (e.g. dam construction, increase dam storage capacity, off-stream reservoirs for agriculture, rainwater harvesting, etc.); water distribution improvement (e.g. leakage control); grey-water reuse and rainwater harvesting; desalination; water transfer; aquifer storage and recovery; and water shipment. Demand measures involve increasing water use efficiency and reducing water consumption through changed sectoral activity (e.g. relocation of industrial production), behavioural changes, and technological uptake (e.g. water efficient appliances). The use of ecosystem-based measures to deal with droughts, flood risks and worsening water quality for example through river restoration, rural land use change and establishing or protecting wetlands has also been proposed.

The project proposal has reviewed the potential options for the project and also the consistency with national climate policies in the CRGE. This has led to the prioritisation of the proposed measures.

For drinking water, there is an existing Government priority to accelerate universal access to safe drinking water. Water supply investments have high health benefits, and these interventions are highly cost-effective, as shown in recent reviews<sup>72</sup>. The project proposal addresses this through the groundwater wells. While this involves higher marginal costs than surface water, the project surveys have identified that there is insufficient or unreliable surface water in these areas, and thus to provide safe and resilient sources of drinking water, groundwater wells are needed. However, to ensure these are sustainable, these will be powered by solar pumps, reducing the environmental impacts of greenhouse gas emissions and air pollution that would arise from diesel pumps. In a recent ex-ante evaluation of a WaSH project supported by the World Bank in Ethiopia<sup>73</sup>, results of economic analyses showed that the economic internal rate of return (EIRR) was 24%, which shows the high benefits of the projects.

There are also benefits from investing in water supply for local irrigation. Small-scale irrigation has been recommended in both the CR Water Strategy and the CR Agriculture strategy in Ethiopia, and there is evidence from studies in Ethiopia on the high benefits of these schemes. Small scale irrigation is well established, a proven good practice with adequate experts available. Irrigation helps to reduce the impacts of climatic variability and many forms of drought (although not all, depending on the source of the water supply). Low-cost irrigation systems allow continuity of production, especially in the dry season, reduce variability of output, and enable a shift to higher-value crops. Studies that have looked at the cost-effectiveness of these schemes (in Ethiopia) report high benefit to cost ratios, of 3 to 5:174, showing

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72 Hunt (2011) Policy Interventions to Address Health Impacts Associated with Air Pollution, Unsafe Water Supply and Sanitation and Hazardous Chemicals. Environment Working Paper No. 35. OECD.

73 World Bank, (2014). Water, Sanitation and Hygiene project: Project Appraisal Document.

74 Bekele Yeshitela, NataTadesse and Bheemalingswara Konka, (2012), Preliminary Study on the Impact of Water Quality and Irrigation Practices on Soil Salinity and Crop Production, Gergera Watershed, Atsbi-Wonberta, Tigray, Northern Ethiopia, MEJS, Volume 4 (1):29-46.

Hagos, F., Makombe, G., Namara, R. E., Awulachew, S. B., (2009), Importance of irrigated agriculture to the Ethiopian economy: Capturing the direct net benefits of irrigation. Colombo, Sri Lanka: International Water Management Institute. 37p. (IWMI Research Report 128).

benefits far exceed costs. Small-scale irrigation practices used in the Lake Tana basin<sup>75</sup> increased mean annual household income by ETB 3353 per year, a 27% increase over income for non-irrigating households.

To complement these, the proposal has a focus on climate smart planning, recognising that the international adaptation literature<sup>76</sup> has identified the following low regret options.

- Options that build capacity and increase knowledge and awareness, such as enhanced climate and hydrological monitoring and information and integrated water management options<sup>77</sup>. These concepts are therefore included in component 1 on climate smart planning.
- In addition, recent studies have highlighted that for water saving,<sup>78</sup> the integration of cross-sectoral effects significantly alters the ranking of the adaptation measures, i.e. when a wider multi-user and functionality approach is taken, different options emerge as priorities. This means that results depend on whether analysis is undertaken from a cross-sectoral perspective, as is the case in this proposal.
- Options that help deal with current climate variability, such as water efficiency measures<sup>79</sup>, leakage reduction and efficient water use<sup>80</sup>. A recent study found for example that conversion from flood to drip irrigation could improve farm-level net returns and public net benefits. In addition, NPV of drip irrigation for small-scale farmers could be improved if the technology was extended to include food crops rather than limiting it to cash crops<sup>81</sup>. These efficient options will thus be considered in the irrigation options to maximise cost-effectiveness.

### ***Analysis of adaptation options for agriculture: component 3***

The existing agricultural systems in the proposal areas are highly affected by the current climate and future climate change has the potential to impact further. The high proportion of rain-fed crop production makes it very sensitive to rainfall variability and water is the central production factor affecting sustainability and food security. There are also compounding factors of soil erosion and land degradation,

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75 Ayele Getaneh K. et al. (2013). Impact of small-scale irrigation schemes on household income and likelihood of poverty in the Lake Tana basin of Ethiopia.

76 ECONADPT (2015). The Costs and Benefits of Adaptation: Review of the Literature.

77 De Bruin, K., Dellink, R. B., Ruijs, A., Bolwidt, L., van Buuren, A., Graveland, J., de Groot, R. S., Kuikman, P. J., Reinhard, S., Roetter, R. P., Tassone, V. C., Verhagen, A. and van Ierland, E. C. (2009b), 'Adapting to climate change in The Netherlands: an inventory of climate adaptation options and ranking of alternatives, Climatic change, 95, 23–45. DOI 10.1007/s10584-009-9576-4.

78 M. Skourtos, Ch. Tourkoulas, D. Damigos A. Kontogianni, P. A. Harrison and P. Berry (2014). Incorporating cross-sectoral effects into analysis of the cost-effectiveness of climate change adaptation measures. Climatic Change. DOI 10.1007/s10584-014-1168-2

79 Flörke, M., Wimmer, F., Laaser, C., Vidaurre, R., Tröltzsch, J., Dworak, T., Stein, U., Marinova, N., Jaspers, F., Ludwig, F., Swart, R., Giupponi, C., Bosello, F., & Mysiak, J. (2011). Climate Adaptation—modelling water scenarios and sectoral impacts. Final Report ClimWatAdapt project.

80 ECA (2009). Shaping Climate-resilient Development a framework for decision-making. A report of the economics of climate Adaptation working group. Economics of Climate Adaptation.

81 Mohamed, B. (2013). Better economics: supporting climate change adaptation with stakeholder analysis: a case study of Morocco. International Institute for Environment and Development (IIED), London, UK.

which affect long-term productivity. Future climate change has the potential to exacerbate these impacts, by increasing variability and affecting rainfall potential.

In response, a set of farm and community level adaptation options have been considered for this proposal.

For the farm level, a range of different approaches are possible, including additional fertiliser use, changes to planting and management practices, and new crop varieties/species. The CRGE Climate Resilience Strategy for Agriculture recommends a focus on climate smart agriculture, as these options have multiple benefits, providing enhanced climate resilience, but also providing wider soil and water conservation benefits which have wider environmental benefits. These sustainable soil and water management practices improve soil water infiltration and holding capacity, as well as nutrient supply and soil biodiversity. They include options such as agroforestry, soil and water conservation, reduced or zero tillage, and use of cover crops. These reduce current climate related risks from rainfall variability and soil erosion, increase soil organic matter and soil fertility, increasing productivity, and reduce emissions by reducing soil emissions or preventing more emission intensive activities<sup>82</sup>. These contrast with more traditional measures to increase productivity, such as fertiliser, which has negative externalities (water pollution, greenhouse gas emissions). Therefore, adoption of sustainable agriculture options (such as soil and water conservation) not only increases income, but also boosts nutrition security and reduces probability of crop failure and agro-chemical use (especially N-based fertilizers and pesticides and herbicides) in Ethiopia<sup>83</sup>.

Detailed studies in Ethiopia<sup>84</sup> have shown that the soil and water conservation options (above) have high cost-effectiveness, different options are more effective in different zones (e.g. with soil bunds and stone bunds in Tigray, waterways and stone bunds in Amhara, shade trees in SNNPR, etc.), reflecting the fact that waterways and trees showed strong and significant positive effects in high-rainfall areas, whereas water management is a priority for the drylands. Spatial heterogeneity is thus included in the proposed project, related to the specifics of each agro-ecological and adaptation planning zone, the existing farming systems, and the institutional and social structures. Their adoption significantly reduces downside risk or probability of crop failure, thus indicating the role of such practices in providing a type of insurance.

A further finding from Ethiopian studies is that complementary packages of options, e.g. as portfolios rather than single technical solutions, are more cost-effective<sup>85</sup>. This information has therefore been used to shape the combination of options put forward in the proposal. This can be applied in two ways.

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82 Giacomo Branca, Nancy McCarthy, Leslie Lipper and Maria Christina Jolejole (2011). Climate-Smart Agriculture: A Synthesis of Empirical Evidence of Food Security and Mitigation Benefits from Improved Cropland Management. Food and Agriculture Organization of the United Nations (FAO). Mitigation Of Climate Change In Agriculture Series 3. December 2011

83 Kassie, M., Teklewold, H., Marennya, P. Jaleta, M. and Erenstein, O. (2015). Production risk and food security under alternative technology choices in Malawi. Application of a multinomial endogenous switching regression. *Journal of Agricultural Economics*. 66(3): 640-659.

84 Deressa, T., Hassan, R. M., et al., 2008. Analyzing the Determinants of Farmers' Choice of Adaptation Methods and Perceptions of Climate Change in the Nile Basin of Ethiopia. IFPRI Discussion Paper 00798, (September).

85 Di Falco, S. and M. Veronesi (2012), "How African Agriculture Can Adapt to Climate Change? A Counterfactual Analysis from Ethiopia", Working Paper Series, No 14, Department of Economics, University of Verona.

First, when interventions are combined with capacity building and improved information: an example in Ethiopia is the portfolio of improved seeds, soil and water conservation, better extension services and improved climate information, was found to be most effective in enhancing agricultural production in climate vulnerable areas.

Second, the adoption of climate smart agriculture practices, such as legume rotation, legume intercropping, minimum tillage, residue retention, conservation agriculture, and soil and water conservation increases net income and food security, but benefits are greater when there is joint adoption rather than through adoption of individual practices. For example<sup>86</sup>, it has been found that when only minimum tillage is adopted, the net income from maize production is USD 99/ha, but that this increases to USD 194/ha when it is combined with use of improved maize varieties and to USDD 240/ha when crop diversification (legume-maize inter-cropping and rotation) is added to these two practices. Similarly, analysis has found these options are win-win for the local farming community if soil and water conservation techniques complemented irrigation and rain-fed agriculture<sup>87</sup>.

At the community level, there are many options that could help agricultural water management. Again the CR Agriculture resilience strategy sets out the potential for ecosystem based water shed management and rangeland restoration. These have high direct benefits but also provide ecosystem services. The proposal therefore has a focus on improving watershed management using integrated water resource management and ecosystem based (green) options. This includes watershed management (enhanced conservation and restoration, notably of upstream catchments with forests), which have been shown to be highly beneficial<sup>88</sup>. A recent study<sup>89</sup> has found that investment in sustainable land and watershed management resulted in a 24% higher value of production in the Blue Nile basin.

There is also a set of interventions on rangeland restoration. This has been advanced in Ethiopia and has shown high benefits and high cost-effectiveness. The benefits<sup>90</sup> arise from improved fodder availability and quality, with productivity benefits for livestock (and increased income), as well as increased use or cash from the harvest of grass. Area rehabilitation has wider ecosystem benefits, in moving from highly degraded areas to rehabilitated areas, with wider benefits in terms of soil and water conservation, and soil fertility improvement.

#### ***Options for livelihood diversification: component 4***

As highlighted earlier, the current livelihoods in the proposed project areas are highly vulnerable, and a policy outlined in the CRGE strategy was for livelihood diversification. The strategy recommended this diversification is targeted towards activities that are consistent with climate resilience (i.e. that are climate smart) but

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86 Marenja, P. and Kassie, M. (2016). Pathways to sustainable intensification in Eastern and Southern Africa: Looking forward, achieving impact. Interim terminal report for the Adoption Pathways project. CIMMYT, Addis Ababa, Ethiopia. pp.23.

87 Lunduka, R.W., Bezabih, M. and Chaudhury, A. (2012). Stakeholder-focused cost benefit analysis in the water sector: A synthesis report. International Institute for Environment and Development (IIED), London, UK.

88 Georgis, Kidane. 2009. The role of trees on natural resource conservation with particular emphasis on watershed, EDIAR, Ethiopian Development Research Institute, Addis Ababa, Ethiopia

89 Schmidt Emily [et al.] (2014). Determinants and Impact of Sustainable Land and Watershed Management Investments: A Systems Evaluation in the Blue Nile Basin, Ethiopia. - Working papaer 62.

90 Georgis, Kidane, Alemneh Dejene and Meshack Malo. 2010. Agricultural based Livelihood Systems in Drylands in the Context of Climate Change: Inventory of Adaptation Practices and Technologies of Ethiopia, FAO publication No 38.

also help deliver in terms of the national green economy objectives, i.e. so that they reduce environmental impacts and emissions at the same time. This provides a link between national CRGE strategy and bottom-up interventions.

The CR Agriculture resilience strategy also includes a set of recommended livelihood diversification options, which is based on a review and prioritisation exercise. This highlighted the need for herd diversification, especially for more drought tolerant species of sheep and goats, as well as diversification towards poultry. Previous analysis in Ethiopia has shown this has very positive benefits for incomes<sup>91</sup>. Similarly, diversification to other activities, notably beekeeping, has been recommended in the strategy. This has important benefits through the linkages to forests, and thus enhances ecosystem protection (and ecosystem services) as well as providing income benefits.

### ***Options for capacity building: component 5***

While analysis of the benefits of capacity building is challenging due to the quantitative nature, studies that do assess these options report high benefit to cost ratios. Indeed, several studies find that these ‘soft options’ (e.g. capacity building, information, planning) are among the most effective options<sup>92</sup> and the benefits of ‘soft’ options increases significantly under higher climate change. Furthermore, a number of studies report that these capacity building and institutional strengthening options lead higher benefits for the outcome based options (e.g. water management, agriculture) as they enhance the effectiveness and efficiency of these options.

Finally, reflecting the focus on iterative climate risk management, there has been a project focus on monitoring, information and learning. This captures the fact that information has a value, and that investment in monitoring with learning will help produce better decisions in the future: a key aspect given the changing climate and high uncertainty on future projections in Ethiopia. These options provide high cost-effectiveness through the provision of benefits from improved decision making. These activities include institutional strengthening and awareness-raising, but also information provision that will support early actions: such measures are highly synergistic to the low-regret options above, creating the enabling environment or increasing the effectiveness of delivery.

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91 World Bank, 2011. Costing Adaptation through Local Institutions Village Survey Results : Ethiopia,

92 The Risk to Resilience Study Team (2009): Catalyzing Climate and Disaster Resilience: Processes for Identifying Tangible and Economically Robust Strategies: Final Report of the Risk to Resilience Study, eds. Moench, M., Fajber, E., Dixit, A., Caspari, E., & Anil Pokhrel, ISET, ISET-Nepal, Kathmandu, Nepal, 328 pp.

Anton Cartwright, James Blignaut, Martin De Wit, Karen Goldberg, Myles Mander, Sean O'Donoghue and Debra Roberts (2013). Economics of climate change adaptation at the local scale under conditions of uncertainty and resource constraints: the case of Durban, South Africa. *Environment and Urbanization* 2013 25: 139. DOI: 10.1177/0956247813477814

**Table 7. Cost of each component and number of beneficiaries**

<b>Project component</b>	<b>Cost</b>	<b>No. of beneficiaries</b>
1. Awareness and ownership of adaptation planning at the local level	367,510	14 Kebeles with climate smart plans
2. Water security	4,736,667	8,750 households receiving access to potable supplies of land irrigated.
3. Climate smart agriculture – land – water - forest integration	1,590,227	560 farm level HH adopting physical moisture and soil conservation structures, 560 HH adopting biological conservation measures, 560 HH adopting farmland gully treatment and 3,360 HH adopting homestead agroforestry  14000 HH benefiting from community rehabilitation with 140 ha of physical and biological measures on communal land, 14 ha of area closures for enhanced natural regeneration, 21 ha of upper watershed gully treatment, 30 ha of rangeland managed, and establishment of nurseries in each targeted kebeles.  14000 households benefiting from enhanced watershed management and ecosystem services from 1600 hectares of afforestation/reforestation of degraded forestland.
4. Climate resilient livelihood diversification	527,371	Households receiving training and support for enhanced access to finance and livelihood diversification.
5. Capacity building, monitoring, evaluation and learning	1,799,288	Local government and farmers staff trained, experience shared, lessons from project captured and disseminated and mainstreamed in local planning process..

**Table 8. Justification for selection of proposal options**

Objective / Intervention	Activities and benefits	Alternative interventions	Reason for not opting for this	Evidence for recommended option
<b>Component 2: Climate resilient integrated water resource use</b>				
2.1. Installation of potable water supplies using solar pumps	Use of solar ground-water pumps to in wells with ground water table above 40 meters or install hand pumps when the ground water is below 40 meters to provide water for public supply - Use of solar pumps or hand pumps to reduce external (environmental) costs. - Springs will be captured when the ground water extrudes above ground.	-Surface water extraction -Rain water harvesting -Different pumping options: Diesel powered pumps or hand pumps	- Surface water excluded due to not being potable and or not available within 15 minutes of walking distance from the kebele - RWH excluded due to unreliability of supply (areas often have no rainfall for months, especially during droughts and high capital costs to construct the RWH scheme). - Diesel Powered pumps excluded due to their unreliability in the rural context, require lubrication and maintenance costs periodically and require diesel to be purchased by the community which at times is not affordable and at most times is not even accessible by the community. Furthermore, Diesel generators emit carbon and are not green.	Water supply has high benefit to cost ratios due to public health benefits and is directly related with increased school enrolment. Solar pumps offer lower environmental impacts and a sustained working period with minimal maintenance and operation requirements. The technology is affordable by the communities as the design does not consider incorporating batteries as power banks which are expensive and also environmentally not friendly..
2.2: Design and development of irrigation for agriculture (and livestock)	Use of small-scale irrigation based on wells and or sand/check-dams for drip irrigation with options based on site conditions to maximise cost-effectiveness. - Hand pumps and springs captured when the ground water is a maximum depth of 40 meters below ground or is extruding on the surface. - Sand (check) dams will be constructed where there is a river and or creek crossing the kebele	-Surface water extraction -Different pumping options: diesel powered pumps -Irrigation technology, i.e. sprinkler, -Water efficiency, demand side management tariffs	Surface water excluded due to other pressures on water resources (supply constraints). - Sprinkler technology excluded as it is not an efficient method of provision of water to irrigate land in a water constrained area. - Diesel powered pumps not considered for reasons listed in 2.1	Irrigation systems chosen on basis of cost-effectiveness. Evidence from previous Ethiopian studies for small irrigation reports benefit to cost ratios of 3:1 to 5:1, showing highly cost-effective.
<b>Component 3: Climate smart agriculture – land – water - forest integration</b>				
3.1. Introduction of climate smart agriculture – farm level	Soil and water conservation, with portfolios of options and strong focus on capacity building and information	Fertiliser use	Fertiliser is expensive, and has negative environmental impacts	Portfolio combining soil and water conservation with enhanced capacity, as well as multiple CSA options, shown to have highest

Objective / Intervention	Activities and benefits	Alternative interventions	Reason for not opting for this	Evidence for recommended option
				benefits in Ethiopia.
3.2. Integrated CRGE watershed management – community and watershed level	Ecosystem based watershed management (afforestation) Rangeland rehabilitation and restoration	Water infrastructure (storage)	Engineered solutions costly and there are high recurrent maintenance costs.	Ecosystem based adaptation and rangeland options generates high direct and ecosystem benefits.
<b>Component 4: Resilient livelihood diversification</b>				
4.1. Climate resilient and green livelihood diversification (climate smart value chains)	Livelihood diversification towards climate resilient activities, with investment in market information and value chains Activity centres on micro-finance rather than grants.	Resettlement Social protection	Resettlement costly ad high social impacts, and likely to increase rural migration (to urban) and land abandonment (increasing degradation). Social protection involves reactive, whereas preventative measures most cost-effective.	Climate resilient, low carbon livelihood diversification including poultry, resilient breeds, beekeeping. Use of micro-finance provides more cost-effective approach.
<b>Component 5: Capacity building, monitoring, evaluation and learning</b>				
5.1. Building capacity and knowledge transfer 5.2: M&E and learning (adaptive management) 5.3: Communication and outreach	Capacity building at local level, with learning components	National capacity building	National level would leave a gap in knowledge and understanding at the local level where key decisions are made and resources deployed.	Investing in capacity building has high benefit to cost ratios. It also enhances effectiveness and efficiency of options above

**Table 9. Summary of Benefits of Main Interventions**

Activity	Benefits
2. Climate resilient integrated water resource use	<p>Potable water supply. The introduction of potable water reduces health impacts and provide multiple benefits to communities. Results of economic analyses in Ethiopia report that the economic internal rate of return (EIRR) was 24%, which shows the high benefits.</p> <p>Low-cost irrigation systems allow continuity of production, reduce variability of output, and enable a shift to higher-value crops. Studies of these schemes in Ethiopia report high benefit to cost ratios, of 3 to 5:1. Small-scale irrigation practices used in the Lake Tana basin increased mean annual household income by ETB 3353 per year, a 27% increase over income for non-irrigating households. Another study in Ethiopia<sup>93</sup> reports small-scale irrigation doubles net gross margin for farmers, with irrigated study sites generating an average net gross margin about US\$323/ha. This compares to the calculated average net gross margin for rain-fed which is US\$147/ha. This indicates that after accounting for annual investment replacement costs, the net gross margin from irrigation is 220% higher than the gross margin from rainfed agriculture.</p>
3. Climate smart agriculture – land – water - forest integration	<p>SWC reduces soil degradation, which is a major problem in Ethiopia. Estimates of baseline rates vary but have been estimated that annual costs of land degradation range from 2% to 6.75% of agricultural GDP <sup>94</sup>. This is a particular problem in vulnerable areas: one recent study estimated the cost of soil erosion (in the watershed) at a cost of \$22 per ha per year, equivalent to \$17 per person per year or about 19% of per capita income<sup>95</sup>. This indicates high baseline costs. SWC measures have benefits in reducing these baseline costs, reducing these costs and enhancing incomes.</p> <p>Detailed studies in Ethiopia have shown that soil and water conservation options have high cost-effectiveness. Ethiopian studies find that complementary packages of options are particularly cost-effective. For example, when only minimum tillage is adopted, the net income from maize production is USD 99/ha, but that this increases to USD 194/ha when it is combined with use of improved maize varieties and to USDD 240/ha when crop diversification (legume-maize intercropping &amp; rotation) is added to these two practices.</p>

<sup>93</sup> Hagos, F., Makombe, G., Namara, R. E., Awulachew, S. B., (2009), Importance of irrigated agriculture to the Ethiopian economy: Capturing the direct net benefits of irrigation. Colombo, Sri Lanka: International Water Management Institute. 37p. (IWMI Research Report 128).

<sup>94</sup> Yesuf M, Mekonnen A, Kassie M & Pender J, 2005. Cost of land degradation in Ethiopia: A critical review of past studies. Addis Ababa: Environmental Economics Policy Forum in Ethiopia and International Food Policy Research Institute. Available at <http://www.efdnitiative.org/publications/cost-land-degradation-ethiopia-critical-review-past-studies>

<sup>95</sup> Getaneh Ayele et al (2105). The economic cost of upland and gully erosion on subsistence agriculture for a watershed in the Ethiopian highlands. African Journal of Agricultural and Resource Economics Volume 10 Number 4 pages 265-278

	<p>Watershed management (enhanced conservation and restoration, notably of upstream catchments with forests), have been shown to be highly beneficial. Investment in sustainable land and watershed management resulted in a 24% higher value of production in the Blue Nile basin.</p> <p>There is also a set of interventions on rangeland restoration. This has been advanced in Ethiopia and has high cost-effectiveness. The economic case for rangeland management is primarily qualitative. It reduces soil erosion and enhances carbon content, enhancing productivity. The benefits arise from improved fodder availability and quality, with productivity benefits for livestock (and increased income), as well as increased use or cash from the harvest of grass for roofing. Area rehabilitation has wider ecosystem benefits, in moving from highly degraded areas to rehabilitated areas, with wider benefits in terms of soil and water conservation, and soil fertility improvement.</p>
<p>4. Resilient livelihood diversification</p>	<p>The resilience livelihood diversification options include herd diversification, especially for more drought tolerant species of sheep and goats, as well as diversification towards poultry. Previous analysis in Ethiopia has shown this has very positive benefits for incomes. Similarly, diversification to other activities, notably beekeeping, has been recommended in the strategy.</p> <p>The potential benefits include enhanced resilience, but also potentially higher productivity and disease resistance. Analysis of the value chain efficiency and herd diversification in Ethiopia have been undertaken<sup>96</sup> and estimate these could increase annual productivity growth by 4.5%.</p> <p>The switch to poultry was recommended in the national CRGE strategy, and has benefits in enhancing resilience but also reducing environmental and GHG emissions associated with cattle. Estimates from the CRGE indicate the value of additional income created from poultry would be equivalent valued at USD 400 per person/year.</p> <p>Finally, there are major livelihood benefits from beekeeping. The switch from traditional to modern techniques has been analysed in Ethiopia<sup>97</sup> and this shows large benefits because it improves the baseline poor quality and volume of honey production. The analysis shows these approaches increase base production 32.5 kg to as much as 100 kg per household, which led to high additional net present values due to the additional income, with an IRR of 50 – 300% depending on the exact measures.</p>

<sup>96</sup> FRDE (2012). CRGE Green Economy Strategy

<sup>97</sup> Mikhail Miklyaev et al. Honey Production In Ethiopia: A Cost-Benefit Analysis Of Modern Versus Traditional Beekeeping Technologies . [http://queensjdiexec.org/publications/qed\\_dp\\_241.pdf](http://queensjdiexec.org/publications/qed_dp_241.pdf)

In addition the following table shows total cost and cost per kebele for each of the components.

**Table 10. Total cost of each project component against cost per kebele**

Project component	Total Cost (USD)	Cost per Kebele (USD)
1. Awareness and ownership of adaptation planning at the local level	367,510	26,251
2. Water security	4,736,667	338,333
3. Climate smart agriculture – land – water - forest integration	1,590,227	224,746
4. Climate resilient livelihood diversification	527,371	37,669
5. Capacity building, monitoring, evaluation and learning	1,799,288	128,521

### **Cost effectiveness from a project management perspective**

The project management structure is designed by making sure the minimum number of staff that is required is employed. Considering that the project covers seven Woredas (districts) in five regions of Ethiopia, the project management includes staff at the Federal level to be involved in the overall coordination as well as staff at the regional and woreda levels. In terms of number of staff to be employed under the project both for project management and execution, the number to be employed at woreda and kebele levels is more than four times the number to be employed at regional and federal levels. On the other hand, the cost of employing staff at woreda and kebele levels is only about 46% of the total cost of salaries paid to all staff employed for project execution and management. Thus, this arrangement will reduce cost of project management while also contributing to very close management and support in the implementation of the project's activities at woreda and kebele levels. Such organization of project management will also contribute to local capacity building and sustainable management of the project even after the end of the project.

Implementation and execution of the project will also benefit from support of government institutions with experience in implementation of activities similar to what is proposed in the project. Experience sharing from other areas will also contribute to reduction of implementation costs.

Existing systems of planning, budgeting, reporting, procurement and financial management systems will be implemented. These are expected to help implement the project at the minimum cost possible while maintaining standards and requirements to reduce losses due to inefficiency and related problems. Moreover, competitive procurement procedures will be followed and that will help reduce costs.

Experience gained from the project will also be used in other areas through scaling up measures.

## D. Alignment with national and sub-national sustainable development strategies

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

The project is aligned with national and local policies, as well as strategies and plans related to development, agriculture, disaster risk reduction, water, forests, climate change and environmental management.

At the highest level, the project is consistent with the Constitution of the Federal Democratic Republic of Ethiopia (FDRE) which provides the overarching framework for sustainable development, planning, and implementation in Ethiopia, and Ethiopia's long-term development vision to achieve middle-income status by 2025 while developing a green and a resilient economy. This vision enables high economic growth through building a modern and productive agricultural sector, strengthening the industrial base, and growing exports.

Agricultural development is the basis for much of this economic growth, with a projected growth rate of 8.6%. This is anticipated to come from increases in production of major food crops, from large increases in fruit and vegetable production, from a fourfold increase in the total value of coffee exports, and from a large relative increase in the export of live animals. The climate smart investments in agriculture and livestock in the project, enhancing productivity by reducing climate induced losses, are therefore in line with this national level policy.

The project is also in line with policies, strategies and plans. The key areas here relate to agriculture (and livestock), disaster risk management, forestry and water.

**Agricultural policy** is set out in the Agriculture and Rural Development Policy and Strategy (2003) and the key role agriculture can play in transforming the economic development of the country. This highlights the need for environmental rehabilitation and watershed development. There is also an Agricultural Development Led Industrialization (ADLI) Strategy which aims to achieve initial industrialization through robust agricultural growth and establishes close linkage between the agricultural and the industrial sectors. This was taken forward with medium-term development plan including the Sustainable Development and Poverty Reduction Plan (SDPRP) (2002/03-2004/05), the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) implemented during 2005/06-2009/10 and subsequent Growth and Transformation Plans (GTP-I, 2010/11-2014/15 and GTP-II, 2015/16-2019-2020). These plans put high emphasis on environmental issues as articulated in the Conservation Strategy of Ethiopia (CSE)<sup>98</sup> including goals for zero deforestation and sustainable forest use, with reforestation and afforestation as carbon sinks, watershed services maintained – to address floods and droughts and provide erosion control.

More recently, these agricultural policies, strategies and plans are being translated into implementation by the MoA Policy Investment Framework. This is a strategic

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<sup>98</sup> The Conservation Strategy of Ethiopia, which was introduced in 1997, focuses on conservation of natural resources and reversing environmental degradation through a variety of means such as soil and water conservation, reforestation and afforestation, etc.

framework for the prioritisation and planning of investments to drive Ethiopia's agricultural growth and development, designed to operationalise the Comprehensive Africa Agriculture Development Programme (CAADP) Compact. It is anchored to, and aligned with, the national vision of becoming a middle income country by 2020 together with a number of key policy and strategic statements.

Within this framework, there are major programmes, focused on agriculture growth and natural resources.

- The main programme in Agricultural Development is the Agricultural Growth Programme. The objective of this is to increase agricultural productivity and market access for key crop and livestock products in targeted woredas with increased participation of women and youth, through i) agricultural production and commercialization, ii) small-scale rural infrastructure development and management, and iii) monitoring and evaluation. Again, the woreda focus of the proposed project and its components are in line with this strategy.
- The main programme of investment in Natural Resources is Ethiopian Strategic Investment Framework (ESIF), which has been translated and operationalized through the Sustainable Land Management Program (SLMP), currently in its second phase. It has the objective of reducing land degradation and increasing agricultural productivity, to lead to higher household incomes and food security. This program combines the benefits of land tenure security and sustainable land and water management practices in watersheds. Hence the inclusion of sustainable land and water management options in this proposal is in line with this national flagship program.
- There is a recently published Livestock Master Plan (2015). The overall objective is to improve smallholder incomes and nutritional status through investments in selected livestock value chains<sup>99</sup>. These investments are, in turn, targeted at increased productivity and competitiveness of selected value chains to the benefit of smallholders, including women, and improvements in the quality and diversity of household diets through intake of livestock products. The Livestock mast plan sets out how investment interventions—better genetics, feed and health services, which, together with complementary policy support—could help meet the GTP II targets by improving productivity and total production in the key livestock value chains for poultry, red meat-milk, and crossbred dairy cows.

In the **disaster risk management** area, there is the National Policy and Strategy on Disaster Risk Management (NPS-DRM). This emphasizes the need for a risk management system that intrinsically applies an ex-ante preventive or proactive, holistic, comprehensive and integrated multi-hazard and multi-sectoral approach. This is reflected in this proposed project.

This policy is being implemented through the Disaster Risk Management Strategy Programme and Investment Framework (DRM SPIF), which has the objective of reducing disaster risk and the impact of disasters through the establishment of a

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<sup>99</sup> International Livestock Research Institute (ILRI) (2015), Ethiopia Livestock Master Plan. ILRI Project Report. Nairobi, Kenya: International Livestock Research Institute (ILRI).

comprehensive and integrated disaster risk management system. There are a number of major programmes that within this framework:

- The main programmes in disaster risk management are the Productive Safety Net Program (PSNP), which has the objectives to reduce household vulnerability, improve resilience to shocks and promote sustainable community development in food insecure rural areas with i) safety net grants (labour for public works and direct support) ii) drought risk financing, iii) institutional support, and iv) Household Asset Building Program (HABP) strengthening advisory services for household investments; improving efficiency and effectiveness of financial service delivery and program management.
- An exercise to climate smart the PSNP has recently been completed (the Climate Smart Initiative, CSI) and this has now been translated into PSNP IV, which is enhancing adaptation in the programme through modifications to the transfer, public works and livelihoods components of the PSNP.

In relation to **water**:

- There is a National water resources management policy and strategy: The overall goal of the national water resources management strategy is to enhance and promote all national efforts towards efficient, equitable, and optimum utilisation of the available water resources of Ethiopia for advancing socio-economic development on sustainable basis (MoWR, 2010). Two strategic directions of the water policy are water resources development and water resources management. The strategy focuses, among others, on water resources development for economic and social benefits of the people, on equitable and sustainable basis, allocation and apportionment of water resources, managing and combating drought, reducing and regulating floods through sustainable mitigation, prevention, rehabilitation and other practical measures, and conserving, protecting and enhancing water resources and the overall aquatic environment on sustainable basis.
- There is a WASH programme. The Government of Ethiopia has the ambition of achieving universal access to water and sanitation by 2020, as a central part of its poverty reduction ambitions. In doing so, a One WASH National Programme have been developed in collaboration with the Sanitation and Water for All Partnership<sup>100</sup>. Provision of safe and sufficient water supply and adequate sanitation services are indispensable components in the sustainable development of Ethiopia's urban and rural socio-economic well-being. The principal objective of the WASH program is to ensure the provision of sustainable, efficient, reliable, affordable and users-acceptable WASH services to the Ethiopian people, including livestock watering.
- The Climate Resilient (CR) Strategy for water and energy identifies these sectors as being key to Ethiopia's development. One of the objectives of the CR strategy is to identify priorities for the water and energy sectors to build climate resilience and reduce the impact of current climate variability and climate change. In particular, the strategy identifies two priority areas in the water resources: balance water demands through development and regulation of water resources,

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<sup>100</sup> [http://sanitationandwaterforall.org/report\\_card/ethiopia](http://sanitationandwaterforall.org/report_card/ethiopia)

and enhance climate resilience self-supply through improving local water storage facilities and supporting participatory water resources management.

- In relation to water management, and Community-based Participatory Watershed Development (CPWD). This aims at conserving soil, rainwater and vegetation for productive uses; harvesting surplus water; promoting sustainable farming and stabilizing crop yields by adopting suitable soil, water, nutrient and crop management practices; rehabilitating and reclaiming marginal lands through appropriate conservation measures and mixing of trees, shrubs and grasses, based on land potential; enhancing the income of individuals through diversification of agricultural produce, increased employment opportunities and cottage enterprises, particularly for the most vulnerable, linked to the sustained use of natural resources.

For **forests**, there is the Forest Policy and Strategy (2007) which aims to achieve dual objectives of (i) meeting public demand in forest and forest products, and (ii) enhancing the socio-economic and environmental contribution of forests. There is also the Ethiopian Forestry Action Program (EFAP), Forest Development, Conservation, and Utilization Policy of 2007 and conservation policies, such as National Forest Priority Areas (NFPAs). The plans for restoration of degraded forestlands in this proposal are in line with these policies.

There are policies that encourage diversifying income sources for farmers (CC-DARE) and activities such as beekeeping, fruit production, and fish farming are being promoted. This proposal builds on these, identifying those new livelihoods that will align to the climate resilient green growth objectives.

On the **environment** side, there is the Environmental Policy of Ethiopia (1997) which comprised eleven-sectoral and eleven cross-sectoral policy elements, and which raised the issues of soil husbandry and sustainable agriculture, forest resources, biodiversity resources, water resources and environmental and land degradation.

With respect to climate change, Ethiopia has undertaken several strategic and programmatic adaptation actions. The strategies and plans include:

- a. The National Adaptation Programme of Action (NAPA) (2007\_
- b. The Ethiopian Programme of Adaptation to Climate Change (EPACC 2011);
- c. Nine National Regional States and two City Administrations adaptation plans;
- d. Five sectoral adaptation plans;
- e. Agriculture sector adaptation strategy

A draft second national communication is also under preparation.

Ethiopia has also submitted an INDC (Intended Nationally Determined Contribution). This centres on the CRGE, though it highlights that the main effort up to and beyond 2020 is to increase resilience and reduce vulnerability of livelihoods and landscapes in three pillars; drought, floods and other cross-cutting interventions. The activities listed in this proposal are ones that have been identified and reported in the INDC.

The INDC lists many of the measures in this proposal, including soil and water conservation measures, water harvesting and small-scale irrigation, restoration of degraded areas and forests, sustainable land management and livelihood diversification and strengthening capacity. The proposal therefore contributes directly to the delivery of the INDC.

Activities on climate change have been brought together under the Climate Resilient Green Economy Strategy (CRGE). The CRGE strategy (2011) has four pillars, two of which are of direct relevance to the proposed project:

- Improving crop and livestock production practices for higher food security and farmer income while reducing emissions (agricultural and land use efficiency measures).
- Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks (increased GHG sequestration in forestry).

Of particular relevance, the CRGE Strategy includes recommendations to increase afforestation, to address degraded agricultural land through small-scale irrigation and to rehabilitate degraded pastureland and farmland. It also recommends livelihood diversification, notably with the development of poultry and bee-keeping, which have been included in this proposal. Detailed CR sector strategies have been produced for:

- Agriculture and forestry<sup>101</sup>, and
- Water and energy<sup>102</sup>.

These sector strategies also provide key recommendations which have been adopted in this proposal. These include:

- The adoption of climate smart agriculture, particularly farm and community level soil and water conservation;
- The use of forests for adaptation (ecosystem based adaptation), notably for watershed management
- Rangeland rehabilitation and management;
- Enhancing access to credit for livelihood diversification away from highly vulnerable livelihoods;
- Accelerate universal access to water;
- To enhance irrigation potential, noting the need for water demands to be managed and allocated according to the water that is available;

A table of how the 5 components of this proposal align with CRGE strategy are shown below.

**Table 11. Alignment of each project component with the CRGE strategy**

Project component	Alignment with Climate Resilient (CR) Strategy
1. Climate smart resilient project design and plans	<ul style="list-style-type: none"> <li>✓ CR Strategy – climate resilience.</li> <li>✓ CR Water and Energy Strategy - water resource management (balance).</li> </ul>
2. Climate resilient integrated water resource use	<ul style="list-style-type: none"> <li>✓ CR Water and Energy Strategy – enhanced access to water.</li> <li>✓ CR Water and Energy Strategy &amp; Agriculture Strategy – small-scale irrigation.</li> <li>✓ CR Strategy – renewable energy</li> </ul>
3. Climate smart agriculture – land – water - forest integration	<ul style="list-style-type: none"> <li>✓ CR Agriculture strategy – farm level soil and water conservation</li> <li>✓ CR Agriculture strategy – community level soil and water</li> </ul>

101 FRDE. Ethiopia's Climate Resilient Green Economy. Climate Resilience Strategy: Agriculture.

102 FRDE. Ethiopia's Climate Resilient Green Economy. Climate Resilience Strategy: Water and Energy.

	conservation ✓ CR strategy – afforestation.
4. Resilient livelihood diversification	✓ CR Agriculture strategy – climate smart livelihood diversification. ✓ CR strategy – climate smart value chains
5. Capacity building, monitoring, evaluation and learning	✓ CR Agriculture strategy – iterative management. ✓ CR Agriculture– capacity building.

In relation to **gender**, the government of Ethiopia has developed gender sensitive policies by passing several national laws concerning women’s land ownership rights, labour, education, and marriage. In 1993, the government adopted the National Policy on Women, otherwise known as the Women’s Policy, to encourage “gender-sensitive” public policies and interventions across government ministries. The following year, the drafting of a new constitution laid out women’s equality as a right under the law. Article 25 of the new Constitution “guarantees all persons equality before the law and prohibits any discrimination on grounds of gender.” Article 35 deals exclusively with the rights of women and addresses several areas such as affirmative action, customary practices, and property rights, among others.

### E. Adherence to relevant national technical standards

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

The project will be implemented in line with the national laws, legislation and standards, which may have relevance for the implementation. At the national level, the relevant laws are set out in the Constitution. There are also a set of relevant laws in the relevant sectors.

**The Constitution (1995):** The Ethiopian Federal Democratic Republic Constitution, which is the supreme law of land, provides the overarching principles and guidelines. It states that any law, customary practice or a decision of an organ of state or a public official which contravenes this Constitution shall be of no effect” (FDRE 1995, p.4). It is the supreme law of land that governs ownership and use of resources, environment, etc. For instance, the Constitution states that everyone has the right to live in a clean and healthy environment and the Government will make every effort to provide such an environment. The Constitution also holds the Government and the people of Ethiopia responsible for the preservation of natural resources and maintenance of ecological balances.

**Forest law:** The Forest Development, Conservation and Utilisation Proclamation (No. 542/2007) is the main federal framework for the forestry sector in Ethiopia (FDRE, 2007). It repeals the Forest Conservation, development and Utilisation Proclamation No. 94/1994. This Proclamation recognises two types of forest ownership- state and private forests- and provides for the designation, demarcation and registration of major forestlands as state forests including providing legal recognition to privately held forests. This proclamation provides a number of incentives for non-state actors such as local communities and the private sector to

get involved in the management of forest reserves or to rehabilitate and/or reforest new areas.<sup>103</sup>

- Forest Development, Conservation and Utilization Policy and Strategy (2007)
- Forest Development, Conservation and Utilization Proclamation No 542/2007

**Land law:** The Ethiopian constitution of 1995 is the main source of the basic law regarding land ownership, management and administration that shall not be overruled. The two main policy objectives for the continuation with respect to land are social equity and tenure security. To meet the first objective, the Constitution as well as other Federal and Regional Land Proclamations ensure access to agricultural land. The objective is to ensure equality of citizens in using the land (Ambaye, 2012:5). As for tenure security, the supreme law of the land prohibits any sale and exchange of land as land is owned by the state or public. As stipulated in Article 40(3) of the constitution, “the right to ownership of rural and urban land, as well as of all natural resources, is exclusively vested in the State and in the peoples of Ethiopia. Land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange” (p.14). So, the Constitution provides user rights only. Further, article 40(4) provides the legal basis for Ethiopian peasants to the right to obtain land without payment and the protection against eviction from their possession. The most recent proclamation is the Federal Democratic Republic of Ethiopia Rural Land Administration and Use Proclamation 2005. The fundamental basis of the proclamation is to ensure sustainable rural land use planning, identify the size and use rights of “the different types of landholdings” in the country, direct mechanisms to resolve problems between farmers and agricultural investors, and between pastoralists and agricultural investors who encourage individual farmers; and establishing a conducive system of rural land administration.

**Environmental laws:** The Constitution of FDRE provides the guiding principles for environmental conservation and management. There are accompanied proclamations to operationalize the law.

- Environmental Policy (1997)
- Development, Conservation and Utilization of Wildlife: Proclamation No. 541/2007
- Ethiopian Wildlife Development and Conservation Authority Establishment: Proclamation No. 575/2008
- Environmental Impact Assessment Proclamation No. 299/2002
- National conservation Strategy, Volume II, 1994,
- National Biodiversity Strategy and Action Plan (2005)
- Ethiopia’s Pollution Control Proclamation and standards (Proclamation no. 300/2002),

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103 See <http://thereddesk.org/countries/laws/forest-development-conservation-and-utilisation-proclamation-no-5422007>

- Guidelines for undertaking sector specific Environmental Impact Assessment on development projects.

The environmental policy and other laws are the basis for protection, conservation and promotion of the environment. Tools that are in use for implementation of the laws and regulations include Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs) which guide operationalizing environment and climate change considerations across sectors including agriculture and non-agricultural sectors. Both environmental and social impact assessments (ESIA) are mandatory for development projects, activities and programs in the country. The ESIA process is overseen primarily by the Ministry of Environment, Forest and Climate Change (MEFCC), CRGE Facility of the Ministry of Finance and Economic Cooperation (MoFEC), and National Planning Commission (NPC). Most recently, within the national policy context, there is an Environmental and Social Management Framework MFCC, which was approved in 2015. In addition, there are also a CRGE Facility manuals and guidelines, operation manuals, and appraisal guidelines to ensure compliance with environmental and social safeguards of the Facility/CRGE and social inclusion.

**The Water Law:** Within the framework of the Constitution (1995) and Water Policy (1999), the water resource management (WRM) proclamation 197/2000 provides the legal instrument governing WRM and administration in the country in terms of use, conservation, protection and management of water resources. The Constitution and the proclamation also provide mandates of the Federal Government and Regional States with respect to WRM.

- Constitution of the Federal Democratic Republic of Ethiopia Proc. 1/1995
- Ethiopian Water Resources Management Proclamation Proc.197/2000
- Ethiopian Water Resources Management Regulation Reg. 115/2005
- River Basin Councils and Authority Proclamation Proc. 534/2007
- Abbay Basin Authority Reg. No. 151/2008

The constitution gives power to the Federal Government with particular mandate to enact Laws for water management. Notably, the Federal law is entrusted with those water linking two or more regional state and those with an outlet the national territory (Art 51/11).

Note that private property, whether individually or collectively owned is inviolable in Ethiopia, i.e. exceptionally, the right to property may be overruled in the case of public interest.<sup>104</sup> In these cases, owners are entitled for compensation. The above policies, laws, and regulations are within each line ministries that have been involved in the project design and will be responsible for or closely involved with implementation. The project will comply with the relevant laws and regulations during implementation.

Where the project is undertaken by government institutions, there will be no need to issue licences.

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<sup>104</sup> Of particular importance is the use of land for public interest or services. As stipulated in the Article 2(5) of Proc. No. 455/2005, public interest refers to 'the use of land defined as such by the decision of the appropriate body in conformity with urban structure plan or development plan in order to ensure the interest of the peoples to acquire direct or indirect benefits from the use of the land and to consolidate sustainable socio-economic development'. Public services refer to services that can directly or indirectly benefit the society such as government office, school, health service, market service, road, etc.

When there are aspects run by the private sector, these will be addressed through the procurement process. The Ethiopian Investment Commission (EIC) is the autonomous regulatory organ responsible for issuing investment permits, work permits, trade registration certificates and business licenses as part of its one-stop-shop services for investors. The Investment Proclamation of 2002, as amended in 2003, and the 2003 Regulation on Investment Incentives, constitutes the main legal framework for both foreign and domestic investment in Ethiopia. This framework describes, among other things, the forms of investment and capital requirement, investment permits, concessions, incentives and facilities. An industrial development strategy was also issued in 2002 aimed at: (i) placing private investment as the engine of industrial development; (ii) promoting export-led and labour-intensive industrial development; and (iii) promoting joint ventures in industrial development. With regards to the forest sector, the current draft Federal Forest Proclamation has provisions for “certificates of possession” to be provided to forest user groups, and requires government organs to make best efforts to strengthen tenure security for participatory forest development associations and community groups.

The project – and procurement process – will also comply with the **Environmental and Social Management Framework MFCC**, which was approved in 2015<sup>105</sup>. This is based on best practices (including screening and categorization) of the environmental and social safeguards policies of the World Bank, the Global Environmental Facility, the Africa Developmental Bank and the European Investment Bank. The GoE has prepared the ESSF to address environmental and social issues that may arise from any CRGE investments. Moreover, the preparation of the safeguards framework is based on the provisions and principles of the national environmental and social policies and legal frameworks, including the Constitution and the Environmental Impact Assessment Proclamation. This integrates environmental protection and social development into CRGE investments in a proactive manner to contribute towards sustainable development. The framework:

- Provides a set of internationally recognized standards and frameworks in environmental and social safeguards to the CRGE investment;
- Avoids, minimize or mitigate any direct, indirect, and potential adverse environmental and social impacts of CRGE investments;
- Defines and sets in place the roles and responsibilities of all relevant stakeholders/institutions in executing safeguards of CRGE investment initiatives throughout their life cycles; and
- Ensures that effective mechanisms are in place for safeguard compliance during CRGE investment implementations.

This applies with the following principles:

- Early application of environmental and social safeguards: Safeguards instruments should be applied proactively in the CRGE investments to contribute towards sustainable development.
- Participation of stakeholders: All concerned stakeholders and affected people should be given the opportunity to participate meaningfully at all stages of CRGE investment.

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<sup>105</sup> Ethiopia's Environmental And Social Safeguards Framework (ESSF) For The CRGE Initiative. Ministry of Environment and Forest. February 2015.

- **Information Dissemination:** Sufficient information should be provided in accessible and culturally appropriate ways. Providing information about the project at an early stage of the ESF/SSF process enables the public to understand the trade-offs, contribute meaningfully to project design and implementation, and to have greater trust with the coordinating and implementing entities of the CRGE projects.
- **Prevention and mitigation of adverse impacts:** one of the key principles is to prevent and/or mitigate any harm to the environment and to people by incorporating environmental and social concerns as an intrinsic part of CRGE investment cycle management. Environmental and social issues will be tracked during all stages of the CRGE investment cycle to ensure that supported investments comply with the procedures and guidelines laid out in the ESSF.
- **Accountability and Transparency:** Both CRGE implementing and executing entities are accountable for providing sufficient information on their CRGE investment proposals to the CRGE coordinating entities, and for managing the potential impacts of their CRGE investments. The CRGE coordinating entities are accountable for the decisions that are taken in line with the CRGE investments. By doing so, the ESSF would enable all entities involved in the CRGE implementation to be accountable and transparent in all their undertakings.

The ESSF applies to investment all projects financed through the CRGE Facility, and thus to this proposal. It involves screening to identify which projects require an EIA and similarly social issues, and then subsequent guidance should these be required.

Finally, it will comply with the CRGE manual and guidelines. The CRGE Operations Manual sets out the operational process. It includes the guidance on appraisal and this requires the compliance with environmental and social safeguards of the Facility/CRGE and social inclusion.

## **F. Duplication of project with other funding sources**

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

As highlighted above, there are a number of existing programmes that are relevant to this proposal. The proposed project will co-ordinate its activities to align with and complement these on-going efforts, but it will also go beyond these existing initiatives to pilot more integrated and portfolio based approaches, and provide a stronger linkage to current and future climate change. The proposed project has deliberately included a strong monitoring, evaluation and learning component to take stock of the lessons and use these to help inform these other initiatives.

As described in section D, the following programmes are relevant:

- The Agricultural Growth Program.
- The Sustainable Land Management Program (SLMP),
- The Livestock Growth Program and Livestock Master Plan ,
- The Disaster Risk Management Strategy Programme and Investment Framework (DRM SPIF), which includes the Productive Safety Net Program (PSNP)

- The National water resources management policy and strategy and the WASH programme.
- The Ethiopian Forestry Action Program.

There is also the CRGE strategy and the sector reduction mechanism, which is the main implementation modality for climate adaptation in the country. The interventions in this proposal have been identified in the CRGE agriculture and forestry/water and energy low carbon, climate resilient strategies.

MoFEC works closely with implementing agencies and coordinates all major CRGE programmes that are implemented by the Government of Ethiopia. Due to this central management system there is good knowledge base of the core activities of current and previously implemented climate change initiatives. This, as a result, enables MoFEC to avoid duplication of actions and encourage complementarities among various programmes.

It needs to be noted, that the woredas selected for this project have one or more of the above indicated programmes running in some of their kebeles. However, the actual intervention sites are different to avoid duplication while at the same time creating synergies to address vulnerability at a larger scale. In the implementation of the CRGE strategy, the GoE aims to implement programmes that complement each other and create synergies that lead to national level impacts.

MoFEC's structure which stretches from the woreda, all the way to the federal ministerial level allows the institution to coordinate activities and continually strengthen its lessons documentation and sharing processes. In designing this project careful analysis was made on key lessons from earlier and ongoing major climate change initiatives. The table below exhibits the area of intervention of programmes / projects that are relevant to this proposed project and from, most of, which lessons have been extracted in developing this proposal.

**Table 12. Summary of recently concluded, on-going, and pipeline projects that are relevant to the proposed project**

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
Agricultural Growth Program (AGP)	<p>AGP is a Program aimed at increasing agricultural productivity and market access for key crop and livestock products in targeted woredas with increased participation of women and youth through: i) agricultural production and commercialization, ii) small-scale rural infrastructure development and management, and iii) monitoring and evaluation.</p> <p>Total financing of the Program is USD 581.8 of which USD 350 is IDA contribution. The remaining finance will be mobilized from USAID, the Netherlands Government, EU, Spain and Italian Development Fund. Implementing agency of the Program is Ministry of Agriculture and Natural Resources.</p>	<p>A five year Program starting in 2016.</p> <p>The Program covers 157 Woredas in the Regional states of Amhara, Oromia, SNNPR, Tigray, Benishangul-Gumuz, Gambella, Harari and Dire Dawa city administration.</p>	<p>AGP contributes to the implementation of CRGE strategy, through inclusion of climate advisory service into the existing extension system, dissemination of yield improving CSA technologies and practices, identification of CSA best practices for dissemination, and training of various implementers on CSA.</p> <p>Having the AGP being implemented in the surrounding kebeles will complement the CSA initiative of this AF Program. As such, the overall impact of, and lessons from these Programs at woreda level is expected to be much more pronounced as a result of synergies that will be created.</p>
The Second Sustainable Land Management Program (SLMP II)	<p>SLMP II is a multi-sectoral landscape approach that supports GoE to coordinate efforts on land use management. It has the objectives of integrating watershed and landscape management, and institutional strengthening, capacity development and knowledge generation. It also incorporates interventions that seek to increase agricultural productivity, strengthen farmers' resilience to climate change, reduce GHG emissions and increase carbon sequestration.</p> <p>SLMP II total financing is USD 107.61 Million of which USD 50 million will be mobilized by the World Bank. The remaining balance will be contributed from GEF including LDCF (USD 12.96 million) and Norway (42.65 Million USD). Implementing agency of the Program is Ministry of Agriculture and Natural Resources.</p>	<p>The Program runs from 2014-2019.</p> <p>It is implemented in 135 watersheds/ Woredas covering 937 kebeles in the National Regional States of Amhara, Tigray, Oromiya, SNNP, Gambela, and Benshangul Gumuz.</p>	<p>SLMP II contributes to Sustainable Forest Management and Adaptation strategies of the GoE by reducing vulnerability of local communities to adverse impacts of climate change while increasing adaptive capacity. Lessons from the implementation processes of SLMP have been used in developing this AF Program.</p> <p>SLMP II is currently functional in one of the woredas selected for the current AF proposal, though the intervention kebele is different. With a number of related climate adaptive activities in the area of land use management, these two programs complement one another and are expected to highly influence overall climate adaptation impact and lessons at the woreda and regional levels.</p>
Livestock Growth Program	<p>The objective of the Program is to improve smallholders' income and nutritional status through investments on selected livestock value chains. These investments are, in turn, targeted at increased productivity and competitiveness of selected value chains to the benefit of smallholders, including women, and improvements in the quality and diversity of household diets through</p>	<p>National level Program</p> <p>On going</p>	<p>The program introduces climate smart practices in the livestock sector and aims to improve household level income generation and nutritional status. This will complement the livelihood diversification component of this AF Program. The selected woredas, as a result, will be able to geographically cover wider areas and support larger number of smallholder farmers. Synergies created as a result will not only result in</p>

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
	intake of livestock products. Implementing agency of the Program is Ministry of Livestock and Fishery Development.		high impact but also provide good learning grounds.
Agricultural Growth Program -Livestock Market Development Project	This project aims at improving smallholder incomes and nutritional status through achievement of three key areas of intervention: (i) increased productivity and competitiveness of businesses related to beef, dairy, and hides (ii) improved policies and regulations to facilitate growth and competitiveness, including through improved quality and sanitation standards (iii) and improved quality and diversity of household diets through livestock products. The project is financed by USAID with an aggregate budget of USD 38 million. A local organization for each region has been selected to take on the leadership implementing the project: the Relief Society of Tigray (REST - Tigray), the Organization for Rehabilitation and Development in Amhara (ORDA - Amhara), The Oromo Grassroots Development Initiative (HUNDEE - Oromiya) and Self Help Africa - Ethiopia (Oromiya and SNNPR).	The project runs from 2012 – 2017. It is implemented in selected woredas of high potential livestock areas of four regional states - Amhara, Oromia, Tigray and SNNP.	The project focused on improving the productivity and competitiveness of livestock value chains, creating enabling environment for Livestock value chains and improving quality and diversity of household diet through intake of livestock products. It is aimed at boosting livelihood of targeted communities' through improving productivity, service and inputs provision. Accordingly it complements the components of the proposed AF program. The impacts of livelihood diversification at the regional level are expected to be tangible and feed into national level lessons as a result of synergies that will be created by the implementation of complementary programs such as these.
Agricultural Development Agents and Farmers Training centers	A minimum of three agricultural development agents with a range of technical skills (animal science, plant science, natural resource management) are assigned in each Kebele throughout the nation and one farmer training center is established at Kebele level. The Agricultural Development Agents and Farmers training centers are financed by Regional Governments budget.	National level Program  Ongoing	The agricultural development agents provide demand-responsive extension and short-term training services for farmers based on their respective skills. Their presence in each Kebele is helpful in implementing local level programs including this proposed program. Having these centers in place will facilitate the various trainings for DAs and farmers that are included in the implementation plan of this Program.
Ethiopia's DRM Strategic Program and Investment Framework (DRM-SPIF)	The Framework involve in (i) developing a system for disaster prevention and early warning; (ii) consulting donors, government agencies, civil society and academic organizations; (iii) preparing an investment Program for operationalizing DRM; and (iv) sharing knowledge on DRM best practices.	National level Program  Ongoing	The DRM-SPIF deals with disaster prevention and early warning and capacity building activities in targeted areas. Lessons from this program have guided the development of this proposal. These initiatives complement one another and further, lessons resulting from the implementation of this program are expected to feed into the ongoing development of DRM system.
Productive Safety Net Program (PSNP)	Currently the Fourth Productive Safety Nets Program (PSNP) is being implemented with the overriding objective of increasing access to safety net and disaster risk management systems, complementary livelihoods services and nutrition support for food insecure households in rural Ethiopia.	Program runs from 2014-2020.  It is implemented in 411 Woredas throughout the country.	Most of the woredas proposed under this AF program are covered by the PSNP – IV, and there is location overlap with the previous PSNP II. However, the two programs are complementary as PSNP primarily focuses on social protection and safety nets to reverse existing extremes (primarily droughts) and helps households to relieve from

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
	<p>The Program delivers key services to the targeted households through safety net transfers to chronically food insecure households and support sustainable capacity development and institutional strengthening.</p> <p>Total Program financing is USD 3,625 million. It is financed by the World Bank (600), USAID (550), DFID (412), EC (130) Canada (115), WFP (100), Ireland (68), Netherlands (68), DANIDA (25), UN Child Fund (25) and Sweden (23) million USD. Implementing agency of the Program is Ministry of Agriculture and Natural Resources.</p>		<p>poverty. On the other hand, the proposed AF proposal is seeking to provide integrated resilience and small-scale infrastructure/ farm-level investments, for targeted woredas. The proposal moves beyond PSNP objectives by considering initiatives that will lead to climate change adaptation.</p>
ONE WASH Program	<p>The Program follows sector wide approach for water, sanitation and hygiene. It engages four ministries - Water Irrigation &amp; Electricity, Health, Education, and Finance &amp; Economic Cooperation. It has the objective of increasing access to improved water supply and sanitation services for residents in participating woredas/towns and communities.</p> <p>Total budget of the current ONE WASH Program is USD 485 million. It is financed by the World Bank (205 million), DFID (131.6 million), AfDB (92.1 million), GoE (46.3 million) and UNICEF (10 million) USD.</p>	National level Program running from 2014-2019.	The two programs are complementary. Beyond the water and sanitation aspects, this proposed program expands to include climate smart water planning, considers multi-sector water demands, as well as provision of climate resilient access to water.
Four towns water supply and sanitation improvement Program	<p>The Program has the objectives of increasing number of people with access to water and improved sanitation; improving utility revenue collection; and improving continuity of service. It will result in new infrastructure in terms of constructed pipeline, storage capacity, treatment capacity, water production, public water kiosks, public latrines, and number of utility staff (30% being women) trained, microenterprises created and staff trained (50% women).</p> <p>Total financing cost of the Program is US \$76.11 million from the AfDB and USD 37.84 million from GoE. The resources from the Bank will be channelled through the Water Resources Development Fund (WRDF) under the Ministry of Water, Irrigation and Electricity to the beneficiary utilities.</p>	<p>A 48-months Program starting January 2016.</p> <p>It is implemented in Adama, Adwa, Bichena and Gode cities.</p>	<p>This program will explore and promote climate change mitigation and adaptation measures customized to the vulnerability profile of each sub-project town. These measures have been harmonized with Ethiopia's Nationally Appropriate Mitigation Actions (NAMA) objectives and national Climate Resilient Green Economy strategy.</p> <p>Therefore, this project complements the proposed program by exploring and promoting climate change adaptation measures customized to targeted cities. Both will contribute to the realization of CRGE in the country and continue to provide best practices for future actions.</p>
Ethiopian Forestry	The Program focuses in conducting various studies on	National level Program	The program aligns with the proposed AF program as it aims

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
Action Program	the forest resource base, analysis of the challenges facing planners and resource managers, and institutional and policy issues in forestry sector development and action Program for addressing the challenges and issues identified.	Ongoing	at building national capacity to share relevant information on the country's forestry resources. Inputs from this program have been useful in developing the AF proposal.
The Bale Eco-Region Sustainable Management Program (BERSMP)	The Program was jointly implemented by FARM-Africa and SOS Sahel Ethiopia in the Bale Massif. It aimed to bring local communities into a central role in sustainable natural resources management supported by government services, across the whole Bale Massif. The Program expanded into incorporating REDD+ financing in participatory forest management and is currently leading one of the earliest REDD+ projects in the country.  The Program was supported by the Irish, Netherlands and Norwegian embassies.	The Program was implemented from 2006-2011 in 14 woredas in Bale and Arsi zones.	The program brought local communities into a central role in sustainable natural resources management to enhance the unique biodiversity and vital ecological processes of the Bale Mountains eco- regions.  Some of the major lessons from this program regarding engagement of local communities as key players of natural resources management will guide the implementation of this AF Program on the ground.
Ethiopia's REDD+ Program	The Government of Ethiopia, established the REDD+ Secretariat to implement the REDD+ Readiness Phase (i.e., R-PP implementation) and coordinate all efforts related to REDD+ in order to effectively deliver the green economy vision.	National level Program  Ongoing	Ethiopia's REDD+ program has direct synergy with the proposed program as it is an integral part of the CRGE strategy. It is aimed at protecting and re-establishing forests for their economic and ecosystem services, including carbon stocks. Though at a much smaller level, efforts that will be put into rehabilitation of degraded areas including reforestation / afforestation through this AF program will contribute to the national level REDD+ initiative.
The Climate Resilient Green Economy (CRGE) Fast-Track Investments on Agriculture, forest, livestock, water and energy	The CRGE Fast-Track Investments (FTI) are designed to start implementation of the CRGE in ministries including Agriculture, forest, livestock, energy and water. The projects have the objective of testing the CRGE Facility's processes and give rapid iterative feedback for implementation modalities on the ground.  The projects were coordinated by the CRGE facility and the budget was 20.8 Million USD.	The Fast Truck Investments projects run for 18 months and ended in early 2016.  Projects were implemented in all the regions in selected Woredas.	CRGE FTIs were designed to contribute to economic growth, greenhouse gas emission reduction and resilience to the adverse effects of climate change. These projects were designed to enable sectors to draw lessons from implementation of these pilot projects and develop long-term strategic plans in line with GTP II planning process.  This AF proposal has also made use of a number of lessons from FTI projects that have implemented activities in line with the AF program's objectives.
Climate High Level Investment Program	The Climate High Level Investment Program (CHIP) helps to build climate resilience and promote low carbon development through support to the Ethiopian Government's Climate Resilient Green Economy financing facility to mainstream climate resilience and low carbon development into three key sectors: Food	National level Program running from 2012 – 2016	The program supports climate institutions building, including financing fast-track climate investments and support to strengthen the CRGE Facility. It has as a result strengthened the Facility's capacity to coordinate climate related projects at national level. The program as a result has contributed for the current capacity of the facility including development of

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
	Security, Forestry and Disaster Risk Management. The Program was financed by DFID with a total budget of 30 million GBP.		this AF proposal. Coordinating similar high level programs will continue to strengthen the facility.
Strategic Climate Institutions Program (SCIP)	<p>The SCIP Fund was an innovative mechanism for channeling climate finance to projects of strategic relevance to Ethiopia's emerging Climate Resilient Green Economy (CRGE). The overall goal of SCIP was to build organizational capacity within the Government of Ethiopia (GoE), the private sector and civil society to contribute to the improved management of climate change adaptation and mitigation initiatives.</p> <p>The Program budget was GBP 9.5 million through DFID/Norway/Denmark-backed fund.</p>	The Program supported 27 climate change related projects in all the regions from 2012 – January 2016	The program was designed to build Ethiopia's capacity to cope with climate change across the public, private and civil society sectors and to respond to the challenges of transitioning to a climate resilient green economy. Project coordination lessons from this program were key inputs in developing a number of guidelines for the CRGE facility. In addition, among a number of institutional capacity development projects, the program supported the AF accreditation process of MoFEC.
Building the national capacity and knowledge on climate change resilient actions in Ethiopia	<p>This project contributes towards achieving Ethiopia's Climate Resilient Green Economy through capacity building and sustainable land management.</p> <p>The overall financing amount is 10 Million Euro from GCCA.</p> <p>The project is implemented by Ministry of Environment, Forest and Climate Change, and Ministry of Agriculture and Natural Resources,</p>	<p>National level Program</p> <p>The project runs from 2012 - 2016.</p>	This project has the objective of increasing the awareness and capacity of targeted government institutions, both at federal and regional levels, and the rural population at large, to deal with climate change. It has, as a result increased the awareness on climate change, adaptation and mitigation actions as well as the CRGE strategy, nationwide. This as a result has significantly reduced initial awareness raising activities that might have been required to initiate this AF program. This program will continue to build on the basic knowledge that is developed and further strengthen the capacity of identified target groups.
Strengthening Climate Information and Early Warning Systems and Support Climate Resilient Development National Adaptation Program of Action (NAPA)	<p>The Program contributes to Ethiopia's NAPA priorities (Strengthening/enhancing drought and flood early warning systems in Ethiopia; Capacity building Program for climate change adaptation in Ethiopia). This initiative supports the National Climate Resilient Green Growth Strategy, and will result in strengthening the observational and analytical capacity of the national hydro-meteorological services and its early warning system, and support the disaster risk management and development planning agencies in their effort to adapt to climate change.</p> <p>Total project budget is USD 37.8 million - USD 4.5 from GEF/LDCF, USD 13 million from UNDP and USD 19.7 million from various other sources. Implementing institutions include the National Metrological Service Agency, Ministry of Agriculture and Natural Resources,</p>	National level Program running from 2013 – 2017	The program promotes resilience to climate change at the national and local levels. It aims to strengthen the capacity of the Government of Ethiopia to observe, analyse and forecast climate information to enhance their early warning systems to support its climate resilient development and adaptation to climate change. The outcome of this Program will provide essential climate information to all climate related programs including this proposed program.

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
	Ministry of Water, Irrigation and Electricity and Regional Governments and the Addis Ababa University.		
Promoting Autonomous Adaptation at the community level in Ethiopia	<p>The project aims to be a catalyst for promoting national action in Ethiopia that builds the resilience of local communities and their capacity to innovate and manage climate change opportunities and risks. Thus, the communities themselves are encouraged to tailor adaptation technologies and techniques to their own needs. The project promotes the positive impact of bringing together climate change adaptation techniques and technologies through an area-based integrated planning and implementation process by local communities.</p> <p>It is financed through LDCF's grant of USD 5.3 million. Implementing agency is Ministry of Environment, Forest and Climate Change.</p>	The project covers eight woredas in Amhara, Oromiya, Tigray and SNNP regions	This project was built on lessons of previous initiatives that demonstrated the strength of fully engaging communities in development activities. The outcome of this project is expected to create good synergy with this proposed program and support the realization of the CRGE strategy.
Coping with Drought and Climate Change	The project's objective is to develop and pilot a range of effective coping mechanisms for reducing the vulnerability of farmers, particularly women and children, to current and future climate shocks.	Implemented in Kalu Woreda in Amhara Region Completed March 2009- December 2012	This project engages in developing and piloting a range of coping mechanisms for reducing the vulnerability of farmers and pastoralists to future climate shocks. Accordingly, the Fund has direct synergy with the proposed Program which builds of lessons from the project.
Readiness Program support Project	The overall objective of this grant is to enhance Ethiopia's chance of accessing the Green Climate Fund as potential source of climate finance which can leverage domestic investment to build a climate resilient and low carbon middle income economy.	Federal level project  Up to July 2017	This program is consistent with the objectives of the proposed AF program. It aims at strengthening the institutional capacities of the Ministry of Environment, Forest and Climate Change (MEFCC) as an NDA of Ethiopia, to effectively fulfill its roles and responsibilities related with the Fund, engage with regional, national & sub-national governments, civil society and private sector stakeholders as well as to develop country program through multi-stakeholders' engagement process. The capacity built through this project will enable the Ministry to be a strong partner to the CRGE facility in implementing and coordinating various climate change related programs, including this proposed program, in the country.
Enabling pastoral communities to adapt to climate change and restoring rangeland	The overall project goals include: Mainstreaming climate change mitigation and adaptation options for pastoralists into national, sub-national and district development frameworks; Enhancing the capacity of government agencies and pastoralist community institutions to	The project targeted communities in Afar, Somali, SNNPR and Oromia Regional states and was implemented from October	This project was designed to bring alternative income generation opportunities; improving rangeland management; raising awareness on adaptation options; empowering pastoral communities to better participate in decision making related to their livelihoods and integrating these options into

Program / Project	Description	Implementation period and geographic coverage	Potential duplication and synergies
environments project	effectively respond to the risks and challenges of climate change and boost pastoral communities' coping mechanisms and capacity for sustainable livelihoods. It is a joint funding project financed by UN agencies including FAO, UNDP and UNEP. Total financing budget was USD 4 million. National implementer institutions are Ministry of Finance and Economic cooperation, Ministry of Environment, Forest and Climate Change.	2009 -March 2013	relevant plans and policies. Implementing this project has capacitated MEFCC and MoFED in coordinating various stakeholders from Federal to community level to implement activities directed in addressing climate change. Lessons from this project both technical and coordination processes have provided essential inputs in the design of this AF proposal.

## **G. Learning and knowledge management**

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

A key element of this proposal is the use of an iterative climate risk management approach (adaptive management). The proposal includes an explicit component targeted at learning, over and above M&E activities, to provide information to improve future decisions as part of an iterative adaptation planning. The selection of different agro-climatic zones in the project maximises this learning, by allowing lessons from different regions to be collated and compared, in terms of bio-physical but also institutional and social factors, thus enabling more targeted interventions in the future. The project will therefore generate knowledge and learning that will contribute significantly to the building of resilience of rural communities to climate change in Ethiopia.

There are a set of monitoring and research activities to learn from the project, as well as further information gathering.

This information will be captured and disseminated through the knowledge management components of the project. The CRGE facility is developing a new communication unit that will advise on communication and public relations, and this will provide the central point for collating and disseminating the results of the project. This complements the various consultations, awareness campaigns, and direct involvement in the integrated land and water management activities that will be undertaken in the Kebeles.

Results from the project will be disseminated within and beyond the project areas through existing information sharing networks and forums. The CRGE Facility in collaboration with the executing entities will identify and participate through its structures, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. Furthermore, the CRGE and the Ministries will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future programmes. A two-way flow of information will be maintained between this project and others of a similar focus.

Action research will be integrated throughout the project, with full engagement of communities and research and development partners, allowing their recommendations to improve future approaches. The lead ministries already regularly engage with academic/research institutions, and these institutional linkages will be reinforced during project implementation. In this regard, relevant development-oriented research will be conducted to identify means for the creation or strengthening of knowledge, collective learning processes, or institutions.

As indicated, the CRGE facility coordinates climate related projects and programs that are being implemented by the Government of Ethiopia to realise the CRGE strategy. To ensure programmes / projects build on lessons from previous and / or ongoing climate change initiatives, the facility has developed a monitoring, evaluation and learning guideline. As a result, this proposal was developed taking into consideration key lessons from other initiatives such as those indicated in section F. One of the key strategies used in designing this program - applying integrated, multi-sectoral approach,

for example, is the result of analysis of lessons from previous initiatives. The facility, as well as the government of Ethiopia, understands the importance of learning and hence institutionalizes those that have been found to be of high value. It is with this understanding of the value of learning this AF proposal incorporates a learning and knowledge transfer component. The program will further enrich its implementation processes as well as feed into other development programs and policies through the lessons it gains in the following ways:

- The CRGE facility, sector ministries and all relevant stakeholders will capture and collate lessons at different levels of implementation using the facility's monitoring, evaluation and learning guideline as well as tools indicated under component 5 of this proposal.
- The program management unit will directly work with the regional CRGE steering committee and heads of the relevant sectors at woreda level. As a result, key lessons of the project at different levels, and especially at the kebele level, will be channeled to the facility through this structure.
- Lessons that are collated will be archived in the CRGE registry where it can be accessed by all relevant stakeholders for immediate application or for further analysis, as found fit. In addition various mechanisms such as workshops, exchange visits, lesson reports, engagement with the media, and development of policy briefs will be used to share lessons with the wider stakeholder.
- From lessons and feedbacks that are captured from this program and a number of other programs that are being implemented in the country, those that have shown high impact and /or are innovative in addressing current climate change issues will be further refined and presented to inform high level policy makers.
- Key lessons and outcomes will also be shared during learning events that will be organized by the program where wider stakeholders are expected to participate. In addition to sharing lessons, these events will create an opportunity to discuss how to institutionalize key lessons and guide the CRGE strategy implementation. Outcome of these events will guide the facility on how to further refine and utilize lessons at the national level.
- Lessons that are refined through these processes will then be taken up during development of annual and mid-term development plans that guide the overall development strategy of the country.

## **H. Description of the consultative process**

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

The entire project follows a demand-driven bottom-up approach - in which communities steer affairs, have a voice in determining priorities and are actively involved in project identification, planning, development and implementation

A wide range of stakeholders, particularly local communities, have been consulted during preparation of the project concept. The consultations will intensify during the development of the full proposal and a plan will be developed to communicate and consult with stakeholders throughout the lifetime of the project.

The risks of gender inequality have been considered in the project – and mitigating actions developed (see section B). These were applied during consultation and will be taken up during the project implementation.

The project has been designed in close consultations with stakeholders in the target communities in terms of identifying challenges and priority needs. There were consultations held within each Woreda, Kebele/village committees and this will continue to be the case throughout project implementation.

The beneficiary selection process commenced at the Federal Level. Line Ministries requested regional sector bureaus to identify potential project target Woredas based on predefined selection criteria. Subsequently, the Regional Bureau identified the target project Woredas based on the defined criteria. Once the Woredas were identified, the Woreda officials in consultation with concerned groups of the society (community leaders and representatives) selected the beneficiary Kebele's with active community participation (*Please refer to Stakeholder Consultation Conducted-Attached*).

Going forward, the detailed Beneficiary Selection shall be conducted objectively in a participatory approach and will involve Woreda, Kebele and community leaders based on pre-defined beneficiary Selection Criteria that ensures Gender considerations are included (*to be developed in this project*). Given that climate-induced hazards affect disproportionately women, female-headed households will form the first criteria for beneficiary selection. Second, the type of livelihoods (e.g. farming, pastoralist, etc.) will be another criteria for beneficiary selection. For instance, in irrigation related activities, households with availability of land, proximity to water, suitable topography (e.g. slope of land), etc. will be considered. In natural resources conservation interventions, labor profile, age, and health status of households will be considered as this involves in-kind contributions to physical activities. These other criteria will be further elaborated through community consultations on the selection of direct project beneficiaries. The beneficiary selection criterion will consider the following parameters amongst others;

- Households who have not benefited from similar initiatives;
- Vulnerability Status of Households;
- Land Ownership Status;
- Willingness to participate in the project;
- Female Headed Households and Youth Groups;

## **I. Justification for funding requested**

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

Ethiopia remains a highly climate vulnerable country and future climate change has the potential to significantly reduce future growth trajectories. Agricultural production is dominated by small-holders and is predominantly rain-fed, making it very sensitive to

climate variability and shocks. Indeed, water is the central production factor affecting sustainability and food security, especially in the drylands, and thus the wider drivers of soil water status, water use and water management are critical. The proportion of irrigated land in Ethiopia is currently low, with more than 95% of land cultivated without irrigation. Productivity has historically been constrained by rainfall variability and extremes, low soil fertility and land/soil degradation. Both agriculture and livestock sectors are heavily impacted by the frequent droughts that arise in Ethiopia, which occur frequently and lead to large impacts, affecting millions of livelihoods. The social and economic costs arising from increasing climate variation and climate extremes are significant, and expected to become even more severe under climate change.

In addition, weak capacity at the Woreda level to prepare climate-responsive development plans and budgets.

The Government of Ethiopia recognizes the importance of designing policies with a view to climate and climate change. This project represents a major element of the CRGE strategy, which is a climate-smart, landscape-based project combining improved water access and resource management with livelihood diversification to enable the most vulnerable communities to adapt to more frequent drought. Adaptation to climate change is central to this proposal, while simultaneously addressing issues of sustainable development pathways under changing climate conditions. The Government of Ethiopia has been implementing large scale flagship programmes in response to climate change-induced drought which include, among others, the following:

- Agricultural growth programme
- Sustainable land management programme
- Livestock growth programme
- Productive Safety Nets programme
- One WASH programme,
- Ethiopian Forestry Action Programme
- Climate High Level Investment Programme
- Strategic Climate Institutions Program (SCIP)
- Building the national capacity and knowledge on climate change resilient actions in Ethiopia

The above programmes help build the adaptive capacity of the Ethiopian economy to climate change and lead to livelihood diversification. This project, with its five components, has a strong synergies with the existing adaptation-focused programmes as identified above. The proposed project is also well aligned with the AF's investment priorities, and should contribute substantially to the achievement of transformational impacts.

### **Component 1: Awareness and ownership of adaptation planning at the local level**

**Baseline: (without AF Proposal):** Without the AF project, any interventions in the proposed intervention areas will continue as small-scale and stand-alone projects, that lack integration and miss important opportunities for synergies. They also will not consider the impact of future climate change and the need to include consideration in the design of community level interventions.

**Adaptation interventions (with AF funding):** The AF funding will be used to develop a climate-smart approach that builds resilience to current climate variability and future climate change and specifically tackles the gendered inequalities around climate change. The integrated approach, grounded in local community development plans and a gender responsive approach, will enable interventions that are consistent with the national CRGE strategy to be implemented at the local level.

## **Component 2: Water security**

**Baseline: (without AF Proposal):** Without the AF project, the existing problems of drought susceptibility will continue in the proposed intervention areas. The high levels of vulnerability will continue, and the Kebeles will experience periodic climate shocks that lead to major health impacts, decreased agricultural yields, and force households to sell valuable assets (notably livestock) to survive. These will reduce incomes and household assets, and the likely increase in variability under climate change could exceed the coping capacity of communities to recover fully after events. Under this baseline, there will also continue to be a reliance on humanitarian responses.

**Adaptation interventions (with AF funding):** The AF funding will be used to invest in climate smart integrated water management, providing a reliable source of clean water for potable supply (reducing current health impacts) and reducing the climate risks from rain-fed subsistence agriculture, but doing so in a way that introduces green technologies and ensures long-term climate resilience. The funding will also shift communities from a reactive response, with high reliance on food aid and social protection, towards more resilience. The improved management of water will increase storage capacity so that farming communities will have water to irrigate crops and women spend less time fetching water.

## **Component 3. Climate smart agriculture – land – water - forest integration**

**Baseline: (without AF Proposal):** Without the AF project, the existing problems of soil erosion and degradation, as well as drought susceptibility will continue in the proposed intervention areas. The high levels of social and climatic vulnerability (the adaptation deficit) in the Kebeles will continue, and soil degradation will reduce agricultural yields and household incomes, increase food insecurity and maintain the dependence on social protection and humanitarian support. This is likely to lead to increasing rural poverty and migration towards urban centres. These impacts have the potential to increase under climate change.

**Adaptation interventions (with AF funding):** The AF funding will be used to invest in integrated climate smart agriculture, as low-regret adaptation that helps reduce current climate vulnerability and builds resilience to future climate change. The options will

improve the watershed, support the sustainability of agricultural practices, reduced soil erosion and increase water management, and reduce environmental degradation. It will also reduce greenhouse gas emissions. This will enhance agricultural production and reduce vulnerability, increase incomes, and will have ancillary benefits on the environment (as land-water-forest integrated solutions). The proposed project will target farmers and communities, reducing the adaptation deficit, and avoiding the costs of land degradation while enhancing incomes from production benefits. Through the use of forests and land restoration, it will also deliver improved ecosystem services.

#### **Component 4 Climate resilient livelihood diversification**

**Baseline: (without AF Proposal):** Without the AF project, rural communities in the intervention areas will continue to be exposed to the periodic climatic shocks that impact on health and livelihoods. These will be exacerbated by the under-developed markets for non-agricultural goods, the lack of electricity and under-skilled workforce, all of which are barriers to moving people out of subsistence agriculture. This situation will potentially worsen under climate change, as variability increases and the potential frequency and severity of shocks changes. This in turn makes local communities food insecure and increases depletion of the natural resource base reducing essential ecosystem services, with the need for humanitarian assistance and social protection nets that drain national resources and expose communities to a series of shocks that stops them graduating out of poverty.

**Adaptation interventions (with AF funding):** The AF funding will increase the livelihood security of vulnerable households living in these areas. This is consistent with the national CR Strategy which aims to increase resilience through diversification into other agricultural products (e.g. land fruits and vegetables), as well as goats, sheep and poultry, and encourages beekeeping as a critical activity for ecosystem based livelihoods (forests). The proposed interventions will support local communities who currently depend on farming to increase and diversify their economic activities by developing markets and building the capacity of target beneficiaries. The funding is not directed to grants but on the facilitation of alternative livelihood activities, and increasing access to existing local micro-finance institutions. It will also provide support for market system value chain development. This will ensure new sources of income for vulnerable communities. The direct targeting of poor women will enable this group to diversify out of subsistence agriculture and obtain the skills and support needed to become economically productive and food secure.

#### **Component 5. Capacity building, monitoring, evaluation and learning**

**Baseline: (without AF Proposal):** The relevant local authorities currently lack the capacity and expertise to support and scale up climate adaptation. Without the project, it is likely that adaptation planning will be slow, with limited development of community based approaches and dissemination of best practice and with low levels of participation in planning activities by women. The most vulnerable communities engaged in agriculture are likely to continue unsustainable farming practices with

increasing exposure to climate change risks while economic opportunities remain limited.

**Adaptation interventions (with AF funding):** With AF funding, community based adaptation and best practices will be implemented during project, and these will be effectively shared and communicated at the local level, but also up to key decision makers so that they can be replicated in other parts of the country. The inclusion of learning components will ensure the lessons from the project are monitored, compiled and used to inform future adaptation decision making, using an iterative, learning based approach, that will also serve as a model for similar activities in other areas.

Local planning process follows participatory approach using different tools such as Participatory Rural Appraisal (PRA). The approach has long been practiced in the country in different government and donor supported development projects including mid-term development plans (GTP). Stakeholders including Kebele Councils community leaders; representatives of women; community and vulnerable groups; NGO's, Community Based Organizations (CBO)'s and Cooperatives working in the area involve in the preparation of the local plan.

The planning process is led and coordinated by the Woreda Finance and Economic Development Office (WoFED), which is responsible body for the development of Woreda development plan. A multi-disciplinary planning team comprised of Kebele and Woreda representatives will organize consultative meetings with different stakeholders. Based on the outcome of the meeting, the team will develop the agreed upon local plan and submit to the Kebele Cabinets for approval.

This project will ensure that the existing local planning process will articulate climate change activities to be mainstreamed into the Woreda Development plan. Furthermore, it will also ensure that these additions are also practiced on the ground.

## **J. Sustainability**

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

At a strategic level, the project has been designed to align to the national development and growth objectives of the GTP, and also the strategic priorities and actions identified in the CRGE strategy (national and sector strategies). It targets low regret adaptation options that provide immediate benefits and build resilience for the future, with a strong element of capacity building and learning that will ensure outcome sustainability. The strong emphasis on monitoring and evaluation (including the use of iterative and learning) will ensure impacts and results are sustained.

The proposed project has been designed to bring about sustainable transformation in the resilience of vulnerable communities. The project promotes collaborative approaches for the development of localised solutions. Through participation in learning and decision making, communities will build sustainable capacity. Furthermore, their involvement in the critical decisions will increase their commitment to making their solutions work, and to assuming responsibility after project completion. The goal is that, by the end of the project duration, the selected communities will be able to continually adapt to changes in climate on a self-sustaining basis, with limited government

assistance. Woreda-level administration will have been strengthened to carry out integrated development planning and delivery using a gender responsive approach, and to be able to continuously provide relevant technical assistance and services to women and men within the target communities.

The project will enable integrated development planning and build delivery capacity at the local level. The project services will be delivered using existing government and community structures. As a result, some technical support will continue to be provided by the government (federal, regional and local) after the project period, although steps will be taken to encourage these to be delivered by the market and community-based organisations wherever practical. Furthermore, the participatory and gender sensitive approach will build ownership of the project in these local communities and support more active participation of women in decision making processes. By engaging women and men from target communities in the design and implementation of the project, the project will build capacity of local people to continue adapting to climate change risks. This will be strengthened by the use of Local Community Development Officers, as these community members are best placed to lead project implementation at the local level, and will be critical in the continuation of the benefits after the project has ended.

The project will also seek to effectively eliminate or at least reduce the barriers that previously prevented these services from being provided by the market or through community-based collaboration, thereby delivering long-term benefits. These barriers include information asymmetry (the fact that smallholder farmers are not well informed of risks, or the practices and technologies available to help reduce risks), risk aversion (that constraints on investments by smallholder farmers), limited ability of smallholder farmers to pay, and limited supply of technologies and inputs.

The following key project sustainability elements have been considered to be attained in the course of the project;

### **Institutional Sustainability**

The institutional sustainability will emanate from;

1. MoFECs mandate and experience of coordinating national development programs and projects;
2. Existing inter-institutional coordination mechanisms as well as Sectoral governance and implementation arrangements cascaded to the local level; and
3. The project components linking with national development priorities and also with other large scale adaptation programs.

The proposed actions have emanated from the GTP II priorities to ensure direct institutional linkage and coordination with relevant national and regional programs (such as PSNP, Household Asset Building, SLMP amongst others). This clear alignment with the country's strategies and plans coupled with the capacity building will ensure that by project completion, the targeted Woredas are able to sustain efforts in the participating kebeles and is also replicable in other Woredas. This project will be implemented through an inter-institutional coordination mechanism using existing systems and structures encompassing local, regional and federal government. In line with its

mandate, MoFEC will provide oversight and coordinate the effective execution of this project.

The project services will also be delivered using existing government and community structures. As a result, technical support will continue to be provided by the government (federal, regional and local) after the project period. Not all the services (or project activities/interventions) will continue to be provided directly by federal, regional or local governments but through the market and community-based organizations.

By the end of its lifecycle, the project will have accumulated extensive assets in the form of soft assets (administrative procedures for quality control, monitoring, evaluation, knowledge management and communication) and hard assets (equipment's and infrastructures). These will be handed over to relevant government institution at the right level (federal, regional or local) in accordance with applicable government regulations. Infrastructures installed in the woredas will be handed over to local administrations or community-based organizations.

### **Technical Sustainability**

It is expected that the Agricultural extension system will continue to provide participatory and demand-driven services in line with the new extension strategy beyond the lifespan of the project. Agriculture growth and sustainable land management are priorities of GTPII and the CRGE Strategy. It should be noted that for project results to be sustainable, some of the project activities/interventions will also have to be sustained. These include operation and maintenance of irrigation schemes installed through the project, supply and use of improved technologies and agronomical practices (climate smart agricultural practices), and natural resource management activities. The continued engagement of local, regional and federal institutions will ensure that the infrastructures and services built by the project are maintained and operational in the long run.

The sustainability of rural infrastructures have been found to be heavily reliant on user participation and their management thereof. Evidences from various projects that have been implemented in Ethiopia reveal that infrastructures are to be sustained, if the community manages them themselves (see Solomon Gebre 1994). In the UNICEF assisted rural schemes, beneficiaries strongly felt that communities should be involved in the management and maintenance of the technologies in use (Alula et al. 1986). Community management was also identified as one of the two key factors in the success of rural schemes by WRC, the other being technology choice (WRC 1993). Without community participation, rural facilities will not be sustainable, and it would be unrealistic to expect a government agencies to manage and maintain such facilities scattered throughout the rural areas.

Against this background, the management of water and associated Solar PV, ground water monitoring devices; and irrigation infrastructures will be entrusted to a body designated by the direct stakeholders, but decisions of a governance nature will be made either in a general meeting of all beneficiaries or through their representatives. The management body will be the Water Users Association (WUA) who will be elected by the water users themselves and organised into an association. It is important that

women will represent 60% and above of the WUA established, as this will empower them to have their voices heard and enable the women to play an active role in the management and sustainability of the water supply projects. The direct stakeholders, mostly women, will define the institutional structure for both management and governance within the by-laws to be developed. The by-laws prepared will ensure that there will be social, economic and gender differentiation among the beneficiaries. There will be female-headed households some of whom may fall in the category of the poor, but will ensure that there will be an equal participation by beneficiaries. Poorer households, women and marginal groups will be given due priority, and governance will in effect ensure for equal participation to avoid discriminatory allocation of water and other benefits. Due to social, economic and cultural reasons, it is known that women tend to be less active in water users groups, and more reluctant to be drawn into them mainly because women have multiple responsibilities and have very little time to spare. This problem will be examined carefully, and the by-laws will be developed to enable rural women to play a more active role in the management of water supply systems. Women will also be given an opportunity to have a say in the design of water facilities and in the choice of technology. Local level training will be given to a select group of beneficiaries in each community on all aspects of water supply, including management and maintenance, during the planning of water supply and associated schemes. The formulation of the by-laws will take into account that the project will not bring about additional burden on women, rather cater to their needs and in effect take into consideration the different groups of beneficiaries to have different needs, which will have a bearing on the process of management, governance and long term sustainability of the project results. In formulating the by-laws, there shall be a mechanism to make leaders accountable, for redress of grievances, and for democratic decision-making.

Considering the sustainability of the Ground water Monitoring devices, the working mechanisms of the instruments depend that they are completely submerged within the water well and properly sealed to avoid tampering by the local communities. In addition, the WUA will also be responsible for the safety of the instruments and will provide an additional layer of security. Annually, a joint data downloading missions will be organized at the Federal level by the Ministry of Water, Irrigation and Electricity to be conducted with the respective Regional and Woreda water bureaus, to safely extract the monitoring devices as per the training given (Component 5) and inline with the operational handbook to download the data that has been recorded by the monitoring device. The water wells will be opened in the presence of the community elders and WUAs. Once all data has been downloaded, the monitoring batteries will be replaced, all data flushed and re-programmed before it is submerged back into the ground water well and sealed as per the instruction. The data gathered will be shared and used by all stakeholders including regional and Woreda planners as well as the academia and the Federal Ministry of Water, Irrigation and Electricity , the data of which will be used to manage available water resources, monitor the toxicity level and ground water flow, avoid possible contamination, as well as monitor on coming drought incidents.

Diversification of livelihood is a normal endeavor to the community and non-agricultural activities are critical components to the diversification process. However, the community has not pursued diversification of their livelihood mainly due to lack of access to financial resources, which has been exasperated by frequent drought incidents and

access to critical inputs. Support that will be given through this project will focus on breaking the barriers vis access to finance, improved off and on farm inputs so the community could engage in a viable livelihood diversification initiatives. It is known that livelihood diversification is pursued by the community for a mixture of motivations, and these vary according to context: from a desire to accumulate to invest, to a need to spread risk or maintain incomes, to a requirement to adapt to survive in eroding circumstances, or some combination of these. Smallholder farmers in Ethiopia mostly produce agricultural crop products just once a year during the summer season of May to September, which indicates the existence of idle rural labor force in the remaining long slack seasons. Therefore, livelihood diversification can make the rural labor force more efficient in employing their labor hour resource efficiently. Livelihood diversification practices of a farm household during the slack periods of agricultural activities will definitely boost the income level. The community, local government agents and community based organizations will be trained on livelihood diversification schemes that is appropriate to the local context (Component 5). FTCs and the regional agricultural bureau will play a decisive role in properly guiding the small holder farmers to invest in new farm technologies that will in turn help to boost both on and off agricultural productivity. The success of a diversified livelihood within the community is a factor of the MFIs, accessibility of improved inputs for both on and off farm activities and also replication centers of seeds and other inputs. This project in its life time will ensure that the revolving scheme will commence availing financial resources to select group of individuals as per the set selection criteria, FTC and Woreda Agriculture Desk are involved to ensure that the community receive the required guidance to the fruition of the finance received and the replication centers are efficiently working so they would be able to distribute required inputs to additional groups of the community. The Ministry of Agriculture and Natural resources will provide an oversight and monitoring and evaluation as well as remove barriers that are identified in due course of the project implementation for this specific component amongst others. This project will in effect act as a catalyst for the diversification process to commence and include more segment of the community over time and possibly include communities from the adjacent kebeles, which are not direct beneficiaries of this project in the future.

The project will also put in place a robust and effective knowledge management and communication structure. Through this, the goals, actions and results of the project are continuously analyzed and communicated widely. The knowledge management system will also ensure that lessons learned are captured and effectively disseminated. The project outreach measures will inform the design of other similar national projects and programs as well as facilitate its replicability in other Woredas'.

The projects focus on human capacity and system development at the various levels will ensure that long-term climate resilient practices is embedded within the livelihood of the community. As technical support to the intended project beneficiaries will be provided through the existing government extension system, it will further strengthen capacity in climate smart agriculture and improved technologies. The robust monitoring and evaluation system that will be applied to the project will ensure that progress towards achieving the intended sustainability will be regularly measured, enabling fine-tuning of implementation of the project.

## **Financial Sustainability**

Financial sustainability will be enhanced by concentrating AF funding on the higher cost capital expenditures required to initiate the transformation process with annual operating costs then becoming substantially lower, these then becoming part of on-going local budgetary commitments.

The technical support provided to farmers in order to promote climate smart and improved technologies will not only address climate change concerns but also improve the productivity and income of smallholders as well as promote livelihood diversification. This diversification should both enhance financial sustainability of community endeavors and attract increased investment from private actors engaged through the value chains.

The integration of the climate resilient initiatives into the local development plans will ensure replicability of project results to adjacent Kebeles, which will lead to the allocation of budget by the central government.

## **k. Environmental and social impacts and risks**

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

A separate environment and social management framework has been produced, with a detailed analysis of environmental and social impacts and how they will be addressed. This is attached as an annex to the proposal.

The overarching strategy of the project is to manage the risks from recurring droughts – both from current risks and under future climate change - through integrated water, agriculture and natural resource management approach. This is complemented with climate resilient livelihoods diversification interventions. The project is to be implemented in climate sensitive and vulnerable areas of Ethiopia.

The major social benefits of the project include increased productivity of livelihoods and their capacity to adapt to climate change, provision of employment opportunities to local populations, provision of direct employment during the construction phase and at operational stage of subprojects such as ponds construction, access roads to water facilities, irrigation sub projects and indirect employment through aspects such as operation of water facilities and maintenance activities which will offer greater job opportunity over a longer period of time.

The project has an explicit learning component that intends to build the capacity of local communities and will provide opportunities for scaling up of innovative approaches and interventions in off project sites. This aspect will generate substantial social benefits in terms of enhancing local planning capacity, community involvement in decision making and will benefit wider communities later when innovative approaches are scaled up.

Water supply systems under this program will ensure that the general public in the targeted areas have access to clean water supply, a pre-requisite for health and sanitation. In promoting irrigation practice, the project will offer opportunities for high value crop productions that will increase the income of rural farmers resulting in enhancing their quality of life.

Improved animal husbandry along with the implementation of safe guard measures will enhance the productivity of farmers increasing their income and accruing health benefits from consuming the various products of domestic animals. This is complemented with a low carbon, climate resilient livelihoods diversification interventions. The project is to be implemented in climate sensitive and vulnerable areas of Ethiopia. The value chain approach that ensures investment in production is complemented with efforts to ensure access to markets, will greatly benefit local communities in securing sustained income.

Increased access to credit facilities will enhance the productive capacity of farmers, while conservation measures will result in increasing water yield of wells and springs, soil fertility improvement which will contribute to increased production and improved health of communities. Agro-forestry will increase the resilience of farmers due to the availability of multiple crops in their fields.

The **environmental benefits** of planned conservation structures include protection of soil against damage due to excessive runoff, increase in yield of springs and water wells and reduced soil erosion. Better productivity on less tilled land due to improved seeds will also contribute to soil conservation. Conservation structures are basically environment enhancing projects and agro-forestry provides sheds to plants, conserve water and protects from soil erosion.

The potential adverse impacts identified include potential risk of import of seeds of alien species along with basic seeds, potential impact resulting from the expropriation of land for conservation and planting activities; potential social impact as a result of change of land use such as changing from mono crop production to agro-forestry, possible farmers resistance due to long gestation period of fruit trees to accrue benefits, generation of solid waste (hazardous and non hazardous) and site level infrastructure construction, competition in water use between domestic and irrigation use, water logging and salinization due to irrigation mal practice and impacts of spraying of toxic chemical fertilizers and herbicides .

A summary of potential environmental and social impacts and proposed mitigation measures for clustered project activities under water, agriculture and conservation sectors is provided below. The details are provided in the ESMF report.

**Table 13. Potential environmental/social risks of activities and proposed mitigation measures**

Project component and activities	Potential environmental/social impacts/risks	Proposed Mitigation Measures
<p><b>All planning activities such as</b> Develop the integrated water, agriculture-land-ecosystem and livelihood diversification plans with the communities</p>	<ul style="list-style-type: none"> <li>• Inappropriate plans , site and technology selection may negatively impact communities and the environment</li> <li>• Plans that require displacement of people</li> <li>• Water facilities located near burial places resulting in health hazards</li> <li>• Interventions located in sensitive areas resulting in destruction of heritages, interference in wild life movements..etc</li> </ul>	<ul style="list-style-type: none"> <li>• The following should be noted with regards to planning, priority setting and site selection:</li> <li>• The plan should indicate that none of the interventions should result in the displacement of people;</li> <li>• The plan should indicate appropriate of implementation such as building of the water harvesting and erosion control structures to be undertaken during the dry season to reduce erosion impacts;</li> <li>• Project activity sites must be outside: protected areas, biodiversity hotspot, natural and historical heritage sites</li> </ul>
<p><b>All activities related to</b> shallow well drilling; Installing pump and electro-mechanical fixtures</p>	<ul style="list-style-type: none"> <li>• Decrease in surface and/or groundwater water quality as a result of drilling and operational activities;</li> <li>• Dumping of construction waste, oil spilling of machineries, solid disposal etc.</li> <li>• Excessive use of groundwater leading to draw down of water table and possible land subsidence.</li> <li>• Impact on safety of community members due to exposure to fixtures</li> </ul>	<ul style="list-style-type: none"> <li>• Designated areas for storage of fuels, oils, chemicals or other hazardous liquids</li> <li>• Refueling to be undertaken in areas away from water systems.</li> <li>• Pump tests and groundwater quality studies should be carried out to determine suitability of groundwater and the safe yield.</li> <li>• Ensure all electrical and mechanical fixtures fulfill safety standards, no exposed electrical fixtures.</li> <li>• Ensure all users of facilities are aware of the dangers and post warning signs at appropriate places</li> </ul>
<p><b>All activities related to</b> construction of physical moisture and soil conservation structures and development of biological conservation measures</p>	<ul style="list-style-type: none"> <li>• Potential for use of degraded communal land for rehabilitation, with little consultation of communities resulting in loss of access to free grazing land.</li> <li>• Long-term anticipated conflict related to benefit sharing, which will arise as a result of the positive natural resource rehabilitation outcomes of the project's intervention</li> <li>• Potential impact resulting from the expropriation of land for conservation and planting activities;</li> </ul>	<ul style="list-style-type: none"> <li>• There should be a well-structured consultation process and a practice undertaking conservation measures including use of communal lands.</li> <li>• There should be a community lead and owned bylaw, which clearly stipulates benefit sharing and is endorsed by the community.</li> <li>• To the extent possible, the site for conservation structures should be on communal land and there should be extensive consultation and buy-in from the community for the intended use of the communal land.</li> </ul>
<p><b>All activities related to</b> fruits and vegetable production; supporting forage seed supply. Promoting small chicken-egg hatcheries and distribution of</p>	<ul style="list-style-type: none"> <li>• Possible farmers resistance due to long gestation period of fruit trees to accrue benefits</li> <li>• Potential risk of import of seeds of alien invasive species along with seeds and seedlings'</li> <li>• Generation of solid waste (hazardous and</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct prior consultation with farmers on the benefits fruit trees to supplement their income.</li> <li>• During seed dissemination stage ensure the quality of seeds and ensure that no alien invasive seed species are disseminatedSolid waste (hazardous and non hazardous) should be managed as per the requirements of Ethiopia's Solid Waste Management Proclamation (517/2007);</li> <li>• Used oil traps and other effluent/discharge management interventions should be put</li> </ul>

<p>imported (more resilient) sheep and goat breeds</p>	<p>non hazardous) and impacts of site level infrastructure construction;</p> <ul style="list-style-type: none"> <li>• solid waste and pollutants (including methane) associated to the production of livestock, poultry and apiculture</li> <li>• Impacts related to quality of seeds adulteration</li> <li>• Impacts related to spread of livestock and chicken disease</li> <li>• Impacts related to Import of exotic foreign livestock breeds</li> </ul>	<p>in place;</p> <ul style="list-style-type: none"> <li>• Dust suppression technique should be in place;</li> <li>• Provide workers operating in these areas personal protective equipment, including mufflers, as per the requirements stipulated in the Labour Proclamation (No. 377/2003).</li> <li>• During seed dissemination stage ensure the quality of seeds and ensure that no alien invasive seed</li> <li>•</li> <li>• species are disseminated</li> </ul>
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An assessment against the checklist of environmental and social principles is presented in the table below.

**Table 14. Checklist of environment and social principles**

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	No further assessment required for compliance	The project components and outputs are in line with many of the provisions of the Constitution of the Federal Democratic Republic of Ethiopia.
<i>Access and Equity</i>	Compliance assessment during implementation may be required	-
<i>Marginalized and Vulnerable Groups</i>	Compliance Assessment during implementation may be required	Initial assessment of vulnerability status during project site/kebele level ESS screening phase, and compliance assessment during implementation is required
<i>Human Rights</i>	No further assessment required for compliance	The constitution and legal proclamations respect human rights
<i>Gender Equity and Women's Empowerment</i>	Further assessment required, as this is one of the focus areas of project and compliance is key.	Initial assessment during project site/kebele level ESS screening phase, and compliance assessment during implementation is required
<i>Core Labour Rights</i>	No further assessment required for compliance	Labor Proclamation (Proclamation No. 377/2003) protects the rights of contract employees and contains similar provisions with that of <b>AF Principle 6..</b>
<i>Indigenous Peoples</i>	No further assessment required for compliance	There is no specific national legislation on this aspect as the Ethiopian population is indigenous. In the Ethiopian context this may not be relevant but the provisions are relevant to any rural community in the selected project areas.
<i>Involuntary Resettlement</i>	Initial screening and compliance assessment required, during implementation	Initial assessment during project site/kebele level ESS screening phase and compliance assessment during implementation is required. Since the project may appropriate land, there is a need to undertake an assessment to minimize land appropriation (to extent possible) and to ensure that communities that have lost assets, and economic and social benefits are compensated accordingly and as per the requirements In case of land appropriation and resettlement – a resettlement action plan is required.
<i>Protection of Natural Habitats</i>	Compliance Assessment during implementation may be required	Assessment to inform and strengthen the minimization of impacts on natural habitat at the project sites may be required.
<i>Conservation of Biological Diversity</i>	Compliance Assessment during implementation may be required	Assessment to inform and strengthen the conservation of biodiversity diversity at the project sites may be required
<i>Climate Change</i>	No further assessment required for compliance	-
<i>Pollution Prevention and Resource Efficiency</i>	No further assessment required for compliance	-
<i>Public Health</i>	No further assessment required for compliance	-
<i>Physical and Cultural Heritage</i>	Initial screening to verify that physical and cultural heritage sites are not in the vicinity	The criteria for section of project sites forbids locating project activities in the vicinity of project activities
<i>Lands and Soil Conservation</i>	No further assessment required for compliance	-

## PART III: IMPLEMENTATION ARRANGEMENTS

### A. Implementation arrangements

Describe the arrangements for project / programme implementation.

#### Implementing and executing entities

The Ministry of Finance and Economic Cooperation (MOFEC) will be the implementing entity for this project. There are four Federal Ministries of the GoE that will be executing entities, namely the Ministry of Agriculture and Natural Resources (MOANR), the Ministry of Livestock and Fishery (MOLF), the Ministry of Environment, Forest and Climate Change (MEFCC)<sup>106</sup>, and the Ministry of Water, Irrigation and Electricity (MOWIE). These ministries have committed to work together under the overall coordination and leadership from the CRGE Facility<sup>107</sup> under MOFEC. The Facility will ensure that the executing ministries will convene periodically to review the project implementation progress, exchange information and take timely actions on issues that will have negative impact on project delivery.

The project will be executed by the four ministries and their regional and district subsidiaries. The executing ministries have a strong institutional arrangement at the Federal, Regional and woreda levels. The project will establish/strengthen coordination structures at all levels. At Federal level, the CRGE Facility will ensure coordination and smooth communication among the four ministries. It will ensure this through the CRGE Facility Management Committee (can be considered as a project steering committee for this project), which is co-chaired by the State Ministers of MOFEC and MEFCC. State Ministers of the four ministries are members of this committee, which will provide overall guidance and oversight to the project. The committee will meet on quarterly basis. The project staff in the CRGE Facility will coordinate technical experts in the four ministries and ensure regular communication and organize platform for joint planning and periodic monitoring missions. The same arrangement with modification to fit local circumstances will be ensured at regional and Woreda level. The Bureau of Finance and Economic Development (BOFEDs) will ensure coordination and communication among the sector entities at regional level. At woreda level, the woreda steering committee (or development committee as it sometimes called in some woredas) coordinates actions on the ground across the four sectors and at landscape levels. It is important to note that the four sectors have common and differentiated responsibilities in terms core responsibilities for delivery of project results. For example, all agriculture and natural resource related outputs will be delivered by MOANR, water and energy related outputs by MOWIE, forest and crosscutting climate change outputs by MEFCC, and livestock by MOLF. In spite of this, all work will be jointly planned and implemented under the coordination of the Woreda Administration Office. Technical Officers and other experts who will be responsible for provision of technical support, planning, periodic monitoring,

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<sup>106</sup> MEFCC was previously the Ministry of Environment and Forestry, which was created as a result of the former Environment Protection Authority (EPA) becoming a full Ministry in 2013.

<sup>107</sup> The CRGE Facility is an entity established under MOFEC to lead and coordinate mobilization, allocation and management of climate finance from bilateral, multilateral and domestic sources. It is managed and lead by a management committee comprised of high officials represented from key CRGE sectors and its day to day operations are executed by a secretariat comprised of of senior experts housed in MOFEC and MEFCC.

supervision and periodic reporting at all levels. The executing sectors will avail office space, logistics and other facilities for project implementation. The federal executing ministries will closely collaborate with their respective sector bureau at regional level. Five project officers (one per region) will be hired to coordinate, closely monitor, report and provide technical support to Woreda level experts and development agents at kebele level. As this is the actual level at which project activities will be executed and that interaction with the direct beneficiaries and stakeholders occurs, priority will be given to assigning the Woreda Coordination with the necessary human resources, budget and logistical responsibilities. One expert will be hired for the seven project target Woredas who will follow up, coordinate and report the day-to-day operations of the project. A Development Agent (DA)/ Community Promoter will be appointed for each of the 14 Kebeles. These agents will be responsible for advisory support and extensions services to local beneficiaries (mainly farmers). CDAs will be responsible for distributing material inputs and providing technical training and backstopping in the implementation of project activities. They will also work within each Kebele with the village committees to engage in project implementation, their responsibilities including but not being limited to beneficiary selection, mobilising community contribution and representing the community in project management. The project will ensure equitable recruitment of women into these and other positions within the project.

The CRGE Facility will ensure that funds received from the Adaptation Fund will be disbursed to federal, regional and Woreda level executing entities through the already established channel of disbursement. The federal executing entities will receive funds directly from MOFEC (the CRGE Facility Account) for activities which they directly execute as defined in the project proposal. Similarly, the four regional sector Bureaus will receive fund through Bureau of Finance and Economic Development (BOFED). For Woreda and kebele level activities, the BOFEDs disburse funds to the Woreda Office of Finance and Economic Development Offices (WOFEDs). Such fund flow from MOFEC to BOFEDs and then to WOFEDs is known as the Channel One Fund Flow Arrangement. Dedicated project Finance Officers will be assigned at the CRGE Facility, BOFEDs and WOFED levels. The Federal and regional executing entities will also assign finance expert who will be responsible for compiling financial reports, facilitate account auditing, etc.

### **Capacity of Executing Entities**

The Executing Entities (EEs) to this project have replica structures that stretch to district and kebele (Sub-district) levels. They do have extensive experience in management and coordination of big national flagship programs and projects. The MoANR, one of the EE, has a mandate to implement agricultural development strategies, ensuring the food security of the country. It has extensive and rich experience in managing and implementing large-scale donor and Government funded projects and programs. Apart from its project management capabilities, the Ministry has rich experience in engaging with several stakeholders and development partners for national priorities. The other EE, MEFCC, is elevated from the former Environmental Protection Authority, and reconstituted in May 2013 with the mandate to develop and implement programs in environmental management and forestry. MEFCC has inherited several capacity and experience from MOA and EPA and is already managing the national REED+ Program, afforestation and restoration activities on millions of hectares degraded land, participatory forest management

activities, and several fast start investment projects financed by the CRGE Facility. The Ministry of Water, Irrigation and Electricity (MoWIE), has substantial accumulated experience in project and programme management. It is currently administering 72 international projects and 56 national accounts. The fast-track programme managed by MoWIE has five components/projects include: (1) Accelerating the National Biogas Program Ethiopia (NPBE); (2) Strategic support upgrading climate and hydrological information systems 3) Improving the Livelihoods and Lifestyles of Rural Communities through the Dissemination of Solar Energy Technologies; (4) Solar power for water supply and irrigation. The ministry is also implementing Energy+ funded by the Norwegian Government. There is also a National Meteorological Agency (NMA) which is an autonomous Government Agency, mandated to establish meteorological stations, monitor, produce and communicate weather and climate information, provide weather and climate services to national stakeholders, and share meteorological data in line with its international obligations. NMA has eleven Regional Meteorological Branch Directorates throughout the country, which are mandated to further tailor and communicate products within their area of responsibility as well as administer meteorological stations networks. Its data communication systems are networked through computer LAN and WAN, particularly with its eleven branch offices.

With regard to building capacity in CRGE, the Agricultural Technical, Vocational and Training Centers aggressively invest in producing Agricultural Development Agents with a range of technical skills (animal science, plant science, natural resource management). The agricultural development agents provide demand-responsive extension and short-term training services for farmers. Currently more than 80,000 development agents are deployed at the Kebele level throughout the country. Furthermore academic programs and universities have started to adapt and include CRGE in their overall objectives and thus curriculum development. They also enhance existing staff knowledge and skill through distance education programs. The Ethiopian Academy of Science (EAS), supports and hosts the Ethiopian Panel on Climate Change (EPCC), to consult on how to review capacity building opportunities involving the universities and other knowledge think tanks such as the Environment and Climate Research Center (ECRC), Environmental Development Research Institute (EDRI) and the Climate Science Centre (CSC).

In spite of the strong organizational structure, experience and functional systems of the EEs, the project has incorporated organizational, system and human capacity building activities under the “Enabling Environment” component. The project will recruit dedicated staff at federal, regional and Woreda levels. It will also organize tailored trainings, workshops, etc. as well as make available tools, equipment and other facilities. The proposed capacity building actions in this project are designed to respond to the “CRGE Capacity Need Assessment” that was conducted by the MoFEC in the year 2015. The main objective of the capacity needs assessment was to understand the gaps and needs in relation to deliver the CRGE objectives and vision. The capacity needs assessment report has identified sector specific capacity development measures that are required to better understand climate change impacts, response measures and to plan, monitor and report accordingly on active Climate Change initiatives. Specifically, it has identified measures to mainstream CRGE into policy responses, attract international and domestic resources, disburse funds to priority actions and apply effective financial management to ongoing activities.

Activities, particularly under components 1&5, will contribute to strengthen the human, organizational and system capacities of the project through on job and classroom trainings, workshops, seminars as well as procurement of tools and office equipment. The project coordination and implementation arrangement will also further strengthen the culture of joint planning, monitoring, supervision and enhance integrations at all levels. As indicated in the project management arrangement, in addition to the CRGE Facility management committee, the regional level project steering and technical committees will serve as a knowledge sharing and learning platform during joint planning, implementation, monitoring and supervision.

## **Roles and Responsibilities of Executing Entities**

### ***Federal EEs***

The **Federal EEs** are line ministries responsible for overall coordination of the project planning, monitoring and verification of the implementation by the regional sector bureaus and Woreda Offices. FIEs ensure that SRAPs are prepared based on the SRM, meet standards and rules of the CRGE Facility as per this Manual and further guidance, and are fully aligned with GTP priorities. They will ensure transparent, fair process for the selection of beneficiaries and allocation of resources. They request The CRGE Facility to authorize project fund release to respective BOFEDs based on a clear budget breakdown and approved plan by regions and woredas. They also request The CRGE Facility to authorize fund release to a designated CRGE account that is opened and managed by the FEE itself for approved activities at Federal Level. They also assign adequate numbers of experts to take charge of tasks for the successful delivery of the project.

- Prepare/compile sectoral annual progress reports on the implementation of the project activities and submit to CRGE Facility not later than 60 days after the completion of the fiscal year;
- Preparing consolidated quarterly narrative reports and submitting these to the CRGE Facility no later than four weeks after the end of the quarter;
- Establish and maintain a separate account for the receipt and administration of the project fund disbursed to them from the CRGE Facility.

### ***Regional EEs***

These are sector Bureaus, such as the Bureau of Water, Irrigation and Energy, Bureau of Agriculture, Bureau of Forest and Climate Change, etc. They are responsible for:

- Coordinating the preparation of annual plans, monitoring, provision of technical support ;
- Preparing periodic (quarterly and annual) narrative reports for activities which they directly implement and submit to their respective FIE copying BOFEDs;
- Preparing periodic (quarterly and annual) financial reports for activities which they directly implement and submit to BOFEDs copying relevant FIEs and BEF;
- Supervising implementation of activities by Woredas and providing support as necessary;
- Establish and maintain a separate account for funds they receive from the CRGE Facility through BOFEDs

- Receiving resources from respective BOFED to implement plans for activities which they directly implement;

### **Woreda Sector Offices**

- Implementing, or facilitating the implementation of activities as indicated on the project proposal, to ensure the delivery of required results;
- Delivery of activities and achievement of results indicated in the project proposal;
- Monitoring and following up the day-to-day implementation of the project activities;

### **Management arrangements**

The project will be overseen by the CRGE Facility Management Committee, which will assume a project steering committee role. The committee will discuss the project during its regular meeting (once per quarter), provides guidance and support. The CRGE Facility can request an extraordinary meeting of the management committee when there are urgent and important issues.

The CRGE Facility, which is housed within the MoFEC has a designated project coordinator reporting directly to the Facility Director. The coordinator is supported by 6 units that are assigned with the role and responsibility of M&E, Safeguards and Gender, mobilizing resource, project design and appraisal, communications and finance and procurement, the latter is also closely overlooked by the Chanel One Programs Coordination Directorate (COPCD)<sup>108</sup> department within the MoFEC (*elaborated at greater detail in the next section – Financial Arrangement*). Pertinent for this project, the units have been structured to effectively appraise projects design are aligned to the national CRGE priorities and to also monitor and evaluate all CRGE funded projects that are being implemented by the executing entities. Since its establishment in September 2012, the Facility jointly with the executing entities has implemented climate-focused projects in priority sectors in the size of USD 40 million.

The implementation of this project will follow suit using the existing experience and staff within the Facility and regional offices whilst also hiring additional focal project staff at the various levels. To this end, this project will hire a Project officer that will be based within the Facility and reporting to the M&E and Safeguards Unit. Four Technical Officers that will be hired and placed within each Executing Entities will support the project officer. The Technical Officers will be responsible to facilitate the execution of the pertinent sectoral activities at each region and provision of a periodic sectoral status report of the project at all regions to the Facility Project Officer. A disaggregated sector focused status reporting mechanism is critically important as it helps in tracking individual indicators in the overall projects log frame. This mechanism helps the pertinent executing entity to identify potential risks and bottlenecks and quickly outline mitigation measures and address the bottlenecks to effectively execute the project. The Executing Entities have the experience and also the leverage in addressing any potential issues and hence a disaggregated sectorial reporting is crucial.

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<sup>108</sup> Channel One Program Coordination Unit (COPCU) has been re-established as Channel One Program Coordination Directorate in 2016

This project will be using the executing entities designated implementing bureaus based at the regions. The pertinent CRGE Focal Officers based in the regional sector Bureaus will support the Technical Officers at the federal level through the provision of oversight to the projects execution at the Woreda level and also reporting periodically on the status of the project at each region. Woreda Facilitators will be hired and placed within the targeted seven-project woredas to effectively implement the project at the ground as well as to report on the status of the project to the CRGE Focal Officers. At Woreda level, a committee comprised of heads of the agriculture, forest, water and energy and livestock offices and chaired by the Woreda Administrator will closely supervise and oversee the project.

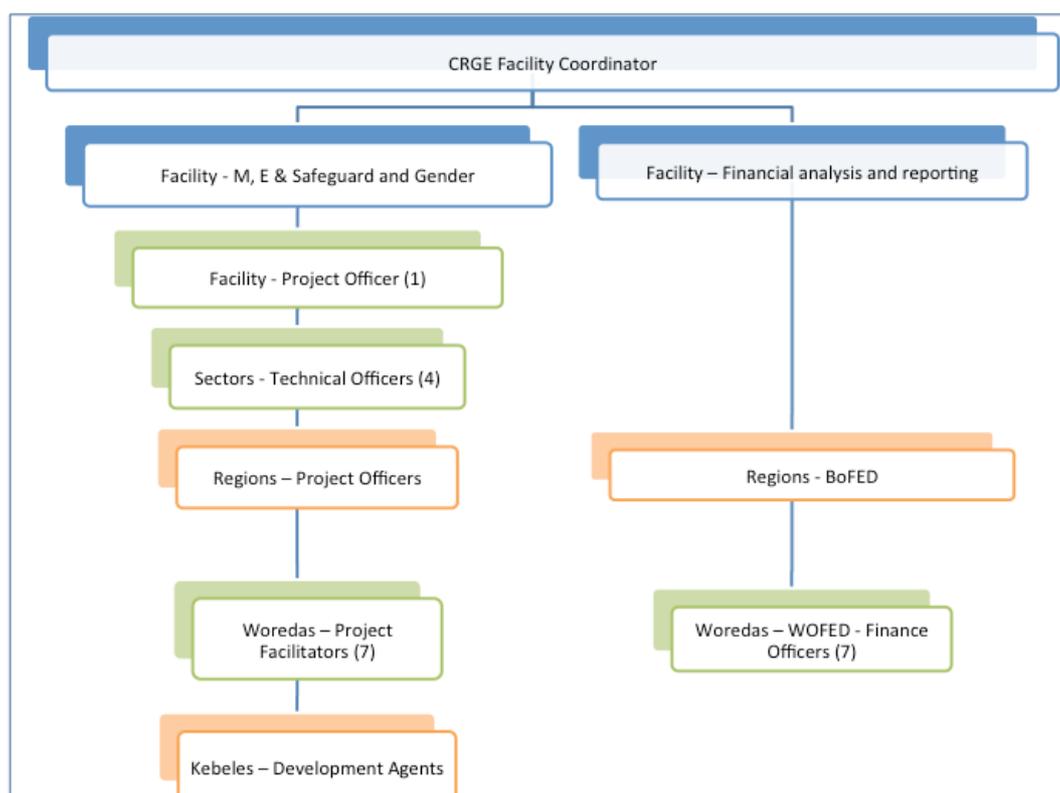
Development agents at the targeted project Kebeles (Villages) will be used to facilitate the execution of the project. Local stakeholders and community members will have a key role to play in the implementation and monitoring of the project. Consultations with all stakeholders will be organised to ensure there is clear understanding of the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines. The Kebele committees will coordinate the representation and engagement of the community. The use of existing staff is fundamentally important to ensure that the project is anchored into the national system so that it will be supported by the Facility, Executing Entities and their designated regional bureaus and Woreda offices to ensure its sustainability.

**Table 15. Experts identified to manage and implement this project**

Institution	Level	Role	No.	Status
MoFEC	Federal	Project Coordinator, M&E; Safeguards and Gender Coordinator	-	Existing Staff
MoFEC	Federal	Financial Management	-	Existing Staff
MoFEC	Federal	Project Officer	1	To be Hired
MoANR, MoWIE, MEFCC, MoLNR	Federal	Technical Officers	4	To be Hired
Bureau of MoANR, MoWIE, MEFCC, MoLNR	Regional	CRGE Officers	-	Existing Staff
Bureau of Finance and Economic Development (BoFED)	Regional	Financial Officers	-	Existing Staff
Woreda Office of MoANR	Woreda	M&E & Project Facilitators	7	To be Hired
Woreda Finance and Economic Development (WoFED)	Woreda	Financial Officers	7	To be Hired
<b>Total to be hired at the various levels</b>			<b>19</b>	

The proposed project implementation structure has been reflected in the project management structure shown below and has been colour coded as blue to represent staff currently working within the Facility, Orange to represent staff currently working at the national and subnational level and green to designate staff that will be hired for this project. The overall project management structure is shown below.

**Figure 12. Management and implementation structure**



### **Financial arrangements**

The financial management and procurement of this project will be guided by the public finance management and public procurement regulation of the Government of the Federal Democratic Republic of Ethiopia, which is compliant with international standards,

MOFEC established COPCD in order to coordinate and enhance implementation of Chanel one projects and programs supported specifically by development partners. COPCD s experience in Financial Management include the implementation of climate change mitigation and adaptation initiatives valued at over USD 400 million WaSH program, USD 1.5 Billion Protection of Basic Services (PBS) Programme that also has components focusing on resilience-building and provision of safety nets for the most vulnerable members of society and USD 2.6 Billion PSNP program among others.

To this end, COPCD is well experienced and capacitated in managing Billions of dollars of Multilateral, Bilateral and development partner funds and will also be responsible to manage AF’s funds disbursed by the Facility to the Executing Entities at the various levels. The project funds will be deposited in designated CRGE accounts of the Federal institutions as well as CRGE accounts of the Bureau of Finance and Economic Development (BOFED) at the regions and CRGE WofED accounts at the Woreda’s on a regular basis. Fund for regional and woreda level activities will be directly channeled from the CRGE Facility National Account to BOFEDs. The BOFEDs will then channel to WOFEDs for woreda level activities. The

project finance will be subject to the financial regulations and management (including auditing) of the government of Ethiopia.

Project finance will be dispersed based on an agreed upon and approved Biannual or annual Work Plan. The utilisation of funds will be monitored through an internal control framework, which depicts the funds transfer and reporting channels; it shows that funds received by a project account at the CRGE Facility are then channelled through the government structure - federal, regional and Woreda - and reported back through the same channels. This government channel has a dedicated financial structure staffed with over 1,000 finance professionals across the country at the various level of governance, who will be responsible for fiduciary assurance and facilitation of reporting, shown below.

### **Figure 13. Technical and Financial reporting channels**

Procurement of goods, services and works will be executed at different levels based on the nature, complexity and size of requirements in line with the Facility Financial Management manual, which was prepared to harmonize the Facilities Financial Management with the MoFEC requirements. The Financial Management Manual articulates on project procurement plans, roles and responsibility of the CRGE Facility Financial Analysis and Reporting unit as well as the executing entities amongst others. To this end, the manual will be used to align its financial management with the COPCD and its procurement of all international and bulk purchases through the Public Procurement and Property Administration Agency (PPPAA) and delivered to the project site concerned. The PPPAA was established by the Federal Government Procurement and Property Administration Proclamation No 649/2009 to effect a transparent procurement system in all public bodies, both at national (federal) and regional levels that ensures value for money.

The law further provides for the setting up procurement endorsing committee and ad hoc evaluation committee for complex procurement in every public body. The procurement unit is comprised of procurement staff while there is a standing 5-member committee including the chairperson to endorse procurement requests and is accountable to the Minister for MoFEC. Its internal audit unit and the Office of the Auditor General (OFAG) audit the procurement process made by the PPPAA to have followed the applicable laws and rules. The ultimate responsibility of ensuring that procurements are made as per the existing laws and procedures lies with the head of the relevant public body, in this case the Minister for MoFEC.

To further enhance the integrity of procurement services, the Proclamation No 649/2009 has established the Federal Procurement Board, whose membership comprises representatives of the private sector, public institutions and government enterprises or parastatals. The mandate of the Board is to review and decide on complaints lodged in regard to the PPPAA, and its decisions are final. The PPPAA serves as the Board's Secretariat.

On the basis of the principles set down in the proclamation and regulations, MoFEC through its PPPAA has issued a Procurement Manual to standardize procurement procedures in all public bodies and conducts periodic audits to ensure compliance with the same. The procurements are performed as per the thresholds set for each method of procurement. This process is also subject to compliance audit by the

PPPAA to provide assurance on reliability of the operation on top of the regular internal and external audits.

The procurement and property administration proclamation and public procurement directives are compliant with international standards, including those of the World Bank. The Proclamation, Directive, and the Manual stipulate the sanctions to apply in the event of non-compliance by any involved party. Compliance with the Manual along with the Proclamation and Directive is a mandatory requirement for all public bodies.

## B. Risk management

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

The CRGE Operations Manual sets out the risk management process for the facility overall. For projects and programmes, standard practice is to identify preventable, strategy and external risks, and identify mitigation measures to minimise these. This has been carried out for the proposed project and is shown below.

**Table 16. Risks, Scoring and Mitigation Actions.**

No	Risks	Risk Level	Mitigation
1	Low awareness and acceptance of the need to engage in climate change adaptation among officials of the Federal, Regional and Woreda level limits the support for action on climate change within key sectors.	Low	The implementation of CRGE strategy is overseen and supported by top government officials, led by the Office of the Prime Minister. This has helped to bring together the various sectors in the process. In addition sector ministries are required to integrate CRGE related activities in to GTP II and their annual budget. The project will build awareness of officials at all levels through consultation and effective advocacy.
2	Lack of project management capacity at Woreda and Kebele level. Most Government projects are managed at Federal and Regional level. While this project will be implemented at Wereda and Keble level there could be human and management capacity shortage.	Low	Lessons were drawn from the CRGE Fast Track Investment Projects and appropriate measures will be taken to establish and strengthen project management capacity. Strong project management staff will be assigned and rigorous support from Federal and Regional sector bureaus and the CRGE Facility will be given.
3	Lack of information and commitment for capacity building and adaptation in targeted Woredas/Kebeles.	Low	The project components and associated activities selection will consider exhaustively the available data on targeted intervention Kebeles. To this end a feasibility assessment of each Woreda and Kebele will be undertaken and informative data collected.
4	Insufficient commitments from Woreda to support the implementation of project components. The project component implementations require significant level of human resources.	Medium	The project will use existing institutional arrangements. Thus the additional project implementation cost will be low. It will be supported by ongoing agricultural extension, DRM, livestock, natural resource and other government structures and resources as well as farmers and farmer's organizations. This will mitigate the challenge for the implementation of the project.
5	Failure to crate ownership of the project at local level results in communities' resistance.	Medium	Important institutional arrangements in organizing and sensitizing communities are already present at Kebele level. There is existing experience of participating in communal practices, such as watershed management, participatory forest management, etc. The project will use such opportunities to create ownership of the project. The project will use Development Agents in the implementation process.
6	Price fluctuation and understated cost estimate of inputs and technology products price could raise cost of implementation and lead to budgetary constraints. The problem could sustain in post project life.	Low	The project cost design will be based on reliable price of inputs and technology products. The Project will establish a financial risk management strategy and regularly monitor and audit accounts.
7	Delays in the disbursement of funds, procurement and	Low	The CRGE Financial Manual has been developed and training will be given to permanent and

No	Risks	Risk Level	Mitigation
	Institutional inefficiencies (lengthy approval processes etc.) delay the resulting in delayed project implementation.		temporary staff at all levels. The financial flow and administration will follow the government regular channel. Additional finance and administrative officers will be recruited to ensure effective mobilization of funds, contracting, monitoring, and financial reporting.
8	Failure to adopt a holistic approach necessary for this type of project. Traditionally, projects were developed by a single Ministry and implement by the same from Federal to Region and Woreda. This project follows a landscape based-integrated approach and requires engagement of different stakeholders at macro, meso and micro levels.	Medium	The CRGE Facility has acquired lessons from the Fast Track Investments implementation and will coordinate r the implementation of this project. The Facility will assign dedicated staff. This team will regularly communicate with the project coordination units of the executing ministries and Bureaus.
9	Low technical knowhow of farmers and communities to use modern technologies. The project will introduce green technologies such as extracting of water and small scale irrigation using solar energy. These and other technologies require adopting the new technologies and associated practices.	Low	Technical support to the intended project beneficiaries will be provided through the existing government extension system. This will include, knowledge transfer on the technologies and improved practices through workshops, exchange visits, demonstration of on farm practices (e.g. using Farmers Training Centers), and training of trainers. It will also focus on capacity building on irrigation practices, farming technologies, livestock feed preparation, cut and carry, existing watershed management guidelines, and soil and water conservation practices. Proper training will also be given to government stakeholders and implementing institutions on trouble shooting, operation and maintenance of the solar PVs and the installed surface pumps.
10	The proposed fails to bring the intended results. The project has a number of components, which are strongly inter-related, and will be introduced in an integrated approach. The implementation of these components is expected to diversify and strengthen livelihoods and sources of income for vulnerable people in targeted areas. Full realization of the expected results of the project could be affected by improper selection of relevant areas and response to address communities' vulnerability.	Medium	The project will address this risk through a number of actions. The first is compiling and examining vulnerability factors of target Kebeles. This will help to undertake relevant natural resource management approaches that, introduced in a coherent and adaptive way. The second is the rigorous approach to selection of participating communities, which ensures that the viability of the approaches has at the outset been validated in the local contexts. In realizing these pre-feasibility assessment has been done during the project design.
11	Communities low awareness of the climate change and less enthusiastic to respond to the dangers brought by climate change. Unless beneficiaries have full awareness about the impact of climate change it is difficult to gain their commitment in the proposed action aimed at building resilience and adaptation.	Medium	The project will start by identifying the severity of communities' vulnerability through engagements. The project will introduce participative mechanisms to understand the impact of climate change and integrate into local planning. It will build awareness through a series of targeted activities and employs Kebele level staff to promote activities.
12	Weak institutional arrangement at Regional and Woreda level to facilitate the implementation of the project. The establishment of CRGE unit at Regions is not fully realized. Some Ministries such as Ministry of Environment, Forest and Climate Change have no corresponding offices at Woredal level. This may hamper the efficient	Low	This risk will be mitigated by creating strong project coordination and governance arrangements. The project governance structure will ensure that cross-sectoral coordination and collaboration will be established. The CRGE Units at Federal level will create smooth linkage at Regional and Woreda level existing institutions. The Woreda Agricultural office which is represented by Development Agents at Kebel level will take the lead and coordination responsibility. It is through this facilitation of the collaboration of the existing institutions that the project will manage this risk

No	Risks	Risk Level	Mitigation
	implementation of the project.		and contribute to its ultimate success
13	Lack of co-ordination with other climate change projects limits the capacity of implementing agency to learn from and build on the experiences of related projects.	Low	The project has reviewed lessons from other projects and has discussed the projects with relevant Ministries and Woredas. The CRGE Facility in collaboration with Ministry of Environment, Forest and Climate Change are engaged in coordinating climate change projects. The Technical Committee under the CRGE Ministerial Committee also plays important role in monitoring and coordination of climate change projects at all levels. The committee will also ensure technical level collaboration with regional entities and ensure cross-sectoral collaboration on matters of common interests.
14	Staff turnover in the project implementing unit may hamper progress	Low	Fair remuneration, training and technical support will be provided to the project staff. This will help to reduce staff turnover.
15	Conflicting interests among stakeholders with respect to land use (e.g. Crop intensification program which is focused on maximizing agricultural production by promoting mono-cropping and the use of chemical inputs) and access to and use of natural resources hampers the success and implementation of project components.	Low - medium	The project will introduce measures to promote dialogue and build trust among stakeholders. It will primarily be implemented on communal lands first and will be replicated with individual farmers. While Development Agents (DAs) already build trust among the community and provide technical support; the project will use them to reach communities.
16	Limited ability of smallholder farmers to pay for project inputs and technologies.	Medium	The project will promote access to credit to purchase and disseminate modern farming inputs and green technologies. The project will support beneficiaries to establish groups/cooperatives to afford economies of scale and bargaining power in buying inputs and aggregating the product in sufficient quality to sell on to traders.
17	Unsustainability of project outputs. Some of the project activities may need operation and maintenance costs such as operation and maintenance of irrigation schemes and, supply and use of improved technologies. Unless a financing mechanism is established or government supports from budget the project output sustainability will be questionable.	Medium	The project will link the project outputs with the existing agricultural extension system. This will help continue to provide participatory and demand-driven services in line with the extension strategy beyond the lifespan of the project. The government is committed to further support and strengthen the extension service, which will provide increased opportunities for rolling out project results.
18	Lack of incentives for local communities to participate and cooperate in interventions that do not yield immediate financial value or reduce incomes in the short term, but aim at longer-term resilience. Furthermore if target communities perceive that the project support lacks fairness and transparency they will be reluctant to participate in the project implementation. This may reduce stakeholder engagement and participation.	Low	Tailored awareness creation will be organized on the importance of the project activities. The project will also demonstrate the benefits of CSA from successful areas. Once the owners of adjacent farmland start enjoying the outputs of project activities; both implementing institutions and communities will start promoting the importance of the project. Local stakeholders and community members have a key role to play in the implementation and monitoring of the project. At the kebele (community) levels, Development Agents (DAs) will provide advisory support and extensions services to local beneficiaries (mainly farmers). DAs will be responsible for distributing material inputs and providing technical training and backstopping in the implementation of project activities.

## C. Environmental and social risk management

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

A separate environment and social management framework has been produced, with a detailed analysis of environmental and social impacts and how they will be addressed. This is attached as an annex to the proposal. The Constitution of FDRE provides the guiding principles for environmental conservation and management. There are accompanied proclamations to operationalize the law.

- Environmental Policy (1997)
- Development, Conservation and Utilization of Wildlife: Proclamation No. 541/2007
- Ethiopian Wildlife Development and Conservation Authority Establishment: Proclamation No. 575/2008
- Environmental Impact Assessment Proclamation No. 299/2002
- National conservation Strategy, Volume II, 1994,
- National Biodiversity Strategy and Action Plan (2005)
- Ethiopia's Pollution Control Proclamation and standards (Proclamation no. 300/2002),
- Guidelines for undertaking sector specific Environmental Impact Assessment on development projects.

The environmental policy and other laws are the basis for protection, conservation and promotion of the environment. Tools that are in use for implementation of the laws and regulations include Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs) which guide operationalizing environment and climate change considerations across sectors including agriculture and non-agricultural sectors. Both environmental and social impact assessments (ESIA) are mandatory for development projects, activities and programs in the country. The ESIA process is overseen primarily by the Ministry of Environment, Forest and Climate Change (MEFCC), CRGE Facility of the Ministry of Finance and Economic Cooperation (MoFEC), and National Planning Commission (NPC). Most recently, within the national policy context, there is an Environmental and Social Management Framework MFCC, which was approved in 2015. In addition, there are also a CRGE Facility manuals and guidelines, operation manuals, and appraisal guidelines to ensure compliance with environmental and social safeguards of the Facility/CRGE and social inclusion.

The project – and procurement process – will also comply with the Environmental and Social Management Framework MFCC, which was approved in 2015<sup>109</sup>. This is based on best practices (including screening and categorization) of the environmental and social safeguards policies of the World Bank, the Global Environmental Facility, the Africa Developmental Bank and the European Investment Bank. The GoE has prepared the ESSF to address environmental and social issues that may arise from any CRGE investments. Moreover, the preparation of the safeguards framework is based on the provisions and principles of the national environmental and social policies and legal frameworks, including the Constitution

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<sup>109</sup> Ethiopia's Environmental And Social Safeguards Framework (Essf) For The CRGE Initiative. Ministry of Environment and Forest. February 2015.

and the Environmental Impact Assessment Proclamation. This integrates environmental protection and social development into CRGE investments in a proactive manner to contribute towards sustainable development. The framework:

- Provides a set of internationally recognized standards and frameworks in environmental and social safeguards to the CRGE investment;
- Avoids, minimize or mitigate any direct, indirect, and potential adverse environmental and social impacts of CRGE investments;
- Defines and sets in place the roles and responsibilities of all relevant stakeholders/institutions in executing safeguards of CRGE investment initiatives throughout their life cycles; and
- Ensures that effective mechanisms are in place for safeguard compliance during CRGE investment implementations.

This applies with the following principles:

- Early application of environmental and social safeguards: Safeguards instruments should be applied proactively in the CRGE investments to contribute towards sustainable development.
- Participation of stakeholders: All concerned stakeholders and affected people should be given the opportunity to participate meaningfully at all stages of CRGE investment.
- Information Dissemination: Sufficient information should be provided in accessible and culturally appropriate ways. Providing information about the project at an early stage of the ESSF process enables the public to understand the trade-offs, contribute meaningfully to project design and implementation, and to have greater trust with the coordinating and implementing entities of the CRGE projects.
- Prevention and mitigation of adverse impacts: one of the key principles is to prevent and/or mitigate any harm to the environment and to people by incorporating environmental and social concerns as an intrinsic part of CRGE investment cycle management. Environmental and social issues will be tracked during all stages of the CRGE investment cycle to ensure that supported investments comply with the procedures and guidelines laid out in the ESSF.
- Accountability and Transparency: Both CRGE implementing and executing entities are accountable for providing sufficient information on their CRGE investment proposals to the CRGE coordinating entities, and for managing the potential impacts of their CRGE investments. The CRGE coordinating entities are accountable for the decisions that are taken in line with the CRGE investments. By doing so, the ESSF would enable all entities involved in the CRGE implementation to be accountable and transparent in all their undertakings.

The ESSF applies to investment all projects financed through the CRGE Facility, and thus to this proposal. It involves screening to identify which projects require an EIA and similarly social issues, and then subsequent guidance should these be required.

Finally, the project will comply with the CRGE manual and guidelines. The CRGE Operations Manual sets out the operational process. It includes the guidance on

appraisal and this requires the compliance with environmental and social safeguards of the Facility/CRGE and social inclusion.

The project has been assessed against the AF Environmental and Social Policy with a summary of the checklist for the project presented in section K.

## **D. Monitoring and evaluation arrangements**

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

Monitoring and evaluation (M&E) of climate change adaptation faces a number of challenges. The scientific and social assumptions are difficult to predict and bound to change, whether relating to temperature and rainfall variability, population demographics or economic growth trajectories. It is very difficult to attribute changes to a given project due to the range of interconnected factors required for change. There is increasing evidence that behavioural and cognitive factors - which are difficult to measure using traditional M&E approaches - are key for climate adaptation. And there can be a significant time lag between interventions and future impacts, with a high probability also for negative outcomes resulting from uncertainty. These challenges have been considered in designing the project's M&E methodology.

The monitoring and reporting system of the proposed project will follow guidance from the CRGE Monitoring and Evaluation System Manual<sup>110</sup>. Consistent with national procedures and international good practice, the M&E system comprises six components: (1) strategy and objectives, (2) performance indicators, (3) monitoring & reporting, (4) evaluation, (5) roles and responsibilities and (6) maintaining the M&E system. This M&E system generates information to:

- Assist with planning of CRGE activities at various levels of operations;
- Assess the relevance, effectiveness, efficiency, sustainability and likely impact of interventions funded by the CRGE Facility;
- Identify improvements to the relevance, effectiveness, efficiency, sustainability and likely impact of interventions funded by the CRGE Facility;
- Communicate to decision makers, the public and to contributors to the CRGE Facility on implementation successes and challenges;
- Contribute to sectoral reporting to the National Planning Commission; and,
- Contribute to global learning to support climate-resilient green growth.

The approach will ensure that the project maintains a simple and interactive monitoring system allowing for regular reporting and learning at all levels. It is expected that it will be based on the following core activities.

The overall M&E activities for the project will be managed by the PMU in the CRGE facility, but supported by locally based project staff members. These staff will be sited at the regions and Woreda level, and will be able to undertake ongoing M&E at the relevant level of the project.

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<sup>110</sup> Climate Resilient Green Economy (CRGE) Facility: Monitoring and Evaluation System Manual. May 2015.

Outcomes, outputs and processes will be monitored during project implementation with data collected, compiled and analysed by the Monitoring and Evaluation Officer (supported by local experts and the Gender Coordinator) on a regular basis. Consistent with the CRGE Facility M&E practices and international good practices, the following M&E activities will be conducted during the course of project implementation.

Activity Recording/Process Documentation: Progress monitoring will provide evidence on accomplishment of the core activities planned under each component and sub-component output, which will be scrutinised by assigning milestones and implementation timelines. This will help the strategic and operational managers to identify which activities are ahead, behind or on schedule. Executing Entities at all levels will be responsible for ensuring routine monitoring on the use of inputs (including finances) and implementation of activities.

Quarterly Progress Report: The federal executing entities will submit aggregated quarterly physical progress reports to the CRGE Facility. The latter will further aggregate and submit a consolidated report (both financial and physical) to the relevant stakeholders. Quarterly reporting will capture activity and output-level information. The narrative section of the quarterly report, therefore, will include a summary of activities and outputs contributing to expected outcomes. The report will also describe progress on implementation as well as lesson learning, a risk update and management. The report will also include the expenditure report and a workplan and budget for the following reporting period. The report will be submitted to the Project Steering Committee for regular review and approval.

Annual Performance Assessment: EEs will submit an annual Performance Assessment Report (PAR) on the project components and sub-components. The PARs inform two monitoring activities at the project coordination level - annual monitoring missions and annual reviews/reports - and leverage the lessons and insights from responses to the M&E Questions. The reporting process is similar to that for quarterly reports. EEs will aggregate component reports before submission to the project coordination unit, which will then submit to the Adaptation Fund and other st. PARs capture activity, output and outcome-level information (as much as possible), as well as lessons and insights from periodic responses to the M&E Questions. The report combines national and GCF reporting requirements, which include but are not limited to, reporting on:

Institutional Learning Events: Federal executing entities will undertake a mid-term and final learning event to reflect on the changes being observed and to take stock of progress made. These learning events will help sharing of experiences and lesson learning among the executing entities (including regional EEs, as relevant).

Annual Monitoring Missions: Joint monitoring missions will provide an opportunity to engage stakeholders of the project, including those that do not have a direct role in implementation. These missions will be organised by the CRGE Facility or federal EEs, to be undertaken annually, and involve regional executing entities, communities and other stakeholders and other development partners.

Mid-term and End of Project Evaluation: Half way through the project life and during the final three months, independent mid-term/terminal evaluations will be organised. The reports of both evaluations will summarise the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not

have been achieved. Outcome level evaluation will be based on assessing results against baseline. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results. Evaluations will be implemented in line with international standards, particularly independence, transparency and the use of standard Development Assistance Committee (DAC) criteria<sup>111</sup>. The evaluations will be guided by best practice approaches to evaluation of climate change interventions<sup>112</sup>. At mid-term, there should be an emphasis upon project or process evaluation, with learning-oriented enquiry; the final evaluation will be more focused upon success in delivering outcomes and the impact on actual climate change adaptation and mitigation in Ethiopia.

Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The CRGE Facility in collaboration with the executing entities will identify and participate through its structures, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. Further, they will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future programmes. A two-way flow of information will be maintained between this project and others of a similar focus.

**Table 17. Monitoring and evaluation activities and budget.**

Activity	Responsible person	Budget US\$	Timeframe
Baseline survey / six monthly visits	Monitoring and Evaluation Officer	55,600	Within 2 months of project starting
Inception report	Project Co-ordinator	-	Within 2 months of project starting
Bi-annual Progress Reports	Project Co-ordinator	-	6 monthly
Inception workshop/ learning event	Project Officer/Technical Officers	23,809	Within 4 months of project starting
Final workshop / learning event	Project Officer/Technical Officers	23,809	Month 36
Annual impact Assessment	Monitoring and Evaluation Officer	-	Annual
Annual field visits by IE	Project Co-ordinator and M&E officer	17,440	Annual
Mid-term Evaluation	External consultant	58,880	Month 18
Final evaluation	External consultant	58,880	Month 36
Audits	External auditor	9000	Month 18 and 36
<b>TOTAL</b>		<b>247,419</b>	

111 The DAC criteria are: relevance, efficiency, effectiveness, impact and sustainability.

112 Colvin J, Williams A, Ebi K & Patwardhan A (eds) (2016) Monitoring, evaluation and learning for climate change adaptation at the national level. Washington: STAP/Provia, in press.

**Table 18. Project Monitoring and Evaluation Plan**

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
<b>Impacts</b>	<ol style="list-style-type: none"> <li>Improved health status of the community</li> <li>Increase agricultural productivity</li> <li>Increased the school enrolment rate of children particularly girls</li> </ol>	<ul style="list-style-type: none"> <li><b>Health Status-</b> measures the prevalence rates of communicable and other forms of diseases, change in behaviour of households in seeking health care services, etc. as indicated in the Ethiopian Ministry of health measurement parameters for rural households</li> <li><b>Agricultural productivity-</b> the increase in productivity per unit area or overall production a household produces</li> <li><b>School enrolment rate-</b> refers to the total number of school aged children who attend school <b>Numerator:</b> # of children who attend school <b>Denominator:</b> Total # of school aged children</li> </ul>	Midterm and/or Final or ex-post	Independent third party (can be consultants); Central Statistics Agency or other	Poverty analysis, Climate Change vulnerability assessment, supplementary technical surveys,
<b>Outcomes</b>					
<b>Outcome 1:</b> Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	<ol style="list-style-type: none"> <li>Number of people suffering losses from drought events</li> <li>Percentage of target population adopting risk reduction measures</li> <li>Number of kebeles where ecosystem services have been maintained or improved under climate change</li> </ol>	<ul style="list-style-type: none"> <li><b>Loss</b> determined by crop failure, livestock deaths due to drought event</li> <li><b>Risk reduction measures</b> refer to the on-farm and off-farm activities introduced by the project</li> <li><b>Ecosystem services</b> determined by improved flow of springs, rivers, reduced run-off, flooding and siltation, etc.</li> </ul>	Annually, midterm and end of the project	<ul style="list-style-type: none"> <li>Federal and regional IEs, CRGE Facility, Joint monitoring missions with relevant stakeholders</li> <li>Independent consultants</li> </ul>	Consultations with woreda planning unit, document review, surveys, field visits and observations, stakeholders consultations

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
<b>Outcome 2:</b> Enhanced and secure access to potable water supply, and small-scale irrigation in drought affected areas	1. Percentage of HH disaggregated by gender having access to potable water, irrigation and livestock watering facilities	<ul style="list-style-type: none"> <li><b>Access</b> refers to the usability of the potable and irrigation water facilities disaggregated by gender</li> </ul>	<ul style="list-style-type: none"> <li>Biannually/ after the installation of the irrigation and potable water schemes and mid-term/ end of project</li> </ul>	<ul style="list-style-type: none"> <li>Federal and regional IEs, CRGE Facility, Joint monitoring missions with relevant stakeholders,</li> <li>Independent consultants</li> </ul>	Beneficiary consultation, field visit, observations, surveys,
<b>Outputs</b>					
Output 1.1: Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels	<ol style="list-style-type: none"> <li>No. of woredas mainstreaming climate issues within their development plans</li> <li>No. of community groups formed and operationalised for adaptation planning (by gender)</li> <li>No. of women/men from target HH participating in adaptation planning processes and mobilised to participate in project activities</li> </ol>	<ul style="list-style-type: none"> <li><b>Mainstreaming</b> is determined by the degree to which climate change agenda and climate change adaptation measures are integrated into the local level development plan</li> <li><b>Community groups</b> refers to the organized groups of youth, women and men for planning and implementation of project activities,</li> <li><b>Participation</b> refers to the representation of both women and men headed households in the adaptation planning expressed as ratio of participants</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly reports or annual reviews</li> </ul>	<ul style="list-style-type: none"> <li>CRGE Facility (optional),</li> <li>Regional IEs, Woreda Offices, Technical Officer</li> <li>Kebele Officials</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly work plans, meetings, reports, regular M&amp;E visits.</li> </ul>
Output 1.2: Climate smart development plans designed	<ol style="list-style-type: none"> <li>No. of climate smart development plans developed and implemented</li> </ol>	<ul style="list-style-type: none"> <li><b>Climate Smart Development plans</b> are plans which integrate climate change adaptation actions and adopted by the responsible entities</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly reports or annual reviews</li> </ul>	<ul style="list-style-type: none"> <li>CRGE Facility (optional),</li> <li>Federal IEs/ Project Facilitators</li> <li>Regional IEs, Woreda Offices, Technical Officer</li> <li>Kebele Officials</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly work plans, meetings, reports, regular M&amp;E visits.</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
Output 1.3: Climate resilient water plans developed	1. Number of climate resilient water plans developed and implemented	<ul style="list-style-type: none"> <li>• <b>Climate Resilient Water Plan</b> refers to a plan for potable and irrigation water structure, which is designed to be climate responsive</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly reports or annual reviews</li> </ul>	<ul style="list-style-type: none"> <li>• CRGE Facility (optional),</li> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, meetings, reports, regular M&amp;E visits.</li> </ul>
Output 1.4. Climate smart agriculture and land – water - forest integration plans developed	<ol style="list-style-type: none"> <li>1. Percentage of committee positions held by women/men from target HH in planning processes</li> <li>2. Number of Climate smart Agriculture and land – water - forest integration plans developed and implemented</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Committee</b> refers to members of community appointed to provide specific function</li> <li>• <b>Numerator:</b> number of female or male</li> <li>• <b>Denominator:</b> total number of people elected for a given committee</li> </ul>		<ul style="list-style-type: none"> <li>• CRGE Facility (optional),</li> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, meetings, reports, regular M&amp;E visits.</li> </ul>
Output 1.5: Climate resilient livelihood plans developed	1. Number of climate resilient livelihood plans developed	<ul style="list-style-type: none"> <li>• <b>Climate resilient livelihood plan</b> refers to a plan being developed by active participation of beneficiaries and one which constitutes initiatives that will improve communities resilience to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Biannually or annually</li> </ul>	<ul style="list-style-type: none"> <li>• CRGE Facility (optional),</li> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, consultations, reports, regular M&amp;E visits.</li> </ul>
Output 2.1. Potable water supply increased in the target areas	<ol style="list-style-type: none"> <li>1. Number of female and male headed HHs having access to a potable water supply</li> <li>2. Number of wells constructed to the required standards of the MoWIE</li> <li>3. Number of wells drilled that are fitted with solar powered submersible pump systems</li> <li>4. Number of well monitoring devices (WMD) installed in</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Access</b> is taken to mean within one km of an adequate amount of water (20 litres per person) through a public standpipe well or spring.</li> <li>• <b>Time</b> the total number of hours or minutes spent to fetch water</li> <li>• <b>Fitted</b> refers to the number of wells, which use solar PV for pumping water</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• CRGE Facility (optional),</li> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, M&amp;E visits, reports,</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
	wells 5. Number of elevated reservoirs constructed	<ul style="list-style-type: none"> <li>• <b>Reservoir</b> refers to water storage facilities constructed to collect and store water</li> </ul>			
Output 2.2: Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change	<ol style="list-style-type: none"> <li>1. Number of hectares of land irrigated from ground water supplies and sand dams</li> <li>2. Number of sites where physical water infrastructure has been improved to deal with climate risk</li> <li>3. No. of shallow wells with Solar Powered pumps, Hand dug wells and Springs developed</li> <li>4. Number of water user groups developing and adopting by-laws for irrigation, livestock watering and drinking water</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Irrigated land</b> refers to the sum of hectare of farm land and back-yard put under cultivation when there is shortage or no-rainfall</li> <li>• <b>Infrastructure</b> are water facilities designed to deal climate risks such as flooding, siltation, run-off, etc</li> <li>• <b>Water user groups</b> are sets of people who are organized to manage and effectively utilize water schemes for drinking and irrigation purposes</li> <li>• <b>Bylaws</b> rules enacted by water user groups to avoid water management and use related conflicts</li> </ul>	<ul style="list-style-type: none"> <li>• biannually and annually</li> </ul>	<ul style="list-style-type: none"> <li>• CRGE Facility,</li> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, M&amp;E visits, reports, surveys</li> </ul>
Output 3.1: Climate smart agriculture implemented at the farm level	<ol style="list-style-type: none"> <li>1. Yield (tonnes) in crops from target areas</li> <li>2. No of target HH adopting climate resilient farming practices disaggregated by type (e.g. soil conservation)</li> <li>3. No. of HH participating in farmer field trials.</li> <li>4. Average crop diversity index</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Yield</b> refers to the amount of crop harvested in the project target kebeles</li> <li>• <b>Climate resilient farming</b>-a farming practice which conserves moisture, uses moisture stress species and improves soil fertility</li> <li>• <b>In farmer field trials</b>- number of farmers who are willing to try climate</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly work plans, M&amp;E visits, reports, surveys</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
		<p>smart agricultural practices</p> <ul style="list-style-type: none"> <li>• <b>Crop diversity index</b>- the inverse of (the number of crops grown by a household + 1)</li> </ul>			
Output 3.2. Integrated watershed management approach used to restore and protect degraded watersheds	<ol style="list-style-type: none"> <li>1. Area of land (ha) rehabilitated (by type)</li> <li>2. Area of rangeland (ha) managed using environmentally sustainable, climate resilient practices</li> <li>3. No of functional community based systems for grazing and efficient feed conservation management</li> <li>4. Area of afforested land (ha)</li> <li>5. No of nurseries established</li> <li>6. No of seedlings distributed</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Land rehabilitated</b>- sum of hectare of land put under different soil and water conservation measures</li> <li>• <b>Rangeland</b>- mostly communal land for grazing purpose</li> <li>• <b>Functional community based systems</b>- bylaws and existing good practices</li> <li>• <b>Afforestation</b>- planting trees on a land which was never covered by forest in the past</li> </ul>	<ul style="list-style-type: none"> <li>• Biannually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs, Woreda Offices, Technical Officer</li> <li>• Kebele Officials and other stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• Work plans, M&amp;E visits and field observations, reports</li> </ul>
Output 4.1: Improved knowledge, understanding and awareness of livelihood opportunities	<ol style="list-style-type: none"> <li>1. No of cooperative and youth groups established;</li> <li>2. No. of cooperatives members (Male and Female) trained and providing assistance to the HHs</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Cooperative Members</b> - Group of individuals who are legally established as per Proclamation number No. 147/1998 of Ethiopia to establish a cooperative on voluntary basis. Cooperatives members have similar needs for creating savings and mutual assistance among themselves by pooling their resources, knowledge and property.</li> <li>• <b>Youth Group</b> – those</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs</li> <li>• Woreda Technical Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Work plans, M&amp;E visits and field observations, reports</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
		group of young people between the ages of 15 and 29 and engaged in various kinds of micro businesses.			
Output 4.2: Increased capacity of target households to participate in climate resilient, market-oriented enterprises	<ol style="list-style-type: none"> <li>1. Number of women/men from target HH with a new source of income.</li> <li>2. No of farmers trained and engaged in a new enterprise</li> <li>3. Number of HH (Male and female headed) accessing credit facilities and market information</li> </ol>	<ul style="list-style-type: none"> <li>• <b>New Source of Income</b> – The diversification of the income portfolio of a household</li> <li>• <b>Engaged in a new Enterprise</b> – The support and training given to improve skills and households networked with rural enterprises to develop household and small scale rural enterprise.</li> <li>• <b>Credit Facility</b> - Rural financial services serving as an instrument with a variety of services including not only agricultural lending but lending to farm households for non-agricultural production and consumption purposes, and loans made to non-farm rural services</li> <li>• <b>Market Information</b> – A coherent body of market information that has been brought together from disparate items.</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs</li> <li>• Woreda Technical Officer</li> </ul>	<ul style="list-style-type: none"> <li>• Work plans, M&amp;E visits and field observations, reports</li> </ul>
Output 5.1: Increased capacity and knowledge transfer	<ol style="list-style-type: none"> <li>1. Number of adjacent woredas practicing integrated climate smart planning, implementation and monitoring</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Climate Smart Planning, Implementation and Monitoring</b> – Proofing</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs/ Project Facilitators</li> <li>• Regional IEs</li> <li>• Woreda Technical</li> </ul>	<ul style="list-style-type: none"> <li>• Work plans, M&amp;E visits and field observations, reports</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
	2. Number of adjacent kebeles adopting climate smart agriculture (CSA), watershed management and diversified livelihoods. 3. No of farmers/pastoralists disaggregated by gender participating in cross visits or view participatory videos by other farmers. 4. Number of people (community and Woreda agents) trained in CSA, agri-business, seeds, irrigation, post-harvest management and the operation and maintenance of Solar PVs and hand pumps and post-harvest management	rural action plans, implementation and monitoring on social and rural infrastructure against climate change impacts. <ul style="list-style-type: none"> <li>• <b>Climate smart agriculture (CSA)</b>, - the farming approach that aims to achieve food security and chart a sustainable pathway for agricultural development in a changing climate.</li> <li>• <b>Watershed management</b> - the action aimed at ensuring the sustainable use of natural resources in a watershed, attempts to provide solutions to climate induced threats.</li> <li>• <b>Diversified livelihoods-</b> The act of diversifying the income base of a households to insulate themselves from environmental and economic shocks, trends and seasonality – in effect, to be less vulnerable.</li> </ul>		Officer	
Output 5.2: Project results monitored and evaluated and lessons captured	1. Number of analytical reports prepared on meteorological station data and satellite data 2. Number of CSA project results analyzed 3. No. of communication materials developed and	<ul style="list-style-type: none"> <li>• <b>Analytical reports</b> - Study paper/s that would use satellite and ground weather station measurements to understand climate variability, associated risks and practical recommendations in</li> </ul>	<ul style="list-style-type: none"> <li>• Mid-term</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs,</li> <li>• Regional IEs</li> <li>• consultant</li> </ul>	<ul style="list-style-type: none"> <li>• Desk review and field visits</li> <li>• Reports</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
	<ul style="list-style-type: none"> <li>shared with stakeholders to share results</li> </ul>	<p>CSA or Natural Resource Management</p> <ul style="list-style-type: none"> <li>• <b>CSA project results analyzed</b> – A project monitoring and analysis report capturing the factors to the result of CSA implemented under this project, outlining the best practices of selected CSA and the rationale behind and a way forward on how to replicate the CSA in similar context.</li> <li>• <b>Communication Material</b> – Includes brochures, banners, newsletters, flyers, and posters, developed and shared as hard and soft copy and workshops and seminars conducted.</li> </ul>			
Output 5.3: Results and lessons communicated to key stakeholders and mainstreamed in local planning processes	<ol style="list-style-type: none"> <li>1. Number of Climate Smart manuals and guidelines prepared</li> <li>2. Number of Federal, Regional and Woreda level media coverage/publications</li> <li>3. No. of information sharing, consultation and dialogues with state and non-state stakeholders</li> </ol>	<ul style="list-style-type: none"> <li>• <b>Climate Smart Manuals and Guidelines</b> - A manual to be used at the local level planning and monitoring of Agriculture -Forestry-Natural resource management – Livestock nexus. The manual shall cover topics inter-alia; <ul style="list-style-type: none"> <li>○ Definition of Climate Change</li> <li>○ CRGE</li> <li>○ Principles of Climate-Smart Interventions</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly and annually</li> </ul>	<ul style="list-style-type: none"> <li>• Federal IEs,</li> <li>• Regional IEs</li> <li>• consultant</li> </ul>	<ul style="list-style-type: none"> <li>• Desk review and field visits</li> <li>• Reports</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
		<ul style="list-style-type: none"> <li>○ Agro-forestry</li> <li>○ Soil and Water management</li> <li>○ Irrigation systems</li> <li>○ Crop and Livestock production</li> <li>○ Gender</li> <li>• A guideline on how to use this manual in the local level planning and monitoring</li> <li>• <b>Media coverage</b> – Radio and or televised broadcast of this project at the national and local level</li> <li>• <b>Information sharing, consultation and dialogues</b> – Stakeholders (State and non state actors from national and International forums) implementing similar initiatives to this project identified; consultations conducted, lessons learned and awareness created both at the national and the local level.</li> </ul>			
<b>Activities</b>		<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly/Monthly</li> </ul>	<ul style="list-style-type: none"> <li>• RIEs, FIEs (optional), Woreda offices, Development Agents at Kebele leves</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly/monthly work plans and meetings</li> </ul>
<b>Inputs and Finances</b>		<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• As specified in the MOU by the</li> </ul>	<ul style="list-style-type: none"> <li>• Woreda office, RIEs, CRGE</li> </ul>	<ul style="list-style-type: none"> <li>• Accounting procedures, list of inputs</li> </ul>

Project Results	Indicators	Definition of Indicators	Frequency	Responsible	Monitoring Methods & Tools
			CRGE Facility	Facility	

## E. Results framework

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

A results framework with Specific, Measurable, Achievable, Realistic and Time-based (SMART) indicators, their baseline and targets and assumptions is provided below. The Framework will be updated during project inception.

**Table 19. Results Framework**

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
<b>Overall objective: To increase resilience to recurrent droughts in 7 agro-ecological landscapes in Ethiopia</b>					
<b>Project outcomes</b>					
1. Increased capacity to manage current and future drought risks through improved adaptation planning and sustainable management of agro-ecological landscapes	1. Number of people suffering losses from drought events	<ul style="list-style-type: none"> <li>Number of people suffering losses from drought events</li> </ul>	<ul style="list-style-type: none"> <li>Number of people suffering losses from drought events</li> </ul>	Project annual impact assessment reports Mid-term and final evaluation reports.	Political will exists at all levels to mainstream climate change considerations into planning.  Government enforces integrated approaches to project implementation.  There is a systemic platform that readily avails climate information at all levels  Government stakeholders cooperate and agree on designing and implementing risk reduction measures.
	2. Percentage of target population adopting risk reduction measures	<ul style="list-style-type: none"> <li>The target population are highly vulnerable and do not adopt risk reduction measures</li> </ul>	<ul style="list-style-type: none"> <li>60% of target population adopting risk reduction measures</li> </ul>		
	3. Number of kebeles where ecosystem services have been maintained or improved under climate change	<ul style="list-style-type: none"> <li>There are no sites in the targeted kebeles where ecosystem services have been maintained or improved under climate change</li> </ul>	<ul style="list-style-type: none"> <li>14 Kebeles where ecosystem services have been maintained or improved under climate change</li> </ul>		
2. Enhanced and secure access to potable water supply, and small-scale irrigation in drought affected areas	1. Percentage of HHs disaggregated by gender having access to potable water, irrigation and livestock watering facilities	<ul style="list-style-type: none"> <li>Access to potable water supply in rural areas is 51%, to irrigation is 11% and to livestock watering facilities is 4%</li> </ul>	<ul style="list-style-type: none"> <li>Access to potable water supply in targeted kebeles is 80%, to irrigation is 40% and to livestock watering facilities is 25%</li> </ul>		<ul style="list-style-type: none"> <li>No major disasters impede progress of project and damage infrastructure.</li> <li>Timely disbursement of project funds.</li> </ul>
<b>Component 1: Awareness and ownership of adaptation planning at the local level</b>					

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
Output 1.1: Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels	1. No. of woredas mainstreaming climate issues within their development plans	<ul style="list-style-type: none"> <li>There is no evidence on existence of a climate mainstreaming framework or practice of climate smart planning at local level</li> </ul>	<ul style="list-style-type: none"> <li>One climate mainstreaming framework will be developed</li> <li>Seven Woredas mainstream climate issues into their development plans</li> </ul>	Project annual impact assessment reports, Mid term evaluation, final report.	<p>Demand for climate change awareness and adaptive strategies among communities</p> <p>Communities motivated to take part in adaptation planning.</p> <p>Woredas supportive of adaptation planning processes.</p> <p>Selected interventions are complimentary to other development interventions. There is adequate technical support, guidance, supervision and follow up</p>
	2. No. of community groups engaged in adaptation planning (by gender)	<ul style="list-style-type: none"> <li>No groups or adaptation planning exist</li> </ul>	<ul style="list-style-type: none"> <li>7 community groups formed and operationalised (1 for each Woreda)</li> </ul>		
	3. No. of women/men from target HH participating in adaptation planning processes and mobilised to participate in project activities	<ul style="list-style-type: none"> <li>No groups or adaptation planning exist</li> </ul>	<ul style="list-style-type: none"> <li>4,375 women and 4,375 men from target HH participating in adaptation planning processes and mobilised to participate in project activities</li> </ul>		
Output 1.2: Climate smart development plans designed	1. No. of climate smart development plans developed and implemented	0	7	Project Plan documents Regular M&E reports	Harmonized planning approaches are applied among implementing institutions
Output 1.3: Climate resilient water plans developed	1. Number of climate resilient water plans developed and implemented	0	7	Project Plan documents Regular M&E reports	
Output 1.4: Climate smart agriculture and land – water - forest integration plans developed	1. Percentage of committee positions held by women/men from target HH in planning processes	<ul style="list-style-type: none"> <li>TBC on baseline studies</li> </ul>	<ul style="list-style-type: none"> <li>50% of committee position held by women</li> </ul>	Periodic project reports, surveys, Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Harmonized planning approaches are applied among implementing institutions
	2. Number of Climate smart Agriculture and land – water - forest integration plans developed and implemented	<ul style="list-style-type: none"> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>7 Climate smart Agriculture and land – water - forest integration plans developed</li> </ul>		
Output 1.5: Climate resilient livelihood plans developed	1. Number of climate resilient livelihood plans developed		<ul style="list-style-type: none"> <li>7 Climate resilient livelihood plans developed</li> </ul>		Harmonized planning approaches are applied among implementing

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
					institutions
<b>Component 2: Water security</b>					
Output 2.1: Potable water supply increased in target areas	1. Number of female and male headed HHs having access <sup>113</sup> to a potable water supply	0	<ul style="list-style-type: none"> <li>8,750 HH (26% Women headed) have access to a potable water supply</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Communities positively perceive benefits and are willing to actively participate and make the necessary in kind contributions
	2. Number of wells constructed to the required standards of the MoWIE	0	<ul style="list-style-type: none"> <li>14 wells</li> </ul>		
	3. Number of wells drilled that are fitted with solar powered submersible pump systems	0	<ul style="list-style-type: none"> <li>14 shallow wells fitted with solar powered submersible pump systems</li> </ul>		
	4. Number of well monitoring devices (WMD) installed in wells	0	<ul style="list-style-type: none"> <li>7 WMD</li> </ul>		
	5. Number of elevated reservoirs constructed	0	<ul style="list-style-type: none"> <li>14 elevated reservoir and water points</li> </ul>		
Output 2.2: Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change	1. Number of hectares of land irrigated from ground water supplies and sand dams	0	<ul style="list-style-type: none"> <li>169 Ha of irrigation agriculture</li> </ul>	M&E reports,, Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Communities positively perceive benefits and actively engage in adaptation interventions.  Information available and appropriate to local conditions
	2. Number of sites where physical water infrastructure has been improved to deal with climate risk	0	<ul style="list-style-type: none"> <li>14 sites/kebeles</li> </ul>		
	3. No. of shallow wells with Solar Powered pumps, Hand dug wells and Springs developed	0	<ul style="list-style-type: none"> <li>14 Shallow wells with Solar Powered pumps, 20 Hand dug wells, 7 sand dams and 12 Springs developed for irrigation and livestock watering purposes</li> </ul>		
	4. Number of water user groups developing and adopting by-laws for irrigation, livestock watering and drinking water	0	<ul style="list-style-type: none"> <li>14 water user groups</li> </ul>		
<b>Component 3. Climate smart agriculture – land – water - forest integration</b>					
Output 3.1: Climate smart agriculture implemented at the farm level	1. Yield (tonnes) in crops from target areas	<ul style="list-style-type: none"> <li>Yields in crops from target areas are currently cereal crops, pulse, vegetables at 21.05,</li> </ul>	<ul style="list-style-type: none"> <li>Yields in crops from target areas for cereal crops, pulse, vegetables at for crops 28.64,20.21</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment	Farmers are receptive to trying new approaches and are motivated to take part in farmer field trials.

<sup>113</sup> Access is taken to mean within one km of an adequate amount of water (20 litres per person) through a public standpipe well or spring.

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
		14.85 and 94.17 quintals per hectares respectively	and,130.67 quintals per hectares respectively	reports Mid-term and final evaluations, Woreda data	Information available and appropriate to local conditions
	2. No of target HH adopting climate resilient farming practices disaggregated by type (e.g. soil conservation)	0	<ul style="list-style-type: none"> <li>560 HH adopting physical moisture and soil conservation structures, 560 HH adopting biological conservation measures, 560 HH adopting farmland gully treatment and 3,360 HH adopting homestead agroforestry</li> </ul>		
	3.3. No. of HH participating in farmer field trials	0	<ul style="list-style-type: none"> <li>870 HH participate in field trials</li> </ul>		
	4. Average crop diversity index <sup>114</sup>	Average crop productivity of female headed HH is 19 quintals per hectares	<ul style="list-style-type: none"> <li>Increase average crop productivity of female headed HH to 33.23 quintals per hectares</li> </ul>		
Output 3.2. Integrated watershed management approach used to restore and protect degraded watersheds	1. Area of land (ha) rehabilitated (by type)	TBC during baseline study	<ul style="list-style-type: none"> <li>140 ha of physical and biological measures on communal land, 14 ha of area closures, 21 ha of upper watershed gully treatment</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Rural communities actively engage in adaptation interventions.  Kebeles support and help implement ecosystem based approaches.
	2. Area of rangeland (ha) managed using environmentally sustainable, climate resilient practices	TBC during baseline study	<ul style="list-style-type: none"> <li>30 ha of rangeland managed</li> </ul>		
	3. . No of functional community based systems for grazing and efficient feed conservation management	TBC during baseline study	<ul style="list-style-type: none"> <li>14 functional community based systems established</li> </ul>		
	4. Area of afforested land (ha)	TBC during baseline study	<ul style="list-style-type: none"> <li>1600 hectares of afforested/ reforested land</li> </ul>		

<sup>114</sup> The inverse of (the number of crops grown by a household + 1)

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
	5. No of nurseries established	TBC during baseline study	<ul style="list-style-type: none"> <li>14 nurseries established</li> </ul>		
	6. No of seedlings distributed	TBC during baseline study	<ul style="list-style-type: none"> <li>840 quintal of seeds distributed through MFI</li> </ul>		
<b>Component 4. Climate resilient livelihood diversification</b>					
Output 4.1: Improved knowledge, understanding and awareness of livelihood opportunities	<ol style="list-style-type: none"> <li>No of cooperative and youth groups established;</li> <li>No. of cooperatives members (Male and Female) trained and providing assistance to the HHs</li> </ol>	0	<ul style="list-style-type: none"> <li>700 farmers trained on poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure</li> <li>14 cooperative members and 14 DAs trained and providing livelihood diversification assistance to the HHs;</li> <li>12,000 tonnes of different low land fruits, 168 tonnes of local variant potatoes and 420 kgs of various vegetables and 21 quintals of forage seed distributed to the targeted HHs through the MFI</li> <li>7 Cooperatives established and members trained on seed production and agro- business</li> <li>7 Youth groups supported to give rental of mechanized agro-services</li> </ul>	<p>Periodic project reports, surveys, studies</p> <p>Project annual impact assessment reports</p> <p>Mid-term and final evaluations, Woreda data</p>	<p>Sufficient demand exists for identified enterprises.</p> <p>Target households perceive the benefits of livelihood diversification</p> <p>Market and technical information available and used by project beneficiaries</p>
Output 4.2: Increased capacity of target households to participate in climate resilient, market-oriented enterprises	<ol style="list-style-type: none"> <li>Number of women/men from target HH with a new source of income.</li> </ol>	<ul style="list-style-type: none"> <li>0 women and 0 men from target HH with a new source of income.</li> </ul>	<ul style="list-style-type: none"> <li>2,590 Men and 1,820 Women headed HHs with new income source.</li> </ul>	<p>Periodic project reports, surveys, studies</p> <p>Project annual</p>	<p>Local micro-finance institutions engage with and support project groups</p>

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
	2. No of farmers trained and engaged in a new enterprise	<ul style="list-style-type: none"> <li>0 farmers trained and engaged in a new enterprise</li> </ul>	<ul style="list-style-type: none"> <li>1,386 farmers trained and engaged in a new enterprise</li> </ul>	impact assessment reports Mid-term and final evaluations, Woreda data	Sufficient demand exists for identified enterprises  Market and technical information available and used by project beneficiaries  Husbands perceive benefits of wives being economically productive and willing to support.
	3. Number of HH (Male and female headed) accessing credit facilities and market information	<ul style="list-style-type: none"> <li>612 male headed and 262 female headed HH accessing credit facilities</li> </ul>	<ul style="list-style-type: none"> <li>3,062 Male and 1,313 Women headed HHs accessing credit facilities and accessing market information</li> </ul>		
<b>Component 5: Capacity building, monitoring, evaluation and learning</b>					
Output 5.1: Increased capacity and knowledge transfer	1. Number of adjacent woredas practicing integrated climate smart planning, implementation and monitoring	0	<ul style="list-style-type: none"> <li>All 7 project woredas adapt climate smart planning, implementation and monitoring</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Government agencies receptive to new approaches  Institutions and individuals recognize the value of training and apply new skills.  Woredas receptive to key messages in training and have resources to incorporate learning into development plans.  Cross visits and participatory videos convince farmers to change farming practices and behaviours.
	2. Number of adjacent kebeles adopting climate smart agriculture (CSA), watershed management and diversified livelihoods.	0	<ul style="list-style-type: none"> <li>All 14 project Kebeles adopt CSA, watershed management and diversified livelihood</li> </ul>		
	3. No of farmers/pastoralists disaggregated by gender participating in cross visits or view participatory videos by other farmers.	0	<ul style="list-style-type: none"> <li>420 farmers (210 female and 210 male) participate in cross visits or view participatory videos by other farmers.</li> </ul>		
	4. Number of people (community and Woreda agents) trained in CSA, agri-business, seeds, irrigation, post harvest management and the operation and maintenance of Solar PVs and hand pumps and post harvest management	0	<ul style="list-style-type: none"> <li>151 woreda experts and development agents trained on CSA, agri-business, seeds, irrigation, post harvest management, Solar PV and Hand pump maintenance. 102 farmers trained on post-harvest management</li> </ul>		

Expected results **	Indicators	Baseline	Target	Means of verification	Assumptions/risk
Output 5.2: Project results monitored and evaluated and lessons captured	1. Number of analytical reports prepared on meteorological station data and satellite data	0	<ul style="list-style-type: none"> <li>7 analytical reports prepared on meteorological station data and satellite data</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data	Communication materials are culturally relevant and targeted on the basis of gender, age, location and area norms.  Lessons learned are identified and analysed in a timely manner, supporting the effective sharing of knowledge.
	2. Number of CSA project results analysed	0	<ul style="list-style-type: none"> <li>5 CSA project results analysed</li> </ul>		
	3. No. of communication materials developed and shared with stakeholders to share results	0	<ul style="list-style-type: none"> <li>18 communication materials developed and shared with stakeholders to share results</li> </ul>		
Output 5.3: Results and lessons communicated to key stakeholders and mainstreamed in local planning processes	1. Number of Climate Smart manuals and guidelines prepared	0	<ul style="list-style-type: none"> <li>1 Climate Smart manual and guideline prepared</li> </ul>	Periodic project reports, surveys, studies Project annual impact assessment reports Mid-term and final evaluations, Woreda data Media reports, publications	Communication materials are culturally relevant and targeted on the basis of gender, age, location and area norms.  Lessons learned are identified and analysed in a timely manner, supporting the effective sharing of knowledge.
	2. Number of Federal, Regional and Woreda level media coverage/publications		<ul style="list-style-type: none"> <li>13 Federal, Regional and Woreda level media coverage/publications made</li> </ul>		
	3. No. of information sharing, consultation and dialogues with state and non-state stakeholders		<ul style="list-style-type: none"> <li>10 information sharing, consultation and dialogues with state and non-state stakeholders</li> </ul>		

## F. Alignment with the Results Framework of the Adaptation Fund

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

**Table 20. Alignment with the results framework of the Adaptation Fund**

Project component	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
<b>Component 1 Awareness and ownership of adaptation planning at the local level</b>	<ul style="list-style-type: none"> <li>No. of woredas developing and mainstreaming adaptation frameworks within their development plans</li> <li>No. of community groups formed and operationalised for adaptation planning (by gender)</li> <li>No. of women/men from target HH participating in adaptation planning processes and mobilised to participate in project activities</li> <li>No. of climate smart development plans developed and implemented</li> <li>Number of climate resilient water plans developed and implemented</li> <li>Percentage of committee positions held by women/men from target HH in planning processes</li> <li>Number of Climate smart Agriculture and land – water - forest integration plans developed and implemented</li> <li>Number of climate resilient livelihood plans developed</li> </ul>	<p>Outcome 1: Reduced exposure at national level to climate-related hazards and threats</p> <p>Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses</p> <p>Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level</p>	<p>1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis</p> <p>2.1 No. of targeted institutions with increased capacity to minimize exposure to climate variability risks</p> <p>3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses</p>	367,510
<b>Component 2 Water security</b>	<ul style="list-style-type: none"> <li>Number of female and male headed HHs having access to a potable water supply</li> <li>Number of wells fitted with Solar PV constructed</li> <li>Number of well monitoring devices (WMD) installed in wells</li> <li>Number of elevated reservoirs constructed</li> <li>Number of hectares of land irrigated from ground water supplies and sand dams</li> <li>No. of shallow wells with Solar Powered pumps, Hand dug wells and Springs developed</li> <li>Number of water user groups developing and adopting by-laws for irrigation, livestock watering and drinking water</li> </ul>	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	<p>4.1. Development sectors' services responsive to evolving needs from changing and variable climate</p> <p>4.2. Physical infrastructure improved to withstand climate change and variability-induced stress</p>	4,736,667
<b>Component 3 Climate smart agriculture – land – water - forest</b>	<ul style="list-style-type: none"> <li>Yield (tonnes) in crops from target areas</li> <li>No of target HH adopting climate resilient farming practices disaggregated by type (e.g. soil conservation)</li> <li>No. of women/men participating in farmer field trials.</li> <li>Area of land (ha) rehabilitated (by type)</li> </ul>	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	<p>3.2. Modification in behavior of targeted population</p> <p>5. Ecosystem services and natural assets maintained or improved under climate change and</p>	1,590,227

Project component	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
<b>integration</b>	<ul style="list-style-type: none"> <li>Area of rangeland (ha) managed using environmentally sustainable, climate resilient practices</li> <li>No of functional community based systems for grazing and efficient feed conservation management</li> <li>Area of afforested land (ha)</li> <li>No of nurseries established</li> <li>No of seeds distributed</li> </ul>	Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	variability-induced stress 5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	
<b>Component 4 Climate resilient livelihood diversification</b>	<ul style="list-style-type: none"> <li>No of cooperative members (Male and Female) trained and providing assistance to the HHs</li> <li>No of cooperatives established</li> <li>Number of women/men from target HH with a new source of income.</li> <li>No of farmers (26% Females) trained and engaged in a new enterprise</li> <li>Number of HH (Male and female headed) accessing credit facilities and market information</li> </ul>	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihood	527,371
<b>Component 5 Capacity building, monitoring, evaluation and learning.</b>	<ul style="list-style-type: none"> <li>Number of adjacent woredas practicing integrated climate smart planning, implementation and monitoring</li> <li>Number of adjacent kebeles adopting climate smart agriculture (CSA), watershed management and diversified livelihoods.</li> <li>No of farmers/pastoralists disaggregated by gender participating in cross visits or view participatory videos by other farmers.</li> <li>Number of people (community and Woreda agents) trained in CSA, agri-business, seeds, irrigation, post-harvest management and the operation and maintenance of Solar PVs and hand pumps and post-harvest management</li> <li>Number of analytical reports prepared on meteorological station data and satellite data</li> <li>Number of CSA project results analysed</li> <li>No. of communication materials developed and shared with stakeholders to share results</li> <li>Number of Climate Smart manuals and guidelines prepared</li> <li>Number of Federal, Regional and Woreda level media coverage/publications</li> <li>No. of information sharing, consultation and dialogues with state and non-state stakeholders</li> </ul>	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks 3.1 Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	1,799,288

## G. Detailed budget

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

**Table 21. Budget Breakdown**

The detailed breakdown is shown below. Project execution costs are 5.16% of the total budget (before implementing entity fees) and the project cycle management fee is 5.29% of the budget.

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
<b>Component 1. Awareness and ownership of adaptation planning at the local level</b>										
<b>1.1 Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels</b>										
National desk based study:										
To collect meteorological data (temperature and precipitation) for the relevant project sites (national consultant)	No. of days	6300	15	94500					94500	4500
To collate future climate projections for the relevant areas, capturing uncertainty (national consultant)	No. of days	6300	10	63000					63000	3000
<b>Sub-total</b>				<b>157500</b>		<b>0</b>		<b>0</b>	<b>157500</b>	<b>7500</b>
<b>1.2: Climate smart development plan designed</b>										
Undertake a study to review the local development plans – identifying climate risks (from current variability and shocks, as well as future climate change), for the planned activities, as well as potential synergies and conflicts between planned activities for water, land, agriculture and forest/ecosystems; and develop locally appropriate climate mainstreaming framework (national consultant)	No. of days	6300	105	661500					661500	31500
Consultation and consideration of how to integrate climate smart activities into the planning process (national consultant)	No. of days	6300	15	94500					94500	4500
Implementation, monitoring and reporting of EIA/ESMP	Lump sum	630000	1	630000					630000	30000

Per diem and travel for consultants	No. of days	2000	50	100000					100000	4762
<b>Sub-total</b>				<b>1486000</b>		<b>0</b>		<b>0</b>	<b>1486000</b>	<b>70762</b>
<b>1.3: Climate resilient water plans developed</b>										
Prepare detailed design and turnkey tender document for water well construction and supply for potable use, cattle and irrigation	Lump sum	150000	1	150000					150000	7143
Conduct geophysical studies	Per kebele	50000	14	700000					700000	33333
Collecting regional and local watershed information for the relevant project areas, i.e. hydro- meteorological data, groundwater information and potential influence of climate change and risk to provide an indicative analysis of water availability and develop a comprehensive ground water management plan (supply-side) (national consultant)	No. of days	6300	100	630000					630000	30000
To estimate indicative existing water demand (household and other water users, i.e. farmers, pastoralists) and future demand considering the local plans (national consultant)	No. of days	6300	56	352800					352800	16800
To consider (scope out) the potential influence of climate change on future demand (increased evapo-transpiration, changes in run-off) (national consultant)	No. of days	6300	45	283500					283500	13500
To provide an indicative water balance (supply-demand) in each Kebele with consideration of current and future risks; and develop an integrated water-agriculture-land ecosystem and livelihood diversification plans with the communities (national consultant)	No. of days	6300	45	283500					283500	13500
To support preparation of bylaws for irrigation and drinking water use and training on operation and maintenance of water related infrastructure	No. of days	6300	20	126000					126000	6000
Per diem and travel for consultants	No of days	2000	80	160000					160000	7619
<b>Sub-total</b>				<b>2685800</b>		<b>0</b>		<b>0</b>	<b>2685800</b>	<b>127895</b>
<b>1.4. Climate smart agriculture and land – water - forest integration plans developed</b>										
To collate information on agriculture production, management systems and practices in the Woredas and Kebeles and on current practice, supplementing with community based surveys (national consultant)	No. of days	6300	70	441000					441000	21000
To undertake survey and analysis to understand existing soil and water conditions, and environmental degradation (national consultant)	No. of days	6300	70	441000					441000	21000

To consider the agriculture development activities in the local plans, and implications for land and water (national consultant)	No. of days	6300	35	220500					220500	10500
To consider the potential portfolio of options for each relevant adaptation planning zone, considering elevation, precipitation, soil suitability, etc. (national consultant)	No. of days	6300	70	441000					441000	21000
To develop locally appropriate tools and methodologies to support uptake of climate smart agriculture (national consultant)	No. of days	6300	35	220500					220500	10500
Per diem and travel for consultants	No. of days	2000	80	160000					160000	7619
<b>Sub-total</b>				<b>1924000</b>		<b>0</b>		<b>0</b>	<b>1924000</b>	<b>91619</b>
<b>1.5: Climate resilient livelihood plans developed</b>										
Collate existing socio-economic data for the Woreda and Kebele and conduct vulnerability assessment of the community (national consultant)	No. of days	6300	70	441000					441000	21000
Conduct consultation with the local community to understand the available livelihood options and foster innovative adaptive practices (national consultant)	No. of days	6300	28	176400					176400	8400
Sensitize the community and discuss current climate variability and future climate change risks to better understand vulnerability (national consultant)	No. of days	6300	70	441000					441000	21000
Develop locally appropriate tools and methodologies to support uptake of climate resilient livelihood strategies (national consultant)	No. of days	6300	20	126000					126000	6000
Per diem and travel for consultants	No. of days	2000	84	168000					168000	8000
Per diem for farmers and pastoralists	No. of days	200	560	112000					112000	5333
<b>Sub-total</b>				<b>1464400</b>		<b>0</b>		<b>0</b>	<b>1464400</b>	<b>69733</b>
<b>Cost for component 1</b>				<b>7717700</b>		<b>0</b>		<b>0</b>	<b>7717700</b>	<b>367510</b>

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
<b>Component 2: Water security</b>										
<b>2.1 Potable water supply increased in target areas</b>										
Shallow well drilling complete with 8" uPVC casing installed to a depth of 150 meters	Per Well	1500000	0	0	14	21000000	0	0	21000000	1000000
Purchase and install well monitoring devices	Piece	30000	0	0	7	210000	0	0	210000	10000
Construction of elevated water reservoir and water point	Per Well	100000	0	0	14	1400000	0	0	1400000	66667
Procurement of complete sets of solar powered submersible pump systems, solar PVs, including all electro-mechanical works	Per Set	400000	0	0	14	5600000	0	0	5600000	266667
Installation of pump and electro-mechanical fixtures	Per Set	50000	0	0	14	700000	0	0	700000	33333
Purchase spareparts and establish linkage with local part suppliers	Lumpsu m per woreda	300000	0	0	7	2100000	0	0	2100000	100000
<b>Sub-total</b>				<b>0</b>		<b>31010000</b>		<b>0</b>	<b>31010000</b>	<b>1476667</b>
<b>2.2 Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change</b>										
Shallow well drilling complete with 8" uPVC casing installed to a depth of 150 meters - for pressurized irrigation systems	Per Well	1500000	0	0	14	21000000	0	0	21000000	1000000
Purchase and install drip irrigation system including canal construction - for pressurized irrigation systems	ha	170000	0	0	30	5100000	110	18700000	23800000	1133333
Up-grading of traditional irrigation schemes for hand dug wells	ha	35000	0	0	28	980000	0	0	980000	46667
Purchase, import and install solar PV with stand including pump and motor - for pressurized irrigation systems	Per Set	400000	0	0	14	5600000	0	0	5600000	266667
Installation of pump and electro mechanical fixtures - for pressurized irrigation systems	Per Set	50000	0	0	14	700000	0	0	700000	33333
Construction of hand dug well with appropriate concrete rings to a depth of 15 meters	Per Well	100000	0	0	8	800000	20	2000000	2800000	133333
Purchase and install an appropriate hand pump (Afridev pumps/Rope and Washer) for 1 ha per hand dug well	Per Well	50000	0	0	8	400000	20	1000000	1400000	66667
Construction of 2000 M3 Sand Dam	Per Dam	210000	0	0	4	840000	3	630000	1470000	70000

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
Solar Powered Surface Pump for Sand Dam, purchase, install and commission	Per Unit	210000	0	0	4	840000	3	630000	1470000	70000
Spring Development	Per unit	420000	0	0	12	5040000	0	0	5040000	240000
Purchase spare parts and establish linkage with local part suppliers	Lumpsum per kebele	300000	0	0	14	4200000	0	0	4200000	200000
<b>Sub-total</b>				<b>0</b>		<b>45500000</b>		<b>22960000</b>	<b>68460000</b>	<b>3260000</b>
<b>Cost for component 2</b>				<b>0</b>		<b>76510000</b>		<b>22960000</b>	<b>99470000</b>	<b>4736667</b>
<b>Component 3. Climate smart agriculture – land – water - forest integration</b>										
<b>3.1 Climate smart agriculture implemented at the farm level</b>										
Supporting the supply of basic seeds	number of cooperatives	30000	3	90000	4	120000	0	0	210000	10000
Physical moisture and soil conservation structures(INRM)	ha	9504	140	1330560	140	1330560	0	0	2661120	126720
Biological conservation measures (e.g. grass strips, hedges, planting of physical measures)(INRM)	ha	14256	140	1995840	140	1995840	0	0	3991680	190080
Farmland gully treatment(INRM)	ha	11880	140	1663200	140	1663200	0	0	3326400	158400
Introducing and enhancing agroforestry(INRM)										
Homestead multi-storey agro-forestry and soil conservation measures (INRM)	ha	7128	140	997920	140	997920	140	997920	2993760	142560
Nurture traditional agroforestry scattered trees on farmlands (Faiherbia, Croton, etc)(INRM)	ha	4752	14	66528	14	66528	14	66528	199584	9504
Establish wind breaks/shelter belts and farm boundaries(INRM)	Lumpsum	62500	2	125000	3	187500	2	125000	437500	20833
<b>Sub-total</b>				<b>6269048</b>		<b>6361548</b>		<b>1189448</b>	<b>13820044</b>	<b>658097</b>
<b>3.2. Integrated watershed management approach used to restore and protect degraded watersheds</b>										
Physical and biological SWC measures(INRM)	ha	17107	70	1197504	70	1197504	0	0	2395008	114048
Area closure for enhanced natural regeneration(INRM)	ha	10692	7	74844	7	74844	0	0	149688	7128
Upper watershed gully treatment(INRM)	ha	4990	7	34927	7	34927	7	34927	104782	4990

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
Rangeland management in pastoral watersheds (INRM)	ha	12500	10	125000	10	125000	10	125000	375000	17857
Nursery establishment ((INRM)	Lumpsum	750000	14	10500000	0	0	0	0	10500000	500000
Purchase of seeds(INRM)	Quintal	400	280	112000	280	112000	280	112000	336000	16000
Tree and grass seedling planting/direct sowing with grass and tree seeds(INRM)	Lumpsum per kebele	100000	14	1400000	0	0	0	0	1400000	66667
Provision of hand tools(INRM)	Lumpsum per kebele	100000	14	1400000	0	0	0	0	1400000	66667
Utilization plan for closed areas (INRM)	Lumpsum per agro-ecological zone	130000	7	910000	0	0	0	0	910000	43333
Seed purchase (0.5 kg seed/ha) (forest)	kg	210	240	50400	240	50400	160	33600	134400	6400
Pot purchase (1 kg/500 seedlings) (forest)	kg	53	2400	126000	2400	126000	1600	84000	336000	16000
Media preparation (5 person/m3/ha)(forest)	m3	158	480	75600	480	75600	320	50400	201600	9600
Chemicals (1kg/25000 pots) (forest)	kg	210	48	10080	48	10080	32	6720	26880	1280
Biophysical baseline data collection for plantation (3 person/ha) (forest)	person day	32	1440	45360	1440	45360	960	30240	120960	5760
Seedling transportation for plantation (1 truck/50000 pots) (forest)	truck	2100	24	50400	24	50400	16	33600	134400	6400
Nursery construction (store, fencing, etc)(forest)	lumpsum	262500	1	262500	1	262500	0	0	525000	25000
Land and bed preparation for nurseries (forest)	lumpsum	105000	1	105000	1	105000	0	0	210000	10000
Provision of nursery tools and equipment (forest)	lumpsum	157500	1	157500	1	157500	0	0	315000	15000
<b>Sub-total</b>				<b>16637115</b>		<b>2427115</b>		<b>510487</b>	<b>19574718</b>	<b>932129</b>
<b>Cost for component 3</b>				<b>22906163</b>		<b>8788663</b>		<b>1699935</b>	<b>33394762</b>	<b>1590227</b>
<b>Component 4 Climate resilient livelihood diversification</b>										
<b>4.1 Improved knowledge, understanding and awareness of livelihood opportunities</b>										
Micro finance facilitation for livelihood diversification (2)										
International consultant	No. of days	16800	10	168000	0	0	15	252000	420000	20000

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
National consultant	No. of days	6300	40	252000	40	252000	40	252000	756000	36000
Value chain analysis (2)										
International consultant	No. of days	16800	10	168000	0	0	10	168000	336000	16000
National consultant	No. of days	6300	40	252000	40	252000	40	252000	756000	36000
<b>Sub-total</b>				<b>840000</b>		<b>504000</b>		<b>924000</b>	<b>2268000</b>	<b>108000</b>
<b>4.2 Increased capacity of target households to participate in market-oriented enterprises</b>										
Potato promotion (Genet, Tolcha, etc)	tonne	7000	56	392000	56	392000	56	392000	1176000	56000
Purchase and adopt lowland fruit	Number	90	400 0	360000	400 0	360000	400 0	360000	1080000	51429
Fruit management tools/scissor	Number	200	600	120000	600	120000	600	120000	360000	17143
Purchase cover crops	tonnes	12000	7	84000	7	84000	7	84000	252000	12000
Vegetable promotion (carrot, tomato, etc)	kg	1000	140	140000	140	140000	140	140000	420000	20000
Closure and improvement of community grazing land	per person	200	14	2800	14	2800	14	2800	8400	400
Efficient feed conservation management-materials (molases, plastic bags etc. )	per woreda	20000	7	140000	7	140000	7	140000	420000	20000
Practice stall feeding/cut & carry system-skill upgrading	per person	300	28	8400	28	8400	28	8400	25200	1200
Practice stall feeding/cut & carry system-for farmers	per person	200	70	14000	70	14000	70	14000	42000	2000
Forage seeds supply	Quintal	50000	8	400000	6	300000	7	350000	1050000	50000
Sheep breed (imported)	number	6000	140	840000	140	840000	0	0	1680000	80000
Goat breed (imported )	number	4500	140	630000	140	630000	0	0	1260000	60000
Closure and improvement of community grazing land skilled labor time	number	300	28	8400	28	8400	28	8400	25200	1200
Closure and improvement of community grazing land-fertilizer purchase( closure, forage )	Quintal	1000	140	140000	140	140000	140	140000	420000	20000
Organize promotion workshop for farmers (poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure)	per person	400	300	120000	400	160000	0	0	280000	13333

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
Trainers for woreda experts, DAs and farmers expense (poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure)	per day	2500	48	120000	64	160000	0	0	280000	13333
Capacity building and training for DAs (poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure)	per day	500	28	14000	28	14000	0	0	28000	1333
<b>Sub-total</b>				<b>3533600</b>		<b>3513600</b>		<b>1759600</b>	<b>8806800</b>	<b>419371</b>
<b>Cost for component 4</b>				<b>4373600</b>		<b>4017600</b>		<b>2683600</b>	<b>11074800</b>	<b>527371</b>
<b>Component 5 Capacity building, monitoring, evaluation and learning</b>										
<b>5.1. Building capacity and knowledge transfer</b>										
Training of woreda experts on seeds, agri-business and irrigation agronomy(crop)	per person	9240	6	55440	8	73920	0	0	129360	6160
Training of DAs on seeds, agri-business and irrigation agronomy(crop)	per person	6796	14	95144	0	0	0	0	95144	4531
Training of Woredas and Kebeles on scaling up of CSA practices (crop)	per person	6796	21	142716	21	142716	0	0	285432	13592
Training of lead farmers from each Kebele on CA, crop rotation, mulching, inter-cropping, use of cover crops and agronomic practices ....(crop)	per person	4530	56	253680	56	253680	56	253680	761040	36240
Provision of seed production and agri-business training for cooperatives members	per person	4580	6	27480	8	36640	0	0	64120	3053
Training on post-harvest crop loss for Woreda experts	per person	9240	4	36960	3	27720	0	0	64680	3080
Training on post-harvest crop loss for DAs	per person	6796	6	40776	8	54368	0	0	95144	4531
Training on post-harvest crop loss for farmers	per person	4530	56	253680	56	253680	0	0	507360	24160
Organizing field day on pre- and post-harvest practices including soil and water conservation and irrigation schemes (crop)	per event per woreda	150000	0	0	7	1050000	7	1050000	2100000	100000
Conduct demonstration of post-harvest technologies (crop)	per event	20000	4	80000	3	60000	0	0	140000	6667
Demonstration of best soil and water harvesting techniques (crop)	per woreda	10000	3	30000	4	40000	0	0	70000	3333

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
Establishment of cooperatives (crop)	number of cooperatives	50000	2	100000	5	250000	0	0	350000	16667
Support formation of youth groups (male and female) to give agricultural mechanization rental & hire services	number of groups	2000000	3	6000000	4	8000000	0	0	14000000	666667
Woreda Logistic support (WSD)	Lumpsum per woreda	35000	7	245000	7	245000	7	245000	735000	35000
Farmers Training Center (FTC) logistic support	Lumpsum per FTC	6000	14	84000	14	84000	14	84000	252000	12000
Conduct farmers peer learning (fruits and vegetables)	per person	1000	140	140000	140	140000	140	140000	420000	20000
Organize farmers training on fruits and vegetables at FTC	per person	400	300	120000	400	160000	0	0	280000	13333
Farmer trainers expense (fruits and vegetables)	per day	2500	24	60000	32	80000	0	0	140000	6667
Organize a woreda to woreda experience sharing for experts (poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure)	per woreda	10000	7	70000	7	70000	7	70000	210000	10000
Organize a woreda to woreda experience sharing for Farmers (poultry, beekeeping, forage, loan and savings, meat production, food nutrition, closure)	per person	200	140	28000	140	28000	140	28000	84000	4000
Establish community based system (by-laws & institutions) for controlled grazing--skilled labour technical support	per woreda	25000	3	75000	4	100000	0	0	175000	8333
MoA workshops and awareness creation forums (INRM)	Lumpsum	400000	1	400000	0	0	0	0	400000	19048
Region workshops and awareness creation forums (INRM)	Lumpsum	900000	1	900000	0	0	0	0	900000	42857
Woreda workshops and awareness creation forums (INRM)	Lumpsum	125000	2	250000	0	0	0	0	250000	11905
MoA, training (INRM)	per person	5000	4	20000	0	0	4	20000	40000	1905
Region, training (INRM)	per person	5000	16	80000	0	0	16	80000	160000	7619
Wereda, training (INRM)	per person	5000	48	240000	0	0	48	240000	480000	22857
Experience sharing field tours for farmers (INRM)	per person	500	360	180000	0	0	360	180000	360000	17143

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
Improve Farmers' Training Centers (FTCs) to demonstrate and train farmers on climate proof measures(INRM)	Lumpsu m/FTC	146250	2	292500	2	292500	0	0	585000	27857
Enhancing experts understanding on forestry and related issues	lumpsu m	500000	1	500000	1	500000	0	0	1000000	47619
Enhance expert capacity in project planning (forest)	lumpsu m	525000	1	525000	0	0	0	0	525000	25000
Conduct awareness raising activities for local people in forest sector	lumpsu m	42000	2	84000	3	126000	2	84000	294000	14000
Provision of capacity building training to local people in forest sector	lumpsu m	42000	2	84000	3	126000	2	84000	294000	14000
Training and awareness raising on operation and maintenance and on efficient potable water use (reuse, recycling and rationing so that supplies can withstand fluctuations in recharge)	Per Kebele	40000	0	0	0	0	14	560000	560000	26667
Training and awareness raising on operation and maintenance and on efficient irrigation water use and by-laws	Per Kebele	40000	7	280000	7	280000	0	0	560000	26667
Technical advise/support for nurseries (forest)	lumpsu m	52500	1	52500	1	52500	0	0	105000	5000
Strengthen forest governance at various level	lumpsu m	525000	1	525000	1	525000	0	0	1050000	50000
Enhance capacities of forestry training institutions in providing skill training for forest governance	lumpsu m	525000	1	525000	0	0	0	0	525000	25000
Establishment of demonstration plots (forest)	lumpsu m	525000	1	525000	0	0	0	0	525000	25000
Scaling-up good practices/knowledge for forest governance (forest)	lumpsu m	2625000	0	0	1	2625000	0	0	2625000	125000
<b>Sub-total</b>				<b>14730876</b>		<b>15956724</b>		<b>1508680</b>	<b>32196280</b>	<b>1533156</b>
<b>5.2 Project results monitored and evaluated and lessons captured</b>										
Analysis of meteorological station data and satellite data for the period of the study for the relevant sites to build up climate risk parameters and trends (national consultant)	No of days	6300	50	315000	50	315000	50	315000	945000	45000
Analysis of the outcomes of the climate smart agriculture pilots (national consultant)	No of days	6300			20	126000	20	126000	252000	12000
Performance of the resilient livelihoods against annual climate variability (national consultant)		6300			20	126000	20	126000	252000	12000
<b>Sub-total</b>				<b>315000</b>		<b>567000</b>		<b>567000</b>	<b>1449000</b>	<b>69000</b>

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
<b>5.3 Results and lessons communicated to key stakeholders and mainstreamed in local planning processes</b>										
Develop a communication strategy (international consultant)	No of days	16800	4	67200	0	0	0	0	67200	3200
Develop a knowledge management strategy (international consultant)	No of days	16800	4	67200	0	0	0	0	67200	3200
Preparation of guidelines and manuals (international consultant)	No of days	16800	20	336000	0	0	0	0	336000	16000
Farmer-to-farmer fora (cross visits, community meetings etc.)	No of days	800			280	224000	280	224000	448000	21333
Development of participatory videos (cam corders)	Lumpsu m	150000	0	0	0	0	1	150000	150000	7143
Experience sharing for Woreda experts on climate smart villages and demonstrations (crop)	per person	11810	14	165340	14	165340	0	0	330680	15747
Experience sharing for Woreda experts on best soil and water conservation and irrigation facilities (crop)	per person	6810	14	95340	14	95340	0	0	190680	9080
Federal level publication and media	Lumpsu m	500000	0	0	0	0	1	500000	500000	23810
Region level publication and media	Lumpsu m	200000	0	0	0	0	5	1000000	1000000	47619
Woreda level publication and media	Lumpsu m	150000	0	0	0	0	7	1050000	1050000	50000
<b>Sub-total</b>				731080		484680		2924000	4139760	197131
<b>Cost for component 5</b>				14166956		16448404		7169680	37785040	1799288
<b>Sub-total for components 1 to 5</b>				49164419		105764667		34513215	189442302	9021062

### Implementing Entity Management Fee use and Breakdown

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
<b>Project execution costs (&lt; 9.5% of the total budget requested, before the implementing entity fees)</b>										
Sectors: Technical officer one each at MoANR, MoLF, MoWIE, MEFCC (4 persons)	Month	25000	48	1200000	48	1200000	48	1200000	3600000	171428.57
Woreda: M & E expert and project facilitator (1 per woreda - 7 persons)	Month	10000	84	840000	84	840000	84	840000	2520000	120000.00
Community development agents/facilitators (1 at each Kebele)	Per person per year	36000	14	504000	14	504000	14	504000	1512000	72000.00
Motor bike: 1 per woreda (ETB 50,000 per bike)	per bike	50000	7	350000		0		0	350000	16666.67
Fuel, maintenance and lubricants for Motor Bike: 10000 ETB per bike per year	Per bike per year	10000	7	70000	7	70000	7	70000	210000	10000.00
Per diem (50 days per person per year)	Per person per year	15000	11	165000	11	165000	11	165000	495000	23571.43
Desk and chair (12000 ETB per person)	Per person	12000	11	132000		0		0	132000	6285.71
Lap tops and printers (20000 ETB per person)	Per person	20000	11	220000		0		0	220000	10476.19
Communication	Per person per year	5000	11	55000	11	55000	11	55000	165000	7857.14
Solar lamps with phone charger for 14 development agents/facilitators	Piece	2000	14	28000		0		0	28000	1333.33
Boots and tee shirts for development agents	Lumpsum per person	1000	14	14000		0		0	14000	666.67
Stationaries (7,500 ETB per person per year)	Per person per year	7500	11	82500	11	82500	11	82500	247500	11785.71
Launching meetings/workshop at woreda level	Per woreda	40000	7	280000						
<b>Sub-total</b>				<b>3940500</b>		<b>2916500</b>		<b>2916500</b>	<b>9773500</b>	<b>465404.76</b>
<b>Sub-total for components 1 to 5 and project execution costs</b>				<b>53104919.20</b>		<b>108681167.20</b>		<b>37429715.20</b>	<b>199215801.60</b>	<b>9486466.74</b>

## Executing Costs and Breakdown

Description of item/activity	Unit	Unit cost (ETB)	Year 1		Year 2		Year 3		Total cost for all years (ETB)	Total cost for all years (USD)
			Qty	Total Cost (ETB)	Qty	Total Cost (ETB)	Qty	Total Cost (ETB)		
<b>Project cycle management fee (&lt;8.5% of the total budget)</b>										
Project officer (with safeguards expertise) (1)	Month	30000	12	360000	12	360000	12	360000	1080000	51429
Management meetings (Steering Committees, etc)	Per meeting	20000	3	60000	3	60000	3	60000	180000	8571
Vehicle: Double cabin pick up (630,000 ETB per vehicle)	no.	630000	4	2520000					2520000	120000
Vehicle operations cost	Per vehicle per year	120000	4	480000	4	480000	4	480000	1440000	68571
Per diem (50 days per person per year)	Per person per year	15000	1	15000	1	15000	1	15000	45000	2143
Office furniture (12000 ETB per person)	Per person	12000	1	12000		0		0	12000	571
Lap tops and printers (20000 ETB per person)	Per person	20000	1	20000		0		0	20000	952
Communication	Per person per year	5000	1	5000	1	5000	1	5000	15000	714
Stationaries (7,500 ETB per person per year)	per person per year	7500	1	7500	1	7500	1	7500	22500	1071
Baseline survey and six monthly visits	Per year			389200		389200		389200	1167600	55600
Launching and closing workshops	Per workshop	500000	1	500000		0	1	500000	1000000	47619
Annual review workshops and final workshop	Once a year			122080		122080		122080	366240	17440
Mid-term evaluation	Lumpsum					1236480			1236480	58880
Final evaluation	Lumpsum							1236480	1236480	58880
Audits	Per year	63000	1	63000	1	63000	1	63000	189000	9000
				<b>4553780</b>		<b>2738260</b>		<b>3238260</b>	<b>10530300</b>	<b>501443</b>
<b>Total amount of financing requested</b>				<b>57,658,699</b>		<b>111,419,427</b>		<b>40,667,975</b>	<b>209,746,102</b>	<b>9,987,910</b>

## H. Disbursement schedule

Include a disbursement schedule with time-bound milestones.

**Table 22. Disbursement Schedule**

Outputs	Year 1				Year 2				Year 3			
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
<b>Component 1: Awareness and ownership of adaptation planning at the local level</b>												
Output 1.1: Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels				100								
Output 1.2: Climate smart development plan designed				100								
Output 1.3: Climate resilient water plans developed				100								
Output 1.4. Climate smart agriculture and land – water - forest integration plans developed				100								
Output 1.5: Climate resilient livelihood plans developed				100								
<b>Component 2: Water security</b>												
Output 2.1. Potable water supply increased in target areas					0			100				
Output 2.2: Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change					0			67				100
<b>Component 3. Climate smart agriculture – land – water - forest integration</b>												
Output 3.1: Climate smart agriculture implemented at the farm level				45				91			100	
Output 3.2. Integrated watershed management approach used to restore and protect degraded watersheds				85				97			100	
<b>Component 4. Climate resilient livelihood diversification</b>												
Output 4.1: Improved knowledge, understanding and awareness of livelihood opportunities				37				59				100
Output 4.2: Increased capacity of target households to participate in market-oriented enterprises				40				80			100	
<b>Component 5. Capacity building, monitoring, evaluation and learning</b>												
Output 5.1. Building capacity and knowledge transfer				41				89				100

Output 5.2: Project results monitored and evaluated and lessons captured				22				61				100
Output 5.3: Results and lessons communicated to key stakeholders and mainstreamed in local planning processes				18				30				100
<b>Project management and execution</b>				40				70				100

**Figure 14. Climate Smart Integrated Rural Development Project - Work plan**

#	Description of Activities	Y-1	Y1				Y2				Y3				Y4			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>0</b>	<b>Climate Smart Integrated Rural Development Project - Workplan</b>	[Gantt bar spanning from Y-1 Q4 to Y3 Q4]																
<b>1</b>	<b>Component 1. Awareness and ownership of adaptation planning at the local level</b>	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
<b>2</b>	<b>Output 1.1 Increased awareness, understanding and ownership of climate risk reduction processes and adaptation planning at all levels</b>	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
3	To collect meteorological data (temperature and precipitation) for the relevant project sites	[Gantt bar spanning from Y-1 Q4 to Y1 Q1]																
4	To collate future climate projections for the relevant areas, capturing uncertainty	[Gantt bar spanning from Y-1 Q4 to Y1 Q2]																
5	National desk based study	[Gantt bar spanning from Y1 Q2 to Y1 Q4]																
<b>6</b>	<b>1.2: Climate smart development plan designed</b>	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
7	Undertake a study to review the local development plans	[Gantt bar spanning from Y-1 Q4 to Y1 Q1]																
8	Consultation and consideration of how to integrate climate smart activities into the planning process	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
9	Implementation, monitoring and reporting of EIA/ESMP	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
<b>10</b>	<b>1.3: Climate resilient water plans developed</b>	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
11	Collecting regional and local watershed information for the relevant project areas, i.e. hydro-meteorological data, groundwater information and potential influence of climate change and risk to provide an indicative analysis of water availability and develop a comprehensive ground water management plan (supply-side)	[Gantt bar spanning from Y-1 Q4 to Y1 Q1]																
12	Conduct geophysical studies	[Gantt bar spanning from Y-1 Q4 to Y1 Q2]																
13	To estimate indicative existing water demand and future demand considering the local plans	[Gantt bar spanning from Y-1 Q4 to Y1 Q3]																
14	Prepare detailed design and turnkey tender document for water well construction and supply for potable use, cattle and irrigation	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
15	To consider (scope out) the potential influence of climate change on future demand	[Gantt bar spanning from Y-1 Q4 to Y1 Q3]																
16	To provide an indicative water balance (supply-demand) in each Kebele with consideration of current and future risks; and develop an integrated water-agriculture-land ecosystem and livelihood diversification plans with the communities	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
17	To support preparation of bylaws for irrigation and drinking water use and training on operation and maintenance of water related infrastructure	[Gantt bar spanning from Y-1 Q4 to Y1 Q3]																
<b>18</b>	<b>1.4. Climate smart agriculture and land – water - forest integration plans developed</b>	[Gantt bar spanning from Y-1 Q4 to Y1 Q4]																
19	To undertake survey and analysis to understand existing soil and water conditions, and environmental degradation	[Gantt bar spanning from Y-1 Q4 to Y1 Q1]																

#	Description of Activities	Y-1	Y1				Y2				Y3				Y4			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
20	To collate information on agriculture production, management systems and practices in the Woredas and Kebeles and on current practice, supplementing with community based surveys		█															
21	To consider the agriculture development activities in the local plans, and implications for land and water		█															
22	To consider the potential portfolio of options for each relevant adaptation planning zone, considering elevation, precipitation, soil suitability, etc.			█														
23	To develop locally appropriate tools and methodologies to support uptake of climate smart agriculture				█													
<b>24</b>	<b>1.5: Climate resilient livelihood plans developed</b>		█															
25	Collate existing socio-economic data for the Woreda and Kebele and conduct vulnerability assessment of the community		█															
26	Conduct consultation with the local community to understand the available livelihood options and foster innovative adaptive practices		█															
27	Sensitize the community and discuss current climate variability and future climate change risks to better understand vulnerability			█														
28	Develop locally appropriate tools and methodologies to support uptake of climate resilient livelihood strategies				█													
<b>29</b>	<b>Component 2: Water security</b>																	
<b>30</b>	<b>2.1 Potable water supply increased in target areas</b>																	
31	Shallow Well Drilling Complete with 8" uPVC Casing installed to a depth of 150 meters																	
32	Construction of elevated water reservoir and water point																	
33	Procurement of complete sets of solar powered submersible pump systems, solar PVs, including all electro-mechanical works																	
34	Installation of pump and electro-mechanical fixtures																	
35	Purchase and install well monitoring devices																	
36	Purchase spareparts and establish linkage with local part suppliers																	
<b>37</b>	<b>2.2 Irrigation infrastructure for agriculture and livestock watering designed and developed to withstand climate change</b>																	
38	Shallow well drilling complete with 8" uPVC casing installed to a depth of 150 meters - for pressurized irrigation systems																	

#	Description of Activities	Y-1	Y1				Y2				Y3				Y4			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
39	Purchase and install drip irrigation system including cannal construction - for pressurized irrigation systems																	
40	Up-grading of traditional irrigation schemes for hand dug wells																	
41	Purchase, import and install solar PV with stand including pump and motor - for pressurized irrigation systems																	
42	Installation of pump and electro mechanical fixtures - for pressurized irrigation systems																	
43	Construction of handdug well with appropriate concrete rings to a depth of 15 meters																	
44	Purchase and install an appropriate handpump (Afridev pumps/Rope and Washer) for 1 ha per handdug well																	
45	Construction of 2000 M3 Sand Dam																	
46	Solar Powered Surface Pump for Sand Dam, purchase, install and commission																	
47	Spring Development																	
48	Purchase spareparts and establish linkage with local part suppliers																	
49	<b>Component 3. Climate smart agriculture – land – water - forest integration</b>																	
50	<b>3.1 Climate smart agriculture implemented at the farm level</b>																	
51	Supporting the supply of basic seeds																	
52	Physical moisture and soil conservation structures, Biological conservation measures, Farmland gully treatment, Introducing and enhancing agroforestry, Homestead multi-storey agro-forestry and soil conservation measures and Establish wind breaks/shelter belts and farm boundaries																	
53	<b>3.2. Integrated watershed management approach used to restore and protect degraded watersheds</b>																	
54	Utilization plan for closed areas																	
55	Purchase of seeds																	
56	Physical and biological SWC measures, Area closure for enhanced natural regeneration, Upper watershed gully treatment, Rangeland management in pastoral watersheds, Nursery establishment																	
57	Land and bed preparation for nurseries and nursery construction																	
58	Tree and grass seedling planting/direct sowing with grass and tree seeds																	
59	Provision of hand tools, nursery tools and equipments																	

#	Description of Activities	Y-1	Y1				Y2				Y3				Y4			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>60</b>	<b>Component 4 Climate resilient livelihood diversification</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
<b>61</b>	<b>4.1 Improved knowledge, understanding and awareness of livelihood opportunities</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
62	National and International consultant contracted and providing the required backstopping for ease of access of credit to project beneficiaries	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
63	Value chain analysis	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
<b>64</b>	<b>4.2 Increased capacity of target households to participate in market-oriented enterprises</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
65	Promotion of various livelihood diversification inputs	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
66	Custom trainings developed and given to project beneficiaries, DAs, Woreda and Regional experts on poultry, beekeeping, forage,loan and savings, meat production, food nutrition, closure	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
67	Capacity building training for DAs and skill upgrading to farmers on stall feeding/cut & carry system	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
<b>68</b>	<b>Component 5 Capacity building, monitoring, evaluation and learning</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
<b>69</b>	<b>5.1. Building capacity and knowledge transfer</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
70	Regional and woreda level workshops and awareness creation forums	[Gantt bar spanning Y1 Q1 to Y1 Q4]																
71	Training of regional and woreda experts, DAs and cooperative members	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
72	Improve and establish Farmers' Training Centers (FTCs) to demonstrate and train farmers on climate proof measures	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
73	Organizing field day and demonstration on pre- and post-harvest practices including soil and water conservation, irrigation schemes, best soil and water harvesting techniques, fruits and vegetables, poultry, beekeeping, forage,loan and savings, meat production, food nutrition, closure	[Gantt bar spanning Y2 Q1 to Y3 Q4]																
74	Support formation of youth groups (male and female) to give agricultural mechanization rental & hire services	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
75	Establishment of cooperatives and community based system (by-laws & institutions)	[Gantt bar spanning Y2 Q1 to Y2 Q4]																
76	Training and awareness raising on operation and maintenance	[Gantt bar spanning Y3 Q1 to Y3 Q4]																
77	Strengthen governance and mainstream plans at the various levels	[Gantt bar spanning Y1 Q1 to Y2 Q4]																
<b>78</b>	<b>5.2 Project results monitored and evaluated and lessons captured</b>	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
79	Analysis of meteorological station data and satellite data	[Gantt bar spanning Y1 Q1 to Y3 Q4]																
80	Analysis of the outcomes of the climate smart agriculture pilots	[Gantt bar spanning Y2 Q1 to Y3 Q4]																

#	Description of Activities	Y-1	Y1				Y2				Y3				Y4				
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
81	Performance of the resilient livelihoods against annual climate variability						[Activity bar]												
82	<b>5.3 Results and lessons communicated to key stakeholders and mainstreamed in local planning processes</b>	[Activity bar]																	
83	Develop a communication and knowledge management strategy and preparation of guidelines and manuals		[Activity bar]																
84	Farmer-to-farmer fora (cross visits, community meetings etc.)						[Activity bar]												
85	Development of participatory videos										[Activity bar]								
86	Experience sharing for Woreda experts on climate smart villages and demonstrations, best soil and water conservation and irrigation facilities						[Activity bar]												
87	Publication and media at the various levels										[Activity bar]								

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

- A. Record of endorsement on behalf of the government<sup>115</sup>** *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

<i>(Enter Name, Position, Ministry)</i>	<i>Date: (Month, day, year)</i>
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- B. Implementing Entity certification** *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (.....list here.....) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
<p><i>Name &amp; Signature</i> Implementing Entity Coordinator</p>	
<i>Date: (Month, Day, Year)</i>	<i>Tel. and email:</i>
<i>Project Contact Person:</i>	
<i>Tel. And Email:</i>	

<sup>6</sup>. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.