



**National Implementing Entity –NEMA - KENYA**

## **PROGRAMME PROPOSAL**

**PROGRAMME TITLE:**

**INTEGRATED PROGRAMME TO BUILD RESILIENCE TO  
CLIMATE CHANGE & ADAPTIVE CAPACITY OF VULNERABLE  
COMMUNITIES IN KENYA**

**Executing Entities:**

**KEFRI, TARDA, CDA**

**SUBMITTED**

**TO**

**ADAPTATION FUND BOARD**



**ADAPTATION FUND**

**February 2014**

## LIST OF ACRONYMS

AFB	Adaptation Fund Board
ASALs	Arid and Semi-Arid Lands
ASDS	Agricultural Sector Development Strategy
ATDC	Agricultural Technology Development Centers
CA	Conservation Agriculture
CBNRM	Community-based natural resource management
CCB	Climate, Community, and Biodiversity
CCU	Climate Change Unit
CDA	Coast Development Authority
DFID	Department for International Development
GFSIT	Green Forest Social Investment Trust
EMCA	Environmental Management and Coordination
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
GFSIT	Green Forest Social Investment Trust
GIZ	German Agency for International Cooperation?
GoK	Government of Kenya
ICRMP	Integrated Coast Region Master Plan
ICZM	Integrated Coastal Zone Management
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KMD	Kenya Meteorological Department
KRCS	Kenya Red Cross Society
Kshs.	Kenya shilling
LDC	Least Developed Countries
LDCF	Least Developed Countries Fund
LVCD	Local Value Chain Development
MEWMR	Ministry of Environment, Water and Natural Resources

MoA	Ministry of Agriculture
MDGs	Millennium Development Goals
MoCDM	Ministry of Cooperatives Development and Marketing
MoF	Ministry of Fisheries Development
MoE	Ministry of Energy
MoLD	Ministry of Livestock Development
MoR	Ministry of Roads
Mo WI	Ministry of Water and Irrigation
MPTS	Multipurpose Tree Species
MoU	Memorandum of Understanding
NAP	National Adaptation Plan
NAMAs	Nationally Appropriate Mitigation Actions
NAPA	National Adaptation Programme of Action
NC	National Communication
NCCACC	National Climate Change Activities Coordinating Committee
NCCRS	National Climate Change Response Strategy
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NRM	Natural Resource Management
SIDA	Swedish International Development Cooperation Agency
SLM	Sustainable Land Management
TARDA	Tana and Athi Rivers Development Authority
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VSLA	Village Savings and Loaning Approach
WB	World Bank

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PART I: PROGRAMME INFORMATION

## PROGRAMME PROPOSAL

CATEGORY:	REGULAR PROGRAMME
COUNTRY:	KENYA
SECTORS:	AGRICULTURE & FOOD SECURITY; WATER MANAGEMENT, DRR & COASTAL MANAGEMENT
TITLE OF PROGRAMME:	INTEGRATED PROGRAMME TO BUILD RESILIENCE TO CLIMATE CHANGE AND ADAPTIVE CAPACITY OF VULNERABLE COMMUNITIES IN KENYA
TYPE OF REQUESTING ENTITY:	NATIONAL IMPLEMENTING ENTITY
IMPLEMENTING ENTITY:	NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY
EXECUTING ENTITIES:	KEFRI, TARDA, CDA
AMOUNT OF FINANCING REQUESTED:	<b>USD9,998,301.74</b>



## 1.0 PROGRAMME BACKGROUND AND CONTEXT

### 1.1 Brief Background on what Programme Aims To Solve

Kenya has a landmass of about 582,350 km<sup>2</sup> of which only 17percent is arable while 83% consists of semi-arid and arid land (GoK, 2012). Like other countries in the world, Climate change and climate variability pose major threats to the environment, economic growth and sustainable development. The negative effects from Climate Change experienced in Kenya include reduced agricultural production, food insecurity, increased incidences of flooding and droughts, widespread disease epidemics, and increased risk of conflict over scarce land and water resources. These impacts of climate change are further compounded by local environmental degradation caused by illegal encroachments, deforestation and unsustainable livestock grazing.

Climate Change affects various sectors in Kenya differently, with the most vulnerable being agriculture, livestock, water, health, fisheries and tourism. Agriculture is a major activity in Kenya, earning 60% of foreign exchange and 24% of the GDP as well as providing employment for 80% of the population (GoK, 2012). Over reliance on rain-fed agriculture and pastoral livestock production systems places Kenya as one of the high risks countries from the impacts of climate change. Changes in weather patterns like rise in temperature and unpredictable rainfall all have direct negative effects on agricultural activities thereby threatening food security and livelihoods of many communities in Kenya especially those from arid and semi-arid areas.

Arid and semi-arid lands (ASALs) areas in Kenya are characterized by fragile ecosystems that have suffered increased degradation due to climate variability. In particular, Kenya's ASALs experienced prolonged droughts during *La Nina* period of 1999-2001, January-March 2006 and 2008-2009 (NEMA, 2007). This significantly caused crop failure and reduced yields compromising food security and leading to famine, human migration and displacements. There has also been a significant reduction of livestock production due to reduced pasture and water resources. In some instances extreme drought conditions occur which lead to death of animals affecting livelihoods and economic status of ASAL communities.

Further, Kenya is classified by the United Nations (UN) as a water-scarce country because of its annual renewable freshwater supply estimated at 647 m<sup>3</sup> per capita that is significantly below the 1,000 m<sup>3</sup> per capita set as the marker for water scarcity. The prolonged droughts which have been attributed to climate change, have severely affected freshwater availability. Major rivers including the Tana, Athi, Sondu Miriu, Ewaso Ng'iro and Mara have experienced severe reduced volumes during droughts and many seasonal ones have completely dried up. In addition, water resources are unevenly distributed in both time and space in five drainage basins namely; Lake Victoria, Rift Valley, Athi River, Tana River, and Ewaso Ng'iro. This is compounded with low development of water resources harvesting infrastructure in the country. The loss of glacier in Mt. Kenya to about 92% of its ice mass, has also led to reduced river water volumes, transformation of permanent to seasonal rivers and in some cases complete drying of the rivers (NEMA, 2007).

On the other hand, other parts of the country that used to receive reliable rainfall are now experiencing sporadic rainfall causing floods. This has become a common phenomenon in areas like Budalangi along River Nzoia in Western Kenya arising from Cherangani Hills; Kano plains along Nyando River in Nyanza region arising from Nandi hills while Tana River floods due to poor land use practices in Mt. Kenya and Aberdares catchments areas (NEMA, 2007). These flooding events have caused severe socio-economic impacts including loss of life and livestock, damage to infrastructure, poor crop yield, and famine due to food shortage, human migrations and displacements, which are affecting livelihoods and posing negative economic performance.

Kenya's inland coastal and marine ecosystems which are a repository of rich natural resources that support local and national economies which include fisheries, terrestrial forests, mangroves, sea grass beds, and coral reefs are threatened by resource overexploitation, transformation and degradation of habitat, pollution, and now, climate change (NCCRS, 2010). Further the coastal zone is threatened by sea rise leading to human displacement and loss of property. The illustrated negative impacts of climate change in different sectors and ecosystems constrain the national budget to respond to food insecurity, settling displaced persons and climate change related disasters at expense of development expenditure that supports capital investments for economic growth and sustainability.

To respond to the above effects of climate change, Kenya has designed this programme to cover the following sectors; water resources, agriculture, livestock, agro forestry, coastal and mangrove ecosystems, energy and infrastructure, human health and gender in relation to climate change. The programme proposes to develop and implement integrated adaptive mechanisms to increase community livelihood resilience to climate change as follows:

- i. Adoption of drought tolerant crops, and promotion of value chain approaches
- ii. Development of water harvesting assets/structures
- iii. Promotion of forestry and agro forestry ecosystem-based strategies to enhance food security and resilience to climate change as well as water and soil conservation.
- iv. Promotion of pastoral ecosystem-based adaptations that will increase resilience through use of pasture conservation and emergency fodder bank, storage and supply of water to improve social life of the people in the district.
- v. Rehabilitation of mangrove ecosystem in the coastal area
- vi. Disaster risk reduction and preparedness through early warning system and flood control structures
- vii. Establishment of a knowledge management system for this programme, development of institution capacity, and raising awareness on Climate Change Adaptation.

### **1.2 Relevant Climate Change Scenarios in Kenya**

The Kenya Meteorological Department (KMD) has provided evidence of the country's temperature and rainfall changes over the last fifty years. From these results, the minimum and maximum temperatures have been increasing since 1960s, depicting warming of the earth (

Table 1: Maximum and Minimum Temperature Trends Since 1960)<sup>1</sup>.

The results also indicate an increase in intensity and frequency of rainfall over the coastal strip and the northern parts of the country in the months of September, October, November, December, January and February<sup>2</sup> (Ogutu, 2007). In addition, an increasing trend in the rise of temperature has been reported in the Mara Serengeti ecosystem from 1907 to 1998 (Figure 1: Rising monthly means of temperatures in Kenya from 1907 to 1998 in the Mara-Serengeti ecosystem).

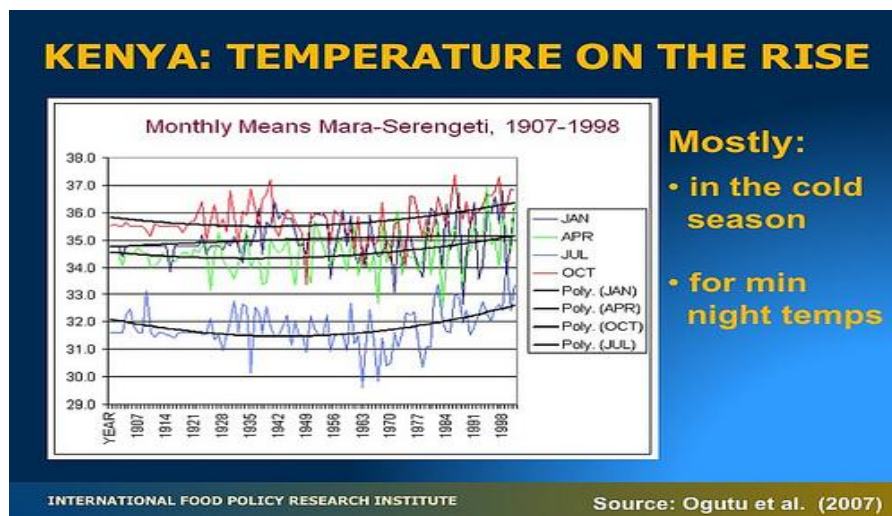


Figure 1: Rising monthly means of temperatures in Kenya from 1907 to 1998 in the Mara-Serengeti ecosystem

Average annual temperatures in Kenya have already increased by 1.0°C over the last 50 years and prolonged droughts have been experienced every year since the millennium. Projections from leading climate scenarios vary between an anticipated annual rises in temperature of an additional 1-5.0°C during the next 100 years. Existing scenarios suggest that by 2100 seasonal rainfall periods are likely to remain the same (i.e. both short and long seasons) but rainy seasons are likely to consist of greater volumes of rain, particularly in the short season (esp. October to December). Global climate models predict an increase of 40 per cent rainfall in northern Kenya, while regional models indicate greater rainfall may be experienced in western areas. Drought frequency is likely to remain similar but rising temperatures will make these more severe. Models diverge greatly over likely impacts upon

<sup>1</sup> Kenya's National Climate Change Response Strategy 2010

<sup>2</sup> Ibid

El Niño events, which are closely tied to periods of extreme drought. Studies have shown that over 70% of the natural disasters in Kenya are related to extreme weather and climate. For instance, there have been recurrent droughts experienced in the years 2000, 2001, 2009, 2010, 2011 and 2012 worsening food security. Additionally, the frequency of floods and mudslides has also increased being experienced in the years 1997, 1998, 2006, 2007 and 2012.

**Table 1: Maximum and Minimum Temperature Trends Since 1960**

Minimum temperature trend		
Region	Trend	Magnitude (°C)
Western	Increase	0.8-2.9
Northern & North-eastern	Increase	0.7-1.8
Central	Increase	0.8-2.0
South Eastern districts	Increase	0.7-1.0
Coastal strip	Decrease	0.3-1.0
Maximum temperature trend		
Western	Increase	0.5-2.1
Northern & North-eastern	Increase	0.1-1.3
Central	Increase	0.1-0.7
South Eastern districts	Increase	0.2-0.6
Coastal strip	Increase	0.2-2.0

Results of another study by the Stockholm Environment Institute on the Economics of climate change in Kenya also revealed that the future economic costs of the impacts of climate change on market and non-market sectors may contribute about 3% of GDP per year by 2030 and about 5% of GDP per year by 2050 (Stockholm Environment Institute 2009).

### 1.3 An outline of the Economic Social, Development and Environmental context in which the project/programme would operate

#### 1.3.1 Agriculture

Agriculture is the most affected by climate variability in Kenya. In the recent past Kenya has experienced successive seasons of crop failure, increasing food insecurity in the country. The famine cycles have reduced from 20 years (1964-1984), to 12 years (1984-1996), to 2 years (2004-2006) and to yearly 2007/2008/2009, necessitating the Government’s distribution of 528,341.77 metric tonnes (MT) of assorted foodstuffs worth \$.24 million over the last five years to feed a population of between 3.5 million and 4.5 million people annually. Past studies have shown that there is a relationship between GDP growth and drought index as shown in Figure 2 below.

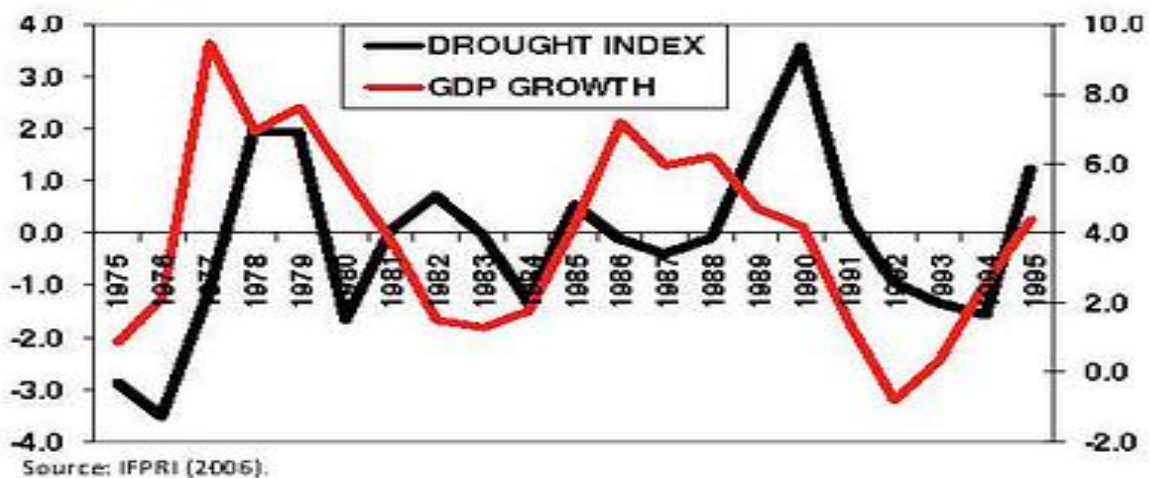


Figure 2: Relationship between drought events and GDP growth in Kenya over two decades (figure by IFPRI 2006).

This scenario of food deficits is experienced in all areas selected for programme implementation (Gwassi in Homabay, LowerYatta in Kitui County, Volta in Machakos County, Upper Tana catchment, Garrisa in Garissa County, Walda in Marsabit County, Loitoktok and Nasaru Kajiado County, Thome in Laikipia County, Nyando in Kisumu County and the Coastal Region). About80% of the population in these areas mainly depends on agriculture as the leading contributor to household income, food security and

employment alongside fishing. However, the communities are vulnerable as a result of unpredictable weather conditions that lead to crop failure, hence livelihood insecurity. Drought is a frequent phenomenon occurring after every 5 years, thus impeding agricultural investments. This situation of unpredictable weather demands for appropriate interventions to support rural poor in improving food security and livelihoods. The need to promote drought tolerant crops, alternative and diversification of livelihoods, small scale irrigation agriculture and access to market among others to improve food security is therefore urgent and pressing.

### **1.3.2 Livestock, Rangelands and Wildlife Resources**

Pastoralism is one of the major sources of livelihood for communities living in Arid and Semi-arid Lands (ASALs) of the country. This system has experienced the brunt of climate change manifested in the form of frequent, intense and long lasting droughts. The 2006 to 2009 droughts are testament to the devastation that climate change could cause to the livestock sector. In 2009, pastoralists lost more than half of their herds due to drought. As a result, about 1.5 million people in the ASALs were dependent on relief food. In addition, outbreaks of diseases like Rift Valley Fever (RVF) and a myriad of others (Wildlife Conservation Society, 2008), have been linked to climate change. This has a great toll on livestock production as the industry loses local and export market. Kenya has been battling with a ban on the export of meat to the European Union (EU) market until 2010 for its failure to control RVF and foot and mouth disease, and this has led to loss of income. With estimated 10 million pastoralists and agro-pastoralist living in the rangelands, these lands are known to support approximately 34% of the country's population.

Rangelands form the largest habitat for wildlife and about 75% of the country's wildlife is found in these areas. This makes the country a key tourist attractions destination. Through tourism, wildlife is one of the country's major foreign exchange earners. However, the capacity for these lands to sustain human and wildlife habitation is gradually declining. This is due to extreme weather events such as intense and prolonged droughts and severe flooding, all associated with climate change. The majority of pastoralists are poor and their practice is weather dependent, therefore their adaptive capacity is low making them highly vulnerable to climate change. This is evident in Kajiado, Tana River, Garrisa, Marsabit, Wajir Counties among others.

### **1.3.3 Forestry and Agro forestry**

Forests not only serve as water catchment resources and carbon sinks, but also provide ton-timber products to an estimated 80% of about 1 million of households living within forest boundaries (Ministry of Energy, 2002). However, the country's forest cover has declined over the years to as low as less than 4% cover falling way below the global recommended cover of 10%. The distribution of forests in Kenya is determined by rainfall, one of the factors most affected by climate change; thus resulting in reduced biodiversity and capacity to deliver important forest goods and services. Climate change has also affected the growth, composition and regeneration capacity of forests due to attacks by invasive species.

The projected rise in temperatures and long periods of drought has led to more frequent and more intense fires. Forest fires have in the recent past affected Kenya's major forests including the Mt. Kenya Forest. Indeed, Kenya has, over the past 20 years, lost more than 5,700 ha of forests per year due to forest fires, wreaking phenomenal economic damage. The programme activities will include agro forestry, tree nurseries, rehabilitation of degraded areas by planting trees and improving production capacity of tree growers among others. This will improve resilience of small holder farmers to climate change resulting to better socio-economic activities and environmental management.

### **1.3.4 Coastal & Marine Ecosystems**

The Kenyan coastline is characterized by a rich diversity of flora and fauna, including fish, coral reefs and mangrove forests. However, rise in atmospheric temperature has resulted in melting of glaciers and polar ice with consequence on sea levels and temperatures leading to the deterioration of coastal biodiversity. A study report by UNEP (2002) revealed that 59% of the world's destroyed coral reefs were located in the Indian Ocean, and these included coral reefs in the Kenyan coast (CORDIO, 2008). In 1997/8 and 2006, massive sedimentation due to erosion of erogenous sediments following extremely heavy rainfall caused mangrove dieback in many areas along Kenyan coast (CORDIO, 2008). This trend is likely to jeopardize the livelihoods of local people depending on the mangroves especially for fisheries, wood products and coastal protection. Temperature changes and further sea level rise will accelerate these trends. This makes Kenyan coast to be one of the most vulnerable to sea level rise in the world, with the most vulnerable aspects being developments on low-lying areas including agriculture, infrastructure and tourism. Coast Development Authority together with its partners will implement various activities along the coastal region in order



to enhance socio-economic development and environmental management while addressing the effects of sea level rise and shoreline changes. Some of the adaptation mechanisms that will be incorporated include; rehabilitation of the mangroves ecosystems, coral reef rehabilitation and protection, shoreline stabilization and erosion and accretion control.

Kenya has an Integrated Coastal Zone Management (ICZM) action plan as well as a Shoreline Management Strategy in place to ensure synergy among the various stakeholders in the management of coastal and marine resources and also to provide environmental baseline, a legal and institutional framework as well as policy recommendations that guide shoreline management. The Programme activities along coastal zone are in line with both the action plan and the Shoreline Management Strategy.

### **1.3.5 Tourism**

Tourism has been growing over the years with the number of visitors increasing from 1.1 million in 2003 to 2.4 million in 2011. Wildlife both in national parks and game reserves depend on either natural rivers feeding the national parks or manmade wells and dams for its survival. However, many of these rivers have reduced in water volume while others have completely dried-up.

However, there is an increase in number of deaths of wildlife due to prolonged and recurrent droughts, human encroachment, inadequate water and forage. For instance Kenya Wildlife Service (KWS) reported the death of 28 elephants in 2008, 37 in 2009 and 43 in 2011 with increasing trends in later years. Lately, the reduction in the volume of the Mara River, largely due to the destruction of the Mau catchment, has affected the spectacular migration of hundreds of wildebeests between the Serengeti National Park in Tanzania and the Maasai Mara National Reserve in Kenya across the Mara River described as the eighth wonder of the world. The declining water volume in Mara River is compromising the tourism industry in the country. Human-wildlife conflicts have been experienced in some areas resulting not only from human encroachment into wildlife habitats but also due to wildlife straying into human settlement in pursuit of water and forage.

The Programme will initiate rehabilitation activities at the Coastal region and Kajiado areas. This will enhance direct gains of eco-tourism activities that will foster socio-economic development and proper environmental management.

### **1.3.6 Energy and Infrastructure**

For Kenya to attain the goals of Vision 2030, used as the country blueprint, access to energy is vital. A comprehensive study completed in 2007 indicated that biomass is the main type of energy consumed by households in Kenya, accounting for 68% of total national primary energy supply. The biomass energy supply and demand imbalance is exerting considerable pressure on the remaining forest and vegetation stocks; thereby accelerating the processes of land degradation. In addition, production of biomass energy poses a threat to competing land use systems such as agriculture, forestry and human settlements among others (Ministry of Energy, 2011). Climate change has led to drying up and decline in productive biomass, thus affecting the supply of biomass fuel and wood.

Kenya's electricity generation largely depends on hydro sources, which account for over half of the total effective capacity (1332.2 MW) while geothermal sources account for 12.2%, with the remaining 29.7% predominantly from petroleum oil based thermal. Drying up of crucial rivers has had a great impact on electricity production within the country and in turn affecting economic productivity. According to the millennium development goal seven (7) energy is a cross sectoral commodity and is literally required for the achievement of all the 8 Millennium Development Goals (MDG's).

Households take the lion share of all energy types, accounting for 73.1% while small scale industries take about 10% (Kamfor 2002). Energy provision to rural communities in the counties has proved to be a great challenge. The vast majority of these people are dependent on the traditional fuels (wood charcoal, crop residues, maize stalk, cobs and dung) often using primitive and inefficient technologies (open fires). For many this combination barely allows fulfilment of the basic needs of nutrition, warmth and light. It has been reported that an average family of six spend about USD 5 on paraffin for lighting only out of a total family's income of USD 71. This is about 8% of the household monthly income which is very high given that the family has to cater for food, shelter, education, health care among others.

There is a need to identify and promote strategies that efficiently use fuel source is important. The programme aims to promote adaptation mechanisms such as promotion of improved cooking stoves, improved charcoal kilns and fireless cookers among other technologies that supports socio-economic development and environmental management.

The areas of focus include Loitoktok in Kajiado County, Lower Yatta in Kitui County and Gwasi in Homabay County.

### 1.3.7 Gender and Climate Change

Climate change affects gender differently across socio and economic activities that determine their livelihoods. Women are most affected by the effects of climate change and climate variability because of their roles in the society especially fire wood, water collection and food preparation. In addition women are highly susceptible to environmental disasters such as floods, mudslides and droughts (Enarson, 2002). During the post-disaster stage, women undertake more responsibilities of reconstruction of homesteads and managers in utilization of natural resources while men often emigrate in search for work. The Programme will take into consideration various gender roles in various activities and by use of such information develop gender segregated adaptation mechanisms to combat adverse effects of climate change.

### 1.4 Scope of the Programme

The Programme will promote appropriate resilience mechanisms and adaptive capacities of selected communities in Kenya. The priority areas will include economic, social development and environmental management with key activities in; water resource management, agriculture, rangeland and wildlife management, livestock, forests and agro forestry, coastal and marine ecosystems, energy and infrastructure. The Programme areas cut across various counties as shown in Table 2: Location of Programme Areas

**Table 2: Location of Programme Areas**

No.	Programme Area	County	Regional Coordination	Executing Entity
1.	Loitoktok District	Kajiado	Central/Western	KEFRI
2.	Gwasssi Division	Homa Bay	Central/Western	KEFRI
3.	Thome Village	Laikipia	Central/Western	KEFRI
4.	Wajir South	Wajir	Eastern	TARDA
5.	Fafi and Lagdera	Garissa	Eastern	TARDA
		Tana River	Eastern	TARDA
		Kitui	Eastern	TARDA
		Makueni	Eastern	TARDA

		Kiambu	Eastern	TARDA
		Meru	Eastern	TARDA
6.	Lower Yatta	Kitui	Eastern	TARDA
		Machakos	Central/Western	KEFRI
7.	Waldaa	Marsabit	Eastern	TARDA
8.	Nyando Wetlands	Kisumu	Central/Western	KEFRI
9.	Kinango, Vanga, Gazi Ijara	Kwale	Coast	CDA
		Kilifi	Coast	CDA
		TaitaTaveta	Coast	CDA
		Mombasa	Coast	CDA
		Lamu	Coast	CDA
		Tana River	Coast	CDA
		Garissa	Coast	CDA

The Programme areas are spread across the country among communities with diverse cultures who derive their livelihoods from the environment and are most vulnerable to the effects of climate change. The selected Programme areas have significant water deficit status that makes the inhabitants more vulnerable to climate change as described below:

**a) Loitokitok District in Kajiado County**

Loitokitok is located at the southern tip of Rift Valley province near the Kenyan border and Republic of Tanzania to the West, Taveta district to the South East, Kajiado Central to the North West and Kibwezi to the East. It is situated between longitudes 36° 5' and 37°5' east and between latitudes 1°0' and 3 °0' south. It covers an area approximated at 6,356. 3 km<sup>2</sup> and has six administrative divisions namely; Entonet, Imbirikani, Kimana, Central, Lenkism and Rombo Division. Of these divisions, Entonet, Lenkism, Oltiasika in Rombo and Imbirikani are arid and semi-arid which experiences frequent droughts and extremely minimal supply of water for livestock and human settlement that is sparsely populated.

Overall the County gets water from Tsavo River with its main tributaries Nolturesh, Magoine and Rombo, which flows from the eastern slopes of Mt. Kilimanjaro. This river is perennial in the upper parts. Ground water yields vary throughout the district from 0.01 to 35.77 cubic metres per hour. Average ground water is reported as good quality and is used

for domestic, livestock and irrigation purposes. The high yielding springs are found in the slopes of Mt. Kilimanjaro with an average yield of 20m<sup>3</sup> to 50m<sup>3</sup>/hr. The county has 6 roof catchments systems which act as water harvesting facilities used to collect rain water which is then led through a gutter to a storage tank. Other sources of water for domestic and livestock are sub surface resources such as water pans, dams and shallow wells. The amount of surface water varies from area to area. In general the area is characterised with inadequate water facilities, encroachment of water catchment areas, poor water resource mapping and poor coordination of water actors among others.

During the implementation of the Programme, Kenya Forestry Research Institute (KEFRI) in collaboration with various stakeholders will promote climate resilient agricultural, agro-forestry, pastoral and agro-pastoral production systems to improve food security in the area. The institute together with collaborating partners will also spearhead water conservation and harvesting technologies, promotion of efficient cooking technologies and charcoal production kilns to reduce risks associated with climate change and improve the adaptive capacity of selected vulnerable communities in the area.

#### **b) Gwasssi Division**

The district is located in Suba, Homa Bay County, and borders Lake Victoria to the North and West, Migori District's Karungu Division to the South; and Ruma National Park covering Central Division of Suba District and Ndhiwa Division of Homa Bay District to the West. It covers a total area of 332.9 km<sup>2</sup>. Gwasssi Division is the largest and most populous in Suba District where Suba is one of the nine districts selected by the Ministry of Planning and National Development as a pilot district for implementation of district based initiatives to fast track the achievement of the Millennium Development Goals (MDGs).

The division has more than 70% of the people without access to clean drinking water. This has resulted in prevalence of waterborne diseases including diarrhea affecting about 32% of children below 5 years. During the implementation of the Programme, World Vision in collaboration with various stakeholders will promote effective management and supply of water resources in order to increase the adaptive capacity of the selected communities. The key adaptation mechanisms will include increased irrigation technology, water and soil conservation strategies and use of drought tolerant crops.

**c) Thome area**

Thome area is located in Matanya sub-location, Tigithi location of Tigithi Division, Laikipia Central District, Laikipia County. This is on the foot of Mt. Kenya at the confluence of EwasoNgiro and the NaroMoru rivers. The village borders NaroMoru River on the north-east and EwasoNgiro River on the south-west area of the Laikipia Plateau (1800 m asl).

The rainfall in Thome area lies between 700-800mm on average per year with some areas receiving less than 600mm. The low amounts of rainfall with varying patterns have led to continued decrease in river discharge, causing conflicts between upstream and downstream users. For instance, the NaroMoru River was perennial and a reliable source of water up to the early 1990s. However, in the past decade the river has repeatedly run dry over extended periods of time. The Programme activities will include construction of water harvesting and supply infrastructure, drip irrigation, promotion of drought resistant crops and conservation of environment through agro forestry.

**d) Wajir South, Fafi and Lagdera**

Wajir South in Wajir County and Fafi and Lagdera in Garissa County comprise the selected Programme areas in North Eastern Kenya. The area is largely ASAL with a fragile ecosystem with erratic and unpredictable rainfall. The selected Programme areas have experienced decrease in rainfall intensity and coverage resulting in shortage of water, poor crop production and depletion of pastures leading to massive loss of livestock and livelihoods. The arid conditions have worsened due to prolonged drought as a result of climate change. This has increased vulnerability of the communities.

The per capita water supply was estimated at 696 m<sup>3</sup> per year in 2000 and is projected to decline to 235 m<sup>3</sup> by 2020. Garissa and Wajir counties are hard hit by water scarcity. These areas experience perennial water shortage which becomes rampant during dry season. Boreholes are the main water sources in both counties although not enough to cover increased water needs especially during dry periods. In addition, water pans and shallow wells also serve as sources of water. However, given of their small sizes and limited numbers; these facilities often dry up at the onset of the dry season, forcing communities to migrate resulting to disruption of livelihoods in the area.

Moreover, the boreholes are also unreliable as they experience frequent break downs due to this extensive use. As such, the boreholes require routine maintenance which is unaffordable

to the local communities causing water scarcity. This has been the main cause of clan conflicts as they seek control over the water resources. The Programme activities to be implemented in these regions will include; construction of water harvesting and storages facilities, reclamation of rangelands, soil and water conservation, promotion of agro-forestry and tree planting. These efforts will enhance water availability thus increase resilience of the local communities to climate change.

**e) Tana and Athi Rivers Basins**

The Tana and Athi River Basins cover Machakos, Tana River, Meru, Makueni, Kajiado, Kiambu and Kitui Counties. These areas experience frequent droughts and unpredictable rainfall, which have devastating effects on the economy and livelihoods. The failure of the 2010 and 2011 seasonal rains followed by the rainfall deficits in the 2012 season virtually halted crop production and alarmingly reduced the water table. This situation has exposed the population in South-eastern Kenya to extreme weather conditions and increased vulnerability of these communities. The TARDA and other collaborating partners will promote various adaptation mechanisms that will improve water availability to support agriculture, livestock and other domestic needs. The Programme activities will include construction of water dams, rehabilitation of degraded areas and promotion of agro-forestry among others.

**f) Waldaa Area**

Wada area is located in Marsabit County, Eastern Kenya region. The area experiences prolonged drought throughout the year. The Programme area lies 80 kms south of Moyale which is largely ASAL.

This is located in Upper Eastern Kenya, which also experiences prolonged drought throughout the year. In this area Kenya Red Cross Society (KRCS) embarked on early recovery initiatives aimed at opening up land under irrigation in Waldaa, a small relief food dependent village, 80 kms south of Moyale, as a disaster risk reduction strategy aimed at building community resilience and enhancing food security. Kenya Red Cross with local people will construct water pans to supply water for domestic and irrigation to improve resilience and adaptive capacity to climate change of the rural poor. Water harvested during the rainy seasons will be used in irrigation. Modern farming methods which are climate

SMART (pressure compensated drip irrigation) will be adopted and solar energy will be used to power the pumping equipment's , which will reduce fuel use and minimize any harmful emissions to the environment. The programme will also contribute to up scaling of already established systems where 60 acres of land has already been piloted and significant level of success demonstrated. Ultimately this will enhance rural development; increase economic activities, social development and environmental management and build greater adaptive and transformative capacity of the target community.

**g) Nyando Wetlands in Kisumu County**

The Nyando catchment in the eastern sub-catchments of the Lake Victoria basin is located in the Lake Victoria South Catchment Area in Kenya. It covers an area of 3,600 km<sup>2</sup> and is situated within the Winam Gulf between longitudes 34°47"E and 35°44"E, and latitudes 0°07"N and 0°20"S within Kisumu County. The Nyando Wetlands cover an area of 3,600 km<sup>2</sup> within Kisumu County and is a zone of low rainfall experiencing semi-arid conditions (Jaetzold and Schmidt, 1982). The rainfall has been declining over the last three decades which has in turn reduced groundwater levels in Nyando River floodplains. There have also been land use changes as a result of intensive deforestation in the upper catchment of Nyando River basin. In particular, the area under wetlands has reduced by 79% between the years 1991 and 2006 (Swallow *et al.*, 2009). This follows an earlier loss where 6000ha of wetland were converted to support rice production in the 1960s and 1970s (Swallow *et al.*, 2007). Flood control structures, evacuation centres will be the primary initiatives in this area.

**h) Coastal Region and Ijara:**

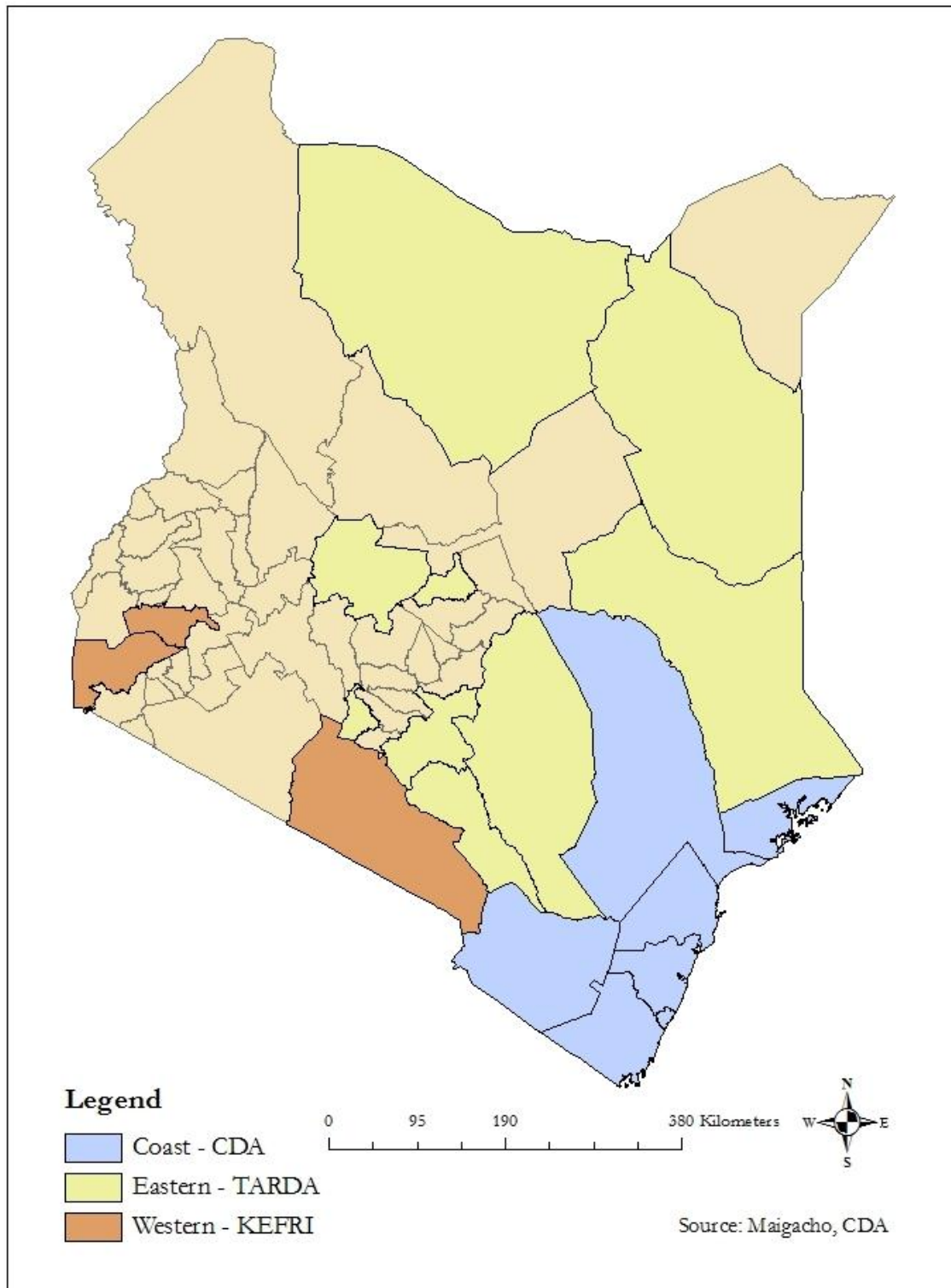
The Coastal Region comprises of six counties namely; Kwale, TaitaTaveta, Mombasa, Kilifi, Tana River and Lamu. The region is located at 3°0'S 39°30'E. The coastal counties cover a total area of about 79,687 km<sup>2</sup> with a population of about 3,325,307 (GoK, 2009). The region's climate is tropical humid characterized by dry spells and unpredictable rainfall.

Supply of portable water has not kept pace with population growth and urban development in the coastal region. Consequently, majority of the population has resorted in abstraction of groundwater by sinking boreholes and shallow wells. Some tourism facilities have also lead in increased use of the available brackish groundwater for toilet needs. Over-extraction of



groundwater and destruction of water catchments has exacerbated the water supply problem and threatened the ecosystem hydrological functions thus the need for strategies to address these issues. Coast Development Authority (CDA) in partnership with other stakeholders thus intends to promote alternative sources of freshwater in a bid to reduce pressure on groundwater sources and also to create public awareness on the importance of protecting natural water systems. Rainwater harvesting is one of the strategies that will be incorporated as an alternative source of freshwater. The Programme activities will thus entail the installation of roof catchments and construction of water pans to harvest rain water for agricultural production and domestic use. These activities will be undertaken in Kwale, TaitaTaveta, Mombasa, Kilifi, Tana River and Lamu Counties as well as Ijara in Garissa County.

## Programme Areas and Executing Entities



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## 1.5 PROGRAMME OBJECTIVES

The overall objective of the proposed programme is to enhance resilience and adaptive capacity to climate change for selected communities in various Counties in Kenya in order to increase food security and environmental management.

Specifically, the programme will be addressing the following objectives;

- i) Enhancing Climate resilient agricultural, agro-forestry, pastoral and agro-pastoral production systems to improve food security in selected Counties in Kenya
- ii) Improving climate resilient water management systems to enhance food security in selected Counties in Kenya
- iii) Increasing resilience to the effects of rise in sea level and shoreline changes through Integrated Shoreline and Mangrove Ecosystem Management at Vanga and Gazi in the Coastal region of Kenya
- iv) Disaster risk reduction among targeted vulnerable communities for climate related risks in Kenya
- v) Strengthening institutional capacity, knowledge management, awareness raising and promotion of adaptation mechanisms to improve resilience on climate change to selected vulnerable communities in Kenya

## 1.6 PROGRAMME COMPONENTS AND FINANCING

**Table 3: identification of programme components, concrete outputs, outcomes and financial allocations**

PROJECT/PROGRAMME COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US\$)
<b>Enhancing Climate Change resilience for improved food security in selected Counties</b>	Increased adoption of drought tolerant food and high value	Enhanced food security and improved livelihoods	<b>2,522,245.71</b>
	Increased food production through appropriate and efficient		
	Established value chain system for the introduced crops		
	Diversified alternative livelihood sources		
	Increased animal production through adoption of drought tolerant fodder		

	Enhanced land productivity through ecological land use systems , conservation strategies and management technologies		
<b>Improving climate resilient water management systems to enhance food security in selected Counties</b>	Established appropriate physical assets and infrastructure for water harvesting, storage and irrigation	Increased access to water and enhanced food security	<b>3,210,455.64</b>
<b>Increase resilience to the effects of sea level rise and shoreline changes through Integrated Shoreline and Mangrove Ecosystem Management (ISMEM) in Kenyan coastal zone</b>	Implemented Integrated Shoreline and Mangrove Ecosystem Management (ISMEM)	Secured human habitation and development	<b>1,086,478.00</b>
	Rehabilitated Mangrove Ecosystem		
	Rehabilitated and protected Coral Reefs		
	Stabilized shorelines		
	Controlled erosion and accretion		

	Inventory and GIS database for the shoreline and mangrove ecosystems		
<b>Disaster risk reduction among vulnerable communities</b>	Constructed and equipped Automatic Weather station (AWS) in selected programme site(s)	Improved disaster preparedness and risk reduction	<b>1,176,999.65</b>
	Documented weather information to facilitate decisions on Disaster preparedness and risk reduction		
	Increased use of weather information in response to various climate risk disasters		
	Established community based friendly weather information dissemination systems		

	Constructed flood control structures (dykes) in Nyando wetland basin	Improved flood control	
	Constructed modest evacuation centres at selected sites in Nyando wetland Basin	Secured human habitation during flood	
	De-silted canals and river beds in Nyando Basin	Reduced flood related damages	
<b>Strengthening capacity for program Implementation and Climate change adaptation</b>	Knowledge Management system established	Increased knowledge base on climate change adaptation for better decision making	<b>476,958.06</b>
	Research and knowledge development	Increased knowledge base on Climate Change adaptation	

7. Total Project/Programme Cost	8,473,137.06
8. Execution Cost by Executing Entities - 9.5% of Total Project Cost (C)	804,948.02
8. Project/ programme Cycle Management Fee / National Implementing Entity (if applicable)	720,216.65
<b>Amount of Financing Requested</b>	<b>9,998,301.74</b>



## 1.7 PROJECTED CALENDAR

**Table 4: Programme Milestones and expected of delivery**

<b>MILESTONES</b>	<b>EXPECTED DATES</b>
Start of Project/Programme Implementation	July 2014
Mid-term Review	December 2015
Project/Programme Closing	June 2017
Terminal Evaluation	September 2017

## **PART II: PROGRAMME/PROJECT JUSTIFICATION**

2.1. Description of the Programme Components particularly focussing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience.

This programme has 5 main components namely:

1. Enhancing Climate Change resilience for improved food security in selected Counties
2. Establishing Climate Change resilient water management systems to enhance food security in selected Counties
3. Increase Climate Change resilience to the effects of sea level rise and shoreline changes through Integrated Shoreline and Mangrove Ecosystem Management (ISMEM) in Kenyan coastal zone
4. Disaster risk reduction and increasing preparedness among vulnerable communities
5. Strengthening capacity and knowledge management on climate change adaptation

### **2A.1 Component I: Enhancing Climate Change resilience for improved food security in selected Counties**

This component has six concrete outputs whose adaptation activities across selected sites will contribute to increased resilience of local and vulnerable communities to climate change in Kenya. The specific activities designed in this programme will build human, natural, financial, physical, and social capital, through better leveraging and utilizing natural resource bases and economic opportunities.

Effects of climate change greatly impact on rural communities. Rural communities rely directly on climate-impacted natural resources for their livelihoods. These impacts are already occurring<sup>3</sup>, and future projections for climate change indicate enormous potential disruption. Such substantial climatic change will further increase uncertainty and exacerbate weather-related disasters, drought, biodiversity loss, and land and water scarcity. Assessment reports indicate that approximately 60 per cent (15 of 24) of key ecosystem services are degraded and used unsustainably, with the natural resources critical to

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<sup>3</sup> Intergovernmental Panel on Climate Change, Impacts, Adaptation and Vulnerability in Fourth Assessment Report: Climate Change 2007, eds. M. Parry et al. Contribution of Working Group II. Cambridge, UK: Cambridge University Press, 2007, <http://www.ipccwg2.gov/publications/AR4/index.html>.

agricultural production and livelihood security for the world's poorest people in rapid decline.

The proponents of each project recognize that local knowledge, including that of women, on the management of natural assets is often quite robust. It is well documented that disempowering those who hold local knowledge may result in degradation of natural assets that undermine local livelihoods. In addition, women are often the holders and conveyors of key knowledge of local species, seeds and medicinal plants, and have a strong interest in management of water and marginal household land.

In the face of long-term climate and environmental challenges, the project proponents appreciate that today's knowledge and technologies do not adequately reach the most vulnerable communities. The programme will therefore, promote suitable farming practices and methods to improve both livestock and crop based production within households in the selected sites. Specifically, this programme will promote: drought tolerant and orphaned crops (DTC); irrigable agriculture through efficient water utilization such as open drip irrigation systems, , small holder irrigation infrastructure, diversion of run-off and rain water harvesting options; alternative livelihood sources such as fruit trees, high value seedlings, fodder preservation/conservation techniques; efficient food utilization through value chain approach such as marketing strategies, value addition and food preservation/storage, SACCOs and business plans, goat farming and improved cook stoves.

Significantly, these climate change adaptation initiatives will be mainstreamed to build community resilience in order to cope with the climatic stresses. Through this component, the programme will strengthen existing livelihoods through improved natural resource management (NRM) by implementing the adaptable activities outlined in each of the outputs detailed below.

***Output 1.1: Increased adoption of drought tolerant food and high value crops and Enhanced efficient utilization through value chain approach***

The agricultural sector is facing many challenges including land availability (only 20% of Kenya's total land area is considered arable), land fragmentation to small non-economical units which cannot support meaningful agriculture, migration of youth to urban areas in search of employment and reliance on erratic rainfall patterns. Climate change and variability has exacerbated these challenges rendering the agriculture sector more vulnerable thus heightened food insecurity in the country. Some of climate change impacts

affecting agriculture include droughts, decline in rainfall patterns, increased crop pests and diseases among others. The selected project sites have limited amount of arable land and are mainly characterized as arid and semi-arid areas (ASALs). In spite of these climatic conditions, their main sources of income and livelihood are from small patches of arable land and vast range lands. For instance, the livelihoods of the population from Gwasi division in Homabay County depend mainly on agriculture (up to 80%), which is a leading contributor to household income, food security and employment alongside fishing. Specifically, agriculture contributes to 51% of the household incomes in the Homabay county and provides employment to over 40% of the district's population. It sustains the county in terms of providing food and nutrition requirements. The potential for horticultural produce especially in the islands and along Lake Victoria is great. Fishing and small scale businesses also contribute in a lesser percentage to household income.

However, the community is made vulnerable as a result of unpredictable weather conditions that lead to crop failure, and hence food insecurity. The area experiences drought on average every five years, impeding agricultural investments, yet irrigation options are quite expensive. During a consultative meeting, the community identified key vulnerabilities in the area and major changes that have occurred over the past 30 years. Most notably, erratic and unreliable rainfall lead to floods and crop failure respectively, drought led to the drying of river beds, death of livestock and famine were identified as issues of concern. In some areas drought is quite severe resulting in loss of vegetation, frequent food shortages and insufficient water.

This increases vulnerability of people/farmers to climate change variability, hence less resilience. The programme intends to increase resilience to climate change by promoting crop diversification and innovations to cushion farmers from total losses due to mono cropping and unpredictable rainfall patterns in the area through the following adaptation activities:

- i) Procure and distribute certified seeds of drought tolerant and orphaned/high value crops namely; sorghum, amaranthus, millet, green grams, cassava, cow peas, pigeon peas, water melons, pumpkins, butter nut to 60 farmer groups at Gwassi division, 90 farmers groups at Lower Yatta district, 120 farmer groups at Loitoktok district, 50 farmers groups at Nyando Wetlands, 30 farmer groups at Wajir, 20 farmer groups at

Garissa, 30 farmer groups in Waldaa and 15 women groups in Kajiado West district to reach a target of 15,000 farmers across the sites.

- ii) Establish seed bulking centre of selected drought tolerant crops per 10 farmer groups to ensure sustainable supply and access of seeds to targeted farmers. The farmers who received seeds in the first season will thereafter donate at least 1 kg of seeds for distribution to a second target group of farmers. This will be monitored over time to ensure sustainability and adoption of promoted crops to increase food security.
- iii) Establish demonstration fields for each selected drought tolerant crop per 10 farmer groups in order to improve awareness and promote drought tolerant/orphaned crops to farmers. These demonstration plots/fields will also be used as training sites to improve farmer's skills on growth and management of drought tolerant crops.
- iv) Undertake at least three farmer field extensions in each group per growing season to increase extension services to the farmers to backstop them on technical issues such as land preparation and early warning systems before planting and during plant growth to guide planting and handling of crop harvest.
- v) Establish a value chain system for the introduced drought tolerant and high value crops

### ***Output 1.2 Diversified alternative livelihood sources***

The promotion of alternative sources of livelihood provides opportunities for farmers to spread climate related risks and increase resilience to climate change. For instance the integration of fruit tree farming, bee keeping and normal crop farming enhances the adaptive capacity of the farmers to shocks of climate change just in case there is crop failure. Some of the proposed adaptive activities in this programme aim to ensure consistency of cash flow/food flow in households to meet their daily demands. The diversification of Livelihoods proposed in the programme is resilient to climate change and appropriate in existing conditions and can address current challenges, while at the same time developing capacity to adapt to future changes). These strategies should will build on existing knowledge and capacities. In order to achieve impact and costeffectiveness of this output, the programme will concentrate on one intervention (*Activity 1 Procure and distribute improved assorted fruit trees seedlings (Mangoes, pawpaw, passion, avocados etc) that are drought tolerant to selected farmer groups in programme selected areas*) and its market linkage activity. The entire budget for this output will be on distribution of drought tolerant

and improved fruit trees, seed bulking activities and creation of market linkages for the same.

Building adaptive capacity of a community or an individual entails improving access to and use of resources/assets. Financial capital is one of the critical livelihood assets necessary to build resilience as it allows diversification of livelihoods. Crop and livestock value addition, increased market information and access, increased entrepreneurial skills etc. results in increased household financial assets thus increased resilience against climate change.

The success stories on some of these alternative sources of livelihood have been reported in the country. For instance in Lower Yatta district in Kitui County, mango fruit trees are drought resistant and have proved to grow well in the area. They are also preferred by the community. Supporting this community with grafted mango seedlings will improve the community's livelihood security and act as a source of income through sale of fruits. Overall, this enables farmers to increase their income and hence improve their livelihood security and asset. The programme will therefore promote the following adaptive activities to increase resilience to climate change;

- i) Procure and distribute improved assorted fruit trees seedlings (Mangoes, pawpaw, passion, avocados etc) that are drought tolerant to selected farmer groups in programme selected areas.
- ii) Establish well equipped fruit tree nursery run by farmer groups in selected sites to supply and improve access of seedlings for planting.
- iii) Train all target farmer groups on fruit tree production and various management techniques.

### ***Output 1.3 Increased food production through appropriate and efficient irrigation methods***

The selected sites experience prolonged droughts and erratic rainfall resulting in serious crop failures. This makes individuals in these areas more vulnerable to food insecurity, and hence, less resilient to climate change. To enhance the viability and success of food production, the programme will promote irrigation agriculture in selected areas based on the existing structures, previous irrigation activities and introducing new ones. For instance, the 64 acre irrigation project undertaken by Kenya Red Cross Society at

Waldaa Community in Marsabit showed that the Walda farmers experienced their very first bumper harvest and were able to harvest tomatoes, onions, butternut, capsicums, kales and spinach for their consumption leaving a large surplus for sale. Similarly small irrigation activities for horticultural crops at Loitokitok has also indicated positive results. The same trend has been observed in other areas where irrigation is practiced such as Yatta, Bura in Coast and Mwea Tebere in Eastern Kenya among others. *It must however be noted that the source of irrigation water is rain harvested water.*

The programme will therefore promote the following adaptation activities to boost food production in the targetted areas;

- i) Procure, distribute and set up drip irrigation kits to selected groups of farmers at Loitokitok, Waldaa, Wajir, Garissa, Thome, Yatta, Tana and Athi Rivers Basins to support agricultural productivity.
- ii) Procure and set up the water distribution equipment for existing dams constructed at Loitokitok district to support agricultural productivity.
- iii) Irrigate/Operate 64 acres at Waldaa in Marsabit County
- iv) Construct water harvesting trenches for farmer group across target sites.
- v) Undertake capacity building for farmer groups on irrigation agriculture such as drip irrigation, construction and management of trenches to increase food productivity
- vi) Construct, equip and maintain an Automatic Weather Station at selected programme site(s)
- vii) Collate weather data and link to Kenya Meteorological Department to support production planning

***Output 1.5 Increase animal productions through promotion of drought resistant fodder crops; pasture conservation and emergency fodder banks.***

Livestock play an important role in most small scale farming systems in Kenya. They provide traction to plough fields, manure which maintains crop productivity, and nutritious food products for human consumption. Like agricultural crops, the production level of livestock largely depends on feeding resources available, environmental conditions, climatic factors like rainfall, temperature among others. The climatic changes such as unreliable rainfall and prolonged droughts will directly affect the livestock production. For example, in

Loitoktok district like other target areas in this programme have reported loss of livestock due to lack of water and pasture. The low livestock productivity of livestock has been reported due to inadequate water supply, pasture, presence and increased incidences of diseases, inaccessibility to credit facilities, low yielding livestock breeds, wildlife conflicts, inadequate marketing information, inadequate technical knowledge and skills, inadequate funds for extension, few extension officers, unpredictable weather conditions, high livestock mortality and crop failure, recurrent drought, poor drought management and preparedness, erratic climatic change and low/inadequate vegetation. These conditions make pastoralists and agro-pastoralists more vulnerable to climate variability hence less resilience to climate change.

Similar situation has been reported on wetlands regions where livestock graze in wetlands pastures feeding on grass and other herbaceous plants. During the wet season these lands provide adequate forage to maintain productive animals. However, during floods, such pastures are submerged and dry season the quantity and quality of forage greatly decreases and is generally low in nutritional value. Livestock sustained on such diets often lose weight and productivity.

To improve resilience to climate change for livestock farmers, there is a need for them to provide their animals with quality feeds to augment flood and dry season forages. One option is to supply expensive concentrates or supplemental feeding. For most small scale farmers this is not possible due to high costs and limited availability of supplements. A more practical option is for farmers to establish fodder banks and conservation. Fodder banks are plantings of high-quality fodder species such as improved fallows like *Calliandracalothyrsus*, *Sesbaniasesban* and other legumes/shrubs whose goal is to maintain healthy productive animals. This can be utilized all year, but designed to bridge the forage scarcity of annual dry seasons. The relatively deep roots of these woody perennials allow them to reach soil nutrients and moisture not available to grasses and herbaceous plants. This characteristic enables these plants to retain fresh foliage into the dry season. The ability of some legumes to fix atmospheric nitrogen makes them protein rich feeds.

Similarly, rice growing areas in Nyando Wetlands, Tana and Athi river basins are able to produce a large volume of straws that can be conserved as hay. Such hay can also enhance feed provision to livestock in times of floods and drought. The wetland ecosystem also harbours macrophytes like *Pycreusnitidus* which are traditionally foraged by livestock. These



plants normally grow luxuriously during the wet seasons and have a high regeneration capacity, thus can be exploited for hay.

The programme will therefore promote the following adaptive activities to increase resilience to climate change so as to improve livestock production.

- i) Construct storage facility of fodder in each pastoral farmer group and promote its adoption across sites
- ii) Establish mechanized fodder processing plant for farmer groups targeting pastoral and agro pastoral farmers in selected sites to enhance value addition on fodder and alternatives feed for animal during dry period (Figure 6).



**Plate 2: A 20HP chopper grinder motorised chaff cutter and processed silage**

Source: District Livestock Officer, Loitoktok district, Ministry of Livestock (2011)

- iii) Procure and plant drought and climate resilient accessions/varieties of grass and forage to selected farmer groups across implementing sites to enhance sufficient animal feeds during dry spell periods.
- iv) Establish green zones for pasture production through purchase of grass seeds among selected farmer groups especially on exhausted rangeland fields at Wajir and Garissa.
- v) Establishment and rehabilitation of livestock watering points such as water trough to ensure adequate water supply for the livestock during the dry period

vi) Link farmer groups across implementing sites to special livestock insurance schemes and micro finance services that will provide them opportunity to spread and transfer climate change risks.

vii) Provide extension services per farmer group to enable them respond to livestock management and early warnings of bad weather

**Output 1.6 Enhanced land productivity through ecological land use systems, conservation strategies and management technologies**

The programme will engage each targeted farmer groups in strengthening their environmental resilience through activities that increase their capacity in natural resource management (NRM) through efficient and sustainable ecological land use, promotion of agro forestry and afforestation activities, soil conservation, landscape protection and farmland planning among others. In particular, Community-based natural resource management (CBNRM) will be promoted to build on the diversified livelihoods opportunities promoted under the programme.

Agro forestry options may provide a means for diversifying production systems and increasing the sustainability of smallholder farming systems. The most worrisome component of climate change from smallholder farmers point of view of is increased inter annual variability in rainfall and temperature. Thus tree-based systems have some obvious advantages for maintaining production during wetter and drier years. These include; the deep root systems of agro forestry species that are able to explore a larger soil volume for water and nutrients, which will help during droughts; increased soil porosity, reduced runoff and increased soil cover lead to increase water infiltration and retention in the soil profile which can reduce moisture stress during low rainfall years, tree-based systems have higher evapo-transpiration rates than row crops or pastures and can thus maintain aerated soil conditions by pumping excess water out of the soil profile more rapidly than other production systems. Finally, tree-based production systems often produce crops of higher value than row crops. Thus, diversifying the production system to include a significant tree component may buffer against income risks associated with climatic variability (Verchot et al., 2007).

In Kenya, various soil fertility management technologies have been developed for highland and dry land areas. Some of these technologies involve sole use of improved fallows such as *Crotolariagrahamiana*, *Calliandracalothyrsus*, *CajanusCajan*, *Sennasiamea*, *Sesbaniasesban* and *Tephrosiavogelii* among others), combination of organic and inorganic fertilizer among others. This combination will ensure that the most appropriate assemblage of species are planted in each adaptation intervention site and that there is achievement of maximum climate change adaptation benefits in the most cost-effective way. The following activities will be promoted across the implementing sites;

- i) Introduce and upscale soil technologies that increase rain water infiltration in selected sites.
- ii) Adoption of terracing across implementing sites to support soil conservation and crop productivity
- iii) Adoption of improved fallow species with high nitrogen content reduce application of inorganic fertilizer in agricultural crops
- iv) Establish herbal gardens to selected farmer groups so as enhance tree crop integration and landscape protection across implementing sites
- v) Undertake enrichment planting in various forests and establish tree nurseries, and woodlots

## **2A. COMPONENT II: IMPROVING CLIMATE RESILIENT WATER MANAGEMENT SYSTEMS TO ENHANCE FOOD SECURITY IN SELECTED COUNTIES**

Kenya is a water scarce country. This is compounded with impact of climate change where most parts of the country are experiencing prolonged drought, erratic rainfall, drying of wetlands, seasonal rivers and water springs among other water bodies. This affects various sectors such as agriculture & livestock that are key to Kenya's economy. The programme therefore focuses on adaptation activities that will improve water resource to support other sectors of Kenya's economy. The areas selected are mainly ASALs where land degradation is on continuous rise and frequently experience erratic rainfall patterns, frequent droughts, limited livelihood diversity, poor infrastructure and widespread poverty. The drought, coupled with natural aridity of the area has also resulted into rampant water shortage, widespread loss of local vegetation and severe pasture depletion. The situation is further aggravated by the massive uncontrolled cutting of trees for fuels and continuous expansion

of human settlements that has left tracts of land bare and exposed to severe soil, water and wind erosion leading to limited capacity for crop production.

The areas have no reliable permanent surface water sources (rivers) and largely rely on boreholes, traditional earth pans and shallow wells as the main sources of water. During the dry seasons, pastoralists rely entirely on boreholes for their water supplies as the earth pans and shallow wells dry up at the early onset of the dry season. The frequent failure of rains causes rampant water shortage resulting into a regular crop failure among the few subsistent farmers and high livestock mortality rates among the pastoralist due to lack of pasture and water.

The scarcity of water resources has been attributed to destruction of water catchments. Most springs are not fenced or protected. This has led to encroachment by both livestock and human leading to low yield and water pollution. Again, poor method used in irrigation (basin) leads to inadequate water for downstream users. Wetlands areas have been encroached and drained to create room for farming communities. This has greatly interfered with the natural ecosystem particularly denying wildlife and livestock their natural source of water and dry season grazing area. As a result wildlife human conflict is experienced and conflict between agricultural farmers and pastoralists is often reported in the area. Further, majority of women use most of their time looking for water in some parts of the district denying them time to engage in other productive work. In contrast areas that experience floods also pose challenges on access of clean water. This requires construction of water retention points to contain run-off such that the water can be used for irrigation under water efficiency technologies for crops and livestock production during the dry seasons.

Water to support the proposed infrastructure will be derived from the existing rivers for TARDA projects mainly Tana River. This river floods during the rainy season, and it is during the flood seasons that water will be harvested. In Kajiado and other semi-arid areas under the project, water will be harvested from storm runoff and roof catchments. Most semi-arid areas of Kenya experience long and frequent droughts, which are usually followed by torrential floods, which in most cases flow into rivers without being put into meaningful use. The rainfall in ASAL areas under the project area ranges from 200-1000 mm per year. The flood water will be collected and directed to surface dams to be used for irrigated agriculture and livestock production. The water harvested from roof catchments

will be put to domestic use. Rain water harvesting will save women and children time spent in walking long distances to look for water and the time will be used in more useful economic and social purposes.

To harness water resources for domestic use and improving food security, the programme will be implementing adaptation activities across the selected sites with following output;

### **Output 2.1 Established appropriate physical assets and infrastructure for water harvesting, storage and irrigation**

- i) Construction of water pans to harness water harvesting to capacity of 352,000 m<sup>3</sup> in the selected sites as follows; 6 water pans at capacity of 17,000 m<sup>3</sup> each at Wajir and Garissa; 50 water pans at capacity of 3000 m<sup>3</sup> each at Kajiado; 6 water pans at capacity of 5000 m<sup>3</sup> each at Loitoktok district ; 2 water pans at capacity of 5000 m<sup>3</sup>each at Thome in Laikipia and 12 water pans at Kwale, Kilifi and Taita-Taveta in Coast region
- ii) Construction of 300mm pipeline approximately 9KM at Thome, Laikipia County
- iii) Install equipment for constructed dams at selected sites to support agricultural production and domestic needs
- iv) Construct irrigation points to improve water harvesting that can support rice farming at Nyando Wetlands, Tana and Athi River basins
- v) Install water tanks and gutters to promote roof water harvesting, shallow wells, rock catchments, underground water tanks and sub-surface dams for selected groups at implementing sites.
- vi) Enhance river bank, canals, retention ponds and protection by planting grasses/fodder grass, bamboo, bananas, sugarcane, agroforestry trees and conservation of natural bushes.
- vii) Establish and strengthen water users associations
- viii) Fence off spring & water sources to protect them further degradation.

## **2A. COMPONENT III: INCREASE RESILIENCE TO THE EFFECTS OF RISE IN SEA LEVEL AND SHORELINE CHANGES IN KENYAN COASTAL ZONE**

Kenya's coastal and marine ecosystems are a rich repository of resources which support local and national economies and include; fisheries, coastal forests, mangrove forests, sea

grass beds, coral reefs, river basins, deltas and estuaries, beaches and sand dunes as well as natural and cultural heritage sites. However, these resources are threatened by overexploitation, transformation and degradation of habitats, pollution and climate change. Some of the interventions in these sectors include; developing county-wide maps depicting areas that will require shore protection (e.g. dykes, bulkheads, beach nourishment) and those areas to be left to adapt naturally, establishing a biodiversity monitoring network to identify species that will be affected by climate change and those that could be used as biological indicators, encouraging a coastal and watershed basin management approach linking land-use practices to marine and fisheries resource conservation, establishing networks of marine protected regions and including small enclosures comprising communities of species resilient to climate change impacts that serve as buffer zones as well as areas for seed regeneration.

Kenyan coral reefs are well distributed around most of the oceanic islands. They buffer the coastline against the impacts of waves and the full force of storms and cyclones. With all its benefits, the Kenyan coastline is extremely vulnerable to sea level rise. The most vulnerable aspects of the coastline are developments in low-lying areas which consist of agriculture, infrastructure and both tourist facilities and hotspots. The impact of climate change on Kenya's marine ecosystems include the likely submergence of approximately 17% of Mombasa or 4,600 ha of land area with a sea level rise of only 0.3 m. over the next century with the projected sea level rise between 0.17 and 0.59 meters, The Kenyan coastal development is exposed to considerable risks. Rising sea levels will lead to the inundation and displacement of coastal wetlands, the erosion of shorelines, increased salinity and the intrusion of saline water into coastal aquifers. Saltwater intrusion into ground water resources and salt wedge estuaries are phenomena that have been observed already in some places such as Lamu.

Rising sea levels associated with melting glaciers and polar ice, plus sea temperature increase (i.e. ocean waters absorbing the bulk of the heat from enhanced greenhouse effect) also threaten to cause deadly floods and high tides in low-lying coastal areas. Increasing sea temperature in the Indian Ocean could affect the entire Eastern African coast by increasing the frequency and intensity of El Niño-Southern Oscillation (ENSO) events (Klein et. al., 2002). Coral reef bleaching is a common stress response of corals to many of natural and anthropogenic disturbances. Beginning in the 1980s, the frequency and widespread

distribution of reported coral reef bleaching events increased. This has been attributed to global warming and consequent rising seawater temperatures (P.W. Glynn and L. D’Croz, 1990). Upholding the results of a recent study that revealed that 59% of the world’s destroyed coral reefs were located in the Indian Ocean, 12 studies by KMFRI in conjunction with other organizations have confirmed coral bleaching and loss of Kenya’s coral reefs. Further, predicted effects of climate change on mangroves include both more extreme droughts and flooding. In 1997, 1998 and 2006, massive sedimentation due to erosion of terrigenous sediments following extremely heavy rainfall caused mangrove dieback in many areas along the Kenyan coast. Mwache Creek, a peri-urban mangrove forest in Mombasa was the most affected, losing close to 500 ha of mangrove forest (KMFRI, 2008). This trend is likely to jeopardize the livelihoods of local people who depend on the mangroves particularly for fisheries, wood products and coastal protection. Increase in atmospheric temperature and further sea level rise will only accelerate these trends.

One of the adaptation measures that has been used to protect human settlements against rise in sea level is sea wall construction. However, sea walls normally alter the shoreline sceneries and also expose the adjacent exposed areas to increased erosion and accretion, other than altering the coastal ecosystem and destroying habitats for flora and fauna. Mangroves, however, provide a natural alternative for shoreline protection. Mangroves provide shoreline protection against erosion and other damages caused by storm and have also been confirmed to contribute towards carbon sequestration hence combating climate change. Mangroves also provide additional benefits such as provision of habitat and breeding grounds for fish and other fauna in addition to the important role in shoreline protection, waste assimilation, and carbon sequestration. Mangroves also provide many direct products—both timber and non-timber. Timber products include firewood, building poles and charcoal used in urban and rural areas.

Overall, mangroves provide a more environmentally sound means of shoreline protection with diverse economic and socio-cultural benefits. However, Vanga and Gazi mangrove ecosystems face various threats as highlighted by the Coast Development Authority Integrated Coast Region Master Plan (IWCRMP), 2010-2030. According to the IWCRMP, environmentally fragile areas in the coast region comprise of threatened ecosystems resulting from human settlement activities such as; overgrazing in Kinango and Samburu during very dry seasons, depletion of forest cover and species in the Kayas and the

mangroves, threatened natural forests such Kayas – Kaya Diani, Kaya Kinondo, Kaya Chale, illegal logging at Shimba Hills Forest Reserve as well as the natural mangroves at Gazi, Vanga, Faza and Tsunzaareas. Moreover, there is also erosion and deposition at the coastline in addition to human activities such as fishing and human settlement, resulting in the destruction of coral reefs and seaweed beds.

The Integrated Shoreline and Mangrove Ecosystem Management (ISMEM) component thus aims at addressing the above, among other challenges. The people of Vanga and Gazi have over the years been victims of rise in sea level forcing the locals to move further inland until the waters subside. The unusual rise in sea level has over the years posed a threat to the locals of Vanga as well as their livestock and property. The main output of this component is therefore increased resilience and adaptive capacity of the people of Vanga and Gazi against the effects of sea level rise and shoreline changes resulting from climate change.

### **Output 3.1 Implemented Integrated Shoreline and Mangrove Ecosystem Management (ISMEM)**

The main activities to be implemented in this output include the following;

- i) Rehabilitation of Vanga and Gazi Mangrove Ecosystems
- ii) Rehabilitation and protection of Coral Reefs
- iii) Shoreline Stabilization
- iv) Erosion and accretion control
- v) Setting up of an Inventory and GIS Database for the shoreline and mangrove ecosystems

## **2A. COMPONENT IV: DISASTER RISK REDUCTION AND INCREASING PREPAREDNESS AMONG VULNERABLE COMMUNITIES**

The level preparedness for climate related risks such as floods, erosions, loss of livestock, prolonged drought and crop failures among others are weak in Kenya. This is further compounded with fragile ecosystem due to over exploitation of natural resources, poor management of agricultural farms and unsustainable utilization of resources from different ecosystems.



Floods depend, among other things, antecedent conditions of rivers and their drainage basins and existence of dykes. Human encroachment into floodplains and lack of flood response plans increase the damage potential. Dominant drivers of the upward trend of flood damage are socio-economic factors such as economic growth, increases in population and wealth being concentrated in the vulnerable areas and upstream land-use change (Swallow et al., 2009). Many floods reported in the Nyando floodplains area are a result of intense and/or long-lasting precipitation. The plains are characterized by intractable, alluvial soils which have very poor drainage, and suffer periodic drought and flooding (Millman, 1973).

In Nyando, The observed increase in precipitation intensity during the early 1950s marked the onset of destructive flooding. During flooding, water spills over into riparian areas, converting many tracts of land into temporary wetlands. The Nyando River, finding its course blocked by the detritus from streams flowing southwards from Nandi Escarpment, forced an outlet southwards via a maze of distributaries which, one by one, became silted and finally abandoned except in times of flooding. Today Nyando River flows out into the Miruka swamp, south of the plains, finding its course hindered further by ever growing area of papyrus reeds, which promote silting conditions and dam up a backlog of waters during flooding times.

At the southern end of the Kano Plains, at Ahero (20km from the river mouth), the lateral confinement of the flood in the channel ceases and floodwater overtops the river bank. Dykes running 8km downstream from Ahero town were constructed in 1975 to contain the floods. Consequently, the river commonly overtops hence spreading out in the Nyando Delta wetlands.

Perennial floods have ravaged most parts of lower Nyando catchment for too long and caused great economic loss in terms of lives and property (CBS, 2004) for the poverty stricken rural communities living around the wetlands who depend exclusively on its resources for subsistence, income generation and employment. On the other hand, floods cause academic problems in the area include poor accessibility to schools, under-staffing and temporary periodic closure of schools. Some of the health problems in the area are exacerbated by this climatic condition. Most people dispose of human waste directly onto the ground or surface water during floods. These and other occurrences enhance the increase or

outbreak of vector borne and water-related diseases (malaria, bilharzias and typhoid) in the area due to the limited medical facilities and lack of drugs in the area.

In recent years, floods in the Nyando River basin have resulted in negative impacts, ranging from loss of human lives and livestock to widespread destruction of crops, houses, public utilities and disruption of various economic activities. Nearly half a million people live in areas of high flood risk within Nyando River Basin (**See table 5**). To reduce the impact of flood and drought, there is need to establish Early Warning System and flood and drought adaptation measures.

**Table 5: Major flooding and drought events in Lake Victoria Basin during the period 1952-2009\*.**

Date	Area affected	Disaster/ main cause	Effects summary
March 1952	Lake shore and Nyando River floodplains	Floods- heavy rain	Houses abandoned and people displaced to higher ground
Early 1961	Lake shore and Nyando River floodplains	Floods- heavy "Uhuru" rains	Many people died and others displaced
1975, 1977 and 1980	Widespread	<u>La Niña</u> drought	Affected tens of thousands of people each year
1982	Nyanza Province	Floods- heavy rains	4,000 people displaced
1983/84	Widespread	<u>La Niña</u> drought	Most severe, 200,000 people affected in Kenya
1985	Nyanza and Western Provinces	Floods- heavy rains	10,000 people displaced

1997-98	Widespread, including Nyando River floodplains	Floods- <b>El Niño</b> rains	1.5 million people affected
1999/2000	Widespread	<b>La Niña</b> drought	4.4 million people affected
April-June 2002	Nyanza and Western Provinces	Floods- heavy rains	150,000 people displaced
26 <sup>th</sup> Aug to 12 <sup>th</sup> Sept, 2003	Western Province – Budalangi and Nyanza (Nyando)	Floods -heavy rains	1 person died, Over 2,500 people left homeless
May 2004	Widespread	Floods- heavy rains and drought	2 people died and 12,470 displaced by floods; 2.3 million people affected by drought
2005	Nyanza Province	Drought	Thousands of people affected
Dec. 2006	Budalangi- Busia and Nyando Plains	Floods- heavy rains	Over 12,000 households displaced
2007	Budalangi	Floods- heavy rains	Over 10,000 people displaced, schools closed down
2008	Widespread	Floods and drought	
2009	Widespread	<b>El Niño</b> floods; <b>La Niña</b> drought expected in 2010	Thousands of people displaced, many more affected by drought

\* Areas mostly affected, main causes and their effects on people have been indicated. Some events were not limited to Nyando floodplains because other areas, like Budalangi area in the Nzoia River basin, were also affected.

*Sources: Republic of Kenya (2004) National Policy on Disaster Management (revised Draft), Nairobi, Kenya; Daily Nation 5<sup>th</sup> September, 2007; KRCS Disaster Appeals 2003 and 2006; Achoka and Maiyo, 2008; Onywere et al., 2007).*

In addition, the country needs to invest in early warning systems so as to prepare the communities that are more vulnerable to climate change. This will significantly reduce the cost of Government recurrent expenditure to respond to emergencies such floods, food relief due to prolonged drought and deaths as a result of landslides among others. In particular there is a need to install and maintain an Automatic Weather station (AWS) to aid in monitoring the climate variability even in very remote areas. The AWS typically consist of a weather-proof enclosure containing the data logger, rechargeable battery, telemetry (optional) and the meteorological sensors with an attached solar panel or wind turbine and mounted upon a mast.

The AWAS system may report in near real time via the Argos System and the Global Telecommunications System, or save the data for later recovery. In the past, automatic weather stations were often placed where electricity and communication lines were available. Nowadays, the solar panel, wind turbine and mobile phone technology have made it possible to have wireless stations that are not connected to the electrical grid or telecommunications network. The AWS will serve several purposes, namely; measuring temperature, wind speed, wind direction, humidity, liquid-equivalent precipitation, depth snow and solar radiation. This will be useful in enabling farmers to plan well for their planting cycles, type of crop variety to plant, better management of ground water and develop rain water harvesting tools among others. The programme will therefore achieve this component by establishing flood and drought adaptation measures, forest conservation, early warning system through river bank protection.

A list of activities is outlined in each output as follows;

***Output 4.1 Established flood and drought adaptation measures on selected sites***

The following activities will be implemented

- i) Construct flood control structures (dykes) in Nyando wetland basin

- ii) Construct modest evacuation centres at selected sites in Nyando wetland Basin
- iii) Unblock by de-silting canals and river beds in Nyando Basin

#### ***Output 4.2 Established early warning systems***

The following activities will be undertaken

- i) Construct and equip Automatic Weather station (AWS) in selected programme site(s)
- ii) Collate weather data and link to Kenya Meteorological Department to document weather change patterns
- iii) Establish community based friendly information dissemination system

## **2A. 5 COMPONENT V: STRENGTHENING CAPACITY AND KNOWLEDGE MANAGEMENT ON CLIMATE CHANGE ADAPTATION**

This Component has been designed as a knowledge management hub where generation of best practices activities (and other relevant activities.) will be undertaken.

Series of workshops conducted in Kenya point out that climate change awareness is low countrywide. The crucial role of communication is to make citizens better-informed on climate change issues and actively participate in programmes to combat and adapt to it. Therefore this component seeks to promote appropriate models of communications such as print and electronic media, drama and community forums among that will serve to transmit and disseminate information on climate change adaptation across areas of programme implementation. Also capacity building through training will be instrumental in improving resilience to climate change. The programme will therefore implement the following activities in strengthening institutional capacity of the local people in each of discussed components as follows;

### **2A. 5.1 Output Knowledge on climate change adaptation disseminated through print, electronic and art**

- i) Undertake radio programmes (local language and Kiswahili), barazas, drama and community forums to disseminate information on climate change
- ii) Produce at least 1000 assorted knowledge products to disseminate information on adaptation to climate change

- iii) Develop an interactive programme website to enhance feedback and information dissemination on climate change adaptation practices.
- iv) Establish and operationalize the central programme repository system to improve storage, retrieval and sharing of information climate change adaptation practices.
- v) Produce peer reviewed journal papers on adaptations measures to support knowledge generation and dissemination on enhancing resilience to climate change
- vi) Building community and county government capacity in planning, coordination and implementation of climate change adaptation activities.

## **2A. 5.2 Trained programme committees on programme management and staff on programme implementation**

The following activities will be implemented to build the capacity of the programme management committee and staff to facilitate effective delivery of all the outlined components

- i) Develop training modules for programme implementation
- ii) Train steering committee, project implementation committee, financial management and procurement committee members on sound management and administration of programme components
- iii) Train all staff on implementation of the programme

**PART 2B: A description of how the programme will provide economic, social and environmental benefits. Describe how the programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.**

### **2B.1 Introduction**

Each of the programme components will significantly contribute to economic, social and environmental development of selected vulnerable communities. The interventions identified for implementation will improve adaptive capacity of the most vulnerable community members which will result in both environmental and economic gains. Through these economic gains, the programme will also deliver significant social benefits.

## **2B. 2 Environmental**

This programme will have several environmental benefits, including contribution to climate change mitigation and biodiversity conservation. This programme aims to increase availability of trees for planting through community owned nurseries, establish green zones and invest in reforestation. A need for cooking fuel is a major cause of mass tree felling to produce firewood and charcoal. One major component of the programme is tree planting envisaged to reduce tree felling and forest destruction as source of timber and fuel wood. This is in addition to introduction of energy saving stoves replacing traditional wood fire stoves that are extremely energy intensive. Beyond reducing tree felling, the energy saving stoves will also reduce emission of harmful gases associated with climate change and poor household health. It is estimated that 200 energy-efficient stoves will reduce emissions by 200-250 tonnes of CO<sub>2</sub> per year as, compared to open fires. Besides, the trees will improve microclimate of the area as well as recycle nutrients through litter fall, leading to natural resource sustainability. Especially, leguminous trees used in agroforestry farming will improve soil fertility by fixing nitrogen.

About three quarters of the population in Kenya are engaged in agriculture. Yet, this industry is threatened by land degradation identified as a major environmental problem in 1935 through increasing soil erosion and runoff. In addition to trees that reduce soil and water erosion and runoff, the programme will train communities and implement soil and water conservation technologies (e.g. Zypits, and terraces) aimed at utilizing natural resources in a sustainable way. The control of soil erosion, use of organic fertilizer and other soil fertility management will improve the environment as this minimizes use of inorganic fertilizers which contributes emission of greenhouse gases (GHG). Another activity that will address environmental degradation is river banks protection that will be done through planting of grass and agro forestry tree species. Similarly, construction of water pans will create local communities capacity on conservation and sustainable use of limited water resource in line with Kenyan Vision 2030, Millennium Development Goals No. 7 (MDG 7) – Ensuring Environmental Sustainability, and also in line with the National Climate Change Response Strategy.

Overall the programme activities in selected sites such as tree planting, control of soil erosion, restoration of degraded lands, use of agro forestry practices, distribution of cooking stoves, protection of river banks and use organic fertilizer

among others will reduce the environmental degradation by 10% and increase biodiversity conservation by 5% against baseline indicator.

### **2B.3 Economic Benefits**

The outputs from each of the programme components will significantly contribute to economic, social and environmental benefits to selected vulnerable communities in different ways. The interventions identified for implementation to improve adaptive capacity of most vulnerable community members and most disadvantaged groups such as women would result to huge economic gains. In particular, the activities outlined in each output of the component on enhancing climate resilience agricultural, agro-forestry, pastoral and agro-pastoral production systems to improve food security among selected most vulnerable communities will benefit them as follows: The programme will lead to increased agriculture and livestock production and move vulnerable communities beyond subsistence farming to selling excess crops and stock for income. For example in 2012, the data from the Ministry of Agriculture (MoA) showed that of the total production targeted from various crops in Oloitoktok District in Kajiado County, it was only sorghum, sun flower and pigeon pea that significantly surpassed the target yield by 240%, 171% and 153%, respectively as compared to maize, beans and Irish potatoes that achieved 91%, 32% and 25% of the target yields in that order. The surplus provides an opportunity for the market resulting to improved income in the households. Also the up scaling of Waldaa Project in Marsabit County on agricultural irrigation where farmers got bumper harvest will increase agricultural production per unit area leaving surplus for sale and reducing the demand for opening more land. Water use efficiency will reduce cost of production and use of local labour and local materials like farm yard manure (FYM) in place for inorganic fertilizers will eventually result to economic gains for the farmers. . In the irrigation system, renewable energy through use of solar will be utilised and this will not only reduce the use of diesel, which is known for GHG emissions, and other environmental hazards related to spills oil based waste disposals but cost of maintaining diesel pumps is significantly high. The project will be economically viable at the local context with farmers not being bothered to cut down their returns to meet fuel costs. Similar trend of agricultural and livestock production is



expected in selected areas of Coast, North Eastern, Nyanza, Tana and Athi River basins that will yield surplus of the markets.

This programme will also aim at building on impressive gains from agricultural and livestock production by organising the farmers into sustainable marketing and credit cooperatives known as Cooperative SACCOs. This is because the livelihoods of smallholder farmers are often constrained by poor access to markets and limited entrepreneurial skills which skills, which hinders the economic development hence limiting the economic base of the most vulnerable communities. The business cooperative approach has proven to be the strongest driver of income generation. By increasing the scale of their combined outputs, the cooperative model will maximize their bargaining power and gain better access to markets and credit. The cooperative will also benefit their members through skills training in agricultural techniques and business practices. It will also support a valuable sense of teamwork and togetherness that helps propel success. This will in turn provide support for improving storage facilities to minimize post-harvest losses, and enhancing not only access to the latest market-information but climate data as well, particularly through new information and innovative communication technologies.

Consequently, supplying the markets offers both higher income and improved business relations for farmers. However, accessing the markets requires significant upgrading in terms of product quality, quantities and business management which management, which this programme will equally address. Current evidence indicates that sustaining success in productivity-based agricultural growth critically depends on expansion of market opportunities and requires thinking beyond productivity to incorporate profitability and competitiveness. The gained money can be used to pay for other household needs such as school fees, healthcare and clothing. The other activities that are intended to be both adaptation and income generating activities such as apiculture (bee keeping and honey production), fish farming and tree nurseries will improve social welfare and economic standards of the most vulnerable groups.

The programme targets 425 farmer groups resulting to at least 15,000 farmers across selected sites as primary beneficiaries. Approximately 60% of these targeted farmers will be women, 10% youth and remaining men.

- The youth engagement on establishment and management of tree nurseries will create direct employment of about 900 young men and women.
- Assembling for energy cooking stoves, solar systems, assembling and installation of plant processing will directly provide gainful employment to about 2000 beneficiaries.
- The knowledge management pathways and access to agricultural produce are expected to reach over 100,000 indirect beneficiaries of the programme.

On overall the activities on enhancing climate resilience agricultural, agro-forestry, pastoral and agro pastoral production systems will increase food security by 30% in selected sites targeting at least 10,000 households. The surplus from agricultural production, value addition, post-harvest management, sustainable animal management and linkage to markets will increase household income by at least 10% of the targeted households.

#### **2B.4 Social benefits**

The interventions identified for implementation will improve the adaptive capacity of the most vulnerable community members and most disadvantaged groups. The social benefits from this program are manifold, as with greater economic power, families and communities will be better able to invest in their own healthcare and education for their children.

As well as being better equipped to pay school fees, when children have fewer responsibilities at home, they are able to attend school regularly, and study at home. Currently, many households rely on their children for the time-intensive activities that allow the family to sustain themselves, such as collection of firewood and water. With improved sources of household water, crops that require less water and reduced dependence on wood fuel, children will be free to engage in their education.

Within Kenyan society, women and girls are traditionally segregated in both their rights and their responsibilities. In agricultural communities, women and girls undertake an estimated 75% of household labour, yet have little control over family finances. Women are also given little opportunity to participate in community level decisions. The selection of beneficiaries aims to redress this imbalance by ensuring a minimum of 50% will be women. In several activities, the beneficiaries will be exclusively women, for instance the KuniMbili/Fireless Stoves. By embracing the essential role women play in providing meals for the household,

the stoves will empower women with improved technologies that require less time to collect firewood and a means of independent income generation.

Many activities will also assist to bring better health to program beneficiaries. The energy saving stoves will reduce the emission of harmful gases associated with climate change and poor household health. It is estimated that 200 energy-efficient stoves will reduce emissions by 200-250 tonnes of CO<sub>2</sub> per year as, compared to open fires. Enhanced nutrition will also be experienced by beneficiaries, who will have more sufficient food supplies, and a greater diversity of foods available to them. With stronger health, beneficiaries will be able to engage more fully in livelihood activities, and for children, their educations.

To ensure equitable distribution, this program is being implemented in districts across Kenya, with a focus being placed on those communities already affected by unpredictable climate events, particularly drought and flooding. The programme will also seek out the most vulnerable in each of the target communities including female-headed households, youth, and people living with a disability or HIV/AIDS. Quantifiable indicators will include;

- The efficient use of water that supports crop and animal husbandry will reduce wastage by about 45%.
- The afforestation activities, establishment of woodlots, use of energy saving/improved jikos and fireless cookers will reduce women and girl child's time spent on fetching firewood by 30% against the baseline indicator. Time saved will be then be used for other productive activities such as agriculture for women and education for girl child.
- The promotion of environmental friendly programme activities such as improved cook stoves, fireless cookers, control of floods etc. will reduce health hazards by about 10% of the selected sites.
- The purposeful selection of women participation in the programme activities and ensuring gender balance will increase by about 30% against baseline of women and youth involvement in implementation and benefit sharing.

## **PART 2C: An Analysis of Cost-Effectiveness of the Proposed Programme**

The grouping of the programme project sites into three zones namely Eastern, Central and the Lake region in implementing the various components presents in itself a cost effective approach in undertaking the adaptation activities. For instance integration of agriculture based intervention such as up scaling of drought tolerant crops, promoting forestry and livestock based adaptation to climate change will add to the synergistic benefits for the programme. Costs that would otherwise be associated with individual sectoral approach such as agriculture, agro-forestry and pastoral/agro-pastoral being implemented parallel will be saved. Equally, the same group of farmers will benefit from both interventions resulting to bigger programme impact. As a result, farmers will have a diversified income strategy, with both crops and livestock, and may use different areas and resources in the landscape for each.

Climate change adaptation will require ever more flexible and diversified livelihood systems; hence the programme projects are more likely to prove to be cost effective by investing in both rain fed and irrigated agriculture and pastoralism, especially considering the broad social benefits for greater income and household food security. The programme will help strengthen and diversify the options by which these socio-economic objectives can be achieved.

In spite of the fact that the programme targets more vulnerable groups/farmers that carries substance farming and their importance to food production, especially meat and dairy, food and horticultural crops the project will also targets larger farmers. This affords the project greater opportunities to commercialize the practices and technologies which will be introduced through the project. This two-track approach is more cost-effective (relative to outcomes and impacts, as well as by financial measures). In particular, the demonstration of the benefits of good farming practices of conservation agriculture and water saving irrigation will be cost effective.

Consequently, it is important to point out that all the farm level measures for resilient agricultural production which will be introduced and promoted are known to be inherently more cost-effective as they represent good international practice of conservation agriculture and known to require less input and maintenance costs. In addition to

inventorying such practices, the programme will facilitate the selection and adaption of suitable practices amongst this inventory on a range of types of farms. This diversification and localization strategy is the most likely to prove cost effective, especially in terms of the impacts felt after the project is finished. Furthermore, the approach to water saving irrigation practice which will be promoted by the project will involve a flexible approach to the farms that are already covered by the central irrigation network; and the efficiency of water application resulting from this dimension of the project will be highly cost effective in light of the current low efficiency of that system.

Also the direct benefits from the landscape-scale land rehabilitation and management approach include improved farm level production, reduced losses due to wind erosion and the monetary equivalent of the fodder harvested which would otherwise have to be purchased or land re-allocated away from other uses to grow fodder. Similarly, the use of organic farming based on indigenous knowledge of the community that utilizes materials that are locally available will prove more cost-effective and economical as compared to use of inorganic fertilizers where the latter will lead soil burn as compared to the former that will build up soil organic with long term effect. These benefits will be quantified during the baseline stage of the programme implementation.

This program of activities 'overarching reference document is the National Climate change Response Strategy (NCCRS). National Climate change Response Strategy is the main national document detailing how the Kenyan government plans to respond to climate change in the country. This program is also consistent with other the national and sub-national development strategies as follows:

### **2C. 1 Vision 2030**

In 2007, Vision 2030 was developed as a national blue-print for long-term industrial and economic development of Kenya by 2030. In order to overcome the persistent development challenges and bottlenecks, the country developed a long term National Development strategy called "Kenya Vision 2030" which envisions a globally competitive and prosperous nation with a high quality of life by 2030. The Vision is anchored on three key pillars; The Economic and the Social Pillars aimed at achieving a just and cohesive society enjoying equitable social development in a clean and secure environment and Political pillar aimed at

establishing an accountable democratic political system. The Economic and the Social Pillars aimed at achieving a just and cohesive society enjoying equitable social development in a clean and secure environment. This programme is therefore consistent with First Medium Term Plan (MTP) 2008-2012 and second MTP 2013-2017 of Vision 2030 as it will contribute to the economic and social pillars on the following areas: education and training, environment, water, gender, vulnerable groups and youth under social pillar and agriculture and livestock under economic pillar. In particular, the economic pillar on the agricultural sector classifies food crops into: cereals (maize, wheat, sorghum, rice, millet); pulses (beans, pigeon peas, cow peas, chick peas, green grams); and roots and tubers (Irish potatoes, sweet potatoes, cassava, arrow roots and yams). These are some of the flagship crops marked for promotion as drought resistance in selected sites.

The Political pillar aimed at establishing an accountable democratic political system. The program has also referenced the Poverty Reduction Strategy Paper (PRSP) and the Economic Recovery Strategy for Wealth and Employment Creation (ERS) in planning the project. Within this plan, agriculture, the environment and climate change adaptation are all highlighted as priorities.

Agricultural efficiency has been acted upon, through three new acts of parliament published in January 2013: *The Agriculture, Fish and Food Authority Act, 2012*; *The Crops Development Act 2012*; and *the Agricultural and livestock Research Act, 2012*. A twenty-year National Forestry Plan has also been developed, aimed at increasing the forest cover to 10%. At the same time according to FAO (2007), agricultural production and the biophysical, political and social systems that determine food security in Africa, Kenya inclusive are expected to be placed under considerable additional stress by climate change.

## **2C. 2 National Climate Change Action Plan (NCCAP)**

As part of *Kenya Vision 2030*, the National Climate Change Action Plan 2013-17 has been developed, to guide 'the transition of the country towards a low carbon climate resilient development pathway' (NCCAP, 2013). This programme shares many of the priorities of NCCAP 2013-17 including clean energy solutions, improved water resource management, restoration of forests on degraded lands, and climate smart agriculture and agroforestry. The climate risk-based adaptation analysis conducted during the preparation of the National

Climate Change Action Plan (NCCAP) built on the findings of the National Climate Change Response Strategy (NCCRS), and was commissioned to among others develop a set of potential and priority adaptation actions to address projected climate impacts per sector that will feed into Kenya's National Adaptation Plan (NAP).

The NCCRS identified the following adaptations options for agriculture which this programme will promote; horticulture and food security; support for community-based adaptation strategies, e.g. building or enhancing systems for conveying climate information to rural populations. The Government and development partners need to provide support to the KMD's Early Warning System to facilitate the timely dissemination of projected and downscaled weather information to farmers. This will enhance farmers' resilience to the impacts of climate change, e.g. through altering the timing of planting dates to adapt to changing conditions; enhanced financial and technical support to the Orphan Crops Programme so that indigenous and more drought tolerant food crops like cassava, millet, sorghum sweet potatoes can be re-introduced into the farming systems; promoting irrigated agriculture by developing irrigation schemes along river basins, construction of water basins and pans, but also reconfiguring irrigated production systems to use water more efficiently and to accommodate the use of marginal quality water; addressing land degradation by building soil and stone bunds, creating grass strips and contour leveling as well as incorporating trees or hedgerows.

These measures will increase rain-water infiltration, reduce run-off during floods, reduce soil erosion, and help trap sediments including dead plant matter; promoting conservation agriculture (CA), whose aim is to achieve sustainable and profitable agriculture and ultimately improve farmers' livelihoods through the application of the three CA principles: minimal soil disturbance, permanent soil cover and crop rotations, diversifying rural economies, e.g. through value addition to agricultural products and financial support for sericulture and apiculture with the aim of reducing reliance on climate-sensitive agricultural practices; developing an innovative Insurance Scheme – low premium micro-insurance policy – which together with low-interest loans will insure farmers against crop failure due to droughts, pests or floods; enhancing agricultural extension services to train farmers on how to better cope with climate variability and change; strengthening integrated and environmental friendly pest management systems to cope with increased threats from

insects, pathogens, and weeds, and developing proper food storage facilities to cater for surplus harvest while promoting traditional and modern food preservation methods.

Similarly the NCCRS also provides various adaptations in forestry, livestock, energy and water among other sectors. The programme project activities in each component were mainly derived from the NCCRS adaptation option which presents an opportunity for the government to implement the NCCRS at local level.

### **2C. 3 Kenya Country Program framework for Ending Drought Emergencies (CP-EDE)**

As per the Government of Kenya Adaptation Technical analysis report ,November 2012 by climate and development knowledge network, the Kenya Country Program framework for Ending Drought Emergencies (CP-EDE) is based on six Strategic Response Areas (SRAs) aligned to the Intergovernmental Authority for Development (IGAD) Common Architecture where some of them include the focus on livelihoods improvements to enable adaptation to increased climate variability over the short term and change over the medium term and strengthening the National Development Management Authority (NDMA) to ensure that it is responsible for the supervision and coordination of all drought management activities and coordination of all stakeholders implementing any drought management program in Kenya.

The arrangement of farmers into groups and forming SACCOs will be cost effective in implementing the programme activities. In particular, pooling of transport to avail crop produce to the market will be significant cost reduction measure among farmers' hence enhanced returns to improve adaptive capacity of vulnerable communities. Similarly, joint implementation of some programme activities will cut travel costs and revisit, hence improved efficiency on use of resource for promoting adaption activities as stipulated in each programme component.

### **PART 2D: Description on consistence of the programme with national or sub-national sustainable development strategies**

The program activities overarching reference document is the National Climate change Response Strategy (NCCRS) which details on how the Kenyan government plans to respond



to climate change in the country. This program is also consistent with other the national and sub-national development strategies as follows:

**i) Vision 2030**

In 2007, Vision 2030 was developed as a national blue-print for long-term industrial and economic development of Kenya by 2030. In order to overcome the persistent development challenges and bottlenecks, the country developed a long term National Development strategy called “Kenya Vision 2030” which envisions a globally competitive and prosperous nation with a high quality of life by 2030. The Vision is anchored on three key pillars; The Economic and the Social Pillars aimed at achieving a just and cohesive society enjoying equitable social development in a clean and secure environment and Political pillar aimed at establishing an accountable democratic political system. The Economic and the Social Pillars aimed at achieving a just and cohesive society enjoying equitable social development in a clean and secure environment. This programme is therefore consistent with First Medium Term Plan (MTP) 2008-2012 and second MTP 2013-2017 of Vision 2030 as it will contribute to the economic and social pillars on the following areas: education and training, environment, water, gender, vulnerable groups and youth under social pillar and agriculture and livestock under economic pillar. In particular, the economic pillar on the agricultural sector classifies food crops into: cereals (maize, wheat, sorghum, rice, millet); pulses (beans, pigeon peas, cow peas, chick peas, green grams); and roots and tubers (Irish potatoes, sweet potatoes, cassava, arrow roots and yams). These are some of the flagship crops marked for promotion as drought resistance in selected sites.

Further, through Vision 2030, Kenya intends to become a knowledge-based economy where creation, adoption and use of knowledge will be the critical factor for rapid economic growth and competitiveness. This is because management of knowledge is essential to successful implementation of Vision 2030. In addition, the vision to make Kenya Africa’s most globally respected knowledge economy is contained in many strategic government documents such as the National Information Communication Technology (ICT) Master Plan 2012-2017, The Science, Technology and Innovation Act 2013 and National Broadband Strategy for Kenya 2013-2017. The right to information is also enshrined in Chapter 4, Article 35 of the Constitution of Kenya 2010. The component of knowledge management in this programme, therefore, aims at increasing access to information on climate change adaptation strategies among the Kenyan people for maximum benefit.

The Political pillar aimed at establishing an accountable democratic political system. The program has also referenced the Poverty Reduction Strategy Paper (PRSP) and the Economic Recovery Strategy for Wealth and Employment Creation (ERS) in planning the project. Within this plan, agriculture, the environment and climate change adaptation are all highlighted as priorities.

Agricultural efficiency has been acted upon, through three new acts of parliament published in January 2013: *The Agriculture, Fish and Food Authority Act, 2012*; *The Crops Development Act 2012*; and *the Agricultural and livestock Research Act, 2012*. A twenty-year National Forestry Plan has also been developed, aimed at increasing the forest cover to 10%. At the same time according to FAO (2007), agricultural production and the biophysical, political and social systems that determine food security in Africa, Kenya inclusive are expected to be placed under considerable additional stress by climate change.

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impacts of climate change, e.g. through altering the timing of planting dates to adapt to changing conditions; enhanced financial and technical support to the Orphan Crops Programme so that indigenous and more drought tolerant food crops like cassava, millet, sorghum sweet potatoes can be re-introduced into the farming systems; promoting irrigated agriculture by developing irrigation schemes along river basins, construction of water basins and pans, but also reconfiguring irrigated production systems to use water more efficiently and to accommodate the use of marginal quality water; addressing land degradation by building soil and stone bunds, creating grass strips and contour leveling as well as incorporating trees or hedgerows.

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### **i) Comprehensive Africa Agriculture Development Programme (CAADP)**

The Comprehensive Africa Agriculture Development Programme (CAADP) has been endorsed by African Heads of State and Governments as a vision for the restoration of agricultural growth, food and nutrition security, and rural development in Africa. A specific goal of CAADP is to attain an average annual growth rate of 6 per cent in agriculture. To achieve this goal; CAADP aims to stimulate agriculture-led development that eliminates hunger and reduces poverty and food insecurity. (*Comprehensive African Agriculture Development Programmed Pillar III Framework for African Food Security*). The activities outlined in are in tandem with programme projects and activities.

### **v) Feed the Future (FTF) 2011-2015**

Kenya's Feed the Future (FTF) 2011-2015 strategy builds upon the experience and results of previous programs, most notably the Initiative to End Hunger in Africa and the Global Food Security Response. Thus, in its formulation, the strategy incorporates best practices and lessons learned over several years. It is focused on, innovation seeking and aims to find what works and bring s it to scale. The private sector will be a partner in the USG's efforts from the beginning; as it develops new partnerships with Government of Kenya (GOK) institutions it will ensure that the private sector has a seat at the table. This strategy will follow the GOK's lead in aligning behind the country's agricultural sector development plan and will work with other development partners to harmonize procedures and encourage shared learning and resource leveraging. It will support analytical work to inform policy-

makers and strengthen advocacy efforts. The main objective of the hunger Millennium Development Goal (MDG) is to reduce the population of the hungry by half by year 2015 where development policies based on sound science and scaling up of best practices are key (Achieving millennium development goals in Kenya, 2012). The goal of the new forest policy and forest Acts, 2005 is to enhance the contribution of the forest sector in the provisions of economic, social and environmental goods and services.

Actions to improve climate resilience in the environment sector will uphold the country's goals to preserve Kenya's rich ecosystems. Forest-based actions are recognised to hold the highest potential for acting on climate change because of the combined adaptation, mitigation and sustainable development co-benefits. Some of the Actions relevant to the programme activities include: Increasing tree cover to 10 per cent of total land area. This could slow the rapid loss of rainwater runoff thereby helping to prevent flooding and landslides, reduced erosion and sediment discharge into rivers and improved water availability; Reforesting and rehabilitating the main water towers and water catchment areas. This a priority for Kenya due to the livelihood and biodiversity improvements; Restoration of forests on degraded lands has a mitigation potential of over 30 MtCO<sub>2</sub>e a year in 2030, the largest potential identified in the low carbon analysis; Other climate change actions include reforestation and reducing emissions from deforestation and forest degradation (REDD), with mitigation potentials of 6.1 and 1.6 MtCO<sub>2</sub>e; Improving coastal zone management to rehabilitate and conserve vital coastal ecosystems through the implementation of the Integrated Coastal Zone Management Plan, the National Disaster Risk Management Response Plan and National Environment Action Plan. Acting to improve water management include increased domestic water supply and improved sewage systems, enhanced irrigation and drainage to increase agricultural and livestock production, effective trans-boundary water resources management, and flood mitigation schemes. These actions reduce the impact of droughts and floods on crop yields and livelihoods, and more irrigation-based agriculture reduces the reliance of crop production on rainfall; improved waste management systems: with proper design can contribute to mitigation and adaptation. By capturing methane and landfill gas, there are opportunities to enhance energy security at the local level through the abundance of resources for electricity generation (National Climate Change Action Plan, 2012-2017)

The implementation of programme activities is in line with the government of Kenya policy and a key issue in the strategic growth of agriculture in Kenya. The Government of Kenya Policy documents; the Strategy for Revitalization of Agriculture (SRA) 2004-2014, its successor the Agricultural Sector Development Strategy (ASDS) 2009-2014 and the Kenya Vision 2030, recognize the agricultural sector as one of the major spring boards for the country's rapid growth to a newly industrializing "mid-income" economy by the year 2030; targeted to grow at an annual rate of 10% where harsh low rainfall is considered as one of the main factors that affect crop productivity negatively.

The government has also realized that improving agricultural productivity requires development of suitable agricultural technologies to harness fully the country's land, genetic and water resources. The overall goal of the agricultural sector is to achieve an average growth rate of 7 per cent per year over the next 5 years. Assuming a conducive external environment and support from enabling sectors and factors, the agricultural sector has set the following among other targets to be achieved by 2015: Reduced number of people living below absolute poverty lines to less than 25 per cent, to achieve the first MDG (Millennium Development Goal); Reduced food insecurity by 30 per cent to surpass the MDGs; Ensuring environmental sustainability and Increasing agricultural productivity and incomes, especially for small-holder farmers.

## **PART 2 E: Description on how the Programme meets relevant National Technical Standards and complies with the Environmental and Social Policy**

The programme will be assisting in fulfilling some national policies and strategies set by the Republic of Kenya as follows;

### **2 E. 1 Compliance with environmental standards and codes**

The programme will be subjected to Environmental Impact Assessment (EIA) specified in the second schedule of EMCA 1999. The Environment Management and Coordination Act no. 8 of 1999 EMCA guides tree planting on water catchment, boundary planting and tree species that are friendly to the environment among others.

The programme also aims to contribute in achievement of Kenya's Vision 2030 and other government regulations towards achieving 10% forest cover as well as improve household livelihoods.

## **2E. 2 Supporting forests and ecosystems in Kenya**

Protection of forests will assist in protecting wildlife, which is emphasized in the Wild Life Conservation and Management Act (Cap. 376), the Water Act of 2002 promotes catchment area and ecosystems management. Sessional paper No. 1 of 2007 on Forest Policy and Act and Agriculture Act (Cap 318) on Farm Forestry Rules 2009 stipulates a 10% forest cover on farms as a way of increasing low forest cover in the country as well as diversify subsistence production and income while contributing to soil and water conservation. Additionally, Sessional Paper No.1 of 2007 on Forest Policy emphasizes the need to support farmers on sound farm and forest management and marketing strategies.

## **2E. 3 Supporting vision 2030 and poverty alleviation initiatives**

Large population in the proposed project areas experiences chronic poverty problems as more than 80% of the population live below the poverty line of 1 USD per day. Pervasive low income attributed to massive unemployment, lack of alternative livelihoods opportunities and poor access to viable livestock markets is largely attributed to this high poverty. Consequently, socio-economic problems such as limited access, lack of sustainable livelihoods, chronic food insecurity, perennial malnutrition and water shortage often repeatedly manifesting into severe situation are quite rampant in the mentioned counties. The programme will contribute towards the national initiatives as stipulated in the above initiatives.

## **2E. 4 Targeting dry lands and drought prone areas**

The selected areas have no reliable permanent surface water sources (rivers) and largely rely on boreholes, traditional earth pans and shallow wells as the main sources of water, all hindering sustainable development in the targeted areas.

**The following laws, policies and strategies will be invoked:**

- The Water Act (2002)
- The Agriculture Act (Cap 318)
- The Environment Management and Co-ordination Act, 1999
- The Land Planning Act (Cap. 303)
- The Environment Impact Assessment and Audit Regulations, 2003

- The Environment Management and Co-ordination (Wetlands, river banks, Lake Shores and Sea Shore Management) Regulations, 2006: Legal Notice No 19 of 2009
- National Policy for Disaster Management in Kenya (2009)
- National Policy for sustainable Development of ASALs of Kenya (2004)
- National Climate Change Response Strategy (2010)

### **2E. 5 Adherence to other Acts and standards**

The programme activities will also adhere to the following Acts and standard

- Regulations, standards and requirements for the installation of irrigation channels on the farms and well drilling.
- Seeds and Plant Varieties Act which is now contained in the new law Agriculture, Livestock, Fisheries and Food Authority Bill 2012, which regulates transactions of seeds, including provision for the testing and certification of seeds, control importation of seeds, restricts importation of new varieties. This will be applicable especially when promoting drought tolerant and disease resistance crops and trees. This will also apply for vaccination and breeding programs.
- The science technology and Innovation Bill 2012 that controls innovations and patents. This may apply in this project when promoting climate change adaptations innovations such as value addition and crop variety among others

### **2E (B) Compliance with Environmental and Social Policy**

The Environment and Social policy was introduced when this programme proposal has been conceptualized, developed and submitted to the Adaptation Fund Board. However during the reformulation process, the proposal has been re-assessed and screened to identify all the environmental and social risks that can arise from its implementation. In this re-assessment it was noted that sufficient environmental and social review had already been conducted during the proposal development phase. Equally, adequate environmental and social management recommendations had been incorporated into the project design during



proposal development process. Further, it was established that this proposal falls under category C because it poses no significant environmental and social impacts and risks.

The NIE fully understands that it will be responsible for risk management associated with the projects and programmes including any environmental and social risks presented by the proposed projects and programmes where applicable. The NIE has adequately reviewed the programme proposal and classified all projects in the C category as per the approved Environmental and Social Policy by Adaptation Fund Board. There are no significant parts of the proposal that poses any serious threat or danger in regard to environment and social aspects during implementation. However, in order to mainstream the environmental and social safeguards as per the policy, the NIE will develop an environmental and social risk management tool to assist in managing any environmental and social risks in the project implementation process. This tool will in addition provide suitable interventions to any identified areas that might introduce environmental and social threats. Overall, a management plan shall be used to address the identified risks and where it will be found appropriate the reporting process will be enhanced in order to track any identified risk. Some of the programme inbuilt proposed measures to deal with these risks are Environmental Impact assessment which can only take place during actual project implementation phase. It is on this basis that it is not feasible to have an environment and social plan at the submission level of the programme proposal.

## **2E (B) Compliance with Environmental and Social Policy**

### **Structures for implementing ESMF for the adaptation fund**

All projects that will feed into the statutory EIA process shall go through the EIA due diligence.

Small project shall be screened using the ESMF screening checklist to develop the ESMP; other triggers of the ESMF will develop the relevant EPM i.e IPP RAP etc

Monitoring of the implementation of the EMSP, RAP IPP EMP from EIA will be done by EE, CDE & PSC/NIE

County Director of Environment & EE shall ensure compliance with the EMSP, RAP IPP EMP

The NEMA officer from the County will visit the project site, observe and consult with the stakeholders the implementation of the Environment Social Monitoring Plan (ESMP), RAP IPP EMP undertake the following

- NEMA to scrutinize all ESMP, IPP EIA & RAPs and develop an inspection checklist

- Visit project site and inspect for implementation of ESMP, RAP IPP EMP
- In case of violation inform the EE & the proponent verbally
- Violation report prepared and given to the County Director of Environment
- Discuss with the EE & the proponent the rectification deadline
- Follow up with a warning letter within 5 days
- NEMA officer to visit the site again if violation continues
- EE and Concerned lead agencies is then notified
- After 2 months and no rectification then NEMA to take disciplinary measures(legal action) within the EIA statutes
- Annual report is compiled and forwarded to project steering committee(PSC/NIE)
- Independent consultant to undertake annual performance & environment audit

**Documentation and roles**

Documentation	Responsibility	level	Report
Administration of screening checklist	EE	Project site	PSC/NIE
Screening checklist review	EE	Project site	PSC/NIE
Annual report	EE	Project site	PSC/NIE
EE annual report	County Director of Environment	County	PSC/NIE
Environment and social framework Audit report	PSC/NIE	Project site	NIE/AFB
Project /NIE annual report	PSC/NIE	Project site	NIE/AFB

**PART 2 F: Description of Duplication of Programme with other funding sources**

The programmes components will as much as possible avoid any duplication of actions and funding sources. In the designing, a call for proposal was made nationwide, to ask key stakeholders in the sector to submit proposals. The proposal received were then analysed and screened by NIE secretariat, where the best 11 were selected against a rigorous criteria. During the selection, a profile of existing funded projects was done to ensure that no duplication occurs. During the selection, regional representation was also considered to ensure, the all climatic zones of the country is all represented (ASAL, Wetlands, and Coastal). This approach therefore not only avoided duplication of funding sources from actors but also ensured synergy of the components being implemented.

The proposed programme of activities are not funded elsewhere and will complement some of the existing projects addressing agriculture and food security as shown in Table 3 below. The programme will learn from the experiences of these projects for better management and implementation of proposed programme activities. Through financial support from government and development partners, the below climate change adaptation and mitigation projects have been developed in the country, with these institutions playing key roles in channelling financial, information, technological, leadership, and policy interventions into these projects, thus enabling different social groups adapt to climate change.

The implementation of the programme components by different executing entities will build synergies through the following:

- Joint consultative meetings among implementing entities with similar components.
- Joint stakeholders monitoring session feedbacks among implementing entities.
- Sharing experiences, lessons learnt best practices amongst various implementing entities.
- Creating linkages through education fora, exchange programmes for project primary beneficiaries with a view to promote and further educate communities' thereby promoting adoption of various programme components implementation.

Thematic synergies will also be achieved. To illustrate this, water harvested in the programme activities (component 2) will be used as input in the food security interventions in component one. The implementers of the programme will create financial and technical synergies by way of hiring same experts and consultants where applicable. This will have a cost saving element and also cross breeding of experiences.

Adaptation project executed by KARI and funded by the World Bank will not duplicate or overlap with the programme activities. The Kenya Agricultural Productivity and Agribusiness Program (KAPAP) activities carried out by KARI at Kitui and Taita-Taveta are research based whose focus is on assessment and documentation of agricultural production practices and associated vulnerability impacts to climate. In this regard they do not overlap with proposed adaptation activities in selected sites but they will rather build synergies on the interventions to be undertaken. The data generated from these activities will inform best approaches to use in promoting drought crops and other adaptation strategies to enhance resilience of the local communities to climate change.

The activity on climate change and adaptation strategies at Fafi district in Northern Kenya are broad and research based expected to generate knowledge on approaches to promote resilience to climate change. In this respect, there is no overlap but rather building synergies to support effective implementation of the NIE adaptation activities in this region that will have direct impact on local communities. The activity on demonstration of adaptable drought tolerant maize varieties under suitable water harvesting technology in the drylands will not result to duplication on selected sites but increase the diversification sources of livelihood and drought tolerant crops in NIE sites. This will also build synergies on selection of drought tolerant crops. For instance as KARI embarks on demonstration, the NIE program will focus on distribution of seeds if the crop is among the selected ones.

The others activities under KAPAP such as evaluation of the potential of water harvesting technologies in maize production in dry areas of Baringo County; identification of adaptable high yielding orange fleshed varieties of sweet potatoes for different agro-ecological zones in Kenya; options for intensification of Beans-maize cropping Systems under Conservation Agriculture Techniques; post-harvest handling technologies in wheat in the ASALs of Kenya; introduction and evaluation of mulberry trees for silkworm production as a commercial livelihood; Improved marketing and production of honey and other bee products in Marsabit, Laisamis and Samburu; and enterprise development for *Aloe* plant in the arid and semi-arid areas of the larger Baringo and identification of drought resistance genes through genetic fingerprinting of native Napier grass (*pennisetumpurpureum*) are similar activities and not carried on selected sites under NIE program.

**Table 6: On-going adaptation and mitigation projects in Kenya**

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
1	National Agriculture and Livestock Extension Programme II (NALEP - SIDA II)	To promote agricultural and livestock production to contribute to socio-economic development through poverty alleviation, improved food security, increased household incomes, and improved environment	Ministry of Agriculture, Livestock and Fisheries (MoALF)	SIDA/GO K	NALEP project focused more on agriculture and livestock production to alleviate poverty. This programme will latch on the gains of NALEP and aim to make them sustainable by utilising the knowledge farmers gained during NALEP
2	Njaamarufuku Kenya (NMK)	To contribute to reduction of poverty, hunger and food insecurity among poor and vulnerable communities in Kenya.	MoALF	GOK	This programme focus area was on Building capacity of institutions on climate change, - Support to Water Harvesting & Environmental Conservation initiatives and Initiate food security project which targets vulnerable small scale farmers by promoting drought tolerant crops.  The proposed NIE program will draw lessons learnt from Njaamarufuku project during

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
					training sessions, and wherever relevant the best practices shall inform how activities the NIE programme will be executed.
3	National Accelerated Agriculture Input Access programme (NAAIAP)	To increase agricultural productivity and outputs at farm level for 2.5 million smallholder farmers with 1 hectare or less of land in 70 districts	MoALF and collaborators	WB/FAO /EU/ADB/GOK	While NAALAP will improve input access and affordability of the key inputs for smallholder farmers so that they can get out of poverty and participate in agriculture for food security and as a business enterprise, This NIE programme aims at increasing climate resilient agriculture, the two projects will over all improve agriculture productivity.
4	Enhanced Food Security through Water Harvesting	To enhance food security through water harvesting of rain water and development of water storage infrastructure for agricultural production in ASAL and medium	MoALF	GOK	Climate change, regional drought and famine, and chronic food insecurity are key characteristics of the ASAL and medium potential areas of Kenya. The government of Kenya through Ministry of Agriculture and

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
	(EFStWH) Water Harvesting for Crop production	potential areas			<p>Livestock has realized that to speed up realization of food security in ASAL and medium potential areas of Kenya, water harvesting is very key. To achieve there is need to promote innovations and initiatives to increase water harvesting, storage and efficient use. These range from water dams construction, water pans digging, construction and installation of water tanks and use of plastic tanks for rain water harvesting. Through EFStWH project efficient use of harvested water is being promoted through techniques such as greenhouse installations at farmer level.</p> <p>The proposed project will scale up adoption of these water harvesting, storage and utilization innovations and initiatives. Further efficient utilization aspect of the harvested water will be</p>

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
					<p>strengthened through greenhouse technologies and sensitization of farmers. Establishment of drought-resistant seeds and other resilient farming practices (integrated soil, water, pest and livestock management practices) with an integrated assessment for performance in agricultural will also be key to increase food availability in the ASAL and medium potential areas of Kenya. Best practices from EFStWH project will be applied and joint meetings and collaborations held where both partners work proximately. Caution will be exercised to avoid duplication and maintain focus of ensuring that as many households are empowered to harvest and store rain water for use during dry season.</p>



No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
5	Private Sector Development in Kenya (PSDA)	To enable small and medium agricultural production and processing entrepreneurs in high and medium potential areas to fully utilize their production, marketing and employment potential	MoALF	GIZ/GOK	NIE programme will emulate in agricultural value addition and marketing from the PSDA project for sustainability of the project
6	Smallholder Horticulture Development Project (SHDP)	To support livelihood improvement of smallholder horticultural farmers in districts under the project	MoALF, Ministry of Environment, Water and Natural resources	ADB/GO K	The proposed NIE programme will complement the support given to small holder farmers in target district by adding climate resilient agriculture.
7	Smallholder Horticulture Marketing Project (SHoMAP)	To support livelihood improvement of smallholder horticulture farmers in districts under the project	MoALF and collaborators		This programme will build synergy with SHoMAP by collaborating and networking. The programme will pick the best practices which can be replicated in its activities where appropriate.

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
8	Kenya Agricultural Production and Sustainable Land Management (KAPSLM)	To assist agriculture producers adopt environmentally sound land management practices without sacrificing their economic welfare in targeted operational areas.	MoALF	WB/GOK	<p>KAPSLIM is mainly on Capacity building on sustainable land management --Increase linkages between Vulnerable groups and financial institutions.</p> <p>Lessons and the knowledge generated at KAPSLIM will be used to inform NIE programme where applicable.</p>
9	Green Zones Development Support Project (GZDSP)	To reduce poverty and increase forest cover for water and biodiversity conservation	MoALF	ADB/GO K	<p>The GZDSP aims at promoting forest regeneration and conservation for environmental protection thus improving forest cover and promoting biodiversity conservation in Kenya.</p> <p>b) To improve rural livelihoods and incomes of communities living adjacent to the forests, while this project will aim to increase the knowledge on the right crops to plant depending on climatically variability in the target areas</p>

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
10	FAO/SIDA	Strengthening capacity for climate change adaptation in sustainable land and water management in Kenya (Multi-partner collaborative project)	Kenya Agricultural Research Institute (KARI)	FAO/SIDA	<p>This project will focus in 4 districts of Kenya mainly Machakos, Mbeere, Bungoma and Siaya. The project focus areas include; increasing soil health, water harvesting, livelihoods diversification and institutional capacity building. This project targets one of the districts Machakos where adaptation funds will be directed to strengthen land use practices and diversification.</p> <p>Areas of synergy with NIE programmewill be in seeking to understand food systems and drivers of food insecurity;(ii) an increased adoption and scaling up of appropriate agricultural practices; (iii) enhanced participation of smallholder farmers into local and external input and output markets among others .</p>
11	EU GoK	ASAL Agricultural Productivity	KARI	EU GoK	NIEprogramme will benefit from the research

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		Research Project - support crop and livestock value chains (Multi-partner collaborative project)			findings in crops and livestock value chains to better production in the ASAL target areas.
12	CAPACITY BUILDING - various donors	<p><i>Trainings in postgraduate level PhD</i></p> <p>a) Climate modeling and downscaling of climatic data in Tana Delta; b) Climate policies and support to vulnerability in Ijara; c) Costs and benefits of adaptation options in Ijara and Trans Mara; d) Trade off analysis of adaptation and gaseous sequestration in Trans Mara; GIS applications in climate change in central Kenya; e) Modelling gaseous emissions for climate change mitigation in the coastal region; f) Economic of climate change</p>	KARI	Various donors	NIE programme will use the reports of the research done by the PHD students to enhance the programming of the project

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
13	GIZ-ICRISAT	Calesa (Climate Analogue Sites And East And Sothern Africa) <i>Adapting Agriculture To Climate Change: Developing Promising Strategies Using Analogue Locations In Eastern And Southern Africa</i> (Multi-Partner Collaborative Project)	KARI	GIZ-ICRISAT	The project will build synergy collaborate with CALESA project to benefit from the results of the research in order to further strengthen the farmers knowledge in a understanding climate change impacts and developing effective adaptation responses.
14	Rockefeller Foundation (KARI Climate	Participatory Assessment of Farmers Adaptive Capacity to Negative Climate Change Impacts on Water Resource in agricultural systems in most parts of Kenya Catchment ; Vulnerability assessment and coping strategies/capacities of farmers to climate change in Asal and semi-arid areas ; Assessment of climate change exposure and impact on biophysical	KARI	Rockefeller Foundation	KARI implemented Rockefeller funded project was an assessment on Farmers Adaptive Capacity to Negative Climate Change Impacts in Kenya Catchment. The assessment report will be used to build synergies on selection of drought tolerant crops. For instance as KARI embarks on demonstration, the NIE program will focus on distribution of seeds if the crop is among the selected ones.

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		<p>and social systems of agro-pastoral systems of the semi-arid parts of eastern and North eastern of Kenya ; Farm level assessment of costs of adaptation to climate change; Assessment of variability trends, vulnerability, impacts and adaptation in the agricultural systems of the above Regions of Kenya to climate change ; Assessment of Vulnerability and Adaptation to Climate Change in the Context of Conflict and Natural Resource Degradation: A Case of Livestock Keepers' System of West Pokot ; An assessment of vulnerabilities and coping strategies to climate change to agricultural systems of coastal Kenya; Maize Yield Forecasting for Adaptation</p>			

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		to Climate Change in the semiarid areas of Kenya; Mainstreaming climate change in KARI research programs; Assessment of Vulnerability and Adaptation of pastoralists to climate change in Marsabit County;			
15	Kenya Agricultural Productivity and Agribusiness Program	1. Assessment and documentation of current agricultural production practices in selected areas of TaitaTaveta and Kitui districts and their perceived vulnerability to impacts of climate variability and climate change; Climate change and adaptation strategies in Daadab and Fafi district of Northern Kenya; Documentation of policies that affect the agricultural value chains as affected by climate change; Demonstration of adaptable drought	KARI	WORLD BANK	Incorporate research findings and technologies developed in KAPAP programme during implementation of NIE programme. E.g. resilient crop varieties, crop husbandry practices that enhance resilience to changing climate-adopt crop post-harvest and marketing chains that have been documented in the KAPAP.

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		<p>tolerant maize varieties under suitable water harvesting technology in the dry lands; Evaluation of drought tolerant maize varieties for adaptation in coastal lowlands ASALs; Evaluation of the potential of water harvesting technologies in maize production in dry areas of Baringo county; Identification of adaptable high yielding orange fleshed varieties of sweet potatoes for different agro-ecological zones in Kenya; Options for intensification of Beans-maize cropping Systems under Conservation Agriculture Techniques; Post-harvest handling Technologies in wheat in the ASALs of Kenya; Introduction and evaluation of mulberry trees for silkworm production</p>			



No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		as a commercial livelihood; Evaluation of indigenous technical knowledge for the control of goat <i>helminthosis</i> ; Improved marketing and production of honey and other bee products in Marsabit, Laisamis and Samburu; Assessment of the constraints and opportunities for sustainable utilization of <i>Doum</i> palm as alternative livelihood in northern Kenya; Enterprise development for <i>Aloe</i> plant in the arid and semi-arid areas of the larger Baringo; viable livelihood option in a high risk environment; Integrating use of climate data, seasonal weather forecasts and improved crop production techniques for enhanced adaptation to climate variability and in			

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		semi-arid eastern Kenya; Evaluation of MAS developed maize inbred lines for insects resistance and drought tolerance; Development of a vaccine against Rift valley fever through expression of Rift valley Glyco-proteins in Transgenic Sweet potato; Identification of drought resistance genes through genetic fingerprinting of native Napier grass ( <i>pennisetumpurpureum</i> ); Farmers' perception of and attitude towards agriculture and its determinants in Kenya; Farm-level mitigation and adaptation strategies in North Rift Kenya; Conservation Agriculture as an option towards adaptation to climate change - Ex-post assessment of impacts			

No.	Project name	Project objective	Implemented by	Source of funds	Synergies and complementarities with Kenya Climate change adaptation programme
		of CASARD activities in Eastern, Rift Valley; and A social, economic and cultural study to understand the low level acceptability of sorghum as a food security crop in the famine among pastoral communities of the dry north rift: Lessons for food policy in Kenya's marginal areas.			

## **PART 2 G: Description of the Learning and Knowledge Management Component to Capture and Disseminate Lessons Learned.**

### 2G. 1 Participatory implementation

Farmer field days, farmer trainings, tour and visits, and on farm demonstrations will be conducted in a participatory way. Documentation of these processes will be done and a common database developed.

### 2G. 2 Participatory monitoring and evaluation:/ community forums

Participatory monitoring and evaluation (M&E) focusing on outcomes and learning parameters to allow stakeholders share control over content, processes, and will be carried out This will help measure the effectiveness of the project, build ownership, and promote accountability at various levels.

### 2G. 3 Dissemination of information through diverse media (Print and social media):

Project magazines outlining from inception to commissioning and detailing possible future outcomes will be used to disseminate information. Pamphlets explaining in very simple terms understandable by communities will be developed. Photos, dram, art, PowerPoint presentations, will be employed to enhance access to information and increase the possibilities for users to find it through search engines

### 2G. 4 Face -to-Face interaction

Highly interactive meetings are important for establishing the trust that is needed for collaboration and communication. Meetings and workshops will be designed in a way to facilitate group discussions

### 2G. 5 Conferences

A conference to profile and disseminate best practices from the programme will be held. Scientific paper presentations at international, regional and national level will be done during climate change conferences and in other relevant forums

### 2G. 6 Publications

The results of this programme will be published in a book and also in peer reviewed journal

### 2G. 7 Web based database and web portal for enhanced interactions and documenttion

Project report to the implementing entity and the executing entity will be done on quarterly basis. Policy briefs will be done whenever a need arises and as per the programme cycle of results

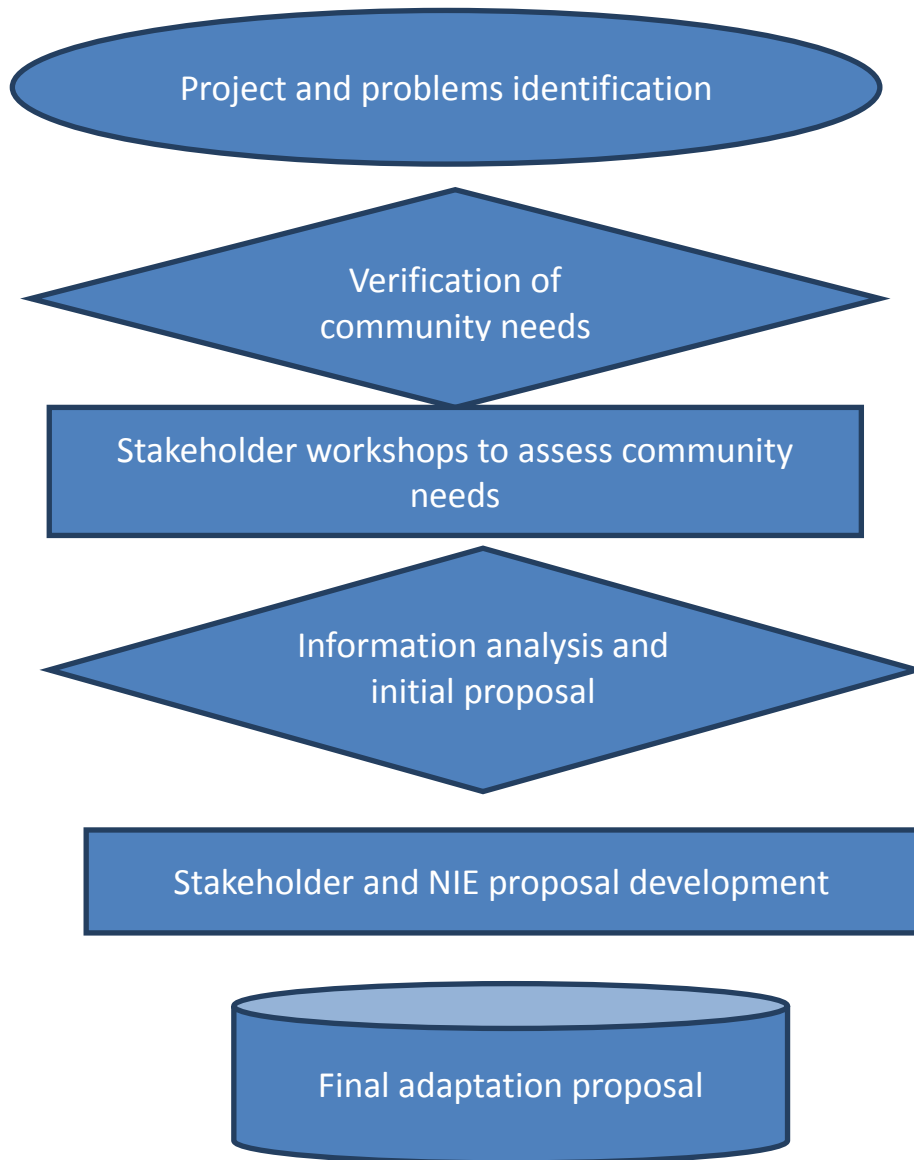
#### 2G. 8 Documentation

Documentation of the entire process with a focus on best practices and lessons learnt will be done and information repositories established. Knowledge products shall be developed and distributed appropriately.

### **PART 2H: Description of the Consultative Process with particular reference to vulnerable groups.**

#### Consultative strategy

To ensure involvement of all the stakeholders in the whole process of needs identification and proposal development an “all inclusive strategy” was utilized as explained in the diagram below:



*Figure 3: Consultative framework*

National Environment Management Authority (NEMA) after its accreditation as an NIE made a public call for proposals in local daily paper (Standard Newspapers) which has a nationwide distribution. NEMA went further and invited relevant Climate Change Adaptation stakeholders to a capacity building meeting to sensitise them on modalities of developing proposals for submission to the Adaptation Fund Board. Various institutions and community based organization (CBOs)/Non-governmental organizations (NGOs) participated in this forum. Total of and 102 proposals were submitted to the NIE for consideration. A suitable screening criterion was developed by the NIE that led to selection of the most suitable adaptation initiatives for Kenya.

### Indigenous population;

This program area of coverage targets rural communities majority who are natives having historically existed on those lands for long time- (pre-colonial). The lands they occupy are ancestral and majority are original cultural people whose lineage has always been the occupants of the lands, speak own language and vary from one specific region of the country to another. The programme therefore ensured the following measures were put in place to safeguard the interest of the indigenous communities;

- During the proposal formulation the local and indigenous (where applicable) communities participated through a community level consultative process, needs identification, problems identification and planning for adaptation measures.
- The program adopted local/indigenous community proposed interventions towards enhanced resilience.
- The indigenous communities will participate in the planning, implementation and monitoring and evaluation of all programme components
- At the end of the programme all facilities will be handed over to the local/ indigenous communities with technical support from relevant government authorities.

The detailed consultative process undertaken during the proposal development as per the regional execution entities is illustrated below;

#### **2H. 1Central/ Western Region**

##### Loitoktok District in Kajiado County

The consultative process entailed consultations, brainstorming and working through a multidisciplinary team in developing desirable proposal on Agriculture and Food Security with overarching water aspects. A proposal on Ecosystems based adaptations to cover three

sectors, namely; agriculture, forestry and livestock (pastoralism and agro-pastoralism) was agreed upon as the most desirable theme. This adaptation theme led to inclusion of Kenya Agricultural Research Institute (KARI) to undertake agricultural ecosystem based adaptations and livestock whereas KEFRI and University of Nairobi, upper Kabete campus on forestry, water and rangelands/woodlands.

Various government documents were reviewed including climate change response strategy, medium term plans, vision 2030 and poverty alleviation plans among others. After review of these documents the team settled Loitokitok district as the case study in Kajiado County which will be up-scaled to other similar areas upon successful completion. This led to the field visit of the area to meet the community members, women groups, youth groups, opinion leaders and government officers from ministry of livestock, agriculture, water, planning and development and vision 2030, regulatory body, Kenya Plant Health Inspectorate Service (KEPHIS) in Loitokitok district. The officers from these government ministries provided valuable reports (quarterly and annual as well as other concluded projects) since 2008 which formed a basis of the project activities in each component. Selected community groups and government made a commitment to partner in implementation of the project activities.

Additional consultations for the proposed climate change adaptation project were undertaken between the Nasaru Women Group Executive Committee and their partners who are the Green Lifestyle Africa (GLA). Then the Women group leaders and their Partners started the process of consulting the local community, collaborating women groups and key stakeholders. The consultative process revealed that the local community understand that there are changes that are happening in the local climate and looked forward for adaptation techniques. The Nasaru and their partners also held focus group meetings and consultations with the Masaai elders in the proposed project area, who own and control use of land, the area Chief of Kisamison government policies, heads of institutions like schools and dispensaries and the local community in and surrounding Kisamis who are beneficiaries of the proposed project. The local community and stakeholders are very supportive of the proposed project.



In particular, those designated to undertake the list of selected activities are as summarized in the table7 below.

**Table 7: List of stakeholders met, organization and their positions.**

<b>Organization</b>	<b>Name</b>	<b>Position</b>
Ministry of Agriculture	Benson Muriuki	District Agricultural Officer Loitoktok
Ministry of Livestock and Development	Musili Miriti	District Livestock Development Officer (DLPO)
Kenya Agricultural Research Institute (KARI) Gene Bank	Dr. D Nyamongo	National Program Coordinator on Biodiversity Kenya Agricultural Research Institute (KARI)
Kenya Agricultural Research Institute (KARI)	Dr. John MutuaMugambi	Centre director The Veterinary Research Centre
Kenya Forest Service	Kurgat B.	County Director Kajiado County
University of Nairobi Department of Land Resource Management and agricultural technology	Dr Oliver Wazonga	Senior Lecturer University of Nairobi
Community Based Organizations	Imbirikani Aids Village group, Boma la Tumaini group, Noomayianat community group, Kenya Women Finance Trust group, Group in Munyula, Olchoro and Inkisanjani sub locations	Selected members

Source (data collection team KEFRI 2013)

### Nyando Wetlands in Kisumu County

The proposal was developed through an adequate consultative process and involvement of the Nyando wetland community. This was done through brainstorming and discussions at local community meetings (Barazas) and workshops. As the key stakeholders, the community contributed immensely in the identification of adaptation measures, resilient crops and suitable areas to conduct different activities for better results. Consultations with the community brought in representatives from the line ministries, government parastatals and private sector such as Ministry of Environment and Natural Resources, Ministry of Agriculture, Ministry of Livestock Development, KENGEN, Lake Basin Development Authority and Red Cross among others. The project will also build on existing public-private partnership which VIRED International has established in the past given their long experience in the project area.

### Gwasi Division in Homabay County

The consultative process began with stakeholders in regard to building community's resilience against climate change impacts. Discussions revolved around building adaptive capacity of the community living adjacent to Gwassi hills against climate change vagaries, as well as participate in climate change mitigation through promotion of GHG mitigation programmes such as cook stoves and forest conservation. The following were the outcomes of the typical issues discussed:

Impacts of climate change - Discussions revolved around causes and impacts of climate change (droughts and floods), and necessary interventions needed to build communities resilience against climate change as well as mitigating impacts of climate change through natural resource management; Population pressure - increased population pressure (the Gwassi Division has a population of over 65,000 people with a population density of 186 people per km<sup>2</sup> and a growth rate of about 3%) in the proposed programme area has been on the rise leading to forest encroachment by adjacent communities in search of land for agriculture as well as alternative sources of livelihoods (firewood, honey, timber) during lean economic times such as during drought. Increased population pressure has exacerbated climate change impacts; Drivers and agents of Gwassi hills forest degradation - charcoal production is a critical driver of forest degradation besides other drivers such as increased search for agricultural land by the community, firewood for household use as well fish

processing, timber for house construction and boat making, among others. The participants agreed unilaterally that impacts of climate change force the community to seek for alternative livelihood sources in the forest thus the resultant forest destruction.

Alternative livelihood options - discussions also revolved around alternative livelihood options with two objectives in mind; one is to divert community's attention from forest destruction, and second was to identify alternative options to agriculture which is becoming sensitive to environmental disasters such droughts and floods. Some of the identified options include production of certified sustainable charcoal, bee-keeping, growing of Yellow Oleander for biodiesel production, improved agriculture and livestock farming including goat farming and greenhouses, eco-tourism (construction of "mountain lodge"), and sale of tree seedlings; Community ownership of proposed programme interventions for sustainability reasons - Implementation of the programme will be by community based structures such as cooperatives and CBOs meaning the project will heavily rely on community structures for implementation. The beneficiaries will, also, monitor evaluate and give feedback on the way all programme resources will be utilized.

Stakeholders present during the community consultation process were as follows:

- Osienala - is an NGO which supports Social agro-forestry and Environmental Conservation programme in partnership with the Green Forest Social Investment Trust (GFSIT) in Nyakanga area, Gwassi division;
- Government line ministries - Kenya Forest Service, Ministries of Environment and Mineral Resources, Water and Irrigation, Education, Agriculture, and Social Development;
- Green Forest Social Investment LTD (GFSI) - The initiative has a long-term goal of providing equal economic opportunities for the social wellbeing of children, youth and women and to invest in the natural environment in Gwassi Division, Suba District Global Nature Fund - German based German based NGO, World Vision Kenya and Germany
- Gwassi Hills Forest Conservation Association - the association supports afforestation programmes in selected parts of Gwassi Hills; Provincial Administration including chiefs and District officers; Local communities.
- The Attendance list of stakeholders is as shown in annex 1

## 2H. Coast Region

Frequent interaction with community members in the Coastal region provided opportunities for on seeking opinions and ideas on what to include in the proposal so as to address the most vulnerable groups. From the 16<sup>th</sup> to the 20<sup>th</sup> of January 2013, consultative meetings were conducted with a cross-section of representatives in Kwale County. The process began with field excursion across some areas worst hit by the water crisis, a glaring impact of climate change. Field visits provided as opportunity to affirm, beyond reasonable doubt, the severe state of affairs, a mere representation of the situation in the greater coastal region. Poverty has without a doubt reinforced the plague, rendering the local communities unable to sustain their livelihoods. It is simply miraculous how the local communities survive in such an environment. Access to water for coastal communities is a matter of urgency, more so in the adversely affected areas. It is indeed a sorry state of affairs.

Consultative meetings were also held with the Kasemeni Divisional Officer (DO) and the area chief, after which the teams visited a nearby local women group that practices vegetable farming amidst the adverse weather conditions. This was very inspiring. The chief impediment to these highly industrious women was the evident scarcity of water. The team thus gathered views from both the DO, the Chief, local women and the surrounding community. Meetings were also conducted at Kasemeni Divisional Headquarters with village elders, women group representatives, youth group members, area chief and assistant chiefs, farmers and community leaders. This was a very fruitful session that re-affirmed the ill state of affairs. It also came out that poverty, coupled with low education levels were a stumbling stone for most households in the region.

Consultative meetings were also undertaken with the District Commissioner's (DC) office, upon which urgent need for water and capacity building for the local communities was echoed. Other discussions and consultations were conducted with Director of Gender and Social Services, the District Development Officer who gave an overview of the socio-economic state in the region as well as some of the positive gains in some regions. The officers also suggested some alternative livelihoods and other critical components that could be incorporated in the project.

## 2H. Eastern Region

### Wajir, Fafi, Lagdera Programme Areas

There were extensive engagements with various community members and organizations involved in land management presented as indicated in table 7 below. Since the project idea was at its early conceptual stage notwithstanding the wide scope that the two river basins cover, only community representatives including women representatives, youth representatives and disabled persons representatives were invited for the stakeholder’s workshop to represent the views of their groups. However, consultative forums will be organized at the grassroots level especially during the project design and implementation. Some of the key selected areas and team includes are as summarized in the table below.

**Table 8: Key selected areas and team**

PERSON	LOCATION AND TITLE
1.Japheth M’Mkengo	Chief Kamainde Location
2. Simon Nthiga	Senior Chief Kajuki Location
3. Gilford Muriuki	Chief, Itugururu Location
4.Kenneth Mureithi	Mukuuni Location
5. Bernard Ag.	Ag. Chief Muiru Location
6.Gitonga Njage	Divisional Agribusiness Development Officer-Mwonge Location
7. David Mwamba	Mwonge Location
8.Irene Mwendandu	District Crops Officer – Meru South District
9. John Elangano	District Commissioner – Meru South District
10.Community Members	Kamainde sub-location

### Lower Yatta Programme Area

The activities in Kitui were designed with the cooperation and support of the community and the local administration. In October, 2012, a rapid needs assessment was conducted in the Lower Yatta district to further assess the deteriorating conditions of the local population. The needs assessment was based on several data collections methods (document review, field observation, household visits, local authority interviews, focus group discussions, beneficiary interviews and gender activity profile). During the needs assessments the following local and regional authorities were consulted: District Forest Officer, District Public Health Officer, the Deputy District Agricultural Officer, the Water Officer, the Drought Management Officer, District Health Officer and the District Commissioner. The field assessment team also conducted 2 focus groups discussions with targeted beneficiaries (25 people in total – 10 male, 15 female) and a detailed qualitative interview with 6 females and 9 males.

Through the Rapid Needs Assessment, the community identified the following critical problems (in order of priority):

1. Disrupted livelihoods due to repetitive droughts and floods leading to increased poverty and human mortality
2. A critical lack of access to safe water;
3. Disrupted livelihoods due to repetitive droughts and floods leading to increased poverty and human mortality
4. A critical lack of access to safe water;
5. A lack of agricultural inputs and adequate techniques.
6. Poor health, hygiene and sanitation practices;

The needs assessment found out that without a community based drought management response and disaster risk reduction measures, the population of Lower Yatta remains exposed to continuing droughts and reliance on government and international aid. Due to the problems encountered, the community has resulted to some coping strategies that have negatively affected the environment, water levels, crop production and the climate in

totality. They include remittances from families, relief food, charcoal burning ,ballast making and river sand harvesting The three most vulnerable location in lower Yatta District include in terms of agricultural production resulting to food insecurity include KwaVonza, Kanyangi and Kanyongonyo

Various stakeholders, opinion leaders, religious leaders who assisted in prioritizing relevant activities for adaptation at Lower Yatta District area.

- The Government of Kenya line ministries.
- World Food Program (WFP) through Catholic Diocese of Kitui (CDK). They provide food for Asset and Protracted Relief and Recovery Program (PRRO) and cover only a small proportion of the vulnerable community members.
- The horticulture project is only covering one Village in Mandongoi Sub-location along the Tiva River.
- Vet works- at Kanyangi and Kanyongonyo locations doing Vaccination and capacity building on livestock diseases for the livestock farmers,
- German International operations (GIZ) which deals with Grass seed bulking and rehabilitation at Kwa-vonza. Works closely with the ministry of livestock
- UNICEF which supports the children under-fives and people living with HIV/AIDs by distributing Anti-Retroviral Drugs and supplementary feeding and works closely with the ministry of health.
- APHIA IV is an NGO that supports the ministry of Public Health in Training the community health units.
- National Council of Churches in Kenya (NCCK) has operations in Kwavonza where they promote water harvesting for agricultural use and works in collaboration with the ministry of agriculture

Waldaa Programme area

Over the years good relationship among stakeholders has been cultivated among them the Government of Kenya, International organizations and communities. Key entail coordination and partnerships forums with other agencies in the area for better resource utilization and to avoid duplications. The selected activities in this programme were widely agreed upon through consultations with local communities, stakeholders and relevant government ministries. Other relevant coordination and consultation mechanisms entail; the

Rapid-Onset Disaster Committee which comprises the Office of the President., international NGOs, UN agencies and Government ministries and the Kenya Food Security Steering Group (KFSSG), which is the main organ for coordination of food security matters.

Consequently, through coordination mechanisms there have been reports and information shared at the district levels which has been instrumental in coordination of various disaster responses through the district disaster committees, district steering committees at the local level and National level. The delivery of the proposed action will be executed in Moyale District in collaboration with the relevant government line ministries and other like-minded stakeholders. In the long-term, the key to sustainability is scaling up, and therefore a main Project goal is to work with relevant government ministries and other stakeholders to create infrastructure programs that can plan for maintenance systematically and take advantage of economies of scale in every respect, both in Waldaa and beyond.

In relation to the proposal for the Waldaa phase 2; Consultations were conducted with the following key stakeholders;

- The Waldaa farmers and the Waldaa community
- Local administrators in Waldaa mainly the chief and the assistant chiefs within Waldaa
- Kenya Meteorological Department who are key partners in the implementation for the proposed Waldaa phase 2 project.
- The various line ministries; Agriculture, Environment Water and Natural Resources, Health, Cooperative development.
- Various NGO's operating in North Eastern Region through the WESCOORD forum to avoid any necessary project duplication
- National Environmental Management Authority (NEMA).



## **PART 2I: Justification of Funding requested**

According to the National Climate Change Action Plan (NCCAP, 2012), climate change will affect all sectors of the economy in this country particularly agriculture and livestock which contributes to 20 per cent of the GDP. Water is the other sector that is hardly hit by prolonged severe droughts, flooding and sea level rise. Transition to resilient development pathway is important for this country because climate change poses a real threat to development prospects and livelihoods. There is therefore need for building adaptive capacity of the country especially in the most vulnerable community groups is therefore crucial in order to enhance the resilience of the agricultural production under the increasing climate variability and extreme events.

The National Climate Change Response Strategy NCCRS (GoK, 2010) identifies alternative sources of livelihoods to be adopted. Farming of drought tolerant crops is spelt out and water harvesting strategies are mentioned explicitly. But the country does not have the technological and financial capacity within the community groups to undertake effective adaptation plans and actions. The appropriate technologies can be deployed and diffused to the communities if adequate financial assistance is provided.

The Kenya's (NCCRS) estimated an annual average cost of Ksh. 235.83 billion (approximately US\$ 3.14 billion) for the implementation of adaptation and mitigation programmes identified in the Strategy over the next 20 years. Annual Cost estimates in the NCCRS for addressing climate change issues in agriculture and other related sectors were: agriculture Ksh. 10.60 billion; Forestry and Wildlife Ksh. 32.26 billion; marine & fisheries resources Ksh. 2.52 billion; and water & Irrigation Ksh. 5.96 billion. However, the Draft National Adaptation Plan (NAP) of the Action Plan for the implementation of the NCCRS, pointed out that the indicative costs for the agriculture sector in the NCCRS do not cover all priority actions in the sector, and that the actual costs, are likely to be higher than the NCCRS estimates.

NCCRS Fund mobilization plan was to target domestic resources from both local and national government, the private sector, international funding agencies such as the World Bank and International Monetary Fund (IMF), external resources from development partners and regional funding agencies such as multilateral development banks e.g. the

African Development Bank (AfDB). The country also intends to target financing from developed countries as part of their obligatory functions to finance cost of climate change interventions in developing countries that are particularly vulnerable to climate change. Such funds include Adaptation Fund, the Green Climate Fund, and World Bank Climate Investment Funds, Clean Development Mechanism, among others.

The government also calls for collaborative and joint action with all stakeholders (private sector, civil society, NGOs, etc) in tackling the impacts of climate change. Since leveraging for funds by government is still at its nascent stages, there is need for a more concerted effort, where all stakeholders join hands with government in leveraging for additional funds to support implementation of climate change response activities. It is against this backdrop that the proposed programme seeks USD 10 Million from the Adaptation Fund Board, to implement climate change Adaptation activities in Kenya. The funding requested will target Agriculture and food security, Disaster Risk Reduction and Water and Coastal Management Themes.

## **PART 2J: Description on sustainability of the programme outcomes**

The programme components and activities will be mainstreamed in respective government entities whose mandate is in relation to the identified activities. In particular the programme will put emphasis on national and county ownership of the programme through the inclusion of all stakeholders including national and regional bodies, in collaborative partnership with county governments and gender and vulnerable groups. The technical support and oversight will be given by Government bodies like National Climate Change Activities Coordinating Committee (NCCACC) of the Ministry of Environment, Water and Natural resources. All the institutions mentioned were involved in the process of designing this programme from the beginning at the level of needs assessment where they are expected to mainstream identified in their respective routine activities.

The proposed programme components not being business as usual;

### **Component 1: Enhancing climate change resilience for improved food security in selected counties.**

Unpredictable erratic rainfall patterns have become common occurrences in the country. Most of our cropping systems are rain fed; hence food crops are all vulnerable. Crop

growing conditions and seasons are becoming less predictable and there are increased livestock pests and diseases. Tackling observed and projected climate change impacts requires a coherent, integrated approach, which builds community's resilience or adaptive capacity. Climate change and variability has exacerbated these challenges heightening food insecurity in proposed project areas. In order to cushion communities against climate change vagaries, proposed adaptation interventions in this component will build resilience of communities.

### **Component 2: Improving climate resilient, water management systems to enhance food security in selected counties**

Kenya is a water scarce country. This is compounded with impact of climate change where most parts of the country are experiencing prolonged drought, erratic rainfall, drying of wetlands, seasonal rivers and water springs among other water bodies. This affects various sectors such as agriculture & livestock that are key to Kenya's economy. The programme therefore focuses on adaptation activities that will improve water resource to support other sectors of Kenya's economy. The areas selected are mainly ASALs where land degradation is on continuous rise and frequently experience erratic rainfall patterns, frequent droughts, limited livelihood diversity, poor infrastructure and widespread poverty. The drought, coupled with natural aridity of the area has also resulted into rampant water shortage, widespread loss of local vegetation and severe pasture depletion. The situation is further aggravated by the massive uncontrolled cutting of trees for fuels and continuous expansion of human settlements that has left tracts of land bare and exposed to severe soil, water and wind erosion leading to limited capacity for crop production. limited livelihood diversity, poor infrastructure and widespread poverty. The drought, coupled with natural aridity of the area has also resulted into rampant water shortage, widespread loss of local vegetation and severe pasture depletion. The situation is further aggravated by the massive uncontrolled cutting of trees for fuels and continuous expansion of human settlements that has left tracts of land bare and exposed to severe soil, water and wind erosion leading to limited capacity for crop production.

**Component 3: Increase resilience for the effect of rise in sea level and shoreline changes in Kenyan coastal zone**

Kenya's coastal and marine ecosystems are a rich repository of resources. However, these resources are threatened by overexploitation, transformation and degradation of habitats, pollution and climate change. Some of the interventions in these sectors include; developing county-wide maps depicting areas that will require shore protection (e.g. dykes, bulkheads, beach nourishment) and those areas to be left to adapt naturally, establishing a biodiversity monitoring network to identify species that will be affected by climate change and those that could be used as biological indicators, encouraging a coastal and watershed basin management approach linking land-use practices to marine and fisheries resource conservation, establishing networks of marine protected regions and including small enclosures comprising communities of species resilient to climate change impacts that serve as buffer zones as well as areas for seed regeneration

**Component 4: Disaster Risk reduction**

This component will address issues of flood control by building flood control structures, modest evacuation centres, and also establish an early warning system. This will significantly reduce disaster risks in target areas. The flood control structures will use affordable and appropriate technologies.

**Component 5: Strengthening capacity and knowledge management of adaptations to climate change**

A number of science based technologies have been developed to respond to the devastating effects of climate change. In particular the focus is on climate change adaptation through breeding of drought tolerant crops, faster maturing species, high yielding crops, pest and disease resistance crops, stable genotypes across the environmental sites, improvement of soil conservation technologies to minimize emissions of greenhouse gases among other innovations whose primary aim is to reduce vulnerability of smallholder farmers from the impacts of climate change. However, the successes of these technologies have been limited to piloted areas and demonstration sites due to inadequate funds to support extension and up-scaling to similar agro-ecological zones. This has led to less awareness on the existing agricultural technologies that will support farmers to respond to the impacts of climate change. Therefore, this component programme will accelerate the uptake of best bet

practices on climate change adaptations strategies to ensure food security to smallholder's farmers in most vulnerable ASALs and medium potential areas.

Kenya is also at infant stage of developing climate change bill and policy that will address mitigation and adaptations plans and strategies at development county government levels. This needs stakeholders participation and empirical data to formulate action oriented policies to enhance farmer's access climate change opportunities in response to adaptation capacity. Therefore, the proposed programme activities will generate information that will support the ongoing process of developing suitable policy framework that will support the implementation of Kenya's climate change response strategy.

The details of various sustainability approaches are as follows:

### **2J. 1 Environmental and technological sustainability**

The Programme will ensure environmental and technological sustainability by equipping the local institutions like the CBOs/FBOs with skills and abilities such as, agro forestry, soil and water conservation, rain water harvesting and its utilization, green house farming with drip irrigation, furrow irrigation, flood management, coast and shoreline management, among others to continue managing these climate adaptation initiatives after programme ends. The rationale is to have the communities participating, owning and sustaining their own development, leading to improved agricultural production systems, as well as sustained use of natural resources, the beneficiaries' livelihood base will be solid as there shall be increased household income which assures beneficiaries' increased resilience against effects of climate change. The outcomes of the programmes will also result in poverty reduction thus reduced destructive coping mechanisms in the forests.

### **2J. 2 Financial sustainability**

To make sure the programme is financially sustainable, this programme is premised on turning rain dependant subsistence farmers into '*agri-prenuers*' (agro-businesses) using their limited resources in a socially and environmentally sound manner. Sustainability is assured when beneficiaries are empowered to initiate income generating activities. This programme will set off activities that are geared to increasing household income, therefore increasing their resilience and ability to adapt to climate change, some of the activities will

include, value addition to livestock and crop products, introduction of improved livestock breeds that would increase milk and meat production for high income. The programme will also link farmers to financiers (including crop/livestock insurance through saccos), input supplies, technology providers, processors, marketers and other private companies to facilitate farmers to produce for the markets and will continue to produce so long as it is profitable (income and food). The programme will also facilitate communities' members to establish and manage Village savings and loaning schemes thus deepening access to financial services.

### **2J. 3 Institutional sustainability**

Implementation of the programme will be by community structures namely CBOs and/or FBOs and county Government, meaning the project will heavily rely on community structures for implementation. The beneficiaries will, also, monitor evaluate and give feedback on the way all programme resources will be utilized.

For long-term sustainability, this project will be implemented in close collaboration with relevant Government line Ministries (stakeholders), namely NDMA, Agriculture, NEMA, Energy, Gender, Forest Department, provincial Administration and research organizations including, Kenya Forestry Research Institute. This will help establish linkages that the communities can use beyond the project life. Use of trainer of trainers (ToT) approach will promote participatory technology development and selection, thus increasing farmer ownership of interventions since the technologies chosen will be appropriate to their situation, technically and financially. In addition, the capacity building of community on all aspects of the projects especially on the new technologies to be upscaled will ensure existence of expertise within the community.

Besides the sustainability of the programme actions in target areas, the issue of scaling up of the programme outcomes is not clear;

The farmer group approach will be designed in a manner that will support the scaling up of the best adaptation practices upon documenting the experiences and lessons learnt in each crop growing seasons. In particular, drought tolerant crops with good uptake will be upscaled to cover other areas within the intervention sites. One of the envisioned approaches to use is

On the case of value addition and market access, the farmer groups will be organized to form commercial villages that will be linked to SACCOs in order to upscale the market network of the farm surplus produce. This will cover more farmers not fully recruited in the programme activities but will form part of the programme beneficiaries. This approach will enhance uptake of the programme activities which will directly translate to upscaling of the best practices on resilience to climate change for improved food security. Overall this will result to over 100,000 households with multiplier effect of about 5 to 6 members per household benefiting from upscaling of activities on improving food security.

The activities and outputs on the outcome on increased access to water and enhanced food security will be designed in a manner that harnesses the existing technologies to improve access to water resources. The efficient utilization of water technologies will result to harnessing of resources that can lead to upscaling of the water harvesting and storage technologies to support food security in the selected counties.

That each farmer in each group will also distribute seeds of about 0.5 to 1 kg seeds of drought tolerant crops to other selected farmers on targeted areas for upscaling purposes. The same chain will follow within the programme period till the target farmers are reached in order to enhance food security and improved livelihoods. The same principle will apply for various outputs within the programme component of enhancing Climate Change resilience for improved food security in selected Counties.

The programme activities will cover a total area of 7531.9 km<sup>2</sup> distributed as follows; Oloitokitok (3245 km<sup>2</sup>) and Kisamis (231.7 km<sup>2</sup>) in Kajiado County, Masinga dam (400 km<sup>2</sup>) in Machakos County, Emali (180 km<sup>2</sup>) in Makueni County, Gwasi (112 km<sup>2</sup>) in Homabay County, Nyando wetlands (800 km<sup>2</sup>) in Kisumu County, Wajir South (420 km<sup>2</sup>) & Lagdera (1245 km<sup>2</sup>) in Wajir County, Thome (19.2 km<sup>2</sup>) in Laikipia county, Lower Yatta (234 km<sup>2</sup>) in Kitui County, Vanga & Gazi (74 km<sup>2</sup>) and Kinango (134 km<sup>2</sup>) in Kwale County, Mwatate (265 km<sup>2</sup>) in Taita-Taveta County, Waldaa (115 km<sup>2</sup>) in Marsabit County and Machakos (57 km<sup>2</sup>) in Machakos County. The implementation of the programme activities across selected Counties will be undertaken with strong collaboration from County Government in conjunction with National Government. In particular, the responsible officers in the ministries of Agriculture, Livestock and Fisheries, Environment, Water and Natural resources and Industrialization and Enterprise Development both at County and National

Governments will collaborate partners in the implementation and follow-up of programme activities. In this arrangement, they will participate on work plan meetings, community sensitizations, extension service meetings, monitoring and evaluations, feedback workshops and development of policy briefs. This will enable them to revise the National Medium Term Plans and County Development Action Plans as well as Strategic Plans to align them to lessons learnt from the programme activities that will impact positively to communities in enhancing resilience to climate change. The information from lessons learnt will also support the National government to draft relevant climate change policy based on empirical data from the programme among other related climate change adaptation activities. The lessons learnt from the programme will also support the County Government in passing legislation that will aid response to climate change adaptation.

## **PART 2K. Overview of Environmental and Social Impacts and risks**

The proposal has been subjected to a screening process and is reported in the checklist below. In order to ascertain the expected environmental and social impacts as well as risks, all programme components were subjected to the checklist.. Areas where no further action was needed, it was marked with X and areas where impact was expected, specific measures were identified to be undertaken as outlined below:

**Table 9: Checklist of environmental 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>		Environmental Impact Assessment for construction of water harvesting Structures
<i>Access and Equity</i>	X Done during needs assessment in project design phase.	
<i>Marginalized and Vulnerable Groups</i>	X Done during needs assessment in project design phase.	
<i>Human Rights</i>	X	
<i>Gender Equity and Women's Empowerment</i>	X Already dealt with during programme design process	
<i>Core Labour Rights</i>	X All programme employees shall be employed in accordance with Labour Laws of the Country	
<i>Indigenous Peoples</i>	X Done during needs assessment in project design phase.	
<i>Involuntary Resettlement</i>	X	

<i>Protection of Natural Habitats</i>	X	
<i>Conservation of Biological Diversity</i>	X	
<i>Climate Change</i>	X	
<i>Pollution Prevention and Resource Efficiency</i>	X	
<i>Public Health</i>	X	
<i>Physical and Cultural Heritage</i>	X	
<i>Lands and Soil Conservation</i>		X  Construction of Water harvesting structures shall be subjected to further assessments namely the Environmental Impact Assessment

FURTHER the NIE shall ensure screening process is undertaken for at the implementation phase to determine the need for interventions. This shall include project and site description, collection of baseline data, profiling of beneficiaries data analysis, evaluation of significance of environmental impacts, evaluation of alternatives, consultation process with relevant stakeholders.

### **PART III: IMPLEMENTATION ARRANGEMENTS**

#### **3A) Programme Management Arrangements**

##### **3A. 1 Description of the arrangements for programme implementation**

The implementation of this programme will have three executing entities namely, Kenya Forestry Research Institute KEFRI, Tana and Athi Development Authority TARDA, and Coastal Development Authority (CDA). These three Executing Entities shall have contractual engagements with the NIE and will report directly to the NIE. In each of these three Executing Agencies a Team Leader will be appointed by the executing Entities to oversee coordination, management, implementation, monitoring and reporting of programme activities. A programme steering committee comprising of membership from the three Executing Entities, Designated Authority, beneficiaries and the NIE of Kenya shall be established. The role of this committee will be oversight of programme implementation. An NIE committee (already in existence) at NEMA will have the role of supervision of the programme implementation, approving workplans and reviewing progress. This committee shall also undertake Monitoring and Evaluation of programme activities. It will as ensure there is prudent expenditure of financial resources and also undertake all the other stipulated NIE roles.

##### **3A. 2 Roles and Responsibilities of NIE-NEMA and Programme Steering Committee**

- i) Provide policy guidance to the Program related to the national policies in Adaptation Fund
- ii) Supervise all aspects of programme implementation and disbursement of funds to the executing entities/Lead Agencies

- iii) Review and approve programme activities for each executing entity
- iv) Coordinate monitoring activities, including internal and external evaluations
- v) Monitor overall progress of the program with a special focus on delays and bottlenecks to ensure adjustments are made from the recommendations of various evaluation missions and audit reports
- vi) Undertake all the stipulated NIE roles
- vii) Review programme and project status reports with the aim of ensuring activities are implemented as planned and that they achieve expected outcomes
- viii) Provide guidance on the use of program resources and take measures that ensure cost effectiveness in Adaptation Fund
- ix) Carry out activities that would ensure achievement of the basic goals of harmonization and integration of programme components as envisaged in Adaptation Fund
- x) Liaise with the government of Kenya & AFB on programme implementation
- xi) The NEMA/NIE shall keep the Regional lead agency informed on its deliberations, decisions, and progress of program implementation
- xii) Train and Capacity build of the regional lead agencies

### **3A. 3 Roles and Responsibilities of Executing Entities (TARDA, KEFRI, CDA)**

- i) Coordinate Adaptation Fund project activities within their regions of jurisdiction.
- ii) Offer overall guidance of the projects challenges within the region and suggest specific solutions.
- iii) Prepare regional progress reports on Adaptation Fund projects on behalf of NEMA/NIE
- iv) Train and capacity build Adaptation Fund implementing agencies within the region coverage
- v) Liaise with the NEMA/NIE on projects implementation
- vi) Coordinate the roll up audits by NEMA/NIE
- vii) Be role model for other regional Adaptation Fund projects by effectively implementing its specific project.
- i) Ensure effective implementation of the projects
- ii) Mobilize capital and human resources towards achievements of the concrete outputs per project
- iii) Training and capacity building of the project beneficiaries.

### **3A. 5 Roles and Responsibilities of Beneficiaries, Partners and Collaborators**

- i) Where applicable provide human, physical and capital resources towards full implementation of the project.
- ii) Take over project management and operations after full implementation.
- iii) Submit progress reports on projects operations to the relevant implementing agencies
- iv) Full participation during project implementation
- v) Disseminate information and create awareness on climate change adaptation and mitigation as per the implemented projects
- vi) Provide feedback on the projects impacts to the program

### 3B) Description of the measures for financial and programme risk management

The following measures for financial and programme risk management will be put in place during implementation of the programme activities. The risk categories on delays in implementation of programme activities and conflict management are rated as low whereas that of limited stakeholders' involvement, instability within programme areas and natural and environmental hazards are rated as medium. The financial risks are one rated as high. The explanation on how to mitigate the risks exists in the submitted programme proposal.

**Table 10: measures for financial and programme risk management**

<b>Risks Category</b>	<b>Level of Risk</b>	<b>Measures to be taken</b>
<b>Delays in Implementation of Programme activities</b>	Low	<p>A programme committee as an oversight body for implementation constituted with regular quarterly meetings to review, approve and provide corrective oversight on programme milestones; inception, mid programme review and end of programme review.</p> <p>Lobbying for inclusion of climate change adaptations mechanisms; policies, strategies and plans within the county government framework.</p> <p>Development of detailed implementation plans (DIPs) and annual plans to be approved by the NIE and to guide the implementation.</p> <p>Joint monitoring team formed to review progress in implementation in the various programme components.</p>
<b>Conflict Management</b>	Low	<p>-NIE Management and conflict resolution Structure/ mechanism set up and providing oversight support role</p> <p>-NIE to ensure agreed arbitration mechanisms on any upcoming programme related conflicts.</p>
<b>Limited Stakeholders Involvement</b>	Low	<p>-All stakeholders to be involved in the programme design, implementation and monitoring &amp; evaluation during the entire programme life cycle.</p>

Risks Category	Level of Risk	Measures to be taken
		<p>-Democratic decision making process on all pertinent issues will be upheld for all the stakeholders.</p> <p>-Involvement of key local stakeholders; local leaders, community beneficiaries, local county government structure and public service organizations.</p>
<b>Instability within programme areas</b>	Low	<p>-NIE to reach out to relevant government departments particularly where ethnic /political tensions/ conflict may interfere with programme implementation</p> <p>-Programme stakeholders also to play key role in conflict resolution in the respective programme implementation areas.</p>
<b>Financial Risk</b>	Low	<p>-A financial management strategy formulated to manage any upcoming financial problems including any inflation in market prices.</p> <p>-The programme to adhere to all Generally Acceptable Accounting Principles (GAAP) regarding control, transparency and documentation, and have processes, procedures and necessary infrastructure in place for an appropriate audit system.</p> <p>-Internationally accepted firm to undertake regular annual programme financial audits</p> <p>-Kenya government approved regulations, procedures and guidelines on costs for services &amp; goods to be upheld</p>
<b>Natural and Environmental hazards</b>	Low	<p>-Traditional and scientific early warning systems to guide decision making process on the implementation of programme components</p> <p>-Diversification of relevant drought/ floods mitigation approaches incorporated in programme implementation.</p> <p>-Improved awareness on climate change vulnerabilities and adaptations among stakeholders.</p>

### 3C (i) Measures for Environmental and Social Risk Management

Measures to manage specific Environmental and Social risks are described in the table below.

Environmental and social Risk Category	Measures to be taken
<b>Gender Equity and Women empowerment</b>	<ul style="list-style-type: none"> <li>• Profiling of beneficiaries during programme implementation phase (partly done during the programme development phase) to ensure that women are direct beneficiaries of the programme.               <ul style="list-style-type: none"> <li>○ Deliberately target women groups in implementation and monitoring of the activities in accordance with the constitution of Kenya 2010</li> <li>○ Encourage women to take up leadership positions in the project implementation process</li> <li>○ Developing gender indicators for monitoring the success of the project. Eg the gender proportion of the beneficiaries, (verifiable during M&amp;E), gender sensitive workplans ( project activities to be executed taking cognizance of availability of different genders)</li> <li>○ Assess and document gender differentiated impacts of the project</li> </ul> </li> </ul>
<b>Loss of biodiversity</b>	<ul style="list-style-type: none"> <li>• Encourage sustainable agriculture within the project areas eg precision farming, water retention fallow techniques,</li> <li>• Promote high value crops and fruit trees as well as improved fallows</li> <li>• Promote integration of crops, trees and animals</li> <li>• Promote protection of gazetted areas and participatory management of natural resources</li> </ul>
<b>Exclusion of farmers with HIV, disabled/physically challenged, Gender</b>	<ul style="list-style-type: none"> <li>• Deliberately target People Living with HIV and Aids (PLWHAS) through their support groups.</li> <li>• Involve the social development officers in identifying the vulnerable groups.</li> <li>• Ensure representation of different age groups</li> </ul>



Environmental and social Risk Category	Measures to be taken
	<p>especially the youth and the elderly among the target farmer groups /communities.</p> <ul style="list-style-type: none"> <li>• Entrench gender and Greater Involvement of People With Aids (GIPA) Principle during the implementation and Monitoring process</li> </ul>
<b>Exclusion of Indigenous technical knowledge (ITK)</b>	<ul style="list-style-type: none"> <li>• Embrace/Mainstream use of ITK in implementing and promoting adaptation activities</li> <li>• Uphold indigenous people’s rights through profiling, documenting and integrating their knowledge in the decision making and implementation processes.</li> </ul>
<b>Labour laws</b>	<ul style="list-style-type: none"> <li>• Ensure that all employed personnel in the programme areas are contracted in accordance with the Labour Laws.</li> </ul>
<b>Compliance with statutory Laws</b>	<ul style="list-style-type: none"> <li>• All the statutory requirements shall be met in the programme implementation.(licences, standards, taxation, procedures, Government fiduciary standards</li> <li>• Environmental Impact assessments and Environmental Audits shall be done in all the project activities that warrant such measures.</li> </ul>
<b>Complaints/grievances</b>	<ul style="list-style-type: none"> <li>• A grievance management mechanism shall be put in place and implemented. There will be deliberate processes to ensure that the all the project beneficiaries and project executors are aware of this mechanism</li> </ul>

**3C (ii) Measures to operationalise /actualise the ESMF in the Kenyan Programme.**

**NEMA as the NIE shall develop structures of ensuring that the Environmental and Social policy is adhered to in the programme implementation using the following strategies;**

1. Before the commencement of the programme implementation NEMA shall develop an Environmental and Social Management Framework (ESMF) specific for this programme.
2. NEMA shall also develop all relevant plans for managing/ implementing the ESMF which shall include practical tools.(e, g screening checklists)
3. NEMA shall hold training and planning meetings to induct the Executing Entities on how to integrate the ESMP in executing project activities
4. Reporting on the Performance of the ESMP shall be integrated in the progress monitoring of the programme implementation.
5. During all the inception workshops, beneficiary trainings and community forums, ESMP shall be discussed. Special emphasis will be given to the grievance mechanism that will be established.
6. All projects that by statutory law require to be subjected to EIA process shall be subjected to the EIA due diligence. An Environmental Management Plan shall be developed.
7. Monitoring of the implementation of the EMSP, IPP EMP from EIA will be done by EE, CDE & NIE
8. The operationalization of ESMF will take the following process:
  - NEMA to scrutinize all ESMP,IPP EIA &EMPs and develop an inspection checklist
  - Visit project site and inspect for implementation of ESMP, IPP EMP
  - In case of violation inform the EE verbally
  - Discuss with the EE & the proponent the rectification deadline
  - Follow up with a warning letter if deadline is not met.
  - NEMA officer to visit the site again to check if violation continues
  - EE and Concerned lead agencies is then notified
  - After 2 months and no rectification then NEMA to take disciplinary measures(legal action) within the EIA statutes
  - Annual report is compiled and forwarded to project steering committee(PSC/NIE)
  - Independent consultant to undertake annual performance & environment audit

### **3D) Description of Monitoring and Evaluation arrangements and Budgets**

Monitoring and Evaluation of this programme shall be designed in a way that it complies with formal guidelines, protocols and toolkits issued by the Adaptation Fund, NIE and government of Kenya's regulations and procedures. The key components of the M&E Framework will be as follows:

*A baseline survey* - this will be done to establish the benchmarks to be monitored and evaluated during the implementation of the programme activities. This will be held within the first month of the programme. The establishment of the benchmarks will be participatory with implementing partners so as to develop common understanding on how to assess the progress of the programme activities based on the baseline information. The implementing agencies and the partners, with support from NIE will do continuous monitoring of the project and semi and annual reporting on the project progress.

*Monitoring* - regular monitoring will be conducted by programme staff, with additional spot checks by technical support staff and visits from NIE and other external validators where necessary. Monitoring will include reviewing and responding to issues raised through the Community Feedback Mechanism, thus strengthening the programme's accountability to its beneficiaries. Participatory monitoring will take place building the capacity of community to hold actors to account for programme plans.

*Reporting* - The programme lead agencies will receive reports from executing entities that will compile them and submit them to NIE as per the agreed periods. In particular, the reports will involve getting feedbacks from communities, stakeholders, observations and secondary data reviews in relation to baseline data. The information will be consolidated on quarterly and annual basis and presented to the project coordinator who will compile final reports. These reports will be reviewed by stakeholders before presentation to NIE. Lessons learnt, recommendations and good practices will be used to review and recast progress against set goals, objectives and targets, and detailed financial

disbursements. Any change with regards to the implementation of the project will easily be identified and appropriate actions taken in consultation with key stakeholders, partners and NIE/Adaptation Fund Board (AFB). The feedback received from NIE/AFB will further enrich the monitoring objectives of the project.

*Mid-term programme Evaluation* - The programme will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation (June 2015). The MTE will determine progress made toward the achievement of outcomes and will identify corrective actions if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The findings of this review will be incorporated in a midterm report.

*Summative Programme evaluation* - At the end of programme evaluation will be undertaken to measure the overall achievements against the baseline survey and a report compiled for presentation as close of project report. Following the baseline, the log frame milestones will be refined and updated. The evaluation will include assessing the programme's performance on value for money.

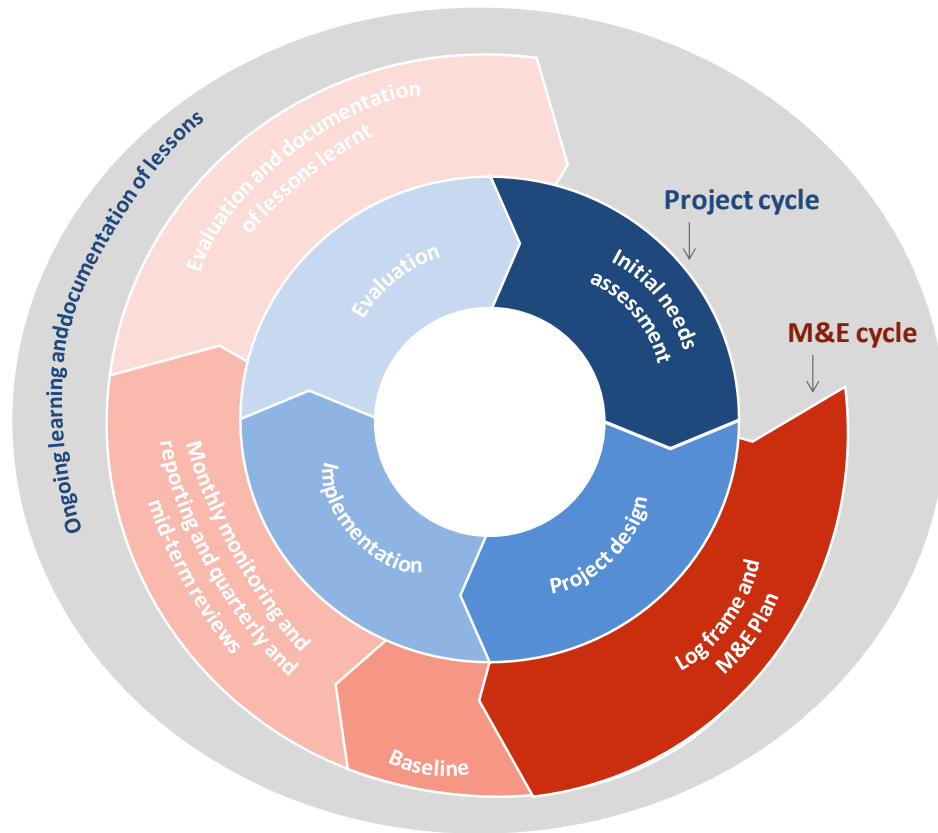


Figure 4: Project Monitoring and Evaluation

**Table 5: M&E BUDGET**

**Vii) Description of Monitoring and Evaluation arrangements and Budgets**

The following are the monitoring and Evaluation products that will be outputs of the framework

- i. Quarterly reports will be developed each quarterly.
- ii. Annual reports will include reports on progress against outputs and outcomes
- iii. Field reports will document findings against objectives of the field visits
- iv. Midterm evaluation report. A consultant will be engaged to develop the report
- v. Programme Evaluation report. This will be done at end of the programme

**Table 11: M&E plan including the budget**

METHODS OR TYPES OF ACTIVITIES	DESCRIPTION	RESPONSIBILITY	COST (USD)
<b>Workshops</b>	Workshops will be conducted to: <ol style="list-style-type: none"> <li>1. Develop M&amp;E instruments, benchmarks and tools</li> <li>2. Introduce the M&amp;E units at EE level</li> <li>3. Inception workshop to Develop annual work</li> </ol>	<ul style="list-style-type: none"> <li>• NIE</li> <li>• Stakeholders</li> </ul>	38,452.53

	plans and log frames		
<b>Meetings</b>	Programme Steering committee meetings  Stakeholder engagement, ownership and verifications in the 3 regions	<ul style="list-style-type: none"> <li>• NIE</li> <li>• EES</li> <li>• Stakeholders</li> <li>• DA</li> </ul>	18,960.80
<b>Quarterly reports</b>	Quarterly reports (4) per annum	<ul style="list-style-type: none"> <li>• NIE</li> <li>• EEs</li> <li>• DA</li> </ul>	28,912.20
<b>Annual reports</b>	Annual Report (1)  Annual audits	<ul style="list-style-type: none"> <li>• NIE</li> <li>• EEs</li> <li>• Other stakeholders</li> </ul>	11,421.34
<b>Field Visits</b>	Baseline surveys  Field visits per EE for verifications of the content of quarterly and annual reports.  Exchange visits between EEs (Exchanges may last	<ul style="list-style-type: none"> <li>• NIE</li> <li>• EEs</li> <li>• Other stakeholders</li> <li>•</li> </ul>	32,672.90

	5 days at most by some members of the M&E Unit )		
<b>Reporting Process</b>	EE to NIE NIE to AFB NIE to Government	<ul style="list-style-type: none"> <li>• NIE</li> </ul>	86534
<b>WRITTEN</b>			
<b>Mid Term Reports</b>	Midterm report (1)	<ul style="list-style-type: none"> <li>• NIE</li> <li>• EES</li> <li>• Consultants</li> </ul>	16,783.02
<b>Evaluation Reports</b>	Evaluation Report (End of the Programme)	<ul style="list-style-type: none"> <li>• NIE</li> <li>• Consultants</li> </ul>	28,423.44



**1 3E) RESULTS FRAMEWORK**

Below is the results framework for the programme. The column of the baseline levels is an average of the various programme target areas. A further baseline survey shall be done at the onset of this programme implementation.

Project Component	Program Outcome	Baseline Indicators	Baseline Levels	Program Outcome Indicator	Programme Output	Programme Output indicator	Fund outcome	Fund Indicator Outcome	Fund Output	Fund Output Indicator	Result/Target
<b>1. Enhancing Climate Change resilience for improved food security in selected Counties</b>	Enhanced climate change resilience for improved food security in selected counties  Number of households with increased types of climate resilient livelihoods	1. % of HHs consuming less than 3 meals per day	80%	Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	<b>Output 1.1:</b> Increased adoption of drought tolerant food and high value crops and enhanced efficient utilization through value chain approach	<b>1.1.1</b> No. of HHs adopting drought tolerant and high value food crops  <b>1.1.2</b> No. and types of livelihood strategies  <b>1.2.1</b> No and type of alternative livelihood strategies  <b>1.3.1</b> % Increase in food production	<b>Outcome 6:</b> Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas  <b>Outcome 5:</b> Increased ecosystem resilience in response to climate change and variability-induced stress	<b>6.1</b> Percentage of households and communities having more secure (increased) access to livelihood assets  <b>6.2.</b> Percentage of targeted population with sustained climate-resilient livelihoods  <b>5. Ecosystem</b>	<b>Output 6:</b> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability  <b>Output 5.</b> Vulnerable physical, natural, and social assets strengthened in response to climate	<b>6.1.1.</b> No. and type of adaptation assets (physical as well as knowledge) created in support of individual- or community-livelihood strategies  <b>6.1.2.</b> Type of income sources for households generated under climate change	15,000 farmers achieving an 25% average increase in food production per Ha <sup>2</sup>  15,000 HH with a 25% increase in food consumption  %30 reduction in reduced negative coping strategies  48,000 drought
		2. Number of months per year that HHs experience food shortage	7 Months								
		3. Percentage of targeted population with sustained climate-resilient livelihoods	15% (within the target areas)								
		4. Type of income sources for	None to one								

		households generated under climate change scenario	per household		production through appropriate and efficient irrigation methods	per Ha <sup>2</sup>		services and natural assets maintained or improved under climate change and variability-induced stress	change impacts, including variability	scenario	tolerant fruit trees planted by farmers
		5. Quantity of food produced per Ha <sup>2</sup>	0.35 T per Ha		<b>Output 1.4</b> Increase animal productions through promotion of drought resistant fodder crops; pasture conservation and emergency fodder banks.	<b>1.3.2</b> No and type of irrigation methods  <b>1.4.1</b> % increase in available fodder  <b>1.4.2</b> No of animals receiving sufficient feed  <b>1.5.1</b> No and type of ecological land use and management systems  <b>1.5.2</b> No and type of conservation strategies				<b>5.1.</b> No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	3000 farmers groups working with drip irrigation
		6. % of HH using climate resilient agriculture techniques	15%		<b>Output 1.5</b> Enhanced land productivity through ecological land use systems, conservation strategies and						

					management technologies							
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Project Component	Programme Outcome	Baseline Indicators	Baseline levels	Programme Outcome Indicator	Programme Output	Programme Output indicator	Fund outcome	Fund Outcome Indicator	Fund Output	Fund Output Indicator	Result/Target
<b>2. Improving climate resilient water management systems to enhance food security in selected Counties</b>	<b>Outcome 2</b> Improving climate resilient water management systems to enhance food security in selected Counties	1. % of communities with climate resilient water management systems to enhance food security in selected Counties	16% (In programme target areas)	% increase of communities with Improved climate resilient water management systems to enhance food security in selected Counties	<b>Output 2.1</b> Established appropriate physical assets and infrastructure for water harvesting, storage and irrigation	Number of physical assets and infrastructure for water harvesting, storage and irrigation established	<b>Outcome 4:</b> Increased adaptive capacity within relevant development and natural resource sectors	<b>4.2.</b> Physical infrastructure improved to withstand climate change and variability-induced stress	<b>4.1.2.</b> No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)	<b>Outcome 4:</b> Increased adaptive capacity within relevant development and natural resource sectors	78 water pans water constructed.  Construction of 300mm pipeline approximately 9km.

<b>3. Increase resilience to the effects of sea level rise and shoreline changes through Integrated system and Mangrove Ecosystem Management (ISMEM) in Kenyan coastal zone.</b>	Enhanced resilience to the effects of sea level rise and shoreline changes through Integrated system and Mangrove Ecosystem Management (ISMEM) in Kenyan coastal zone.  Number of households with secured human habitation and development	1.	% of HHs affected by the effects of sea level rise and shoreline changes.	57.73 %	Vulnerable physical, natural and social assets strengthened in response to climate change and variability induced stress.	<b>Output 3.1:</b> Implemented Integrated Shoreline Mangrove Ecosystem Management (ISMEM)	3.1.1 Length of shoreline stabilized.  3.1.2 No. of HHs secured from the effects of sea level rise and shoreline changes.	<b>Outcome 5:</b> Increased ecosystem resilience in response to climate change and variability-induced stress.	<b>5.1</b> Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress.	<b>Output 5.</b> Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability.	<b>5.1.</b> No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets).	Stabilize at least 4.81 km of the Vanga Shoreline  Secure at least 3,579 households from the effects of sea level rise and shoreline changes in Vanga  Rehabilitate at least 2,815 Ha of the Vanga and Gazi Mangrove Ecosystems  Rehabilitate and protect at least 6.15 km of coral reef along the Shimoni-Vanga shoreline  Control erosion and
		2.	% of HHs with secure human habitation and development	42.27%		<b>Output 3.2</b> Rehabilitated mangrove Ecosystem	3.2.1 Area in Ha of Mangroves Ecosystem rehabilitated in Vanga and Gazi.					
		3.	Area in Ha of mangroves in existence	4,915 Ha		<b>Output 3.3</b> Coral reefs stabilized	3.3.1 Length of coral reefs rehabilitated and protected.					
		4.	Length in Km of shoreline affected by erosion and accretion	39.12 Km(Vanga and Gazi mangroves)		<b>Output 3.4</b> Controlled erosion	3.4.1 Length of shoreline where erosion and accretion has been controlled.					
		5.	Length in km of				3.5.1					

		coastline with intact coral reefs.	2.05 Km		and accretion . <b>Output 3.5</b> Inventory and GIS database for the shoreline and mangrove ecosystems	Inventory and GIS database for the shoreline and mangrove ecosystem in place.					accretion for at least 7.51 km of the Vanga and Gazi shorelines  Establish a GIS Inventory and Database for the shoreline and mangrove ecosystems
<b>4. Disaster Risk Reduction and increasing preparedness among vulnerable communities</b>	Reduced risk reduction and increased preparedness among the vulnerable communities	1. Frequency/types of natural disasters experienced  2. Number of actions undertaken to prepare for disaster	2-3 times of flood disasters per year  Variable - Will be verified during the programme level	Reduced exposure to natural disasters  Increased adaptive capacity for the vulnerable community	<b>Output 4.1:</b> Vulnerable physical, social land natural assets strengthened in response to disaster occurrence	<b>4.1.1:</b> Number of infrastructures developed or modified to respond to new conditions arising from disasters  <b>4.1.2:</b> Development of early warning	<b>Outcome 4.1:</b> Reduced exposure to climate related disasters and threats  <b>Outcome 4.2:</b> Increased adaptive capacity among the	<b>Output 4.1.1:</b> Vulnerable natural, physical and social asset strengthened in response to disaster occurrences	<b>4.1.1:</b> Number of infrastructures developed or modified to respond to new conditions arising from disasters  <b>4.1.2:</b> Development of early warning	-Number & type of resource assets created, maintained or improved to arrest disasters  -Number & type of projects that conduct and update risk and vulnerability	Construction of Dykes in the yala basin (10 Km stretch)  Construction of 4 evacuation Centers  Developed system of

		<p>3. Number of people with reduced risk to extreme weather events</p> <p>4. Percentage of population covered by adequate risk-reduction systems</p>	<p>baseline survey.</p> <p>30 – 40% of households affected</p> <p>10 % (from the people living within the basin)</p> <p>20% of Livestock &amp; 60% of crops destroyed</p>	ities	<p>ces</p> <p><b>Output 4.2:</b> Risk and vulnerability assessments generated and disseminated to stakeholders on timely basis</p>	<p>systems</p> <p><b>4.1.3:</b></p> <p>Numbers of physical assets strengthened or constructed to respond to disasters</p> <p><b>4.1.4:</b></p> <p>Number of sensitization forums held to build the capacity of the vulnerable communities and stakeholders for increasing knowledge &amp; skills in arresting disasters</p>	vulnerable communities and stakeholders		<p>systems</p> <p><b>4.1.3:</b></p> <p>Numbers of physical assets strengthened or constructed to respond to disasters</p> <p><b>4.1.4:</b></p> <p>Number of sensitization forums held to build the capacity of the vulnerable communities and stakeholders for increasing knowledge &amp; skills in arresting disasters</p>	<p>assessments</p> <p>-Number of physical assets strengthened or constructed to withstand disasters</p> <p>-Early warning systems developed</p>	<p>sending disaster alerts</p> <p>Construction of an automated weather data generation station</p>
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Project Component	Programme Outcome	Baseline Indicators	Baseline levels	Program Outcome Indicator	Programme Output	Programme Output indicator	Fund outcome	Fund Indicator Outcome	Fund Output	Fund Output Indicator	Result/Target
<b>5. Strengthening institutional capacity and knowledge management on climate change adaptation</b>	<b>Outcome 2:</b> Strengthened Community institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks  2. Percentage of targeted population aware of predicted adverse	20%	2.1 No of communities trained on DRR strategies  No of Community based DRR committees formed  No of DRR action plan developed and implemented by the target communities  No of capacity building training workshops held for the implementing partners	<b>Output 2.1:</b> Strengthened capacity of national and regional centers and networks to respond rapidly to extreme	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses in the target areas  3.2. No of observable modification	<b>Outcome 2:</b> Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	<b>2.1</b> No. and type of targeted institutions with increased capacity to minimize exposure to climate variability  <b>2.2</b> No of observable Modification in behavior of targeted population documented	<b>Output 2.1:</b> Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather events	<b>2.1.1.</b> No. of staff trained to respond to, and mitigate impacts of, climate-related events  <b>2.1.2</b> No of community Committees trained on DRR  <b>2.1.2</b> No of publication on climate change	Over 300000 knowledge products (IEC) developed and distributed  12 Radio talk shows on DRR  Web portal for interactions  One database for documentation of programmer implementation processes  One Documentary developed for the programmer



		impacts of climate change, and of appropriate responses			me weather events	in behavior adopted by of targeted population to respond to shocks and climate change documented			<b>Output 3:</b> Targeted population groups participating in adaptation and risk reduction awareness activities	produced and distributed  <b>3.1.1</b> No. and type of risk reduction actions or strategies introduced at local level  <b>3.1.2</b> No. of news outlets in the local press and media that have covered the topic  <b>7.1.</b> No., type, and sector of	1 Policy makers, ministerial training  10 farmer exchange field tours  One conference to profile disseminate best practices  One empirical research study  Participation in short courses on climate Change, project management
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										<p>policies introduced or adjusted to address climate change risks</p> <p><b>7.2.</b> No. or targeted development strategies with incorporated climate change priorities enforced</p>	
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### 3F) Alignment of Programme Components and Outcomes with Adaptation Fund Results Framework

Table 13: Programmed Components and Outcomes with Adaptation Fund Results Framework

Programmed components	Programmed Indicator(s)	Fund Outcome	Fund Outcome Indicator	Fund Output	Fund Output Indicator	Grant Amount (USD)
<b>1. Enhancing Climate Change resilience for improved food security in selected Counties</b>	Percentage of households with secure food supply  Number of households with increased types of climate resilient livelihoods	<b>Outcome 6:</b> 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 livelihoods	<b>Output 6:</b> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1.No. and type of adaptation assets (physical as well as knowledge) created in support of individual- or community- livelihood strategies 6.1.2. Type of income sources for households generated under	

	Percentage of farmers adopting agro forestry practices	<p><b>Outcome 5:</b></p> <p>Increased ecosystem resilience in response to climate change and variability-induced stress</p>	<p>5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress</p>	<p><b>Output 5.</b></p> <p>Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability</p>	<p>climate change scenario</p> <p>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)</p>	
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<b>2. Improving climate resilient water management systems to enhance food security in selected Counties</b>	No. and type of water infrastructure constructed and improved to enhance resilience to climate change	<b>Outcome 4:</b> Increased adaptive capacity within relevant development and natural resource sectors	4.2. Physical infrastructure improved to withstand climate change and variability-induced stress	<b>Output 4:</b> Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by asset types)	
<b>3. Increase resilience to climate change of Shoreline and Mangrove Ecosystem in Kenyan coastal zone</b>	Area of stabilized shorelines and rehabilitated mangroves to enhance climate change resilience and protection investments	<b>Outcome 5:</b> Increased ecosystem resilience in response to climate change and variability-	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	<b>Output 5.</b> Vulnerable physical, natural, and social assets strengthened in response to climate change	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from	

		induced stress		impacts, including variability	climate variability and change (by type of assets)	
<b>4. Disaster risk reduction and increasing preparedness among vulnerable communities</b>	No. and type of physical and natural infrastructure established and improved to reduce risk of disaster	<b>Outcome 1:</b> Reduced exposure at national level to climate-related hazards and threats  <b>Outcome 4:</b> Increased adaptive	1. Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis  weather events	<b>Output 1:</b> Risk and vulnerability assessments conducted and updated at a national level  <b>Output 4:</b> Vulnerable	1.1. No. and type of projects that conduct and update risk and vulnerability assessments  1.2 Development of early warning systems  4.1.1. No. and type of health or social infrastructure developed or	

		<p>capacity within relevant development and natural resource sectors</p> <p><b>Outcome 5:</b> Increased ecosystem resilience in response to climate change</p>	<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> <p>5. Ecosystem services and natural assets maintained or improved</p>	<p>physical, natural, and social assets strengthened in response to climate change impacts, including variability</p> <p><b>Output 5:</b> Vulnerable physical, natural, and social</p>	<p>modified to respond to new conditions resulting from climate variability and change (by type)</p> <p>4.1.2. No. of physical assets strengthened or constructed to withstand conditions resulting from climate variability and change (by</p>	
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		and variability-induced stress	under climate change and variability-induced stress	assets strengthened in response to climate change impacts, including variability	asset types)  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>5. Strengthening institutional capacity</b>	No. of people trained	<b>Outcome 2:</b> Strengthened	2.1. No. and type of targeted institutions with	<b>Output 2.1:</b> Strengthened	2.1.1. No. of staff trained to respond	



<p><b>and knowledge management on climate change adaptation</b></p>	<p>for effective programmer implementation</p> <p>No. and type of knowledge products developed and disseminated</p>	<p>institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses</p> <p><b>Outcome 3:</b> Strengthened awareness and ownership of adaptation and climate risk reduction</p>	<p>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>	<p>capacity of national and regional centers and networks to respond rapidly to extreme weather events</p> <p><b>Output 3:</b> Targeted population groups participating in adaptation and risk reduction awareness</p>	<p>to, and mitigate impacts of, climate-related events</p> <p>3.1.1 No. and type of risk reduction actions or strategies introduced at local</p>	
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		<p>processes at local level</p> <p><b>Outcome 7:</b> Improved policies and regulations that promote and enforce resilience measures</p>	<p>3.2. Modification in behavior of targeted population</p> <p>7. Climate change priorities are integrated into national development strategy</p>	<p>activities</p> <p><i>Output 7:</i> Improved integration of climate-resilience strategies into country development plans</p>	<p>level</p> <p>3.1.2 No. of news outlets in the local press and media that have covered the topic</p> <p>7.1. No., type, and sector of policies introduced or adjusted to address climate change risks</p> <p>7.2. No. or targeted development strategies with incorporated</p>	
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					climate change priorities enforced	
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**Table 14: Kenya Climate Change Adaptation Funds Programmed Budget**

<b>Component 1:</b>	<b>Enhancing Climate resilient agricultural, forestry, pastoral and agro-pastoral production systems to improve food security in selected Counties in Kenya.</b>						
<b>Outputs</b>	<b>Description</b>	<b>Budget Notes/Activities</b>	<b>YEAR 1 Budget in USD</b>	<b>YEAR 2 Budget in USD</b>	<b>YEAR 3 Budget in USD</b>	<b>TOTAL Budget in USD</b>	<b>Explanations</b>
Output 1.1.	Increased resilience to drought through enhanced cultivation of drought tolerant food crops and high value crops.	To procure and distribute drought tolerant seeds for target farmer groups across the country. Seeds/ seedling bulking centers will be established for sustainability.	148,173.33	103,173.33	23,333.33	274,680.00	Over 100,000kgs of various crops suited for various localities in the country. Deliberately targeting women /gender
		Establish field Learning demonstration plots for the selected drought tolerant crops	18,941.15	17,647.06	-	36,588.21	Learning farms on sowing, timing, spacing and best practices for enhanced productivity of drought resistance crops
		Train targeted farmers on appropriate agronomic practices for propagating the introduced drought tolerant food crops / high value crops.	16,681.00	16,681.00	-	33,362.00	Agronomist and crop production officers interactions with farmers
		<b>Sub Total for 1.1</b>	<b>183,795.48</b>	<b>137,501.39</b>	<b>23,333.33</b>	<b>344,630.21</b>	
Output 1.2.	Diversified alternative livelihood sources as a coping mechanism to the changing climate	Procure and distribute assorted high value improved fruit tree seedlings to provide alternative sources of food during droughts.	59,951.37	48,951.37	21,666.67	130,569.41	Over 32,000 fruit trees
		Establish tree nurseries for bulking and grafting fruit tree seedlings to enhance sustainability.	26,764.71	18,764.71	13,764.71	59,294.12	Tree nurseries will be established within private lands, among groups, community land

							and in public schools
		Establishment of value addition technologies for targeted crops/agricultural products. This will include installation of cooling and processing plants, establishment community level cottage industries.	56,085.29	128,383.13	33,865.55	218,333.97	Establishment of cooling plants for agricultural products, Establishment of community level cottage industries @ USD 95581.09
		International Consultancy in different localities (Environmental Impact assessment.)	4,705.88	-	-	4,705.88	8 days @ USD 600 per day
		International Consultancy in different localities (Survey and design of water pans, check dams and water supply structures.)	3,529.41	-	-	3,529.41	6 days @ USD 600 per day
		Training on Agro economic practices of the fruit tree	12,940.95	12,940.95	-	25,881.90	Over 50% of total Farmer groups
		<b>Sub Total for 1.2.</b>	<b>163,977.61</b>	<b>209,040.16</b>	<b>69,296.92</b>	<b>442,314.69</b>	
Output 1.3.	Increased food production through enhanced water harvesting and establishment of efficient micro & macro irrigation methods to stabilize food security	Install micro- irrigation kits for small irrigation and kitchen gardens for selected farmers and groups	51,058.82	156,941.18	65,882.35	273,882.35	400 drip kits with 2,000 Lts water storage capacity
		Procure and install water harvesting facilities to avail supplies of water for the established irrigation systems and kitchen gardens.	-	228,571.43	-	228,571.43	Various tanks: plastic, construction, gutter systems
		Training farmers and selected community resource persons on establishment and management of the introduced irrigation technologies and water harvesting.	12,964.71	15,964.71	-	28,929.41	Over 80% of target groups
		Operate a 64 acre irrigation system for Waldaa community in Marsabit County.	28,200.00	28,200.00	-	56,400.00	64 acre irrigation system for

							Waldaa community in Marsabit County. Kenya Red Cross Society shall have an annual financial vote after the 3 year project period to sustain this farm. It's also anticipated that after sometime the farm will be able to sustain its own cost.
		Undertake trainings for Management and water committees for Waldaa farm to enhance sustainability	7,044.60	1,200.00	5,844.60	14,089.20	Train water committee to ensure sustainability
		<b>Sub Total for 1.3.</b>	<b>99,268.13</b>	<b>430,877.31</b>	<b>71,726.95</b>	<b>601,872.39</b>	
Output 1.4.	Enhanced efficient food utilization through implementation of post harvest strategies and value chain approach as a strategy of building food security	Support establishment of common grain storage facilities.	-	65,948.23	65,948.23	131,896.46	140 Common grain stores for farmer groups
Hold demonstrations on improved post harvest strategies for fruits, wild fruits and other target high value food crops. (to include traditional and modern foods preservation methods)		28,965.11	28,965.11	8,965.11	66,895.33	Over 40 Value addition, preservation and storage techniques demonstrations	
Train and sensitize target communities on post harvest strategies and value chain management.		-	3,795.24	2,200.00	5,995.24		
International Consultancy (Undertake Market						3.75 days @ USD	

	resilience	surveys for selected products)	2,235.29	-	-	2,235.29	600
		Establishment of farmer Cooperative societies, Village Savings and Loans Associations (VSLA) and Economic Empowerment Committees as part of sustainability strategy.	11,927.71	11,666.67	-	23,594.38	Support fully operational marketing cooperative society, Operational VSLAs & EECs for groups
		<b>Sub Total for 1.4.</b>	<b>43,128.11</b>	<b>110,375.24</b>	<b>77,113.34</b>	<b>230,616.70</b>	
Output 1.5.	Increased animal production through adoption of drought tolerant animal breeds, pasture conservation and emergency fodder banks	Distribute drought and climate resilient varieties of grass, fodder and forage to enhance availability of livestock feeds during dry spell	106,533.33	28,999.83	30,190.31	165,723.47	Variety of each category: Cereal, Graminacious and Leguminous
		Establish field Learning demonstration plots for the selected fodder and forage varieties.	-	11,500.00	11,500.00	23,000.00	Learning points on propagation, silvicultural and management practices. After they will be bulking points for sustainability
		International Consultancy in different localities (Environmental Impact assessment.)	2,352.94	-	-	2,352.94	4 days @ USD 600 per day
		International Consultancy in different localities (Survey and design of water pans, check dams and water supply structures.)	1,764.71	-	-	1,764.71	3 days @ USD 600 per day
		Establishment of value addition technologies for fodder and animal products. This will include installation of cooling and hay making equipment	60,707.28	121,156.86	13,333.33	195,197.48	Over 100 Hay machines distributed. To aid in fodder conservation and Income



							generation for youth and women
		Rehabilitate livestock watering points and along rivers	50,000.00	50,000.00	50,000.00	150,000.00	More than 100,000 trees planted at watering points and fences installed
		Train farmers on pastoral and agro pastoral adaptation practices (fodder conservation, breeds improvements, disease and pest control).	11,150.66	11,150.66	12,327.13	34,628.45	Skills building on fodder conservation, breeding, pests and diseases control for over 50% of target groups
		<b>Sub Total for 1.5.</b>	<b>232,508.92</b>	<b>222,807.35</b>	<b>117,350.77</b>	<b>572,667.05</b>	
<b>Output 1.6.</b>	Enhanced land productivity through ecological land use systems, conservation strategies and management technologies improve resilience to changes the changing climate. This is	Distribute and facilitate adoption drought tolerant, pest and disease resistance tree species such as Melia volkensii, Neem, Terminalia brownii to increase adaptive capacity and resilience to climate change.	16,950.00	16,950.00	16,950.00	50,850.00	More than 30,000 drought tolerant tree species introduced in ASALs for alternative incomes and landscapes conservation.
Set up field demonstrations on soil and Water conservation methods for learning.		9,202.33	9,202.33	5,319.94	23,724.61	Education and learning points	
Hold training and awareness forums on best agro-forestry practices, soil and water conservation methods for farmers, youths and women.		38,821.08	41,121.08	12,297.67	92,239.83		
Support reforestation of Saimet and Loitoktok						2 major but very	

	in response to deteriorating soils quality and landscapes	forests in Kajiado County through establishment of woodlots, plantations, boundary planting.	7,209.30	7,209.30	7,209.30	21,627.90	degraded forests replanted and growth monitored
		Support Formation and operationalization of community forest associations (CFAs) to enhance community management of forests and tree resource on farm.	1,465.12	1,465.12	1,465.12	4,395.36	Build local capacity on alternative livelihood sources and value for trees including protection and their nurture.
		Support women representatives on environment management, high value crop growing, hay making and management of kitchen gardens	-	9,000.00	-	9,000.00	Women targeted as they are high drivers of deforestation in search of firewood.
		Show casing on alternative and improved of resources exploitation methods to reduce soil erosion and land scape degradations and water conservation methods.	64,868.99	16,868.99	11,868.99	93,606.98	Aloe growing, aloe processing.
		Establishment of community based green zones	17,350.00	17,350.00	-	34,700.00	
		<b>Sub Total for 1.6.</b>	<b>155,866.83</b>	<b>119,166.83</b>	<b>55,111.02</b>	<b>330,144.68</b>	
		<b>Total Component 1</b>	<b>878,545.09</b>	<b>1,229,768.29</b>	<b>413,932.34</b>	<b>2,522,245.71</b>	
<b>Component 2:</b>	<b>Improving climate resilient water management systems to enhance food security in selected Counties</b>						
<b>Outputs</b>	<b>Description</b>		<b>YEAR 1</b>	<b>YEAR 2</b>	<b>YEAR 3</b>	<b>TOTAL</b>	

			Budget in USD	Budget in USD	Budget in USD	Budget in USD	
Output 2.1.	Established appropriate physical assets and infrastructure for water harvesting, storage and irrigation	International Consultancy in different localities (Survey and design of water pans, check dams and water supply structures.)	19,265.31	1,724.14	-	20,989.45	35 days @ USD 600 per day
		International Consultancy in different localities (Environmental Impact assessment)	22,470.59	-	6,000.00	28,470.59	47 days @ USD 600 per day
		Excavate water pans and check dams for harvesting surface run off and flood waters during rainy season.	1,142,292.50	699,023.21	600.00	1,841,915.71	Construction of 609,527 M3 different sizes of Water pans, check dams, canals and water intakes @ 3.56 USD per m3
		Construction of water distribution systems and protection of river banks	636,130.57	197,301.00	197,051.00	1,030,482.57	Irrigation infrastructure
		Installation of water harvesting and storage facilities.	193,630.65	35,513.00	-	229,143.65	
		Training for communities on management and maintenance of the water structures (1 per group)	43,168.38	14,260.30	2,025.00	59,453.67	
		<b>Sub Total for 2.1.</b>	<b>2,056,958.00</b>	<b>947,821.64</b>	<b>205,676.00</b>	<b>3,210,455.64</b>	
		<b>Total Component 2</b>	<b>2,056,958.00</b>	<b>947,821.64</b>	<b>205,676.00</b>	<b>3,210,455.64</b>	

<b>Component 3: Increase resilience to climate change of Shoreline and Mangrove Ecosystem in Kenyan coastal zone</b>							
<b>Outputs</b>	<b>Description</b>		<b>YEAR 1 Budget in USD</b>	<b>YEAR 2 Budget in USD</b>	<b>YEAR 3 Budget in USD</b>	<b>TOTAL Budget in USD</b>	
Output 3.1.	Promote Integrated Shoreline and Mangrove Ecosystem Management (ISMEM) at Coastal region through: Rehabilitation Mangroves, Coral reef, stabilization of Shorelines, accretion control, Coastal erosion control and development of the management plan for Gazi and Vanga mangroove ecosystem.	Mangrove Rehabilitation	204,407.00	204,407.00	-	408,814.00	
		Coral Reef Rehabilitation and Protection	125,035.00	125,035.00	-	250,070.00	
		Shoreline Stabilization	90,949.00	90,949.00	-	181,898.00	
		Erosion and Accretion control	68,852.00	68,852.00	-	137,704.00	
		Creation of Inventory and GIS database	1,000.00	1,000.00	-	2,000.00	
		Develop Management Plan - Exploitation and Socio-economic	13,775.00	13,775.00	-	27,550.00	
		Capacity Building- Mangrove Training, Education and Awareness	12,723.00	12,723.00	-	25,446.00	
		Empowering and Capacity building the community on Participatory Forest Management.	9,793.00	9,793.00	-	19,586.00	
		PES Capacity Building	16,705.00	16,705.00	-	33,410.00	
		<b>Sub Total for 3.1.</b>		<b>543,239.00</b>	<b>543,239.00</b>	<b>-</b>	<b>1,086,478.00</b>
		<b>Total Component 3</b>		<b>543,239.00</b>	<b>543,239.00</b>	<b>-</b>	<b>1,086,478.00</b>

<b>Component 4: Disaster risk reduction and increasing preparedness among vulnerable communities</b>							
<b>Outputs</b>	<b>Description</b>		<b>YEAR 1 Budget in USD</b>	<b>YEAR 2 Budget in USD</b>	<b>YEAR 3 Budget in USD</b>	<b>TOTAL Budget in USD</b>	
Output 4.1	Enhanced disaster risk reduction and increasing preparedness among vulnerable communities	Construction of flood control structures (dykes)along river banks	360,000.00	360,000.00	-	720,000.00	Assist communities to increase preparedness for the vulnerable communities in Nyando as well as reduce death and crop/ animal losses during the annual floods that have been prevalent in the area.
		Un block/desilt drainage channels to enhance smooth water flow	75,000.00	75,000.00	-	150,000.00	
		Strengthening of river banks to cub flooding	52,400.00	52,400.00	-	104,800.00	
		Establish Early warning systems - disaster alerts	28,800.00	28,800.00	-	57,600.00	
		Construct of modest evacuation centers	20,000.00	20,000.00	-	40,000.00	
		Functional Installed Automatic Weather Station (AWS) in Waldaa farm.	83,599.65	-	-	83,599.65	
		Maintenance of one Automatic Weather Station (AWS) in Waldaa farm.	7,000.00	7,000.00	7,000.00	21,000.00	
		<b>Sub Total for 4.1.</b>	<b>626,799.65</b>	<b>543,200.00</b>	<b>7,000.00</b>	<b>1,176,999.65</b>	
		<b>Total Component 4</b>	<b>626,799.65</b>	<b>543,200.00</b>	<b>7,000.00</b>	<b>1,176,999.65</b>	

Component 5: Strengthening capacity and knowledge management for Program Implementation and Climate change adaptation							
Outputs	Description		YEAR 1 Budget in USD	YEAR 2 Budget in USD	YEAR 3 Budget in USD	TOTAL Budget in USD	
Output 5.1.	Established information systems for documenting program implementation processes, information and best practices/lessons learnt	Establishing a database to document all program implementation reports and survey information.	6,000.00	5,500.00	5,500.00	17,000.00	1 common database
		Establish a Web based information system for the program	10,000.00	2,500.00	2,500.00	15,000.00	1 website and feeding into other existing databases
		Program Communication and visibility	5,882.35	5,882.35	5,882.35	17,647.06	Banners, sign posts, IEC materials for enhancing program visibility. Will bear logos of Kenya Government and the fund board logo.
		<b>Sub Total for 5.1.</b>	<b>21,882.35</b>	<b>13,882.35</b>	<b>13,882.35</b>	<b>49,647.06</b>	
Output 5.2.	Knowledge generation and dissemination	Hold meetings/ conferences to profile success stories, best practices and lessons learnt from the program implementation process.	44,000.00	44,000.00	44,000.00	132,000.00	
		Holding community forums for information generation and dissemination (barazas, drama, community forums, storytelling, riddles as well as other traditional community media among others.)	1,000.00	4,500.00	4,500.00	10,000.00	At least 4 per year with various key communities
		Farmer tours , visits and field days to showcase project best practices and success stories	5,000.00	5,000.00	5,000.00	15,000.00	Learning exposure trips, at least 1 per year
		Print Information Education and Communication (brochures, posters, banners ) materials about the program	5,000.00	5,000.00	5,000.00	15,000.00	Over 20,000 brochures, posters, booklets, pamphlets and cards.
		Research on Generation of best cropping systems for Climate Resilience	22,500.00	10,000.00	20,500.00	53,000.00	1 empirical research case study
		<b>Sub Total for 5.2.</b>	<b>77,500.00</b>	<b>68,500.00</b>	<b>79,000.00</b>	<b>225,000.00</b>	
Output 5.3.	Awareness creation and sensitization on	Awareness creation on climate change, impacts and adaptation: through Radio programme (local language and Kiswahili),	4,651.20	4,651.20	4,651.20	13,953.60	

	climate change adaptation.	Community forums for information dissemination (barazas, drama, community forums, storytelling, riddles as well as other traditional community media among others.)	6,740.00	6,740.00	6,740.00	20,220.00	Participate in mainstream community events to share information
		Publications in peer reviewed journals	1,666.67	2,666.67	1,666.67	6,000.00	
		Produce extension Information Education and Communication materials (booklets, manuals, brochures, posters, banners and leaflets) on agricultural, forestry and pastoral ecosystem based adaptations.	5,000.00	6,794.03	7,794.03	19,588.05	Over 30,000 brochures, posters, booklets, pamphlets and cards.
		Develop and air on key television channel nationwide a documentary on scenario changes due to climate change and best adaptation approaches	-	14,117.65	-	14,117.65	1 documentary
		Interministries training on importance of enhancing complementarity in climate change adaptation promotion strategies.	20,200.00	34,583.50	14,383.50	69,167.00	3 trainings for various staffs
		Train on Community Disaster Preparedness Planning	4,250.00	4,250.00	-	8,500.00	At least 2 per year
		Radio Talk shows on disaster alerts and preparedness.	7,500.00	7,500.00	-	15,000.00	Responsive
		<b>Sub Total for 5.3.</b>	<b>50,007.87</b>	<b>81,303.04</b>	<b>35,235.39</b>	<b>166,546.30</b>	
		Output 5.4.	Strengthening capacity for program Implementation and Climate change adaptation	Participating in International meetings, seminars, national workshops and short courses on program management and Climate Change adaptation.	10,980.39	10,980.39	10,980.39
Support Institutions of higher learning to generate information and knowledge on environment, Climate change, International relations, water and irrigation.	941.18			941.18	941.18	2,823.53	Support institutions of higher learning
<b>Sub Total for 5.4.</b>	<b>11,921.57</b>			<b>11,921.57</b>	<b>11,921.57</b>	<b>35,764.71</b>	
<b>Total Component 5</b>	<b>161,311.79</b>			<b>175,606.96</b>	<b>140,039.31</b>	<b>476,958.06</b>	
<b>TOTAL COSTS PER YEAR</b>		<b>4,266,853.53</b>	<b>3,439,635.89</b>	<b>766,647.65</b>	<b>8,473,137.06</b>		
<b>TOTAL COSTS</b>					<b>8,473,137.06</b>	-	
<b>Execution Cost by Executing Entities - 9.5% of Total Project Cost (C)</b>					<b>804,948.02</b>	The breakdown of this cost is provided/attached	

<b>Project and Programme Cycle Management Fee charged by the Implementing Entity - 8.5% of Total Project Cost (D)</b>										<b>720,216.65</b>	These are costs related to the management of the entire project and the management of executing entities (EE) by the NIE. A detailed budget for these funds is provided.
<b>GRAND TOTAL FOR THE PROGRAMME</b>										<b>9,998,301.74</b>	Entire programme cost for 3 years.

## Breakdown of execution costs

Implementation Costs Breakdown	Activities or Cost Drivers	Explanation	Cost for 1	Unit	No	Unit Cost USD	TOTAL	Year 1	Year 2	Year 3	Total for 3 Years	
At 3 Regional Offices (3 EEs)	Main Inception workshops	3 Project inception workshops will be held at Regional level by the three EEs The budget will also entail facilitation costs (all project Holders must be represented in the workshops). Other costs include venue procurement, travel costs, communication, allowance and refreshments.		3	29	82.35	7,164.71					
			Travel Costs to and from workshop venue	1	29	23.53	682.35					
			Refreshments per person per day-2 waters	6	29	1.76	307.06					
			Facilitator Costs-2 facilitators per Main EE	2	3	58.82	352.94					
			Stationery	1	29	2.94	85.29					
			<b>Total for 1</b>					8,592.35				
			<b>Sub Total for 3</b>						25,777.06	25,777.06		
				Unit	No	Unit Cost USD	TOTAL	Year 1	Year 2	Year 3	Total for 3 Years	
2 per year planning and progress meetings	The forums will be held on quarterly basis for planning and generation of progress reports.. Each meeting will have representatives from project holders, stakeholders, leaders and relevant government authorities. The meeting will comprise of about 30 participants. Costs	Accommodation & subsistence per person for 2 nights	2	25	82.35	4,117.65					-	
		Travel Costs to and from workshop venue	1	25	23.53	588.24					-	
		Refreshments per person	4	25	1.76	176.47					-	



	involved will include venue procurement, travel costs, allowance, communication and refreshments.	per day-2 waters								
		Stationery	1	25	2.94	73.53				-
		<b>Total for 1</b>				4,955.88				-
		<b>Total for 3 Regional Offices in a quarter</b>				14,867.65				-
		<b>Sub total for all quarters in 3 years</b>				89,205.88	29,735.29	29,735.29	29,735.29	89,205.88
			Unit	No	Unit Cost USD	TOTAL	Year 1	Year 2	Year 3	Total for 3 Years
Bank Charges	Bank transaction costs	999.83	1	1	999.83	999.83	333.28	333.28	333.28	999.83
Utility Bills	Water, electricity, postage and courier services, Security fees, workman insurance, office and office equipments insurance	Courier services-USD 10*3=30,	3	36	50.00	5,400.00	1,800.00	1,800.00	1,800.00	5,400.00
Purchase and Maintenance of 3 Vehicles	The costs will encompass buying, insurance, fuel and maintenance costs	Purchase 1 car per Regional office	3	1	37,647.06	112,941.18	112,941.18	-	-	112,941.18
		Purchase of motorcycles per region	3	2	1,176.47	7,058.82	7,058.82	-	-	7,058.82
		Maintenance costs	3	30	587.06	52,835.29	17,611.76	17,611.76	17,611.76	52,835.29
		Motor vehicle Insurance costs	3	3	1,411.76	12,705.88	4,235.29	4,235.29	4,235.29	12,705.88
		<b>Sub total</b>								
Monitoring and Evaluation	This cost will enable project implementers to monitor activity processes and progress. To monitor if activities achieved and get feedback from communities involved. The costs involved will include; This will be to enable execution and field visits to areas of operation by the EE, meals and accommodation for short meetings, communication costs, and other related costs on a quarterly basis	Per Region per Quarter - USD 2,353	3	10	1,105.88	33,176.47	11,058.82	11,058.82	11,058.82	33,176.47
Baseline Survey costs	Situation analysis before the project implementation starts. Will be undertaken at 3 regional offices	Baseline design, data collection, synthesizing and reports generation	3	1	4,705.88	14,117.65	14,117.65			14,117.65
Project	Secondment means; an existing government	Extraneous/	3	34	3,400.00	346,800.00	115,600.00	115,600.00	115,600.00	346,800.00

Co-ordination Secondment	officer will be compensated for extra duties of coordinating the project through payment of extraneous/ responsibility allowances. This will save cost instead of new employment.. In addition the fees will compensate officers with the following expertise: environmental scientists, agronomists, meteorologists, coordinator, managers, agriculturalists, water engineers, knowledge management, secretarial, administration assistance, communication, enterprise development among others.	Responsibility Compensation				00	0.00	0.00		
		<b>Sub total</b>								346,800.00
Contract Drivers	The costs involved: remuneration costs for hiring a driver on contract for the project period., insurance and statutory compensations.	Driver remuneration including allowances for the 3 regional offices	3	36	235.29	25,411.76	8,470.59	8,470.59	8,470.59	25,411.76
Office day to day running costs	Water, tea, refreshments, stationary, newspapers	Calculated as USD 588 per month for each of the 3 offices	3	36	117.65	12,705.88	4,235.29	4,235.29	4,235.29	12,705.88
Office Equipment and Furniture	Costs involved: office furniture, computers, telephone handsets, tablets, I pads, stationery, Internet connectivity, Modems, LANs, mobile phones, Laptops, water dispenser, fans and others	Each Office to get funds to furnish and maintain the office	3	1	1,411.76	4,235.29	4,235.29			4,235.29
Communication Cost	Purchase of modems and airtime cards, airtime allowance.	Each office to get USD 353 per month	3	36	340.00	36,720.00	12,240.00	12,240.00	12,240.00	36,720.00
Annual Audit Costs	There exist Internal auditors within all the government institutions. The project will be audited alongside other government activities annually. Audits to be undertaken include environmental audits, financial audits and social audits. Cost will cater for auditors' travel, accommodation, Venue, reports generation, meals and allowances while auditing.	The audits will be annual and the cost reflected is that for all audits	3	3	1,411.76	12,705.88	4,235.29	4235.294118	4235.294118	12,705.88
Community Level Meetings	To cater for community mobilization, focused group discussions and other meetings to generate inputs for planning and reporting meetings.		1	1	3,882.35	3,882.35	1,294.12	1294.17647	1294.17647	3,882.35

**380,021.74    2125.40.41    211413.3    804,005.45**

**Total 804,005.45**

**NIE BuDGET**

The implementing entity fee will be utilized by NEMA to cover its indirect costs in the provision of General management support and specialized technical support services.

<b>Expenditure</b>	<b>costs</b>	<b>Description</b>
Oversight and management of project development and project implementation	220,000	Project coordination: project planning, day-to-day project management and implementation
Financial management, including accounting, fiduciary standard monitoring, financial audits	70,000	ensuring that financial management practices comply with AF requirements ensuring financial reporting efficient procurement processes and compliance with Government procurement rules and provides support in the identification of suppliers. Estimation of bank costs for transfer operations and other transaction costs.
M&E and Auditing	266160	Monitoring and Evaluation providing technical support in the areas of risk management, providing guidance in establishing performance measurement

		developing M&E tool Quality assurance including internal and external audits M&E
Information and communication management	40,000	Information management systems and specific project management tracking system
<b>Legal.</b>	10,000	This includes legal advice to assure conformity with Kenyan Laws , county laws
Overall administration and support costs	110,220	Technical support, office management , travel troubleshooting, and support oversight missions ,providing guidance on AF reporting requirements
Total indirect cost	720,000	

Table 15: 3H. Disbursement Schedule

**ANNEX 3: DISBURSEMENT MATRIX – KENYA PROGRAMME**

	Upon Agreement &signature				Total
Scheduled Date	June 2014	June 2015	June 2016		
Direct Costs	4,266,853.53	3,439,635.89	766,647.65		8,473,137.06

Execution Costs(9.5%)	380051.74	212540.41	211413.3	804005.45
NIE Costs (8.5%)	310000.00	302000.00	108000.00	720000.00
Total Costs	4,956,905.27	3,954,176.30	1,086,060.95	9,997,142.51

**Part 4 – Letter of Endorsement**



**MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES**  
**STATE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**Office of the Principal Secretary**

Telegrams: "NATURE" Nairobi  
 Telephone: 254 20 2730805/9  
 Fax: 254 20 2734722  
 Email: [ps@kenyaenvironment.or.ke](mailto:ps@kenyaenvironment.or.ke)  
 Website: [www.environment.or.ke](http://www.environment.or.ke)

MAIL BUILDING  
 RAGATI ROAD  
 RAGATI ROAD  
 NAIROBI

Ref. No: DENR/HMC/11

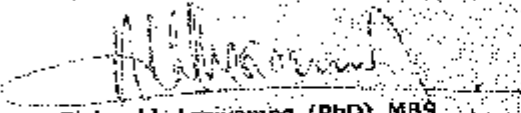
Date: 14 February 2015

The Adaptation Fund Board  
 c/o Adaptation Fund Board Secretariat  
 Email: [Secretariat@Adaptation-Fund.org](mailto:Secretariat@Adaptation-Fund.org)  
 Fax: 202 522 3240/5

**Subject: Endorsement for Integrated Programme to Build Resilience to Climate Change and Adaptive Capacity of Vulnerable Communities in Kenya**

In my capacity as designated authority for the Adaptation Fund in Kenya, I confirm that the above national programme proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of and risks, posed by climate change in the country.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the proposal will be coordinated and implemented by the National Environment Management Authority (NEMA) and executed by the identified Entities.

  
**Richard L. Lesiyampe, (PhD), MBS**  
**PRINCIPAL SECRETARY**



CLIMATE CHANGE ADAPTATION

DURING STATEHOODS FORUM ON A LIST OF ATTENDANCE  
 AT TONGA CATHOLIC PARISH HALL TRAINING/MEETING  
 DATE 21<sup>st</sup> SEP 2011

No.	NAME	GROUP (CBO/FBO/WUC etc)	GENDER M/F	ID NUMBER	IF RC PARENT /GUARDIAN, RC NAME	SCHOOL NAME OF RC	SIGNATURE
1.	DR. Godfrey Ogonda	OSIENALA	M	10703468			<i>Godfrey Ogonda</i>
2.	ANNE ORELO	OSIENALA	F	20259752			<i>Anne Orelo</i>
3.	EL Otiemo	GREEN FOREST SOCIAL INV	M	23255404			<i>El Otiemo</i>
4.	Bader Odier	G.H.F.C.A	F	8260760			<i>Bader Odier</i>
5.	MAMUCE O. OGBLA	G.H.F.C.A	M	5857742			<i>Mamuce O. Ogbla</i>
6.	ELPHAS O. TEMBE	NYAKONYA CBO	M	8160545			<i>Elphas O. Tembe</i>
7.	LEA AWITI	A.K.A NYA CBO	W	7210500			<i>Lea Awiti</i>
8.	JACKSON MUGUNA	GSPDG	M	3096479			<i>Jackson Muguna</i>
9.	KENNEDY OSAMA	PUNDO SUPPORT GRP	M	20018736			<i>Kennedy Osama</i>
10.	FRANCIS W. KITOTO	SUSHO CBO	M	8154064			<i>Francis W. Kitoto</i>
11.	JAKIM UGUDH	G.H.F.C.A	M	1150894			<i>Jakim Ugudh</i>
12.	SALMON OTIENO	GSDDG	M	2721124			<i>Salmon Otiemo</i>
13.	J. Otiemo	GSDDG	M	6612309			<i>J. Otiemo</i>
14.	KIRI OENGO	GSDDG	F	6612309			<i>Kiri Oengo</i>
15.	Marian Muno	BEHIND TOWER GROUP	F	26175191			<i>Marian Muno</i>
16.	Catherine Otiemo	Green Forest social inv.	F	26061955			<i>Catherine Otiemo</i>
17.	Beatrice Ochieng	GSPDG	F	27964711			<i>Beatrice Ochieng</i>
18.	GORDON OCHIENG	MOA	M	6191759			<i>Gordon Ochieng</i>
19.	Timothy Mwangi	WV Kenya Nrb.	M	14511800			<i>Timothy Mwangi</i>
20.	Phimon Otiemo	member of G.H.F.C.A	F	4455094			<i>Phimon Otiemo</i>
No of FEMALE PARTICIPANTS		No of RC PARENTS/GUARDIANS		No of RC PARENTS/GUARDIANS WITH DISABILITY			
No of MALE PARTICIPANTS		No of OTHER PARENTS/ GUARDIANS		No of OTHER PARENTS/GUARDIANS WITH DISABILITY			
Prepared By: <i>Car Juma</i> Date: 21 <sup>st</sup> SEP 2011	Sign: <i>[Signature]</i>	Reviewed By: <i>Namukia Chini</i> Date: 29/09/11	Sign: <i>[Signature]</i>	Approved By: <i>DIMONDI FREDERICK</i> Date: 29.09.2011	Sign: <i>[Signature]</i>		



**MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES**  
**STATE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**  
**Office of the Principal Secretary**

Telegrams: "NATURE", Nairobi  
Telephone: 254-20-2730808/9  
Fax : 254-20-2734722  
Email : [psoffice@environment.go.ke](mailto:psoffice@environment.go.ke)  
Website : [www.environment.go.ke](http://www.environment.go.ke)

NHIF BUILDING  
RAGATIROAD  
RAGATIROAD  
NAIROBI

Ref. No.: DEN/EMC/1/1

Date: 4<sup>th</sup> February, 2014

The Adaptation Fund Board  
c/o Adaptation Fund Board Secretariat  
Email: [Secretariat@Adaptation-Fund.org](mailto:Secretariat@Adaptation-Fund.org)  
Fax: 202 522 3240/5

**Subject: Endorsement for Integrated Programme to Build Resilience to  
Climate Change and Adaptive Capacity of Vulnerable  
Communities in Kenya**

In my capacity as designated authority for the Adaptation Fund in Kenya, I confirm that the above national programme proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the country.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the proposal will be coordinated and implemented by the National Environment Management Authority (NEMA) and executed by the identified Entities.

  
**Richard L. Lesiyampe, (PhD), MBS**  
**PRINCIPAL SECRETARY**