



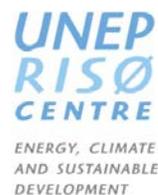
REPUBLIC OF KENYA

PROJECT IDEA REPORT FOR CLIMATE CHANGE TECHNOLOGIES ADAPTATION

MARCH, 2013



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PROJECT IDEA REPORT FOR CLIMATE CHANGE TECHNOLOGIES ADAPTATION

This document is an output of the Technology Needs Assessment project, funded by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP) and the UNEP Risoe Centre (URC) in collaboration with Environmental Development Action in the Third World (ENDA Senegal)), for the benefit of the participating countries. The present report is the output of a fully country-led process and the views and information contained herein is a product of the National TNA team, led by the National Environment Management Authority-Kenya (NEMA-Kenya).

ACKNOWLEDGEMENTS

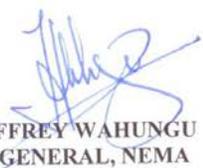
This Technology Needs Assessment (TNA) and Technology Action Plan for Climate Change Report for Adaption is an output of the Technology Needs Assessment Project under the United Nations Framework Convention for Climate Change.

The process for preparing this four-part report benefited immensely from the support and guidance of many persons and organizations and we acknowledge and appreciate their contribution. At the National level, the TNA process was guided by the TNA National Steering Committee which was composed of representatives from government ministries, the National Council for Science and Technology and the Kenya Association of Manufacturers. Our appreciation also goes to all stakeholders from all government ministries, state corporations, non-state actors, university and research institutions, private sector and individuals who participated in the questionnaire surveys, key informant interviews and national stakeholder forums. The TNA adaptation sector working group contributed immensely in the technical review, guidance and backstopping of the adaptation reports and to them we are indebted.

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I would also wish to thank the Permanent Secretary, Ministry of Environment and Mineral Resources for the overall guidance in this project. The NEMA Board of Management provided an enabling environment that made the completion of this report possible, and to them we are indebted. I further wish to recognize the role played by all NEMA staff especially the Director, Environmental Planning and Research Coordination who supervised the TNA Project Management Unit (PMU). The TNA PMU was headed by the Climate Change Coordinator who was the project's National Coordinator. Finally and none the less the least, I would wish to thank the national consultant, Professional Training Consultants for producing this four part report.

This report has assessed the technology needs for climate change adaptation in Kenya. The report has further prioritized technology needs for adaptation within the water and agriculture sectors using a multi-stakeholder process and a linear additive Multiple Criteria Analysis Framework. A Barrier Analysis and Enabling Framework for the prioritized technologies have been done and measures identified to overcome these barriers. Finally, Technology Action Plans and Project Concepts have been developed. It is my sincere hope that these 4 part report findings will prompt all stakeholders to take timely action in climate change adaptation and that the reports will form an important reference tool to spur all actors to implement the prioritized technologies in order to build the resilience of our country in a changing climate.



PROF. GEOFFREY WAHUNGU
DIRECTOR GENERAL, NEMA

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CHAPTER 1

PROJECT IDEAS FOR WATER AND AGRICULTURAL SECTORS

1.1 Brief Summary of the Project Ideas for Water and Agricultural Sectors

The proposed project idea is an integrated project that will introduce 10,000 surface runoff water harvesting systems, 50,000 roof rainwater harvesting units and 500,000 drip irrigation systems to communities for agriculture and household use.

This project idea was conceived in a brainstorming session in a stakeholder's workshop and through consultation with Adaptation Technical Working Group and later developed by the Consultant.

Although the two sectors of water and agriculture form the backbone of this country's social economic development, the two sectors are largely sensitive to climate change. Rainwater harvesting and storage and irrigated agriculture technologies would be ideal measures to address this challenge. Although these technologies have been used in parts of the country for many years, they have not been widely adopted due to several financial and non-financial barriers (discussed in Report II). The purpose of the proposed project is to address these barriers in order to enhance the adoption and diffusion of these technologies. The proposed project will be piloted in 10 selected Counties in the arid and semi- arid areas (ASALs) of Kenya and later replicated to other counties in Kenya.

1.2 Specific Project Ideas: Integrated Climate Change Adaptation Project in Water Harvesting and Drip Irrigation in Selected Counties

1.2.1 Introduction/Background

The proposed project idea is an integrated project on surface runoff and roof rainwater harvesting and drip irrigation technologies for agriculture and household use. The project idea was developed through a participatory and all inclusive process involving key stakeholders through workshops, brainstorming sessions with the Adaptation Technical Working Group, and individual consultations with relevant technical officers.

The proposed technologies are available locally but they are not widely used due to underlying barriers particularly in the arid and semi-arid areas. The main barriers to the adoption and diffusion of the technologies are initial high cost of installation of the systems, lack of incentives and financial credits, and inadequate technical capacity and information on technologies and their benefits. The purpose of the proposed project is to address these barriers in order to enhance the adoption and diffusion of the technologies. The proposed project will be piloted in 10 selected Counties in the arid and semi- arid areas of Kenya, where the effects of climate change and variability are most serious. Each County will start-of with a demonstration centre which will enable farmers to access, learn and appreciate the benefits of the technologies and therefore adopt the technologies.

Other methods that will be used to transfer and diffuse the technologies will be awareness creation, field trips and hands-on training as well as provision of extension services by water and agricultural extension officers. It will also involve developing and

implementing policies to make easily available cheap financial credits and incentives to the local communities.

The project implementation will reduce impacts of climate change on availability of water resources and agricultural development. It is expected that the project will lead to employment creation, improve food security, health and livelihoods for local communities, and enhance gender and children social and economic opportunities. The best practices will be replicated in other ASAL counties.

The **goal** of the proposed project is to enhance transfer and diffusion of climate change adaptation technologies in rainwater harvesting and drip irrigation in selected counties in Kenya, for socio-economic development.

1.2.2 Objectives

- i) To construct 10,000 community surface run-off rainwater harvesting systems in 10 ASAL areas Counties by 2017.
- ii) To install 50,000 roof rainwater harvesting systems in the 10 Counties in the ASAL areas by 2017
- iii) To introduce 100,000 drip irrigation systems to individual farmers and institutions, in 10 Counties of the ASALs area by the year 2017.

1.2.3 Outputs

- i) 10 pilot surface run-off water harvesting and roof rainwater harvesting demonstration centres, each integrated with a drip irrigation demonstration site are established and functional in the first two years.
- ii) 10 irrigation demonstration projects are functional and ongoing in 10 counties.
- iii) 1,000 surface run-off water harvesting systems are established and functional in 10 counties by 2017.
- iv) 50,000 roof rain water harvesting systems are installed and functional in 10 counties by 2017.
- v) 100,000 drip irrigation systems are operational and functional in 10 counties by 2017.
- vi) 10 technicians per county to man the demonstration centres and provide extension services are trained within the first 2 years.
- vii) Local communities and institutions are trained and continuously made aware of the importance of adapting the technologies.
- viii) Advocacy for incentives including rebates, tax waivers and soft loans are launched.
- ix) Brochures, audio visual materials and bill boards are placed in strategic locations.

1.2.4 Relationship to the Country's Development Priorities

Kenya's development plans and strategies are anchored on Vision 2030, which is the Country's blue print for transforming the country to a newly Industrial Middle Income country, capable of providing high quality of life to all citizens, by the year 2030. The Vision and other country's strategies and action plans have identified several key sectors of development, which include water resources and agriculture. All economic sectors depend on water resource availability and adequate quantity and quality of

water is recognised as a basic requirement for Kenya's economic growth and performance (GoK 2010). Agriculture is the mainstay of the Kenyan economy and accounts for about 26% of GDP directly and another 25% indirectly through linkages with manufacture, distribution and other service related sectors (GOK, 2010).

The Constitution of Kenya (2010) also guarantees the right to water and food under the Bill of Rights. The proposed technologies will enhance the provision of these rights by providing water and food from irrigation.

1.2.5 Deliverables

The proposed integrated surface runoff and roof rainwater harvesting and drip irrigation project is expected to have the following deliverables:

- i) Training manuals and charts on water harvesting and drip irrigation technologies for technical personnel and local communities
- ii) Workshops and training seminars reports
- iii) Annual and quarterly project review reports
- iv) Established and functional water harvesting and drip irrigation demonstration sites
- v) Survey reports on the project impact on socio-economic status of local communities including employment, improved livelihood, gender empowerment, children education
- vi) Visibility materials for further enhancement, transfer and diffusion of technologies are developed.

1.2.6 Project Scope and Possible Implementation

The project broadly responds to National goals relating to the adaptation to climate change, which is negatively impacting on the social economic development. The National Climate Changes Response Strategy (2010) fully acknowledges the reality of climate change and proposes policy decisions on climate change adaptation measures. In line with this is the National Policy for the Sustainable Development of Northern Kenya and other Arid Lands emphasizes how to ensure food and nutrition security in arid and semi-arid lands, where rainfall is unpredictable, a the problem is certain to increase as the impact of climate change deepens.

The scope is national but the pilot project will target 10 counties in ASAL areas. Several integrated environmental projects have been implemented in this country and experience shows that implementing stand alone projects is not cost effective. Therefore, the proposed project will link to the current and past projects in the ASAL areas. These include e.g. sand dams that have in the past been constructed in south eastern regions of Kitui and Machakos, and have helped to alleviate water problems associated with prolonged dry seasons in these regions. The project will also build on the completed World Bank project on Natural Resources Management in 28 arid and semi-arid districts in Kenya. The water harvesting and drip irrigation projects will build on these projects among others and therefore enhance resilience to climate change for the local communities.

1.2.7 Project Activities

The project activities and associated actors are sequentially presented in Table 1.1.

Table 1.1: Projected Activities and Actors

	Activity	Actors
1.	Organise stakeholder meetings to identify and select participating counties and location of the demonstration sites	NEMA and Key Stakeholders
2.	Administrative activities including recruitment and retraining of staff	NEMA and Project Implementation Committee (PIC).
3.	Undertake baseline surveys on the impacts of climate change and variability and identify natural resources, economics, cultural and social barriers and enabling environment to the adoption and diffusion of rainwater harvesting and drip irrigation technologies	Project staff assisted by PIC
4.	Undertake training needs assessment	Project staff assisted by PIC
5.	Construction of water harvesting and drip water irrigation demonstration facilities	Project staff and local labour
6.	Give the hands-on training on the use of the identified technologies.	Project staff and PIC
7.	Preparation of publicity materials, training curriculum and learning materials for community groups, governmental and non-governmental organisations and community based organisations.	Project Staff with locally procured firms
8.	Demonstrate the application and benefits of the integrated project at household, community, and institutional levels.	Project Staff and PIC
9.	Undertake awareness creation in the participating counties through farmers' field days, print and electronic media in local languages, and during chief's barazas and agricultural shows.	Project Staff and PIC
10.	Carryout exchange programmes between and within counties where technologies are being practised.	Project Staff and PIC
11.	Identify and document best practices for replication in other parts of the country.	PIC and project staff
12.	Identify barriers to and challenges on the implementation of the technologies and come up with appropriate measures and mitigation.	Project Staff and PIC
13.	Initiate follow-up activities by water and agriculture extension officers.	PIC and project staff
14.	Soliciting of funds including soft loans, grants, and seeking collaboration with micro-financing institutions.	PIC

1.2.8 Timelines

The whole project will be implemented in 5 years and the activities will be implemented as indicated on Table 1.2.

Table 1.2: Timelines for the Integrated Project

	Objectives/Activities	Timeline/ Year (Yr)
1.	Establish pilot rainwater harvesting centres in 10 selected counties	Yr 1 - 2
2.	Establish pilot drip irrigation centres in 10 selected counties	Yr 2 - 3
3.	Train technicians and farmers in surface run off and rainwater harvesting and drip irrigation technologies	Yr 2 - 3
4.	Awareness creation and diffusion of the technologies to the local communities	Continuous
5.	Visibility materials for further enhancement, transfer and diffusion of technologies	Yr 2 - 5

1.2.9 Budget/Resource Requirements

The proposed budget for the integrated project is Kshs 16.5 Billions. The itemised budget is presented in Table 1.3.

Table 1.3: Summary of the Proposed Budget

Serial No.	Project Component	Cost per County (Million Kshs)	Total Cost (Million KShs)
1.	Establishment of functional surface water harvesting and related activities	410	4100
2.	Establishment of functional roof rainwater harvesting and related activities	200	2000
3.	Establishment of functional drip irrigation facilities and related activities	170	1700
4.	Establishment of administrative centres at the headquarters and project sites	200	2000
5.	Procurement of vehicles, equipment, stationery and related activities	100	1000
6.	Staff employment/ Remuneration, consultancies and related activities	200	2000
7.	Reimbursable	100	1000
8.	Monitoring and evaluation	20	200
8.	Miscellaneous Expenses	250	2500
Total Budget (Million KShs)		1650	16500

The project will be funded through community contributions, government budgetary allocations, soft loans from micro-financing institutions, grants from development partners and Non-governmental Organisations, and private sector.

The Government budgetary allocations will fund government technical and extension officers, research on the technologies, and devolved funds for implementation of the technologies and infrastructure.

The communities will contribute labour and land for implementation of the climate change adaptation technologies within the counties. For purposes of sustainability and

ownership of the projects the communities will be expected to implement the projects through acquiring soft loans, for implementation of the projects, which they will be expected to pay back. The government will put in place enabling framework to enable local community to access soft loans from micro-finance institutions.

The development partners will co-finance special funds for micro-finance, training and awareness creation materials, vehicles and equipment, exchange visits and consultancy services. NGOs and private sector in partnership with the government will be expected to contribute to diffusion of the technologies.

The project implementation will be carried out in partnership with community, government, private sector, NGOs and Development partnership.

1.2.10 Measurements/Evaluation

A participatory evaluation, monitoring and evaluation system will be put in place. This will include a quarterly monitoring system to identify planned outputs, achievements and challenges of technology up-take and diffusion. A mid-term evaluation and end of project evaluation will be undertaken. This will form a basis for lessons learnt and project replication.

1.2.11 Possible Complications

Out of the three proposed technologies, the challenge that was highlighted most as risk to the implementation of the integrated project is political goodwill (Report III). This was seen in terms of possible government's inadequate support to climate change adaptation initiatives and poor cooperation and collaboration among government agencies in implementing the project. The challenges will be addressed through awareness creation and exposure of Policy Makers to the costs of not undertaking climate change adaptation measure and the benefits of implementing the technologies.

Inadequate awareness and negative attitudes could also bring complications as many people generally resist change and would likely not put in place measures for adaptation. The project will create awareness to local communities on the socio-economic benefits of adopting these technologies. Training is expensive and this could be a challenge in the capacity building of technicians and key stakeholders. However, it is expected that the resources to facilitate training will be provided by the government in partnership with donors and private sector.

The other challenge is difficulties in obtaining funding for the project due to lack of donor financial support and competition with other organs of the government like health and education for limited government funds. Poor loan recovery measures would constrain revolving loans proposed in agriculture sector. This challenge will be overcome through development of policy on provision of incentives in form tax rebates and soft loans, and creation of special irrigation and water harvesting funds. Scarcity of resources like land is likely to be a challenge to the project implementation but can be overcome through involvement and intervention by local communities.

Climate related factors such as prolonged drought and the associated impacts on water harvesting for drip irrigation maybe a major constraint to the implementation of the

proposed integrated project. However, issues of climate are external but can be overcome by putting in place early warning systems.

1.2.12 Responsibilities and Coordination

The overall coordination of the project will be undertaken by National Environment Management Authority (NEMA) under the oversight of Ministry of Environment and Mineral Resources (MEMR). The government ministries responsible for water resources and agriculture will facilitate the implementation of rainwater harvesting, drip irrigation and agricultural activities in collaboration with local communities and development partners. The Ministry of Finance will provide the counter devolved funds for the up-take of the project including provision of financial incentives and soft loans.

The project will be implemented through a project steering committee at the national level, which will comprise all partners and stakeholders. Project implementation committees will also be established at the County levels and will include the key partners, stakeholders and a representation of gender and people with disabilities.

CHAPTER 2 PROJECT IDEA FOR AGRICULTURE SECTOR

2.1 Brief Summary of Project Idea for Agriculture Sector

The project idea of Drought Resistant Sorghum Varieties was identified through stakeholder consultation on the basis of its potential to climate change adaptation and contribution to socio-economic development. The main purpose of the project is to increase food security in the ASAL area by expanding the area under arable land and promoting wide adoption of Drought Resistant Sorghum in Kenya's ASAL Counties. Sorghum is not only drought tolerant but also adaptable to most of Kenya's climatic zones and soils. The project will be implemented in 10 selected ASAL counties with a possible extension to other counties.

2.2 Specific Project idea for Promotion of Adoption of Drought Tolerant Sorghum in Arid and Semi-Arid Lands (ASALs) of Kenya

2.2.1 Introduction/Background

Rainfall pattern is unreliable in most parts of the country and droughts have become more frequent. Therefore there is need for introduction of high yielding, drought tolerant, early maturing crop varieties, such as drought tolerant sorghum, in order to enhance food security in the country. Drought tolerant sorghum requires relatively little rainfall and it therefore grows well in arid and semi arid areas.

Drought resistant sorghum technology reduces the risk of total crop failure and provides the producers with chances of dealing with uncertainties created by climate change because it requires little moisture to mature. It is also adaptable to most of Kenya's climatic zones and soils and is not affected by pests as much as other cereals such as maize.

The drought resistant sorghum project idea was developed through a participatory and all inclusive process involving consultations of key stakeholders in workshops, brainstorming sessions with the Adaptation Technical Working Group, and consultations with technical officers. The proposed project ideas will be piloted in 10 selected counties in arid and semi arid areas of Kenya which are hard hit by climate change and later replicated to other parts of this country.

The **goal** of the proposed project is to introduce drought tolerant sorghum varieties to 100,000 farmers in 10 selected ASAL counties by the year 2017.

2.2.2 Objectives

- i) To create awareness and build capacity of stakeholders on drought resistant sorghum varieties in 10 selected counties in the ASAL areas.
- ii) To promote adoption of drought tolerant sorghum varieties through seed multiplication in 10 demonstration centres in each participating county.
- iii) To promote marketing and distribution of sorghum varieties seeds to agro-dealers, stockists and retailers in order to enhance production of sorghum by participating farmers.
- iv) To promote access to loans and credits to farmers.

2.2.3 Outputs

- i) Stakeholders are trained in the management of drought resistant sorghum varieties
- ii) Awareness created on the availability of the drought tolerant sorghum varieties.
- iii) Sorghum foundation seeds are made available in 10 demonstration centres
- iv) 50% of farmers in 10 selected ASAL counties adopt the technology
- v) Improved efficient and effective seed marketing system is in place in 10 selected counties
- vi) Access to markets and services in 10 selected counties is improved.
- vii) Loan scheme for drought tolerant sorghum created in the 10 counties

2.2.4 Relationship to the Country's Sustainable Development Priorities

Kenya's Vision 2030 recognizes agriculture as a key driver of the national development programs towards realization of the Vision. Agricultural policy of 2006 emphasizes the goals of increasing productivity and income growth, especially for smallholders, enhanced food security, and equity. This will mainly be achieved through increasing agricultural productivity and incomes by encouraging diversification into non-traditional agricultural commodities and value addition to reduce vulnerability and enhancing the food security, which will lead to the achievement of Millennium Development Goals (MDGs). Promotion of development of drought resistant sorghum in the ASALs will assist Kenya to achieve food security and also enhance its capacity to adapt to climate change in the ASALs of Kenya which occupy about 85% of the total land area.

2.2.5 Project Deliverables

The proposed promotion of adoption of drought tolerant sorghum varieties technologies is expected to have the following deliverables:

- i) Training manuals on seed production, inspection, storage and certification for extension officers and agro-dealers.
- ii) Workshops and training seminars and reports
- iii) Annual and quarterly project review reports
- iv) Drought tolerant sorghum technology is developed and used by targeted communities in 10 participating counties for climate change adaptation.
- v) Report on the project impact on socio-economic status of local communities including employment, improved livelihood, gender empowerment, children education
- vi) Visibility materials for further enhancement, transfer and diffusion of technologies are developed.

2.2.6 Scope and Possible Implementation

The National Climate Change Response Strategy (2010) was the first national policy document to fully acknowledge the reality of climate change and give guidance on policy decisions on climate change adaptation measures. As a follow-up measure, the National Policy for the Sustainable Development of Northern Kenya and Other Arid Lands emphasized how to ensure food and nutrition security in arid and semi-arid

lands, where unpredictability is certain to increase as the impact of climate change deepens.

In the semi-arid areas of Kenya, four agricultural projects that include drought growing of sorghum are being run by the National Agricultural and Livestock Extension Programme (NALEP), SIDA, Swedish International Development Agency (SIDA), Government of Kenya (GoK) and the National Museums of Kenya (NMK) and about 5 % of farmers have been reached. The proposed project will link to these and other related ongoing present and past projects in the ASAL areas.

The technology has been developed but not widely adopted by farmers in the country. However, the adoption studies have been on and are still on-going. Extension agents and NGOs are promoting drought tolerant sorghum for food security and beer brewing. Trials are on for forage sorghum variety that is capable of multiple cutting for over 3 years, which will double the harvest per acres. Each farmer will initially grow the drought tolerant sorghum on one acre piece of land.

The project will be piloted in 10 ASAL counties with possible replication to the other counties in the ASAL areas and will target about 10,000 farmers per county. It is expected that the production of the sorghum will address food security in the area.

2.2.7 Project Activities

The project activities and associated actors are sequentially presented in Table 2.1.

Table 2.1: Project Activities and Actors

	Activity	Actors
1.	First stakeholders meeting and establishment of Project Implementation Committee (PIC)	Ministry of Agriculture and Ministry Special of Programmes
2.	Establishment of project offices and demonstration centers in 10 selected counties	Ministries of Agriculture and Special of Programmes and PIC
3.	Recruitment of project staff	Ministries of Agriculture and Special of Programmes and PIC
4.	Community sensitization and public awareness campaigns on Drought Tolerant sorghum varieties	Technical officers from the Ministries of Agriculture and Special of Programmes and PIC
5.	Training of Extension Staff , Agro Dealers, Stockiest, Retailers on seed business on: Production, Inspection, Certification, Storage, Processing, Packaging and Marketing and Good Agricultural Practices (GAP)	Technical officers from the r Ministries of Agriculture and Special of Programmes and PIC
6.	Dissemination of information on the technology to farmers through print and electronic media and public meetings	Project Staff and PIC
7.	Provide subsidies to enhance access to seeds, fertilizers and other inputs to increase Sorghum Production	Technical Officers from Ministries of Agriculture and Special of Programmes and Project Employees
9.	Initiate collaboration initiatives between Research Institutions and Extension Officers.	Project staff
10.	Initiate networks, collaboration and cooperation amongst the various Stakeholders involved in seed business	Project Staff
11.	Promote access to markets and services in and outside Kenya	PIC and Project staff
14.	Provide loans and credits to farmers	Financial Institutions

2.2.8 Timelines

The project will be implemented in 5 years and the activities will be implemented as indicated on Table 2.2

Table 2.2: Timelines for Project Implementation

	Activities	Timeline
1	Staff employment	01 Month-03 Month
2	Information sensitization and public awareness creation	04-60 Month
3	Training of extension staff, agro dealers and stockists	05-60 Month
4	Promote information flow to farmers through I.C.T to reach many farmers	06-60 Month
5	Enhance networking, collaboration and cooperation amongst stakeholders	06-60 Month
6	Intensify the collaboration between extension officers and farmers	30-60 Month
7	Provision of equipment, stationery and related activities	01 Month-03 Month
8	Provide loans and credit to farmers	08-60 Month

2.2.9 Budget/Resource Requirements

The total project budget the National project is as shown in table 2.3 below is Kshs. 20.04 billion which will be used to implement 100,000 draught tolerant sorghum projects in 10 selected counties. The project budget will be implemented as shown in table 2.2 below.

Table 2.3: Summary of the Proposed Budget

	Activity	Cost per County (Million Kshs)	Cost per County (Million Kshs)
1.	Establishment of project offices and demonstration centers in 10 selected counties	10	100
2.	Community sensitization and public awareness campaigns on Drought Tolerant sorghum varieties	5	50
3.	Training of Extension Staff, Agro Dealers, Stockiest, Retailers on seed business	60	600
4.	Dissemination of information on the technology to farmers through ICT, print and electronic media, and public meetings	2	20
5.	Provide subsidies to enhance access to seeds, fertilizers and other inputs to increase Sorghum Production	10	100
6.	Initiate collaboration initiatives between Research Institutions and Extension Officers.	2	20
7.	Promote access to markets and services in and outside Kenya	2	20
8.	Provide loan and credits to farmers	100	1000

9.	Staff employment and remuneration and related activities	10	100
10.	Reimbursable	1	10
11.	Monitoring and evaluation	2	20
Total Budget (Million KShs)		204	2040

The project will be funded through community contributions, governmental budgetary allocations, and soft loans from micro-financing institutions and grants from development partners and Non-governmental organisations and private sector.

The Government budgetary allocations will fund government extension officers, land for demonstration centres, research on the technologies, devolve fund for implementation of the technologies and infrastructure.

The communities will contribute labour, land for implementation of the climate change adaptation technologies within the counties. For purposes of sustainability and ownership of the technologies the communities will be expected to implement the technologies through soft loans which they will be expected to pay back. The government will put in place enabling framework to enable local community to access soft loans from micro-finance institutions.

The development partners will co-finance special funds for micro-finance, training and awareness creation materials, vehicles and equipment, exchange visits and Consultancies. NGOs and private sector in partnership with the Government will be expected to contribute to diffusion of the technologies.

The project implementation will be carried out in partnership with community, government, private sector, NGOs and Development partnership.

2.2.10 Measurement/Evaluation

The project will have a project steering committee chaired by the Ministry of Agriculture. Other members will comprise representatives from the relevant government institutions, financial institutions, development partners, NGOs and project beneficiaries. The Project Steering Committee will be responsible for monitoring project implementation and will receive project progress reports from the Project Manager on quarterly basis.

2.2.11 Possible Complications/Challenges

Political goodwill was seen as the greatest risk to the implementation of the drought tolerant sorghum. This can however, be addressed through sensitization of technical officers on the benefits of adopting this technology and continuous collaboration and update. The other challenge is difficulties in obtaining funding for the project, mainly due lack of donor financial support and competition with other organs of the government like health and education for limited government funds. This can be addressed through sourcing of funds from donors private companies particularly the end users of sorghum and micro-credits to local communities.

Climate related factors such as prolonged drought and the associated impacts on agriculture can be a major constraint to the implementation of the proposed project. While this is beyond the projects control, local communities will be encouraged to put in place measures for adapting to climate change such as water harvesting and storage. The challenge can also be addressed through establishment on early warning systems and timely dissemination of information on climate variability to farmers.

2.2.12 Responsibilities and Coordination

The project will be coordinated by the Ministry of Agriculture in collaboration with the interested stakeholders. These include the following:

- i) Government of Kenya
- ii) Civil society(NGOs)
- iii) Private sector
- iv) Financial institutions
- v) Development Partners

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Annex I

SECTOR WORKING GROUP – ADAPTATION FOR THE 4TH TNA
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