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Ministry of Agriculture Animal Industry and Fisheries

Performance Monitoring and Evaluation Framework for National Adaptation Plan for Agriculture (NAP-Ag)

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Acronyms and Abbreviations

ASSP	Agriculture Sector Strategic Plan
CAADP	Comprehensive Africa Agriculture Development Programme
CCA	Climate Change Adaptation
Co2	Carbon dioxide
CSA	Climate Smart Agriculture
EAC	East Africa Community
GHG	Green House Gases
IITA	International Institute of Tropical Agriculture
M&E	Monitoring and Evaluation
MAAIF	Ministry of Agriculture Animal Industry and Fisheries
MDGs	Millennium Development Goals
MGLSD	Ministry of Gender Labour and Social Development
MoICT	Ministry of Information and Communication Technology
MoLG	Ministry of Local Government
MoLHUD	Ministry of Lands Housing and Urban Development
MTEF	Medium Term Expenditure Framework
MWE	Ministry of Water and Environment
NAPAs	National Adaptation Action Plans
NAP-Ag	National Adaptation Plan for Agriculture
NARO	National Agriculture Research Organization
NPA	National Planning Authority
PACCA	Policy Action for Climate Change Adaptation
PEAP	Poverty Eradication Action Plan
PM&E	Performance Monitoring and Evaluation
PRA	Participatory Rural Appraisal
UBOS	Uganda Bureau of Statistics
UNDAF	United National Development Assistance Framework
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United Stated Agency for International Development

1. Background

1.1 Agriculture and Climate Change

Agriculture is the biggest pre-occupation for the majority of Ugandans, providing a source of income and livelihood for over 76% of the population. Most of the agriculture is dependent on rain and relative fertile soils. However, high population increase, climatic variability and poor agricultural practices have placed growing pressure on land leading to soil degradation and a slow growth in the agriculture sector.

Climate change affects agricultural production in a diverse and complex manner. Variability in rainfall and more extreme weather events and climate impacts are also having a detrimental effect, causing significant crop losses. For example, an increase in temperature escalates soil chemical reactions leading to increase in decomposition of organic matter and therefore release of greenhouse gases into atmosphere. This process also results in loss of fertility thus affecting yield negatively. Somehow agriculture contributes to climate change and is also affected adversely by climate change.

Uganda has over the last three decades been affected by annual El Nino rains that have caused flooding and mudslides, on the one hand, and severe droughts on the other. Between 2015 and 2017, 13 districts across Uganda (and mainly in the cattle corridor) recorded severe temperatures, leading to loss of both crops, fisheries, animals and human life. Erratic weather patterns have complicated agricultural decision by Government but also for family households.

Box 1: According to the modelling done by MAAIF, weather changes by 2^0C will see a drastic reduction in yield for Arabic coffee and limit Robusta coffee only to limited highlands only. Trends show that this could happen as soon as 2025 if the current trends are not reversed.

Adaptation in the agriculture sector is imperative if Uganda is to achieve goal of the National Agricultural Policy which is achieving a commercially viable, competitive, profitable and sustainable sector. Climate change threatens now to undo gains in food and cash crop production; animal and fisheries productivity and contribute to forest fires (in dry spells) and mudslides (in rainy seasons).The United Nations Development Assistance Framework (UNDAF) has since early 2000s produced study reports on the potential impact of climate change on agriculture in Uganda. In response, Uganda put in place a climate change platform through which stakeholders would engage and complement each other to address this problem. This and other process led to the adoption of the specific actions for adaptation and/or mitigation of adverse effects of climate change. Since 2010, Agriculture has taken the lead and became the first sector to elaborate a nation-wide national adaptation action plans for its sector. It is hoped that this will continue to inspire other sectors to put these plans in place – but also implement the various strategic interventions to address climate change.

1.2 National Adaptation Action Plan for Agriculture (NAP-Ag)

By signing and ratifying both the United Nations Framework Convention on Climate Change, 2010 (UNFCCC), Uganda has committed to the adoption and implementation of policies and measures designed to mitigate climate change and adapt to its impacts. Parties to the UNFCCC adopted National Adaptation Action Plans (NAPAs) in 2011 in Durban South Africa and the elaboration of the plans is part of the Global Climate

Change Alliance (GCCA) in partnership with UN-FAO and UNDP in Uganda all supporting the Ministry of Agriculture Animal Industry and Fisheries in this endeavour.

The National Adaptation Action Plan (NAPAs) are a series of interventions planned to guide a process that builds the country adaptation undertakings, to integrate climate change into national decision-making schedules and other planning opportunities. NAPAs are intended as a means for countries to reduce their vulnerability to the impacts of climate change, by building adaptive capacity and resilience, while facilitating the integration of climate change adaptation into development planning processes and strategies across all sectors.

Uganda's Cabinet approved the National Climate Change Policy in April 2015 with a goal of 'ensuring a harmonized and coordinated approach towards a climate- resilient and low-carbon development path for sustainable development in Uganda'. The policy provides overall direction to all sectors that are and/or likely to be affected by climate change to facilitate action on climate smart development. On its part, MAAIF working through its Climate Change Unit has elaborated the National Adaptation Plan for the Agriculture sector (NAP-Ag). The purpose of the NAP-Ag plan is particularly to highlight responses needed to reduce the level of vulnerable to climate change due to extensive reliance on rainfall, high seasonal climate variability, recurrent drought and floods and persistent poverty that limit the capacity to adapt. The Vision of the NAP-Ag is **'climate resilient and sustainable agricultural sector contributing towards achievement of the Uganda Vision 2040'.**

The NAP-Ag has the following overall objectives:

i. Promote climate resilient cropping systems and value chains;
ii. Promote climate resilient livestock production systems and value chains;
iii. Promote climate resilient fisheries and integrated fisheries resource management;
iv. Strengthen climate information, early warning and disaster preparedness mechanism for a better informed agricultural planning and decision making;
v. Promote sustainable natural resources management that enhances the resilience of agriculture and agrarian communities to a changing climate;
vi. Promote climate smart agricultural research and innovations;
vii. To enhance knowledge of good practices and partnerships to reduce vulnerability of the agricultural sector to the impacts of climate change; and
viii. Promote a gendered climate smart agriculture programme to reduce the vulnerability of women, youth and other groups.

MAAIF has rallied key stakeholders at national and district levels to ensure that this framework meaningfully contributes to address the adverse effects of climate change in fulfilment of Uganda's obligations under the UNFCCC. To ensure MAAIF is able to implement the NAP-Ag interventions and assess the progress being achieved, this Monitoring and Evaluation Framework has been produced to a reference document for this process.

1.3 Rationale for the M&E Framework for NAP-Ag

As Performance and Monitoring Framework, this report will support the assessment of NAPAs for agriculture (NAP-Ag) and guide documentation of achieved impact at national and subnational levels. The framework presents the overall performance indicators (at output and outcome levels), mechanisms to capture and manage data (and with gender lenses); and the estimates of the implementation cost. This framework is aligned the national overall framework on Climate Change, UN Sustainable Development Goals and UNDAF framework. MAAIF will use this report to train end users of the PM&E Framework at all levels.

1.4 Other Key Aspects of the M&E Framework

Gender Profiling within the Framework

Agriculture is the main source of employment for Uganda's rural women. Ensuring women's economic empowerment and access to and control over resources and space in the knowledge society requires an integrated approach to growth and development, focused on gender responsive employment promotion and informed by the interdependency between economic and social development. A number of gender[1] based differences in the Agriculture sector exist in Uganda. Most women do not own land and while they contribute to farm labour, they often do not make economic choices on returns from sale of produce at the household level. It is mostly the men who are heads of households in most cases that do. This framework will also support a process to increase gender awareness, build capacity for gender mainstreaming at both national and local government levels to ensure proportionate benefit for all.

While Uganda has made progress promoting gender equity and equality in various sectors, more needs to be done to further mainstreaming as various NAPs are implemented. The framework gives attention to key aspects to make the process: gender-sensitive, responsive to aspects that promote decent work, and promote access to productive assets including land, equipment, financial services, and other aspects of social protection (to ensure inclusive growth).

Use of Quasi-Experimental Designs to study CCA best practices

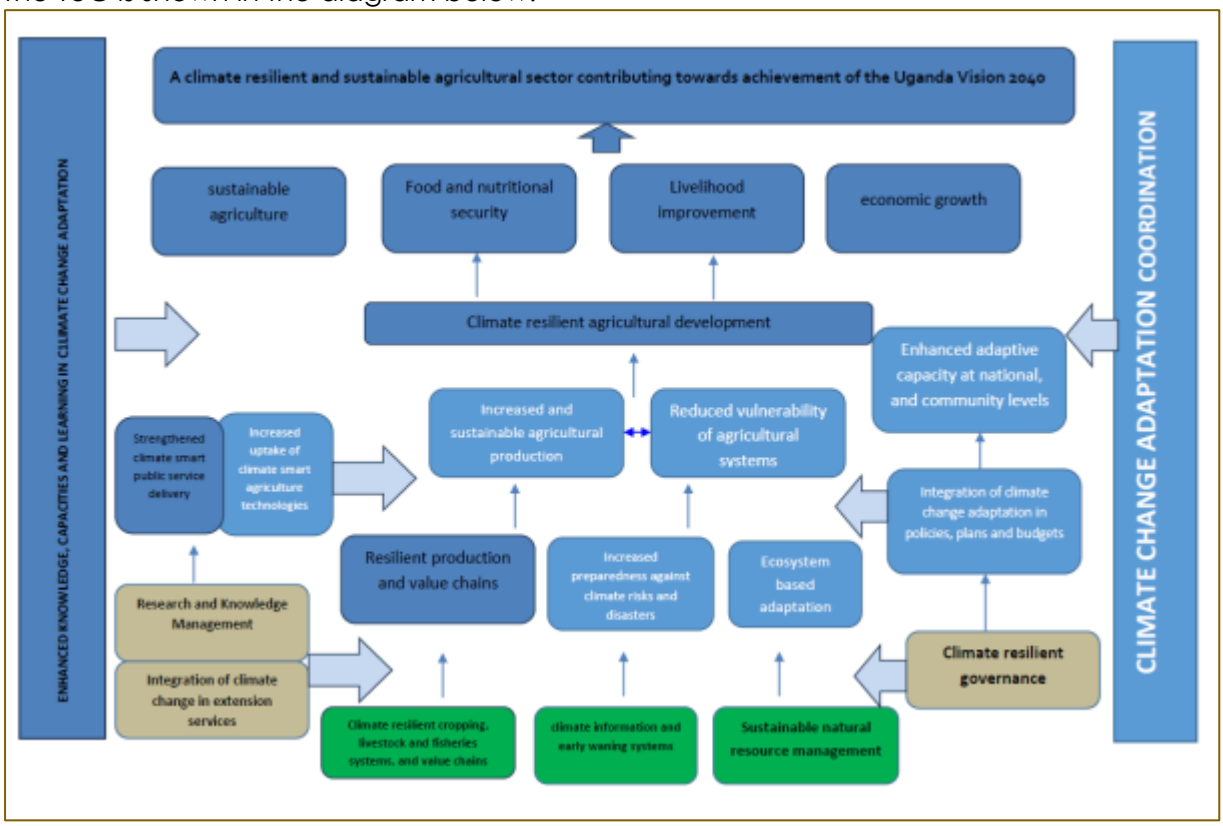
This framework will generate national and district level (preferably per enterprise) as evidence to inform policy makers of courses of action/ opportunities for intervention. This will be done by conducting studies on adaptation options based on quasi-experimental design principles – as commonly used in impact evaluations. Quasi-experimental designs (QEDs) provide evidence of intervention outcomes in comparison to areas where such interventions have not been made to assess the net impact. For the start, the target is to have a minimum of two sub-sectors of MAAIF adopt impact assessment frameworks based on QEDs.

[1]Uganda was ranked 73 out of 86 in the 2012 Social Institutions and Gender Index with a score of 0.383802; 46 out of 136 in the 2013 Global Gender Gap Index with a score of 0.7086; 110 out of 148 in the 2012 Gender Inequality Index with a score of 0.517.

2. NAP-Ag Theory of Change

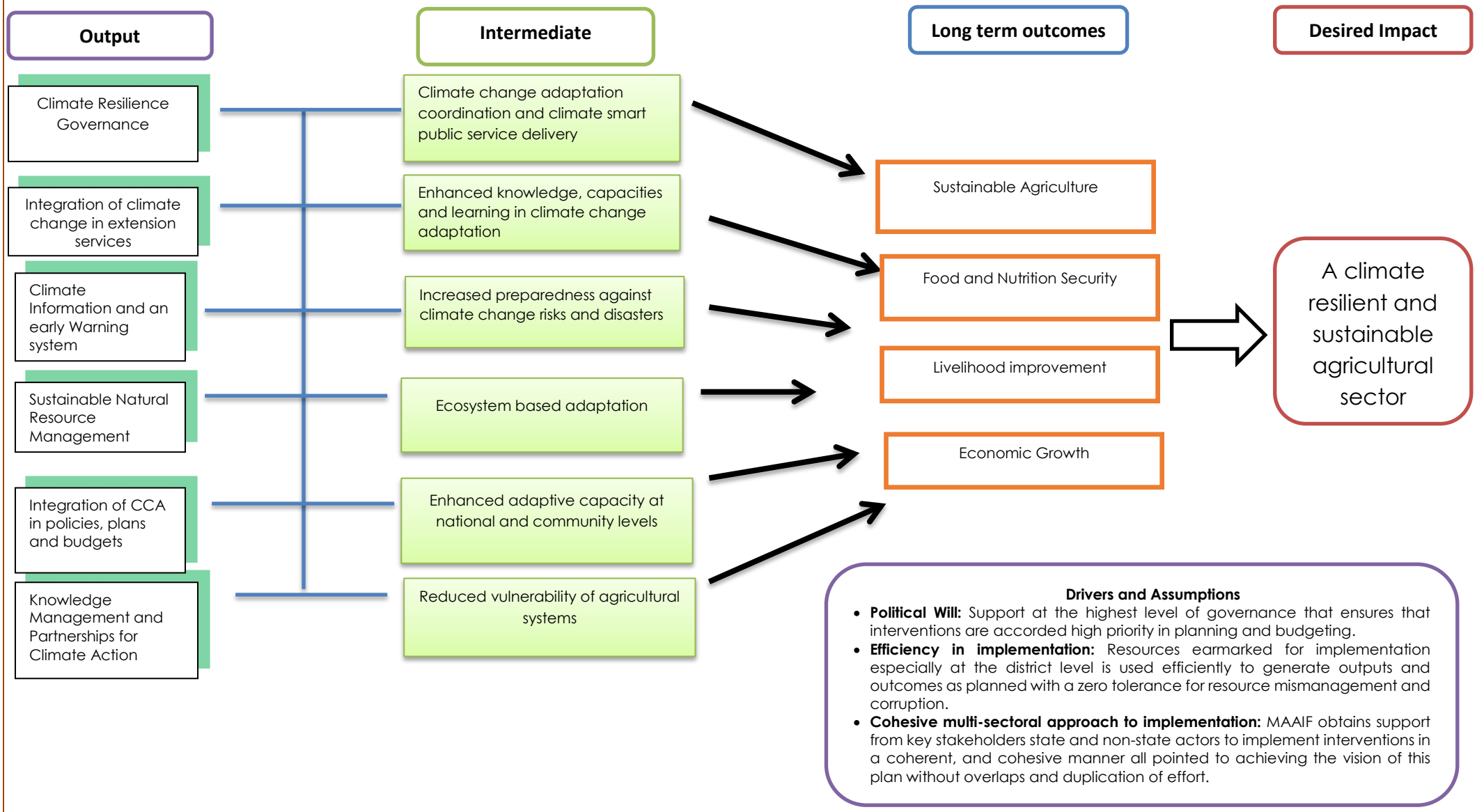
The NAP-Ag M&E framework theory of change (ToC)provides a visual presentation of the locus of points aligned as steps necessary to bring about a given long-term goal/impact desired. It also includes assumptions as well as success factors underlying this theory. Outputs translate into intermediate outcomes in the medium term and longer term outcomes which eventual lead to the vision of the plan.

The ToC is shown in the diagram below.



After discussion with various stakeholders, due to the complexity of the layout and difficulty to follow the various arrows, there was consensus that this ToC be re-drawn to make it simpler and show much more clearly how these interventions. As shown by the diagram below, a climate resilient and sustainable agricultural sector is the desired impact overall that is desired. To achieve this long term vision, a series of interventions will be required to generate both intermediate and long-term outcomes which will result into food and nutrition security; livelihood improvement, sustainable agriculture all contributing to economic growth. To start on this process (as shown on the left) MAAIF will support process that enhance knowledge, capacities and learning in CCA; ensuring climate change resilience governance; integration of CCA in agricultural extension services to ensure resilient value chains. Investment will also be made in sustainable natural resource management for eco-system based adaptation as well as increased uptake of climate smart agricultural technologies.

Re-constructed NAP-Ag Theory of Change



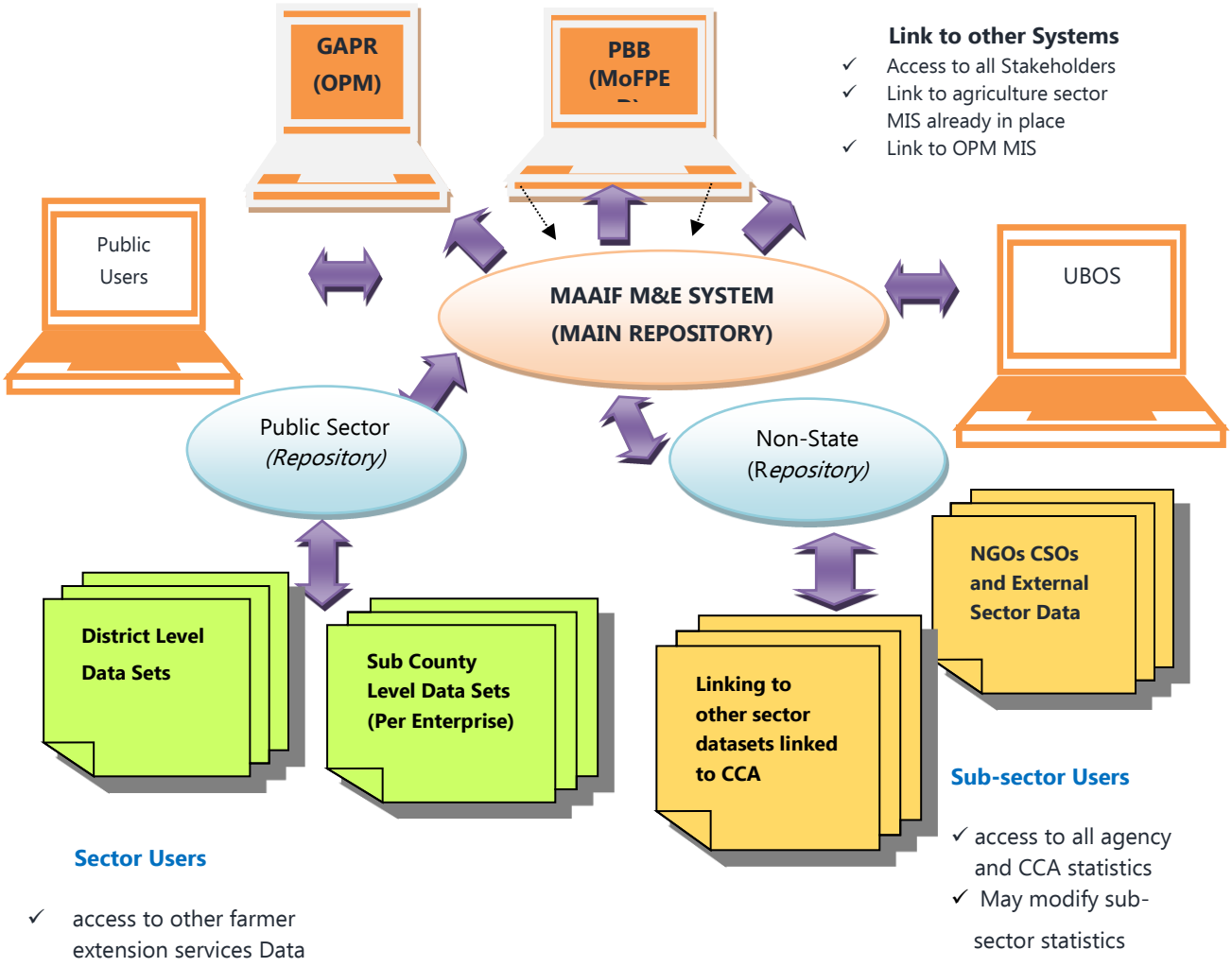
Drivers and Assumptions

- **Political Will:** Support at the highest level of governance that ensures that interventions are accorded high priority in planning and budgeting.
- **Efficiency in implementation:** Resources earmarked for implementation especially at the district level is used efficiently to generate outputs and outcomes as planned with a zero tolerance for resource mismanagement and corruption.
- **Cohesive multi-sectoral approach to implementation:** MAAIF obtains support from key stakeholders state and non-state actors to implement interventions in a coherent, and cohesive manner all pointed to achieving the vision of this plan without overlaps and duplication of effort.

3. M&E Results Framework

Government put in place a National Public Sector M&E Policy (2013) and this framework has been developed to align to this policy. As shown below, data collected from local governments will feed into the National MAAIF M&E system. From the analysis made by the system, the Ministry of Agriculture will generate quarterly reports to support national reporting under the broader Performance Based Budgeting tool (PBB) - submitted quarterly to the MAAIF. Key performance data will be captured by budget performance reporting by ministry of finance and Government annual and bi-annual performance (GAPR) under Office of the Prime Minister.

Fig. 4: Visualization of Working of an Integrated Information Management System



The system will link to the already existing MIS in MAAIF and will host a main repository that will be fed by data from other stakeholders, research institutions, districts and also non-state actors. The data will respond to data needs by both users at the district and national level. It will have a review module to respond to queries from Uganda Bureau of Statistics (UBOS) and other MIS in an interactive interface. The performance of the NAP-Ag interventions will be assessed against the following indicators as shown in the table below:

Long Term Outcomes Projected			
▪ **Increased crop yields** ▪ **increased growth rates of livestock population** ▪ **Increased fish stock** ▪ **Improved Agricultural risk management** ▪ **Increased prioritization of LULUCF** ▪ **A resilient agricultural sector** ▪ **Acquisition of information and communication systems that will aid decision making process** ▪ **Gender mainstreamed in CSA**			
Framework Components			
Component 1: Crop production	**Component 2:** Livestock Development	**Component 3:** Fisheries	**Component 4**: Climate Information, Early Warning and Disaster Preparedness Systems
Component 5: Forestry, Land and Natural Resources Management	**Component 6:** Research for climate resilient agricultural development	**Component 7:** Knowledge Management and Partnerships for climate action	**Component 8:** Gendered Approach to climate change adaptation

Component 1: Increased crop yields

Effective implementation of the NAP-Ag recommends that increased crop yields will be achieved through irrigation, use of improved seeds, conservation agriculture and post-harvest storage and handling. Monitoring of crop yields will entail annual assessment of areas under irrigation, production volumes and productivity trends and reduction in post-harvest losses. Crop yields affected by climate change are projected to be different in various areas. In some areas, crop yields will increase and for other areas, it will decrease depending various ecosystems. Therefore, it is urgent to determine the impact of climate change on crop production and productivity to develop possible adaptation and strategies as soon as possible. Key indicators are tabled below:

PME indicators

Outcome Indicator	Indicator Explanation	Source	Frequency
% increase in crop yields	Opting for better farming techniques that are resilient to climate change	MAAIF reports	Bi-annually
Yield variability under different adaptation options	The amount of yields produced during good conditions and bad conditions	MAAIF reports MWE	Bi-annually
% reduction in crop losses resulting from climate change effects	Crop losses resulting from different climate change effects	MAAIF, Department of Crop Inspection & Certification (CIC)	Bi-annually
Increased households that are food secure as a result of adoption of	Household food security coping strategies in face of climate change	MAAIF Reports and OPM Documentation	Annually

Outcome Indicator	Indicator Explanation	Source	Frequency
climate change adaptation practices	Vulnerability scales measuring level of food security		

Component 2: Increased growth rates of livestock population

Climate change poses a major threat to livestock production. It threatens livestock production through its adverse impact on availability and quality of animal feed, water, quantity and quality of products and biodiversity relevant for genetic improvement. The potential impacts on livestock include; increased mobility in search of pasture and water and thus requiring vast land area, increased conflict over shared natural resources, reduced availability of quality animal feed, increased emergence and re-emergence of diseases and vectors, and reduced animal productivity (reduced reproduction capacity, reduced growth, reduced milk production). Proper pasture management and genetic modifications through breeding are promising adaptation measures.

Climate change is likely to reduce land available for livestock production as more land becomes drier or vulnerable to flooding, making it unsuitable for livestock production and a hindrance to livestock mobility. In addition, increases in environmental temperatures suppresses productivity across all livestock and may promote production in some breeds while suppressing production in others, particularly preferring smaller to bigger breeds, which generally leads to reduced total production and productivity. As such, climate change generally affects the numbers, the types and quantity of livestock and livestock products. Key indicators are proposed to measure this component as tabled below:

PME indicators

Indicator	Explanation	Source	Frequency
% increase in livestock production (Meat, Milk, Hides, Eggs etc.).	Livestock production can be achieved through an improved management system of livestock and value chain which leads to food security and incomes	Statistical Abstracts (MAAIF/UBOS)	Annually
Yield per livestock unit	The capability of a livestock to produce an amount of yields in a given season	MAAIF reports	Annually

Component 3: Increase in fish stock

Globally, nearly half a billion people derive their income from fisheries and aquaculture, and fisheries products provide about 15% of the animal protein in the diets of three billion people. Climate change involves a complex of effects that collectively may dramatically modify the natural environment and have profound influence on the world's fisheries, which are judged as negative. Climate change will compound existing pressures on fisheries and aquaculture and the question of how to meet increasing demand for fish in the face of climate change poses a great challenge to fisheries and aquaculture management.

Since most aquatic animals are cold-blooded, their metabolic rates are strongly affected by environmental conditions, especially temperature. Changes in temperature can have significant influence on the reproductive cycles of fish, including the speed at which they reach sexual maturity, the timing of spawning and the size of the eggs they lay. Whether positive or negative, these changes will have social and economic impacts on the fisheries and aquaculture in dues and communities through new mismatches between where the fishing happens and where it is landed or processed, changes in farm

profitability either through inputs needed or productivity of individual farms, or through the disappearance of traditional sources of local food and livelihood security and fish stock at large. Climate change has accelerated the need improve the resilience of human and aquatic systems. The Code of Conduct for Responsible Fisheries and the Ecosystem Approach to Fisheries and Aquaculture provide many principles, strategies and tools that can be implemented to lessen these social ecological systems' exposure and sensitivity to climatic change as well as increasing their adaptive capacities in a sense of increasing fish stock for both fisheries and aquaculture. Therefore the following key performance indicators are proposed below

PME indicators

Indicator	Explanation	Source	Frequency
% Increase in fish stock in capture fisheries and aquaculture systems	Increase in fish stocks especially those mainly consumed, endangered species and exported fish species like Nile perch , tilapia and silver fish (*locally known as mukene*)	MAAIF, NARO reports	Annually
Capture and aquaculture fish production as % of stock	changes in the climate affect the level of fish stock in lakes and aquaculture production	MAAIF reports, NARO reports	Annually
water use per unit of aquaculture production	The available amount of water for use to support aquaculture production	MWE, MAAIF reports, NARO reports	Annually

Component 4: increased use of integrated climate change information and risk management instruments/tools and Prior warning systems.

To overcome the impacts of climate change there is a need to introduce a system which includes wider access to an integrated climate change information system, access to climate risk management instruments, and early warning mechanisms. Early warning information system is much more than development and dissemination of a forecast. An early warning information system is a systematic collection and analysis of relevant information about and coming from areas of impending risks that provide capabilities for generating problem-specific risk assessments and scenarios and effectively communicates options to critical actors for the purpose of decision-making and preparedness and mitigation. A linked risk information (including people's perception of risk) and communication system actively engage communities involved in preparedness. The successes illustrates that effective early warning depends upon a multi-sectoral and interdisciplinary collaboration among all concerned actors at each stage in the warning process from monitoring to response and evaluation. According to the United Nation's International Strategy for Disaster Reduction(2006), early warning information system must be people and location centred, integrating four elements-(i) knowledge of the risks

faced; (ii) technical monitoring and warning services; (iii) dissemination of meaningful warnings to those at risk; and (iv) public awareness and preparedness to act.

Climate information
Climate risk management instruments
Insurance

Risk assessment for early warning and risk management require indicators that are internationally agreed and locally referenced. Key performance indicators are proposed to measure this outcome as below:

PME indicators

Indicator	Explanation	Source	Frequency
Response level to alerts **No. of actors responding to CC information / alerts**	Raising prior awareness on CC issues.	MWE, Ugandan National Meteorological Authority, Department of Relief and Disaster preparedness and Management Department of Relief and Disaster preparedness and Management reports	Annually
Percentage of farmers with access to climate change information and warnings	Farmers who are able to access the information on climate change warnings and preparedness to enable them control the risks and losses	Ugandan National Meteorological Authority reports	Annually
Farmers that have knowledge, use advice & are satisfied with climate risk management services	Farmer who consider and put the advices and warnings into use and are satisfied with the services	MAAIF, Ugandan National Meteorological Authority reports	Annually
No. of farmers reporting an impact due to access and use of the early warning information	Increase in access to information and EWS is impacting the adoption of climate resilient options	MAAIF Data	Two years

Component 5: Land use and Land use change and forestry (LULUCF)

The rate of build-up of Carbon dioxide (CO2) in the atmosphere can be reduced by taking advantage of the fact that atmospheric CO2 can trapped and accumulated as carbon in vegetation and soils in terrestrial ecosystems. Human activities affect terrestrial sinks through land use, land-use change and forestry (LULUCF) activities and consequently the exchange of CO2 between the terrestrial biosphere system and the atmosphere is changed. As a result, terrestrial systems decrease/increase with respect to carbon endowment depending on the actions, which eventually affects land productivity.

Adaptation can be achieved through activities in the LULUCF sector that promote diversified livelihood systems like production of gums and resins, honey, silk, fruit growing and forestry products while increasing removal of greenhouse gases (GHG) from the atmosphere. Sustainable management of natural resources like water and soil, planting and rehabilitation of forest and grasslands can conserve or increase carbon stocks, diversify livelihood options and increase sources of incomes. The key PME indicators are tabled below.

PME indicators

Indicator	Explanation	Source	Frequency
number of hectares in which sustainable NRM practices used	NRM practices carried to protect land, water and forest	MAAIF, MWE, MoLHUD reports	Annually
New forest acreage established	Afforestation carried out to protect land and forest from climate change impacts	MWE, MAAIF, NFA, MoLG reports	Annually
value of carbon trading schemes	Carbon trading schemes available to mitigate climate change impact on the environment	MAAIF reports, MWE reports	Annually

Component 6: A Resilient agricultural sector

Climate change is expected to impact on the agricultural sector in multiple ways, among others through increased variability with regard to temperature, rain, frequency and intensity of extreme weather events (such as drought, floods and others), changes in rain patterns and in water availability and through degradation of ecosystems. The main effects on agricultural production are expected to be an increased variability of production, decrease of production in certain areas and changes in the geography of production. One way to cope with the adverse effects of climate change is to build resilience for adaptation in the agriculture sector.

As climate change brings new uncertainties, risks and changes, one of the most effective ways for the agriculture sector to adapt is increasing its resilience to climate change. Agricultural activities are by nature prone to risks and uncertainties of various nature, both biophysical, abiotic, climatic, environmental, biotic (pests, diseases) and economic. Many of these risks have a climatic component and most of them will be affected by climate change, in either, intensity, scope or frequency. In that respect, agriculture is very sensitive because of its greater vulnerability to even slight changes in temperature or rain patterns, which can have devastating effects on crops, livestock, fisheries and aquaculture, grasslands and forests.

Resilience can be described as the capacity of systems, communities, households or individuals to prevent, mitigate or cope with risk, and recover from shocks. Increasing resilience can be achieved by reducing vulnerabilities and increasing adaptive capacity, this can be achieved by reducing exposure, reducing sensitivity and increasing adaptive capacity for every type of risk. The view of resilience itself is particularly powerful to bring together measures intervening into very different dimensions, biophysical, economic and social. It also enables clarification of the relationships between "specific" vulnerabilities and resilience and how addressing known risks can enable strategies to be planned to

build general resilience in order to cope with uncertainty. As such, it provides an efficient way for no regret of the adaptation. A crucial element of it could be to better manage known risks, whether climatic or not, to get prepared for future, uncertain risks and changes by encouraging activities in the sectors of agriculture, forestry and fisheries that increase sustainable production while strengthening the resilience of agricultural ecosystems in order to cope with the current and future climate change challenges and key performance indicators are proposed to measure this outcome as below.

PME indicators

Indicator	Explanation	Source	Frequency
Knowledge/use of sustainable agricultural practices	Sustainable crop , animal, and fisheries knowledge practices put into use to mitigate risks arising from climate changes	MAAIF reports, NARO reports	Annually
Farm under risk of flood/drought	Research carried out on areas mostly affected by climate changes and adopt ways on how to control risks	MWE reports and NARO reports	annually
Track funds that support adaption actions at national and sub-national levels	Level of funding towards activities for building climate resilient agriculture	Development Partners Ministry of Finance CCD	Annually

Component 7: Strengthened knowledge management mechanisms that aid decision making process

The agricultural support services and institutions at the national and local levels need climate change information for planning their activities and providing timely services to the ultimate beneficiaries. Better-informed decision-support systems can be very efficient and capable of providing need-based information services to the farmers, livestock herders and fishers. Users of climate information at institutional level need historical climate information, climate monitoring products and forecasting in different time scales for institutional decisions. In most cases, effective use requires that raw climate information be translated into quantitative information (soil water status, pest and disease risk, vegetation conditions, crop yields etc.), with sufficient explanation of uncertainties.

The agriculture support institutions (extension and research) should offer and also make use of information about agriculturally relevant precipitation indices (deviation from normal, water stress, agriculture season length (beginning and end) etc.), progress of the precipitation indices from the past to current, near real-time information about the crop state and early-warning systems for humanitarian response. Three sources

i. Indigenous / traditional knowledge
ii. Documented Research outputs
iii. New research interventions

PME indicators

Indicator	Explanation	Source	Frequency
Number of climate actions shared No. of stakeholders reporting improved decision making due to improved knowledge management	Information and communication shared among stakeholders	MoICT, MAAIF, MWE,OPM, MTTI, UNMA), OPM Management reports Surveys	Annually
Number of farmers who are members of knowledge platforms on climate change adaptation	Farmers and farmer organisations involved in climate change adaptation as stakeholders	MoLG, MAAIF reports	Annually

Outcome 8: Gender mainstreaming in climate change adaptation

Women are the majority in the agriculture workforce in Uganda are the most vulnerable to climate change. Their traditional roles as the primary users and managers of natural resources, primary caregivers, and unpaid labourers mean they are involved in and dependent on resources that are put most at risk by climate change. More, women lack rights and access to resources and information vital to overcoming the challenges posed by climate change. Women are particularly vulnerable to climate stress – indeed, they are more so than men (FAO 2011; Dankelman 2010; Women Watch 2009. For example, climatic strain on natural resources could create additional workload for women by increasing difficulty in accessing fuel wood and water. According to the International Rescue Committee global report 2014, women are 14 times more likely to die than men during a disaster. Adaptation actions that do not incorporate gender perspectives may exacerbate these inequalities. Hence, a focus on women and other vulnerable members of society should be a significant priority of any adaptation effort including planning and financing of adaptation. Uganda NAPs roadmap has identified Gender equity as a necessary tool for achieving national adaptation and development goals.

Gender consideration will facilitate equitable participation of both women and men, so as to adequately address their strategic and differing needs. The approach entails the use of a gender lens to understand the social processes of adaptation. A gender approach is a working tool that should be integrated into the entire policy planning and implementation process, including: (i) gender analysis; (ii) disaggregating all data by sex; (iii) gender responsive indicators to measure results, benefits and impact; (iv) building capacity and strengthening sustainable development strategies and institutional frameworks; and (v) documenting and dissemination of best practices to continually promote learning and innovation. Key performance indicators tabled below.

PME indicators

Indicator	Explanation	Source	Frequency
Number of CC gender responsive plans, programmes and frameworks developed	Plans/programmes/ on gender issues in CC adaptations	MAAIF, MoGLSD reports	Annually

Indicator	Explanation	Source	Frequency
Number of gender responsive livelihood options	Climate resilient agriculture development will build on technologies and resilient capacities for sustainability Access to and ownership of alternative of livelihoods that men and women farmers have, to adapt to climate change	MAAIF reports, NARO reports	Annually
% of population with increased knowledge on climate change, disaggregated by sex and age **% number of women and vulnerable groups adopting cc technologies and practices**	Population with access to knowledge on climate change adaptation by sex and age	MAAIF, MoGLSD reports	Annually

Measuring Un-intended outcomes

In addition to the NAP-Ag programme leading to the intended outcomes and impacts, there is a possibility that there are unexpected results that may need to be measured and tracked. These can be both positive and negative. At the output level, Climate resilient Fishing practices adapted may have both **positive impacts** (a resilient fishing practice leads to increase in fish stock both at aquatic and lakes) but may also result in some **negative impacts** (in case of new fishing technologies, the natural environment can be greatly damaged e.g. in the use of dynamites or poison or from the inappropriate use of an otherwise acceptable gears).

Below is the presentation of the detailed logical framework table as part of the PME framework.

Results Framework Matrix

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
Goal A climate resilient and sustainable agricultural sector contributing towards achievement of the Uganda Vision 2040"		Climate Change documents		Government continues to priorities NAP-Agriculture as the vision 2040 and NDP
Purpose/ Mission To reduce vulnerability and enhance adaptive capacity of Uganda's agricultural sector to the impacts of climate change in order to achieve sustainable agricultural development".		MAAIF reports, CC reports		
Component 1. Crop Production				
Objective 1.1 Promote climate resilient cropping systems and value chains				
Strategy 1.1.1: Promote and encourage highly adaptive and productive crop varieties and cultivate in drought-prone, flood prone and rain-fed crop farming systems				
1.1.1 (a) Short Term sub-actions				
1. Conduct a crop vulnerability and suitability assessment in all agro-ecological zones of Uganda	Number of climate resilient crops identified and profiled in all agro-ecological zones of Uganda	Crop vulnerability and suitability assessment reports from MAAIF, NARO and UBOS		On-farm crop production data available and shared Functional research and extension systems Adequate financing
2. Conduct studies on climate resilient crop varieties and cultivars (early maturing and drought tolerant) in the different agro-ecological zones	Number of studies carried out on climate resilient crop varieties and cultivars	Crop vulnerability and suitability assessment reports from NARO/ MAAIF		On-farm crop production data available and shared Functional research and extension systems Adequate financing
3. Conduct field trials and demonstrations and profile climate resilient crops	Number of field trials and demonstrations carried out of climate resilient crops and cropping practices	Field trials and demonstration reports, MAAIF reports and on-farm data		Farmers adopt lessons from demonstration for profiled resilient crops
4. Build capacity of farmers and farmer groups in all agro-ecological zones and support them to upscale and improve access to high quality planting materials	Number of functional farmer groups in all agro-ecological zones	MAAIF, MTIC reports,		Improved quality planting materials Existence of organized farmer groups

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
5. Build capacity of certified seed producers and support them to expand and improve the quality of seed	Number of certified seed producers % of farmers accessing certified seed and quality planting materials	MAAIF, UNADA, USTA, ISSD reports		Quality seeds produced Functional seed delivery mechanism Proper seed storage and handling facilities
6. Increase timely access to quality agricultural inputs and their efficient use	Number of farmers with timely access to quality agricultural inputs	MAAIF reports		Timely access to quality agro-inputs
	Percentage increase in farmers using quality agro-input	MAAIF reports		Farmers affording quality agro-inputs
1.1.1 (b) Medium and long term sub-actions				
1. Increase awareness on the need for and type of climate resilient crop varieties	▪ Number of training session conducted on climate resilient crop varieties ▪ Number of farmers aware and accessing climate resilient crop varieties ▪ Number of media campaigns held	MAAIF Activity reports Radio recordings, documentaries, newspaper clips and pull outs		Functional information access mechanisms
2. Increase access and adoption of climate resilient crop varieties by farmers and communities in different agro-ecological zones	Number of farmers and communities accessing and adopting climate resilient crop varieties in different agro-ecological zones	MAAIF Activity reports, MTIC		Availability of data on farmers and communities accessing and adopting climate resilient crop varieties
4. Establish regional Seed Banks for strategic crops	Functional Regional Seed Banks in place	MAAIF, NARO/PGRC report,		Accessibility to parent breeding materials
Strategy 1.1.2 :Promote and encourage conservation agriculture and ecologically compatible cropping systems to increase resilience to the impacts of climate change				
1.1.2 (a)Short Term sub-actions				
1. Identify and conduct field trials on climate resilient agricultural practices in different agro-ecological zones of Uganda	Number of field trials on climate resilient cropping practices in different agro-ecological zones of Uganda	MAAIF/ NARO reports On ground surveys carried out and documentation of the outcomes		Farmers accessing the field trial sites

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	% of farmers practicing conservation agriculture	MAAIF Reports Field Activity Reports CCA reports		Farmers learn CCA practices and adopt them
2. Conduct demonstrations of climate resilient cropping practices	Number of demonstrations of climate resilient cropping practices established	MAAIF Field activity reports		Farmers have hands on information on better farming methods that are climate resilient Availability of land to host demonstrations
3. Identify and establish trials for multipurpose agroforestry tree crops and agroforestry systems	Number of trials for high value, multipurpose agroforestry tree crops and systems identified and established	MAAIF/ NARO Field activity reports, District Forest Services		Quality agroforestry tree species made available and accessible for farmers
1.1.2 (b) Medium and long term sub-actions				
1. Promote and scale up climate resilient cropping practices appropriate for different agro-ecological zones	Number of appropriate climate resilient cropping practices promoted	MAAIF reports,		Resources for scaling up available Farmers willing to take up the appropriate climate resilient practices
2.Promoted locality specific CSA technologies and practices	Forms of CSA that are indigenous or locality specific	MAAIF Reports, NARO reports CCA reports		A baseline is conducted to document locally utilized practices
Strategy 1.1.3 : Strengthen water harvesting and irrigation farming to build resilience to droughts				
1.1.3 (a)Short Term sub-actions				
1. Identify suitable sites for rainwater harvesting and agricultural water management schemes	Number of suitable sites for rainfall harvesting	MAAIF, MWE		Well established water harvesting plants
	Number of agricultural water management schemes	MAAIF, MWE		Increased number of well managed water harvesting plants
2. Train farmers/ household members in water harvesting and agricultural water management technologies	Number of farmers trained in water harvesting and agricultural water management technologies	MAAIF, MWE, Local Government		Resources for training available

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
3. Facilitate the construction of water harvesting structures at household and community levels	Number of water harvesting structures at household and community levels	MAAIF, MWE, Local Government		Affordability by farmers
4. Conduct studies on the irrigation potential and identify sites in various river floodplains and underground water sources for micro-irrigation systems	Number of studies on irrigation potential conducted	MAAIF, MWE		Financial resources for the studies available
	Number of irrigation sites in various river floodplains and underground water sources identified	MAAIF, MWE		Well established water harvesting plants to aid irrigation systems
5. Develop appropriate efficient small-scale irrigation technologies and packages	Number of appropriate efficient small-scale irrigation technologies and packages developed	MAAIF, MWE		Capacity and affordability to install small scale irrigation technologies
6. Train extension workers on irrigation and water management technologies and impart skills to enable them undertake irrigation extension	Number of extension workers trained on irrigation and water management technologies; Number of farmers equipped with knowledge on irrigation and water management technologies	MAAIF, MWE		Functional extension system in place
7. Undertake comprehensive management needs assessment of existing large-scale irrigation schemes	Number of comprehensive management needs assessment of existing large-scale irrigation schemes undertaken.	MAAIF, MWE		Responsiveness of targeted stakeholders
1.1.3 (b) Medium and long term actions				
1. Train farmers and private sector in the installation, operation and maintenance of various and appropriate irrigation technologies	Number of farmers trained in installation , operation and maintenance of recommended irrigation	MAAIF, MWE,PPP		Farmers wiling to acquire skills for installation, operation and maintenance of recommended irrigation technologies

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Number of private sector stakeholders trained in the installation , operation and maintenance of appropriate irrigation technologies	MAAIF, MWE,PPP		Private sector willing to facilitate maintenance of irrigation equipment
2. Disseminate and scale up appropriate efficient small-scale irrigation technologies and packages	Number of small-scale irrigation technologies and packages disseminated and scaled up	MAAIF, MWE		Affordability by farmers
4. Establish strategic linkages within put and output markets and service providers of irrigation equipment	Number of formal linkages created to input and output markets and service providers of irrigation technologies	MAAIF, MWE		Service providers willingness to formalize linkages
5. Establish and build capacity of water committees in watersheds to manage water for irrigation and other production purposes	Number of functional water committees in place	MAAIF, MWE, MoLG		Established and committed water committees
6. Support innovative production techniques that can increase productivity, better manage water resources, and reduce GHG emissions	Number of production techniques that can increase productivity, better manage water resources, and reduce GHG emissions	MAAIF, MWE		Farmers willing to work together as catchment management committees
Strategy 1.1.4 : Promote and encourage agricultural diversification and improved post-harvest handling, storage and value addition				
1.1.4 (a)Short Term actions				
1.Promote diversification and integration of agricultural enterprises at all levels to spread climate risks	Number of additional enterprises promoted	MAAIF reports		Willingness by farmers to take new enterprises
2.Promote diversification of livelihoods through supporting of alternative off-farm and non-weather dependent enterprises and employment opportunities	Number of functional off-farm and non-weather dependent enterprises and employment adopted	MAAIF PFSU, MTIC, UNMA, , UIRI reports		Willingness of farmers to take on new enterprises Affordability
3. Invest in improved appropriate storage facilities and technologies along the value chain	Number of functional appropriate storage facilities and technologies developed	MAAIF, MTIC reports, academia		Availability and accessibility of functional appropriate storage facilities and technologies Affordability

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
4. Invest in improved post-harvest management	Number of functional post-harvest management systems established	MAAIF, MTIC reports, Academia		Improved post-harvest management
5. Rehabilitate existing warehouses and silos and establish public-private-partnership management for long term food/grain storage and supply	Number of Rehabilitated warehouses and silos	MAAIF reports, MTIC reports		Creation of secure and hygienic storage facilities for produce
	Number of public-private-partnerships management created	MAAIF reports, MTIC reports, PPP		Willingness of the Public and private actors to collaborate in putting up modern facilities for storage
6. Strengthen the warehousing receipt system and link smallholder farmers to warehousing receipt system in the grain supply chain	% increase in adaption of warehousing receipt system	MAAIF , MTIC reports, UEPB, UWRSA		Increase in profits after sell of produce
	Number of linkages between smallholder farmers to warehousing receipt system established	MAAIF, MTIC reports, UEPB,UWRSA		Improved relationships among the different stakeholders for proper warehousing receipt system
7. Train value chain actors in post-harvest management, preservation and long term storage	Number of value chain actors trained in post-harvest management, preservation and long term storage	MAAIF , MTIC reports		Value chain actors equipped with techniques in post-harvest management, preservation and long term storage
1.1.4 (b) Medium and long term actions				
1. Establish an effective market information system	Web based MIS that regularly captures market information on agriculture commodities marketing trends	MAAIF, MTIC reports, telecom companies Surveys and interviews conducted and documented on marketing and distribution of		Public accessing timely and accurate market information

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
		agricultural commodities and food stuffs		
	Number of farmers accessing accurate and timely market information	MAAIF MTIC reports Published marketing manuals in place to aid farmers in the value chain		Market information disseminated is usable by the farmers Farmers make informed marketing decisions
2. Develop and promote innovative micro-financing packages to facilitate access to low interest credit	Number of innovative micro-financing packages promoted	MAAIF, MTIC reports, financial institutions	Commercial Banks, MFIs, SACCOs, VSLAs and Cooperatives	Farmers have access to low interest credit
	Number of farmers accessing low interest credit	MAAIF, MTIC reports, financial institutions reports	Commercial Banks, MFIs, SACCOs, VSLAs and Cooperatives	increase in farmers production and diversification of agricultural enterprises
	Number of marketing centers established in rural areas.	MAAIF, MTIC reports, MoLG		Rural farmers accessing marketing centers
	Number of infrastructure setup	MAAIF, MTIC reports. MoLG		conducive environment for the establishment of marketing infrastructure
5. Support private sector to invest in food processing as well as value addition, including packaging and branding	Number of farmers adapting value addition	MAAIF, MTIC report, PPP reports		Value added to agricultural produce
	% increment of farmers' incomes attributed to value added enterprises	MAAIF, MTIC report, PPP reports		Acceptability of consumers to purchase new value added products

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
Promotion of agricultural insurance among farming communities to address climate change shocks and risks	Number of farmers accessing agriculture insurance	MAAIF reports, UIA, Financial institutions		Insurance companies offer agriculture insurance
Strategy 1.1.5 :Support community-based adaptation strategies through expanded and climate resilient extension services				
1.1.5 (a)Short Term actions				
1. Ensure CCA issues are part of the agricultural extension system	Number of integrated climate change issues into agricultural extension and community management	MAAIF reports, CC reports LG reports	National Agricultural Extension Policy and Strategy	Extension of climate smart services to the communities and households
2. Train and build the capacity of extensionists and community based facilitators to deliver climate resilient agricultural technologies and practices.	Number of extensionists and facilitators s trained	MAAIF reports,		Trained agents are able to replicate knowledge acquired
3. Strengthen platforms, through which small scale farmers can access agricultural information and extension services	Number of functional platforms established	MAAIF reports,		Existence of platforms where local farmers can easily access agricultural information and extension services
	Modes of information used to contact the farmers	MAAIF reports,		Easily understood and viable approaches to contact farmers
4. Promote innovation platforms that build on indigenous knowledge and partnerships along the commodity value chains	Number of innovation platforms	MAAIF reports, Field activity reports		Transformed indigenous knowledge to suit local and small scale farmers
	Number of partnerships formed along the commodity value chains	MAAIF reports, Field activity reports		Viable partnerships by the different stakeholders on the value chain
	Number of indigenous knowledge sources	MAAIF reports, Field activity reports		Preserved indigenous knowledge
5.Promote integrated crop-livestock systems to enhance community resilience to a changing climate	Number of integrated crop-livestock systems.	MAAIF reports, CC reports		Improved farming methods like crop

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
				rotation and mixed farming
6. Empower communities to wisely use early warning information to enhance resilience	% of farmers with access to early warning information	MAAIF reports, Field activity reports, CC reports		Traceability that supports an early warning system
7. Build capacity and equip extension service in delivery/ dissemination of climate smart agriculture technologies and practices.	Number of functional service delivery agencies climate smart agriculture technologies and practices	MAAIF reports, Field activity reports, CC reports		Farmers practice climate smart agriculture with new technologies and practices
	Number of people equipped with skills on climate smart agriculture technologies	MAAIF reports, Field activity reports, CC reports		Farmers equipped with skills on climate smart agriculture technologies
	Number of climate smart agriculture technologies disseminated	MAAIF reports, Field activity reports, CC reports		Farmers can easily access and are also able to use climate smart agriculture technologies
Component 2. Livestock Development				
Objective 2.1 Promote climate resilient cropping systems and value chains				
Strategy 2.1.1 : Promote and encourage highly adaptive and productive livestock breeds				
2.2.1 (a)Short Term sub-actions				
Conduct climate change risk and vulnerability assessment for the livestock sector in all agro-ecological zones	Number of climate change risk and vulnerability assessment carried out.	National/MAAIF reports, CC reports		Sufficiency of funds to cover all agro-ecological zones
Increase awareness on climate change impacts on the livestock and the need for highly adaptive livestock breeds	Number of awareness campaigns carried out	National/ MAAIF reports, CC reports		Adaptive stock available and accessible to farmers Human technical capacity available
Identify, pilot and introduce improved livestock and poultry breeds and management practices	Number of breeds of livestock and poultry introduced	National/ MAAIF reports, CC report		Farmers accept/adopt new breeds

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
Profile better performing indigenous livestock and poultry breeds and management practices	Number of Climate Smart management practices introduced	National/ MAAIF reports		Farmers find new practices relevant and applicable
	A functional Database for climate resilient breeds and management practices.	National/ MAAIF reports		Farmers willing to provide and share information on breeds, best practices and indigenous knowledge
Build local capacity in extension services related to breeding	% coverage of technical breed managers	National/ MAAIF reports		National system has enough breeders on board Appropriate services, materials and equipment for breeding available and accessible
2.1.1 (b) Medium and long term sub-actions				
1.Facilitate and support the acquisition of improved breeding stocks by men and women farmers	Number of men and women who have acquired improved breeding stocks	MAAIF reports, MoLGSD reports		Gender balance consideration in acquisition of breeding stocks
2.Rehabilitate, restock and build capacity of livestock breeding centers to produce improved breeds of livestock for farmers	% increase in average production and dissemination capacity of breeding stock by national breeding centers	MAAIF reports		Appropriate infrastructure and technical capacity in place
3. Develop viable livestock breeding schemes for climate change resilience	Number of functional breeding schemes	MAAIF reports, DLG reports		Breeding schemes distributed equitably across production zones
Strategy 2.1.2 : Promote sustainable management of rangelands and pastures through integrated rangeland management				
2.2.2 (a)Short Term sub-actions				

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
3.Identify areas with acute problems of water for livestock and support construction of watering points and water systems	Number of watering points and water systems developed			
4.Build capacity of water and watershed management committees in management of water resources	Number of people trained in managing water for livestock rearing	MAAIF reports, CC reports		Water resources management committees remain committed
2.1.2 (b) Medium and long term sub-actions				
1. Identify, develop and disseminate indigenous best practices in range land management and drought coping mechanisms	Number of indigenous practices disseminated in in range land management and drought coping mechanisms	MAAIF reports, CC reports		Farmers are willing to share best practices Indigenous knowledge management systems in place
2. Conduct capacity building in indigenous knowledge, early warning systems, early action, stocking rates, vaccination campaigns, disease control	Number of people trained in in indigenous knowledge, early warning systems, early action, stocking rates, vaccination campaigns, disease control	MAAIF reports, CC reports		Human technical capacities available
3. Facilitate and support establishment of quality pastures (grazing and fodder), feed resources, fodder banks and strategic reserves	Acreage of quality pastures established			
4. Strengthen livestock disease surveillance, veterinary and entomological services to control pests and diseases	% coverage of veterinary laboratories	MAAIF reports, CC reports		Well-equipped veterinary laboratories
	Functional national disease and vector surveillance and monitoring system	MAAIF reports, CC reports		Adequate human technical capacity at all levels
5.Build capacity of farmers to manage livestock diseases, pests and vectors	Number of farmers trained	MAAIF reports, DLG reports		Adequate number of veterinary personnel

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Veterinarian: Farmer ratio	MAAIF reports, CC reports		demand for services by farmers exists
Strategy 2.1.3 : Promote and encourage diversification and improved livestock value chains				
2.2.3 (a)Short Term sub-actions				
1.Promote small ruminant animal production in dry ecosystems	% increase in Number of women and men keeping small ruminants % increase in amount of animal products from small ruminants	MAAIF reports		Farmers taking up rearing of small ruminants from a commercial perspective
2.Promote livelihood diversification (e.g. raising of camels, indigenous poultry, beekeeping, rabbits, emerging livestock - quails, guinea fowls and ostriches)	% increase in Number of farmers involved in alternative (non-conventional livestock farming (e.g. raising of camels, indigenous poultry, beekeeping, rabbits, emerging livestock - quails, guinea fowls and ostriches)	MAAIF reports		Markets develop for non-conventional animal products
3.Promote value addition for livestock products	% increase in marketed processed animal products	MAAIF reports, MTIC		Farmers find value addition technologies affordable and useful
	Number of livestock based food reserves established by government and private sector players	MAAIF reports, MTIC		Policy environment fosters investment in livestock based food reservation
4. Promote market infrastructure improvement and transport	% increase in number animal and animal products' markets developed country wide			
	Number of animal and animal products' markets' with good quality road or other infrastructure networks			

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
5.Establish price stabilization schemes and strategic livestock based food reserves	No of Public Private partnerships established to stabilize supply of animal products across the year/seasons			
6.Mobilize and build capacity of livestock farmers for collective and cooperative effort to engage more efficient handling, storage, agro-processing and marketing	% increase in number of functional farmer cooperatives	MAAIF reports, MTIC, activity reports		Policy environment continues to foster formation of cooperatives and VSLAs
Objective3.1: Promote climate resilient fisheries and integrated fisheries resource management.				
Strategy 3.1.1 : Promote climate resilient fisheries sector and integrated fisheries resource management				
3.1.1 (a)Short Term sub-actions				
1,Undertake risk and vulnerability assessment of the fisheries sub-sector and value chains	Resilient fisheries sub-sector and value chains Number of vulnerability assessments under taken	MAAIF reports, CC reports, NARO reports		Farmers are able to plan on the adaptation plans to undertake on the value chain
2.Enhance capacity of the fisheries sub-sector to address the impacts of climate change on fisheries	Number of fishers and farmers trained on how to address the impacts of climate change on fisheries and aquaculture	MAAIF reports, CC reports, NARO reports		Fish farmers are fully trained in resilient fishing practices and are able to implement them
3.Encourage climate change resilient fishing practices, including fish farming, training in building fish ponds, fish cages, and making fish f feeds	Existence of climate change resilient fishing practices Number of trainings and number of farmers and fishers trained Number of climate change resilient fishing practices	MAAIF reports, CC reports, NARO reports		farmers practicing climate resilient fishing practices
4. Capacity development of men and women involved in fish value chain (quality assurance systems) to stop post-harvest losses.	Number of men and women supported Percentage reduction in post-harvest losses Number of climate smart technologies supported	MAAIF/Reports		Increased knowledge and skills of men and women thriving artisanal fish processing

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
5. Support fish farming in order to promote climate resilient fisheries resources	farmers get access to low rates loans and grants			
3.1.2 (b) Medium and long term sub-actions				
1. Put in place economic incentives to diversify livelihood options and reduce dependence on climate-sensitive fisheries resources	Number of economic incentives in place	MAAIF report, CC reports		Improved livelihoods of farmers and ability to fish year round
2. Promote the breeding of climate resilient fish breeds/species, appropriate to particular ecosystems and communities 3. Strengthen monitoring capacity and the capability to prevent over fishing and unauthorized exploitation of water bodies	Availability of climate resilient fish breeds/species	MAAIF report, CC reports		Availability of innumerable fish species that are climate resilient
	Functional monitoring systems	MAAIF report, CC reports		Farmers have systems to detect progress and their tract levels
	Existence of stringent laws on fishing	MAAIF report, CC reports		Strong leadership to enforce better fishing practices that are climate resilient
4.Up-scale climate resilient strategies/technologies in fisheries and climate resilient fish varieties	High quality climate resilient strategies/technologies Number of beneficiaries of climate resilient technologies	MAAIF report, CC reports		Farmers adapt to better equipment and inputs.
5.Establish, restore and maintain the bio-physical health of water bodies				Stringent la body prote
Component 4: increased use of integrated climate change information and risk management instruments/tools and Prior warning systems				
Objective 4.1: Improve climate information, generation and dissemination and strengthen early warning mechanism for a better informed agricultural planning and decision making.				
Strategy 4.1.1: Improved climate information, generation and dissemination and early warning mechanisms for a better informed agriculture planning and decision making process				
4.1.1 (a)Short Term actions				

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
1. Increase coverage of automated weather monitoring stations country-wide and integrate use of indigenous knowledge into community early warning systems	Functional automated weather monitoring stations country-wide.	MAAIF report, CC reports, Activity reports		Farmers are informed on the weather forecast and are able to know when to plant
	Mainstreaming indigenous knowledge into community early warning systems	MAAIF report, CC reports, Activity reports, LG reports		Farmers are able to jointly use indigenous and modern knowledge on early warning systems.
2. Strengthen and widen weather forecasting systems to inform better farmer decision	Wider coverage of weather forecasting	MAAIF report, CC reports, Activity reports		Farmers get access to weather forecast information thus can make informed decisions
3. Put in place community information platforms, to facilitate and disseminate climate information early warnings	Functional community information platforms formulated	MAAIF report, CC reports, Activity reports, LG reports		Through radio talk shows, barazas farmers are able to access climate information and early warnings
4. Produce and disseminate early warning messages, that include risk information that are easily understood by authorities and end users	Early warning messages distributed that are easily understood by authorities and end users	MAAIF report, CC reports, Activity reports, LG reports		Translated versions of climate information and early warnings in communities.
5. Promote use of ICT in disseminating information	No. of ICT based dissemination mechanisms developed (SMSs, websites etc.)	MAAIF		Communities are responsive to information on climate change being disseminated
4.1.1 (b) Medium and long term sub-actions				
1. Facilitate specialized training; to increase capacity, knowledge and improved accuracy of models for predicting weather and climate	Training on models for predicting weather and climate	MAAIF report, CC reports, Activity reports		Farmers adapt simplified training models.
	Availability of functional models for predicting weather and climate	MAAIF report, CC reports, Activity reports		Availability of simplified training models of farmers

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
2. Build capacity to downscale global and regional climate change models and information to national and local levels to support agricultural planning and decision-making	Campaigns on climate change models and information targeting to national and local levels	MAAIF report, CC reports, Activity reports, LG reports		Farmers trained to down scale climate change models to national and local levels
3. Scale up countrywide vulnerability mapping to support agricultural production, food security and disaster preparedness interventions	Plans in place to cater for agricultural production, food security and disaster preparedness	MAAIF report, CC reports, Activity reports, LG reports		Farmers make documentations showing production to detect uncertainty
	Built reserves for food (maize, rice, sorghum, millet)	MAAIF report, CC reports, Activity reports		Farmers setup granaries and silos for seed storage.
1. Support the development of contingency plans at national and sub-national levels	No of contingency plans development No of contingency plans funded	CCA reports Development Partner Reports		Development partners support national contingency plans for adaption
Strategy 4.1.2: Support innovative insurance schemes to protect farmers against climate risk related crop and livestock losses				
4.1.1 (a)Short Term actions				
1. Develop and implement varied innovative crop and livestock weather-indexed insurance packages	Variety of innovative crop and livestock weather-indexed insurance packages in place.	MAAIF report, CC reports		Farmer have a variety of crops and livestock that are climate resilient
3. Enhance the capacity of micro-finance institutions to act as agents to deliver innovative crop and livestock weather-indexed insurance packages	Training on financial management	MAAIF report, CC reports		Farmers receive training on how to access low rate credit facilities and saccos
4. Raise awareness within the insurance industry of extreme weather and climate risks and communicate actions and opportunities	Awareness campaigns conducted on extreme weather and climate risks	MAAIF report, CC reports		Farmers are sensitized on the insurance of extreme weather and climate risks.
5. Undertake farmer education and address barriers to uptake of weather-indexed insurance products with a view to gain their trust	Farmers sensitized on weather-indexed insurance products	MAAIF report, CC reports		Farmers receive knowledge on how to collect weather data, transmit, and validate it
6. Conduct a study to explore other safety nets and alternative risk transfer mechanisms	Studies conducted on alternative risk transfer mechanisms	MAAIF report, CC reports		Responsiveness by key stakeholders

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
Component 5: Land Use and Land Use Change and Forestry (LULUCF)				
Objective 5.1: Promote sustainable forestry, land use and water management that enhances the resilience of agriculture and agrarian communities to a changing climate.				
Strategy 5.1.1 Increase water use efficiency and water storage				
5.1.1 (a)Short Term sub-actions				
1. Promote awareness on how climate change impacts on water and how it affects the agriculture sectors	Percentage of farmers sensitized on how climate change impacts on water and agriculture sector	MAAIF report, CC reports, Activity reports, MWE reports, NFA		Farmers practice afforestation and reforestation in order to preserve the climate
2. Enhance public awareness on water conservation and efficient water use for agricultural production	Increased awareness on water conservation and efficient water use for agriculture production.	MAAIF report, CC reports, Activity reports, MWE reports		farmers are equipped with conservation skills through trainings, and hands on experiences,
3. Develop guidelines to ensure that irrigation plans and designs consider water availability, climate variability and climate change	Percentage of farmers provided with guidelines on irrigation plans and designs	MAAIF report, CC reports, Activity reports, MWE reports		Construction and rehabilitation of water sources like boreholes, shallow wells, valley dams and water tanks that will help in micro-irrigation
4. Develop policy briefs to advocate for updating policies to emphasize water use efficiency improvements in response to climate change	Percentage increase in the numbers of policies on water use efficiency updated	MAAIF report, CC reports, Activity reports, MWE reports		Farmers come up with plans for water conservation
5. Mainstream disaster risk reduction measures in water sector planning and service delivery, particularly in vulnerable agrarian communities	Reduced disaster risk measures mainstreamed	MAAIF report, CC reports, Activity reports, MWE reports, MoGLSD, LG reports		To strengthen the capacity of agricultural communities through agricultural awareness and training.
6. Construction of multi- purpose dams and water harvesting infrastructure for medium and large scale irrigation, livestock and fisheries	Functioning multipurpose dams and water harvesting infrastructure for medium and large scale irrigation, livestock and fisheries	MAAIF report, CC reports, Activity reports, MWE reports		Communities construct multi-purpose dams to conserve water

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
7. Support on farm water storage facilities for storing harvested rainwater, during periods of water scarcity, for farming activities	Percentage increase in the number of farmers accessing on farm water storage facilities for storing harvested rainwater, during periods of water scarcity for faming activities	MAAIF report, CC reports, Activity reports, MWE reports		Develop water harvesting technologies for example solar water pumping.
5.1.1 (b) Medium and long term sub-actions				
1. Conduct a stocktaking on water use efficiency, water lifting technologies, rainwater harvesting and water storage technique	Stocktaking on water use efficiency, water lifting technologies, rainwater harvesting and water storage technique conducted	MAAIF report, CC reports, Activity reports, MWE reports		There are records from farmers on how water is utilized, harvested and storage
2. Use environmental assessment and enforcement to strategically integrate water availability and climate change into irrigation projects and planning	Percentage of farmers using environmental assessment and enforcement to strategically integrate water availability and climate change into irrigation projects and planning	MAAIF report, CC reports, Activity reports, MWE reports		Farmers are able to plant throughout the year using irrigation
3. Promote the sustainable use of groundwater resources for irrigation purposes	Increased sustainable use of ground water resources for irrigation purposes promoted	MAAIF report, CC reports, Activity reports, MWE reports		Farmers through their cooperative dig up wells and boreholes
4. Support traditional and improved/modern rainwater harvesting techniques	Traditional and improved use of improved /modern rain water harvesting techniques in place	MAAIF report, CC reports, Activity reports, MWE reports		Famers are able to access funding to improve their water harvesting techniques
Strategy 5.1.2 Strengthen catchment management in agricultural planning				
5.1.2 (a)Short Term sub-actions				
1. Develop conservation management plans upstream and downstream of catchment areas with irrigation schemes and other water for production infrastructures	Conservation management plans upstream and downstream of catchment developed	MAAIF report, CC reports, Activity reports, MWE reports		Farmers practice agro forestry and farming methods
	Number of irrigation schemes and other water for production infrastructure in place	MAAIF report, CC reports, Activity reports, MWE reports		Increase in the use of irrigation techniques

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
2. Develop a stakeholder engagement strengthening program to protect water catchment areas in areas planned for agricultural intensification	Stakeholder engagement strengthening program to protect water catchment areas	MAAIF report, CC reports, Activity reports, MWE reports		Stakeholder willingness to participate and train farmers on environmental protection
3. Increase community awareness on sustainable land and water management on farm lands	Number of people educated on sustainable land and water management on farm lands	MAAIF report, CC reports, Activity reports, MWE reports		Increase in the number of farmers who receive sensitization
	Sustainable land and water management approach established	MAAIF report, CC reports, Activity reports, MWE reports		Farmers adopt better farming methods and thus reduce the level of production risk
5.1.2 (b) Medium and long term sub-actions				
1. Protect water catchment areas through integrated watershed management	Water catchment areas protected	MAAIF report, CC reports, Activity reports, MWE report, NFA		Planting of trees by each farmer household
	Integrated water management systems in place	MAAIF report, CC reports, Activity reports, MWE report, NFA		Farmers practice activities that are environment friendly like crop rotation, intercropping and reestablishment of wetlands
2. Promote upstream water catchments conservation to reduce sediment yields into the river and lake systems	Number of upstream water catchment areas conserved	MAAIF report, CC reports, Activity reports, MWE report, NFA		improved farming methods, reforestation and afforestation
	Sediment yields into the river and lake systems reduced	MAAIF report, CC reports, Activity reports, MWE report		Community members plant trees on river and lake banks
3. Promote appropriate forestry and agroforestry technologies to improve the environment and livelihoods	Appropriate forestry and agroforestry technologies in place	MAAIF report, CC reports, Activity reports, MWE report, NFA		Each farmer household plants at least two trees a year

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Environment and livelihoods improved	MAAIF report, CC reports, Activity reports, MWE report, NFA		Farmers who practice agroforestry earn from selling timber and also offer jobs to the saw mills
4. Identify and promote sustainable traditional farming systems, indigenous technologies, and farmer initiatives under similar agro-ecological/agro economic conditions	Sustainable traditional farming systems, indigenous technologies and farmer initiatives in place	MAAIF report, CC reports, Activity reports, MWE report, NFA		Farmers practice mulching, intercropping, contour ploughing and terracing
Strategy 5.1.3 : Adopt sustainable agricultural land, forest land and water management to reduce degradation				
5.1.3 (a)Short Term sub-actions				
1. Develop guidelines and principles on sustainable land and water management	Presence of guidelines and principles on sustainable land and water management	MAAIF report, CC reports, Activity reports, MWE report, NFA		There is follow up on laws breakers who pollute and mismanage the environment
2. Build capacity of local governments and other stakeholders to plan, implement and monitor sustainable land management practices that involve local communities	Number of trainings carried out	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Communities and households receive training on monitoring SLM
	Sustainable land management practices in place	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Use of improved methods of farming like soil fertility enhancement , mulching and agro forestry
3. Increase community awareness of sustainable land and water management on farmlands	Number of communities aware of sustainable land and water management on farm lands	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Increased land and water management on farmlands
4. Support initiatives for community action to control soil erosion, reforest, protect and conserve degraded agricultural landscapes and watersheds	Community action initiatives established	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Communal tree planting with seedlings from NFA and the private sector

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Soil erosion controlled, degraded agricultural landscape and wetland conserved and protected	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Practicing smart agricultural techniques and combating pollution
5.1.3 (b) Medium to long Term sub-actions				
1. Support land use planning at district and local levels, to guide sustainable land use and management and monitoring of both subsistence and commercial farming activities	Land use planning at district and village level supported	MAAIF report, CC reports, Activity reports, MWE report, LG		Farmers put in practice the district and local level plans in practice and develop activity reports
	Subsistence and commercial farming activities monitored	MAAIF report, CC reports, Activity reports, MWE report, LG		Farmers have activity reports showing what has transpired
2. Support preparation of agricultural land management plans at village level to guide sustainable land use, which should include both subsistence and commercial farming and look at upstream and downstream water users and uses	Number of agricultural land management plans prepared at village level	MAAIF report, CC reports, Activity reports, MWE report, LG		Plans developed at community level
	Sustainable land use adopted			
3. Promote appropriate agroforestry and clean energy technologies to improve livelihoods and the environment	Appropriate agroforestry and clean energy technologies functional	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Farmers practice forestation and use of solar power technology for irrigation and recycling materials
4. Implement all or some of the land use plans prepared for the districts on sustainable land management.	Number of land use plans prepared, implemented and operationalized	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Farmers incorporate small-scale irrigation technologies and agro forestry
5. Training and research in appropriate technology development	Number of farmers trained	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Farmers adopt new and indigenous technology
	Number of research findings and recommendations disseminated and adopted			

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Number of training and research in appropriate technology development conducted			
Strategy 5.1.4 : Promote appropriate forest and ecosystem management practices to increase the resilience of agrarian communities to the impacts of a changing climate building, financing, Technology				
5.1.4 (a) Mainstream climate change in agricultural research and innovations				
1. Develop and implement management plans for ecosystems in order to encourage sustainable use	Management plans for ecosystems implemented	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Farmers have access to organic farm inputs
2. Support the establishment of tree nurseries and distribution of tree seedlings.	Number of tree nursery beds established and distributed	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG		Farmers have access to affordable and quality seedlings
3. Provide incentives to farmers to increase tree cover on their land	Number of farmers receiving incentives	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Farmers receive free seedlings to plant trees
4. Develop a business model for ecosystem management in order to facilitate Payment for Ecosystem Services/ PES (e.g. use of tourism revenue to motivate farmers to conserve wildlife and use of revenue from payment for water in urban areas to pay farmers for conservation of water catchments)	Business model for eco system management developed	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Farmers who plant trees on large scale given grants or free seedlings
	Percentage of farmers conserving wildlife			
	Percentage of farmers receiving payment for conservation of water catchments			
5. Promote best management practices for forest and ecosystem management, to improve and maximize net benefits for the farmers	Best management practices for forest and eco system in place	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Practicing recycling and reforestation

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
	Number of farmers receiving improved and maximum net benefits due to best management practices for forest and ecosystem management	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		More farmers indulged in production for farmers who use good management practices
6. Document biodiversity in the ecosystems, including below ground biodiversity and develop eco-tourism opportunities in such areas	Biodiversity in the ecosystem documented	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Availability of technical personnel to do the documentation
	Eco-tourism opportunities developed in the areas	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Availability of resources
7. Support Local Governments at District and Sub-county levels to undertake afforestation and reforestation through Public-Private Partnerships	Afforestation and reforestation initiated at local government and sub-county level	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Willingness of the private sector to participate
	Number of public private partnerships supporting afforestation and reforestation	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Increase in the number of private sector participation
8. Scale up and strengthen wetland conservation and restoration of degraded wetlands, lakeshores, river banks, hilly and mountainous areas and rangelands	Number of wetlands conserved	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Existence of rules and regulations governing the environment
	Number of degraded wetland, lake shores, river banks, hilly and mountainous areas restored	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Willingness by the government to act

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
9. Support the planting of woodlots to ensure a steady supply of wood fuel in transition to renewable energy use	Number of farmers planting woodlots	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Availability of finances and willingness of farmers to plant woodlots
	Increased supply of wood fuel	MAAIF report, CC reports, Activity reports, MWE report, NFA, LG, Private sector		Support from the government
Component 6: Research for climate resilient agricultural development				
Objective6.1: Promote climate smart agricultural research and innovations.				
Strategy 6.1.2 : Mainstream climate change in agricultural research and innovations				
6.1.2 (a)Short -Term sub-actions				
1.Develop and implement a climate change and agriculture research program	A climate change and agriculture research program developed and implemented	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		CSA Research report and activity reports presented
2.Establish and operationalize a climate smart agricultural research fund	A climate smart agriculture research fund operationalized	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		A functional fund where farmers can become members
3.Strengthen the infrastructural and technical capacities of the agricultural research centres to enable them undertake climate resilient agricultural research and innovations	Infrastructure and technical capacities of the agriculture research centres strengthened	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		More funding given to research centers on climate change
	Climate smart agricultural research and innovation undertaken			

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
4.Conduct participatory research work on improved technologies and practices, informed by needs of users and agro-ecological zones along the value chain	Participatory research work on improved technologies and practices conducted	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		Documented research on each concept of value chain is conducted
5.Enhance adaptive research on climate resilient and productivity enhancing technologies, including indigenous knowledge and local innovations, on-farm and on-station demos/trials	Adaptive research on climate resilient and productivity enhanced	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		Research and documentation on climate resilient and productivity enhancing technologies conducted
6. Strengthen platforms through which researchers will have regular contacts with stakeholders and other users at the national, Zonal, District and farm levels.	Platforms for researchers for regular contacts with stakeholders and other users at the national, zonal, District and farm levels strengthened	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		Platforms for researchers and stakeholder engagement active and regularly meeting
7.Develop a framework to target climate adaptation projects in vulnerable areas	Framework to target climate adaptation projects in vulnerable areas developed	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector, Mo GLSD		A developed agenda o target climate adaptation projects in communities
8.Develop a framework to advocate for increased public sector funding in research and development and innovations	Increased public sector funding	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sector		Solicit for funds to cater for research and development and innovations
9.Incentivize private sector and civil society investments in climate smart agricultural research and development, and innovations	Private sector and civil society investments in climate smart agricultural research and development, and innovations	MAAIF, MWE, NARO, MoES, Research Institutes and Universities, Civil Society and Private Sec		Several private sector and civil society get involved in climate smart agricultural research to fill the gaps

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
Level of funding for climate resilient agriculture	Amount of funding leveraged to support CCA interventions and national and sub-national levels	Value of financial development assistance to climate change adaptation	MoFPED Development Partners CCD MAAIF	Collaboration of private sector and development partners
Component 7: Knowledge Management and Partnerships for climate action				
Objective 7.1: To enhance knowledge on good practices and partnerships to reduce vulnerability of the agricultural sector to the impacts of climate change				
Strategy 7.1.1: Develop knowledge management and communication systems to support climate resilient agriculture				
1.Support the development of a climate resilient agriculture communication and awareness strategy as well as communication tools	Climate smart agriculture communication and awareness strategy developed	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Development of a Climate Change Knowledge Management System for agriculture
2.Undertake a climate smart agriculture knowledge mapping, audit and analysis	Detailed planning on climate change	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Conduct studies on climate change and draw plans on how to disseminate the findings
3. Establish multi -stakeholder knowledge sharing networks, both National and international	Stakeholder engagement and communication network operationalized	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		National networks and collective knowledge on communication established
4. Develop, operationalize and regularly maintain a Knowledge Management System and Web portal for climate smart agriculture	A knowledge management system and web portal for climate smart agriculture developed and regularly maintained	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and		Monitoring and evaluating of Climate Change activities and making amendments in

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
		Private Sector, UNFFE		the management system
7.1.1(b) Medium and long term -actions				
1.use ICT to continuously raise awareness and disseminate of targeted information on climate resilient agriculture	Campaign using ICT to raise awareness and disseminate targeted smart agriculture conducted	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Use of ICT through social media platforms to raise awareness and disseminate targeted information on climate resilient agriculture
2.Build a climate resilient agriculture knowledge database and documentaries	Climate smart agriculture knowledge warehouse built	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Creation of a data base to store climate smart agriculture knowledge
3. build capacity of stakeholders in knowledge management	A training plan for relevant stakeholders developed and implemented	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Training stakeholders on how to develop knowledge management and communication systems
4. Develop and disseminate documentation for lessons learned to policy makers and implementers, researchers, communities and other stakeholders; throughout the project	Numbers of documents for lessons learned to policy makers, implementer, researchers and communities	MWE, MAAIF, NARO, MoICT, Universities and Research Institutes, MoLG, LG, Civil Society and Private Sector, UNFFE		Reports on for lessons learned disseminated to policy makers and implementers, researchers, communities and other stakeholders
7.1.2 Strengthen partnerships and networks to enhance a common approach to climate resilient agriculture				
7.1.2 (a)Short Term sub-actions				

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
1.Develop a network of institutions (government, civil society, private sectors, DPs) active in climate smart agriculture	Numbers of networking of institutions active in climate smart agriculture	MAAIF, MWE, MoLG, LG, Universities and Research Institutes, DPs, Civil Society and Private Sector		A network developed for institutions active in climate smart agriculture
2. Establish and strengthen forums and platforms for engagement between national and local governments, the private sector and civil society on climate change and agriculture	Number of Forums and platforms for engagement between national and local governments, the private sector and civil society on climate change and agriculture	MAAIF, MWE, MoLG, LG, Universities and Research Institutes, DPs, Civil Society and Private Sector		Utilize the use of platforms such as radio, TVs, social media, conferences, conventions for engagement on climate change and agriculture
3. Enhance programmatic coordination on climate resilient agriculture between GoU and Development Partners	Increased enhancement of programmatic coordination on climate smart agriculture between the government and development partners	MAAIF, MWE, MoLG, LG, Universities and Research Institutes, DPs, Civil Society and Private Sector		Government solicits for funds from development partners to facilitate climate smart agriculture
4.Increased enhancement of programmatic coordination on climate resilient agriculture between the government and development partners	Increased enhancement of a science policy dialogue by establishing and	MAAIF, MWE, MoLG, LG, Universities and Research Institutes, DPs, Civil Society and Private Sector		More development partners are put on board on climate smart agriculture matters
5.Strengthening platforms and networks between the academia, researchers, farmers, policy and decision makers	Strengthening platforms and networks between the academia, researchers, policy makers and decision makers.	MAAIF, MWE, MoLG, LG, Universities and Research Institutes, DPs, Civil Society and Private Sector		Involve the academia, researchers, policy makers and decision makers on platforms and networks on climate smart agriculture.
Component 8: Gendered Approach to climate change adaptation				
Objective 8.1: Promote a gendered climate Resilient agriculture Programme to reduce the vulnerability of women, youth and other disadvantaged groups				
Strategy 8.1.2: Mainstream gender in climate smart agriculture				
8.1.2(a)Short Term actions				

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Data Sources	Underlying Assumptions
1.Conduct a comprehensive gender analysis to identify gender issues in CC adaptation in agriculture	A comprehensive gender specific assessment on climate change impacts on agriculture conducted	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Available resources to conduct a comprehensive gender specific assessment
2. Develop and implement a targeted and gender capacity support Programme	A targeted and gender capacity support programmes developed and implemented	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Training stakeholders on how to mainstream gender into climate change
3. Develop a multi-sectoral coordination mechanism for monitoring and reporting on gender and climate change adaptation	Ratio of men to women mainstreaming in the sector	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Supervision of activities and programmes on gender and agriculture coordination
4.Develop and apply a tool for gender-responsive climate smart agriculture budgeting and planning	Ratio of men to women in agriculture budgeting and planning	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Formulating a framework for gender-sensitive climate smart agriculture budgeting and planning
5.Develop an implementation strategy to address gender and vulnerable groups issues in agriculture and climate change policies, plans, programmes and projects	A framework to address/ mainstream gender and vulnerable groups issues in place and functional	MAAIF, MoGLSD, MoIG, LGs, Civil Society		A functional framework to address/ mainstream gender and vulnerable groups issues in place
	Number of climate change policies, plans, programs and projects in place	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Adopt climate change policies, plans, programs and projects in place
6.Assess, document and disseminate gender responsive technologies based on locations	Documented gender sensitive technologies in place	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Observations, workshops and reports made on gender sensitive technologies and their locations
7.Creation of gender-climate change platforms at sub-national level	Gender-climate change platforms formed	MAAIF, MoGLSD, MoIG, LGs, Civil Society		Chances to express ideas on gender-climate change made available

4. Detailed Budget

The NAP-Agaric report has been finalized and has been costed. It has been broken down in to a series of components, objectives, strategies and activities with the help of National Adaptation Plan (NAP) for the Agricultural Sector. Costing the NAP-Agaric entailed the following benchmarks:

i. Prioritization of activities that would deliver immediate and tangible results to build initial momentum for up-take of NAP-Ag interventions on the ground;
ii. Emphasizing items in the budget that are already on-going and building on their success to lobby for more financing for their scale-up
iii. Prioritizing areas that are very prone to adverse effects of climate change (including water stressed areas in the cattle corridor) where a lot of studies and piloting has already been undertaken.

Summary of the costing for the NAP-Agaric

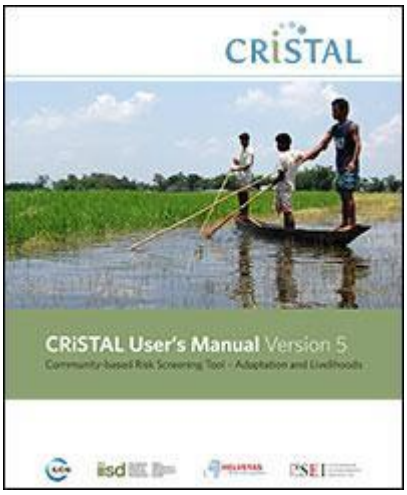
NAPs for Agaric M&E framework Components ,Objectives ,Strategies and Activities	Total for 5 years USD	Total year 1 USD	Total year 2 USD	Total year 3 USD	Total year 4 USD	Total for year 5 USD
Grand total	**521,972,044**	**133,288,546**	**129,397,423**	**117,552,009**	**72,789,499**	**68,812,568**

The other aspects to underpin the costing framework included:

i. Use of current base figures within the ASSP and the MTEF for Agriculture
ii. Cost estimates based on expenditure figures for similar NAPA work in Mowed
iii. Added costs to support new technical and logistical support as well as operational cost
iv. Accommodation for inflation, loss risk (especially due to breakdowns and bad weather) as well miscellaneous for activities both at coordination level nationally and in districts
v. Incremental cost to accommodate new interventions as well as the M&E cost in line with the National M&E Policy.

See the detailed budget as Annex 1 of this document

5. Tools for Data Capture



There are a variety of tools to capture data on climate change adaptation. **There is consensus now among various stakeholders that since CRiSTAL has already been used among 13 districts in Uganda- it is scaled up for wide use as PMF data management tool for this purpose.** However, before this conclusion is made- it was also important to note that various data capture systems serve well different purposes as shown by the shades in the table below.

CVCA has proven successful especially with capacity analyses. CRiSTAL has a risk-screening aspect which could link well with early warning systems (an aspect very important for Uganda farmers). It is also good in capturing data on livelihood trends. When it comes to Community Education and information dissemination, CEDRA used mainly by CSOs in most developing countries has been widely popular- due to its 'easy-to-use' functionality and interface with other systems. This is similar to CBA although the Community Based Adaptation tool takes a wider scope and not only focused on agriculture. There are also relatively new tools including the CCMT (Climate context Monitoring tool) which is mainly preferred by researchers in the academic institutions; and recently the NAC – National Adaptive Capacity Framework.

Table5: Various Management Information System in CCA

	CARE Climate Vulnerability and Capacity Analysis (CVCA)	Community-based Risk Screening Tool – Adaptation and Livelihoods (CRiSTAL)	CEDRA (community education and demonstration tool on Risk Awareness)	Framework of Milestones and Indicators for Community-Based Adaptation (CBA)	Climate Context Monitoring Tool	National Adaptive Capacity (NAC) Framework
Analysis	■	■				
Design			■	■		■
Implementation					■	
Information & Knowledge Management				■	■	■

KEY QUESTIONNAIRE/CHECKLIST FOR NAP-Ag PERFORMANCE

Component 1: Crop Production

Strategy 1: Promote and encourage highly adaptive and productive crop varieties and cultivars in drought-prone, flood-prone and rain-fed crop farming systems

- Record of vulnerability and suitability assessments have been carried out per cropping enterprise per local government and urban authority per annum.
- Number of nursery operators and quality seed producers trained and responsive to needs for adaptive and productive crop varieties and cultivators in drought-prone districts and urban authorities (categorized by enterprise, gender and crop type)
- Various forms of events held at district and community levels to promote and encourage farmers to adopt crop varieties as well as drought and flood resilience crop farming systems (categorize per type of event and response noted)

Strategy2: Promote and encourage conservation agriculture and ecologically compatible cropping systems to increase resilience to the impacts of climate change

- Number of farmers (categorized by enterprise age, gender, and location) with demonstrable ability (on and off-farm) to adopt compatible crop systems resilient to the impacts of climate change
- Documentation of the impact these promotion and encouragement of conservation and ecologically compatible cropping systems has had on yields and household incomes vis-à-vis farmer input and effort.
- Probe the resilience of these cropping systems and if modern SLM practices including use of a combination of both organic and inorganic fertilizers as well as irrigation are new investments needed to increase yields.

Strategy 3: Strengthen water harvesting and irrigation farming to build resilience to droughts and floods

- List of farmers (categorized by age, gender and location) have under gone training in water harvesting and agriculture water management technologies?
- List of farmers have these water harvesting structures in their homes (recorded per location, purpose and quality of facility)?

Strategy 4: Promote and encourage agricultural diversification and improved post-harvest handling, storage, value addition and marketing

- List of farmers (categorized by age, gender and location) able to demonstrate use of improved post-harvest technologies
- List of farmers (categorized by age, gender and location) able to demonstrate use of improved storage and marketing facilities locally or with modern facilities
- Trends (per season and year) in volume and value of produce that farmers adopting improved practices in comparison to those that are not (recorded by gender of market players and location)

Strategy 5: Support community-based adaptation strategies through expanded and climate smart extension services

- Assessment (per enterprise and location) of the extent to which agricultural extension services have incorporated adaptation mechanisms within a climate smart agricultural platform.
- Categorization (age, gender, enterprise and location) of recipients of community-based adaptation strategies through various community management programs

- Assessment of impact achieved by support provided by various actors on community level agricultural performance in the intermediate and long run.

Component 2: Livestock Development

Strategy 1: Promote and encourage highly adaptive and productive livestock breeds

- Documentation of efforts (showing various livestock breeds) to promote and encourage highly adaptive and productive livestock breeds
- Attendance (by age, gender and location) of various campaigns conducted on climate resilient livestock (with record of informative material provided)
- Record of intermediate and longer term impact of adoption of highly productive and productive livestock breeds including impact on poultry breeds and management practices?

Strategy 2: Promote sustainable management of rangelands and pastures through integrated rangeland management

- How does this community manage its rangelands, grazing reserves and water sheds to maintain their productivity?
- How many farmers (categorized by age, gender and location) have received training on watersheds to manage water livestock rearing?
- What impact has any training received had on your capacity to improve conservation and management of rangelands and pastures?

Strategy 3: Promote and encourage diversification and improved livestock value chains

- Record of livestock farmers (age, gender and location) reached with capacity building initiatives (on-and off-farm) on diversification and improvement of production of marketable livestock products (Including poultry)
- Trends in value addition and incomes changes as a result of diversification and improvement of livestock management practices (efficient handling, storage, agro-processing and marketing) per farmer and location
- What are the other livelihoods being pursued other than or alongside livestock?

Component 3: Fisheries

Strategy 1: Promote climate resilient fisheries sector and integrated fisheries resource management

- How effective have been the fisheries and fish farming targeting criteria to train farmers on fisheries and aquaculture management practices?
- Record of vulnerability assessments for fisheries and aquaculture documenting intervention areas for climate change mitigation and adaptation (date and location and results report)
- What climate resilient fishing practices are being promoted especially those to prevent over fishing and unauthorized exploitation of water bodies?

Component 4: Climate Information, Early Warning and Disaster Preparedness Systems

Strategy 1: Strengthen climate information, and early warning and disaster preparedness systems to support sustainable agriculture

- What kind of automated weather monitoring stations do you have in your community and which platforms do access this kind of information?
- Which early warning message dissemination mechanism do you have in place in your community?
- How many staff have been given specialized training on knowledge and improved accuracy of models for predicting weather and climate? Of these how many are female and youth?

- Do you have a food strategic stock plan in place in your community? If yes, how has it been of help?

Strategy 2: Support innovative insurance schemes to protect farmers against climate risk related crop and livestock losses

- Do you have any agricultural insurance cover? Do you think it's important and beneficial to the agricultural sector?
- Does your community have agro-meteorological infrastructure in place? If no, how do you detect your whether conditions?
- How many farmers (categorized by age, gender and location) have been educated about whether indexed insurance products and how many are under adaption insurance financing?

COMPONENT 5: Forestry, Land and Natural Resources Management

Strategy 1: Increase water use efficiency and water storage

- Document number of users (age, gender and location) of various techniques for efficient water harvest, storage, and use - per system used and its benefits
- Record of challenges faced in water user efficiency and storage and what is being done to address them (per location and water system)
- What approaches can be developed to increase water use efficiency in agricultural production?

Strategy 2: Strengthen catchment Management in agricultural planning

- Efficacy of the current planning guidelines to protect the water catchment areas
- Record of activities done by local and district authorities that constitute catchments management and protection institutions
- Level of awareness (categorized by age, gender and location) among communities on issues of catchment protection and the link this has to agricultural development
- Efficiency and effectiveness of methods used to protect the catchments areas (documented by location and method used).

Strategy 3: Adopt sustainable agricultural land and water management to reduce degradation

- Mechanisms in place (recorded for location and processes) to ensure sustainable land use management especially the focus on reducing land degradation
- The impact (positive or negative) of the current enforcement of land laws on land tenure, land use and ownership on the environment and potential impact in the future
- Documentation of innovative ways to promote sustainable water and land management in your area

Strategy 4: Promote appropriate forest and ecosystem management practices to increase the resilience of agrarian communities to the impacts of a changing climate

- What the some of the LULUCF activities carried out in your area?
- How do you conserve the forests from losing carbon stock?

- Do you have forest reserve areas and are they being protected?
- Record of tree planting and reforestation in communities.

COMPONENT 6: Research for climate resilient agricultural development

Strategy 1: Mainstream climate change in agricultural research and innovations

- Documentation of best practices (categorized per enterprise and location) adopted as a result of agricultural research aimed at climate change resilience
- Trends in the introduction of crop, animal and fish species that are climate change resilience?
- Identified local technologies being used to mitigate climate change impacts that could be scaled-up (per enterprise and location)
- Capacity to sustain both personal, equipment and logistics to keep the work on information and knowledge sharing on climate change vibrant at the grassroots?

COMPONENT 7: Knowledge Management and Partnerships for climate action

Strategy 1: Develop knowledge management and communication systems to support climate resilient agriculture

- Record of evidence of vibrancy of platforms for coordination among various stakeholders are in your place and how many are they?
- PROBE the availability and level of use of knowledge and information platforms to drum support for local interventions on climate change resilience
- How do you receive and share information of knowledge on climate change?
- Which means do you use to share climate change information and knowledge?

Strategy 2: Strengthen partnerships and networks to enhance a common approach to climate resilient agriculture

- What are the best social learning and multi stakeholder models to bring together farmers, researchers, commercial enterprises, policy makers and other key actors to develop better technologies and institutions for a more equitable, suitable and innovative agriculture sector?
- USE CASE STUDIES and document evidence of use of knowledge obtained (categorized by age, gender, enterprise and location) to make agriculture more climate resilient. How else, do you propose climate change information and knowledge should be shared?

COMPONENT 8: Gendered Approach to climate change adaptation

Strategy 1: Mainstream gender in climate smart agriculture programme

- Evidence of the efficacy of ensuring that interventions (on-farm and off-farm) are implemented cognizant of dual roles of both men and women in ensuring climate smart agriculture?
- Documentation of incorporation of clear gender roles at all levels of the agriculture value chain especially marketing to dual benefit of both men and women

- Efforts (with record of activities at local levels) to engender capacity support programs in agriculture and benefits of this process for rural women
- Record of impact of community based adaptation activities that strengthen women's access to resources as well as the appropriateness of relevant measures that can be adopted to mitigate gender disparity in agriculture.

6. Training End-Users on the M&E System

A participatory methodology to make the framework relevant to the user teams will be adopted and also ability to train potential users to utilize the frameworks widely. Below are some of the steps adopted.

6.1 Understanding the M&E needs of the trainees

The first step is to understand the M&E needs at each level and work towards meeting these needs. This will base on the selected group to be trained and on the session objectives which will be identified before the training.

Selected participants will be invited to training workshops at the end of the assignment which will highlight how the performance matrix will be used to capture data but also premise results analysis the areas for learning and improvement. A focus will be laid on gender profiling and analysis and how to report gender-based data right from the baseline, and systemically into the planning, implementation and results reporting. This will include training of how to construct different M&E tools among which include;

- Result Chain
- Logical Framework
- Theory of Change
- Problem Tree Analysis
- SWOT Analysis
- Balanced Score Card

6.2 Use of an adult learning approach

For ease of this process, an adult learning approach will be devised and content presented in an easy-to-know and easy-to-use format and the learning itself should respond to their needs. Practical examples will premise the training exercises and routinely capacity assessments made to verify the impact of the training.

6.3 Developing training materials

While designing the training materials, the following points will be kept in mind:

- Focus should primarily be put on the learning needs of the trainees, and not on what's easy for your trainers
- Only create training content and assessments that relate directly to your learning objectives
- The adult learning principles will be considered for example they are self-motivated; they come with their expectations and goals to attain.
- Include as much hands-on practice or simulation as possible: people learn by doing e.g. discussions, Question and Answer, exercises and brain storming.
- Where possible, trainees will be put in control of the learning process (instead of the trainer)
- Do everything possible to let the trainees talk and interact with the trainer and with each other during the training
- Make sure there's plenty of opportunity for feedback during training mainly though Question and Answers.
- Training materials will be broken up into small "chunks" that are easier to take in and understand
- Training materials will be ordered in a logical manner—one step that builds on top of another, or chronologically, etc.

— A "blended learning" approach that includes training in several different formats (computer-based, instructor-led, power point presentations).

6.4 Tools that can be used in training

- Create hand outs for trainees and to create training outlines and notes.
- Materials for hands-on elements and/or role-playing elements of the training
- PowerPoint for in-class projections and/or hand outs to deliver to employees. Beware of PowerPoint presentations that are nothing but screen after screen of bullet points, however.
- Flip-charts, posters, transparencies, and/or computer-generated graphics for presenting visual materials during training
- Use of case studies.

The table below shows such a tool that can be used to demonstrate the different levels of data capture that can be used a sample during training:

Region	**x**				
District	xx				
Sub Country code	xxx				
	Yield Data (current)	**Tends over last 5 years**	**Data for early warning system**	**ENR data (LULUCF)**	**Innovations inventory (examples of good practices at local level)**
Enterprise1 crop					
Enterprise 2 Livestock					
Enterprise 3 Fisheries					
Task holders					
Activity					
Gender illustrations					
File Name and Number					

6.5 Workshop setting will be used

— Before starting a workshop there is a need to define the main goal for the workshop, know who your audience will constitute, create an agenda (materials to be used such as Visual aids e.g. power point presentations and activities to be completed.). Getting everyone involved is significant to a successful workshop. This can be done through use of practical examples which can be done in groups. Creative Group exercises, Case studies

6.6 Validations of Training

These are carried out after the training; they act as training evaluations to get feedback from the trainees. This could be done through issuing a questionnaire detailing what the participants have learnt and their recommendations.

— Trainees' reaction

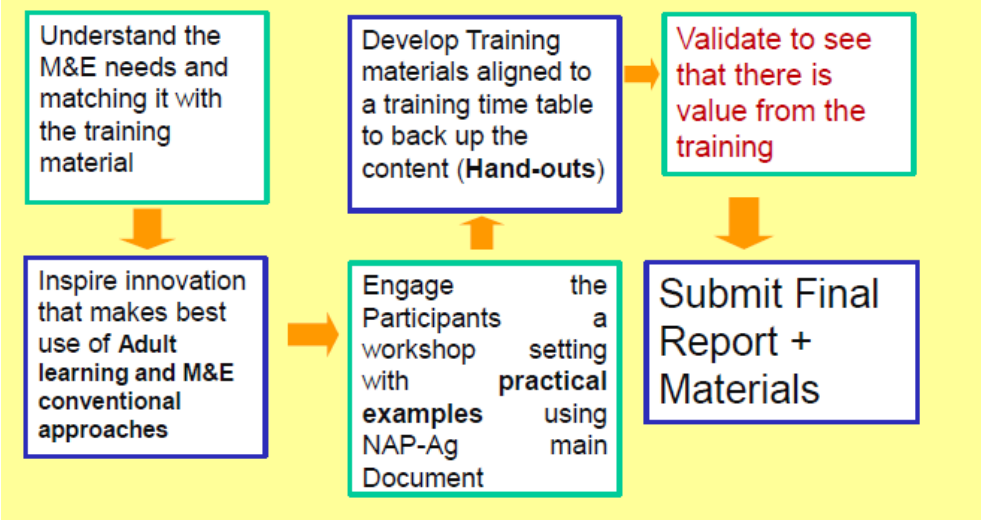
— Trainees' learning

— Trainees 'post-training job behaviour

- Quantifiable business results
- Did the trainees like the training?
- Did the trainees learn from the training?
- Are trainees performing desired tasks on the appointed position?
- Was the business goal reached?

6.7 Training Model

Users of this M&E framework will be the sector level and district level officials as well as community duty bearers who will be reporting on performance and using result to inform better implementation.



During the training sessions, the model above (insert) will be used. Training will be delivered in an adult learning environment referencing the NAP-Ag main report and other reports on climate change adaptation plans for agriculture.

Tailored training materials, will be developed depending on the themes and audience and hand-out materials provided to ease appreciation of concepts by participants. Field visits will be made and practical example approach emphasises key practices in an endeavour to make these trainings hands-on. Evaluation forms will be handed over to participants to appraise their satisfaction levels and assess the value they obtained from various training sessions. All trainings will have a training report and a file of all training materials used for scaling up and standardization.

7. Implementation Arrangements

The M&E Framework for the NAP-Ag will be embedded in the existing MAAIF M&E framework. In the event that the M&E mechanism within the ministry is being set up, this framework has proposed a PME modular that will report performance at the following levels as below tabled:

Level/Institution and detail	How to build the Systems for M&E at each level	Desired Outcome
National Government ministries: MAAIF and MWE	Policy implementation, Coordination of NAPs implementation, Resource mobilization. Extension services, Regulation, Standards, Early warning information, Human Resource Management Prioritize, Plan and budget for climate change adaptation in the agriculture sector at central government level	Embed the indicator framework within the ASSP M&E module that is being developed. Taking into account some of the indicators into the WS-MIS under the Ministry of Water and Environment
MoLHUD, MTIC, MoFPED, MoLG, NPA, OPM, MoGLSD	Participate as members of Climate Change Taskforce and other committees and platforms, participate in implementation	Strengthen the gender-based indicators within the gender proofing section with further consultation with the MoGLSD as well as well as the manual for Gender based financing
NARO	Research and development	Strengthen the Climate Smart Agriculture aspects within the NARO reporting framework (already work is on-going on production of drought resilient varieties for various crops, pastures as well as livestock)
UNMA	Climate Information and Early Warning Systems	
Local Governments	District and Sub-County Local Councils District and Sub-county Technical Departments	List out the climate change adaptation in the agriculture sector at LGs looking at the national budgeting and reporting outcomes by NPA under the NDP II reporting framework
Private Sector including Financial Institutions and insurance companies able to support agricultural insurance	Report on provision of financial products that support CCA including credit and banking services and guarantees to farmers and the private sector	Options for risk reduction to make agriculture more responsive to agricultural financing products available to incentivize the sector as well as Provision of goods and services for Market information, provision of credit, provision of market for produce, implementation of CSA

Level/Institution and detail	How to build the Systems for M&E at each level	Desired Outcome
Farmers Institutions Uganda National Farmers Federation, Farmer Cooperatives, Farmers Associations		Facilitation of group formation/SACCOs, awareness, mobilization, advocacy and coordination of partnerships for CCA, implementation of CSA activities; promotion of group marketing and warehouse receipt systems
Civil Society NGOs, CBOs, Faith Based Organizations Cultural Institutions	Advocacy, capacity building and support to implementation of CSA interventions	Synergetic reporting with CSOs engaged in CSA work to sharpen indicators (SEATINI for instance is an example on this aspect)
Development Partners (Bilateral and Multilateral)	Contribution towards policy development and implementation; financial support for development	Development partner reporting on performance systems to assess CSA work in Uganda especially the UNDAF framework and the SDGs
Media and 4th estate other actors	Platform and frequency for vital information at times of emergency — e.g. warnings on imminent floods and landslides; explaining how to deal with disease outbreaks, and dissemination of the NAP	Frequency and modular of reporting performance with target on: - Newspapers, - FM Radios - TV Programmes and - Public events (workshops, Barazas)

The details are shown in the table below.

Annex 1 Table Detailing the M&E implementation Arrangements

Components	Intermediate Outcomes	Wider Impact	Assumptions	Accountable officers (who?)	Mechanism for monitoring (how?)
1.Crop production	Increased crop yields	Food security, secure livelihoods and Improved nutrition	— Conducive climatic conditions — Improved farming methods/techniques — Increased soil fertility — Persistent food surplus	• MAAIF • MFPED • MoGLSD • MWE • Department of Crop Inspection & Certification (CIC) • Department of Entomology • Resource Management (FRM)and Development • Department of Agribusiness and the statistical Division • NARO • MoLG • Civil Society • Private Sector • Natural resources department	— Review performance and accountable review meeting — Progress reports — Technologies used — Ongoing projects — Early Warning Systems — National statistics

Components	Intermediate Outcomes	Wider Impact	Assumptions	Accountable officers (who?)	Mechanism for monitoring (how?)
2.Livestock Development	% increase in growth rates of livestock population	Contributes to food security, secure livelihoods and generates some export earnings	— Improved animal breeds — Good feeding and nutrition of livestock — Conducive climatic conditions — Availability of better-quality feed resources	• MAAIF, • NARO Research • Universities, • Civil Society • Private Sector • Veterinary officers • MTIC • DDA • LGs • Civil Society • Private Sector • Natural resources department	— Ongoing projects — Progress reports — Review performance and accountable review meeting — Surveillance systems — National statistics
3.Fisheries	% increase in fish production	Food security and secure livelihoods	— Improved fishing methods — Improved climatic conditions	• Department of Fisheries • Department of Fisheries Regulation • Department of Aquaculture • MAAIF • MWE • NAFIRI • LVFO • Universities • Research Institutes • LGs	— Ongoing projects — Progress reports — Farmer groups — National statistics

Components	Intermediate Outcomes	Wider Impact	Assumptions	Accountable officers (who?)	Mechanism for monitoring (how?)
				• Civil society • Private Sector. • Natural resources department • Environmental committee	
4.Climate Information, Early Warning and Disaster Preparedness Systems	Prior warning for vices and alertness.	Existent climate change profiles	— Informed agricultural sector — Accessible data, climate projections and crop models — Planning is simplified	• UNMA • MAAIF, OPM, NARO • CCD • LGs • Civil Society • Private Sector • Early warning systems • OPM • MoFPED • Insurance and Microfinance Institutions • Uganda department of meteorology	— Ongoing projects — Review weather information — Progress report forms
5.Forestry, Land and Natural Resources Management	Land restoration and conservation	Improved ecosystem management	— Enhanced agricultural productivity — Environmental conservation	• NFA • MWE • MAAIF • NEMA • LGs	— Ongoing projects — Review agricultural policies — Review agricultural and management plans

Components	Intermediate Outcomes	Wider Impact	Assumptions	Accountable officers (who?)	Mechanism for monitoring (how?)
			— Building resilience to climate change — Improved in soil fertility	• Civil Society • Private Sector • Communities • MoFPED • Environmental committees • Natural resources department	— Capacity building — Field visits — National statistics
6.Research for climate resilient agricultural development	Functional meteorological information system	Available references	— Accomplished and reliable data — To fill the knowledge gaps — Capacity building	• MAAIF • MWE • NARO • MoES • NCST • Research Institutes and Universities • Civil Society • Private Sector • NARO •	— Ongoing projects — Research carried out / Documented studies — Available data /adequate data — Research initiatives — National statistics
7.Knowledge Management and Partnerships for climate action	Acquisition of information, and communication systems that will aid the decision making processes	Established national networks and collective knowledge on coping strategies	— Information sharing — Availability of transfer, retention and replication of good practices — Surplus structured frameworks for stakeholders — Evidence upon which to make climate-smart	• MWE • MAAIF • NARO • MoICT • Universities and Research Institutes, • MoLG • LG	— Ongoing projects — Accurate data collection — Available data — Ensure sustainable response systems — National networks — Information sharing — Systematic dissemination and communication of all sector NAP activities and outputs

Components	Intermediate Outcomes	Wider Impact	Assumptions	Accountable officers (who?)	Mechanism for monitoring (how?)
			decisions and strategies to communicate key messages	• Civil Society and Private Sector • DPs	— Documenting and communicating the lessons learned —
8.Gendered Approach to climate change adaptation	Gender mainstreaming in climate smart agriculture	Equality for all (men, women, youth and vulnerable persons).	— Reduced vulnerability of women, youth and other disadvantaged groups — Empowerment of women, youth and the disadvantaged	• MAAIF, • MoGLSD, • MoLG, • LGs • Civil Society	— Ongoing projects — Choose indicators that are applicable — Meetings and notes taken

ANNEX 2: Detailed Costing of the NAP-Ag

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
Component 1: Crop Production									
Objective 1.1: To promote climate resilient cropping systems and value chains.									
strategy 1.1.1 Promote and encourage highly adaptive and productive crop varieties and cultivars in drought-prone, flood-prone and rain-fed crop farming systems									
1. Baseline survey on crop vulnerability and suitability assessment in all agro-ecological zones of Uganda including crop resilience for various varieties	Report on the status of Crop vulnerability and suitability in all agro-ecological zones of Uganda	1	200,000	200,000	200,000				
2 Inspect field trials and demonstrations of climate resilient crops and cropping practices	field d trails and demonstrations report on crops and cropping practices that are climate resilient	5	130,000	650,000	130,000	130,000	130,000	130,000	130,000
3 Assess and report on efforts to capacity of nursery operators in all agro-ecological zones and support them to expand and improve quality of seedlings	Nursery operators supported	5	110,000	550,000	110,000	110,000	110,000	110,000	110,000
4. Impact assessment as a result of increased on the need for and type of climate resilient crop varieties	campaigns on the need for climate resilient crop varieties conducted	1	400,000	400,000					400,000
5. Assessment and reporting on scale up with intent to increase access to climate resilient crop varieties by farmers in different agro-ecological zones	Climate resilient crop varieties given to farmers in all zones	1	500,000	500,000					500,000
Sub-Total				**2,300,000**	**440,000**	**240,000**	**240,000**	**240,000**	**1,140,000**
Strategy 1.1.2 Promote and encourage conservation agriculture and ecologically compatible cropping systems to increase resilience to the impacts of climate change									
1. Routine monitoring of the field trials on climate resilient cropping practices in different agro-ecological zones of Uganda using conservation agriculture and related practices	field trial reports on climate resilient cropping practices	5	500,000	2,500,000	500,000	500,000	500,000	500,000	500,000
2. Monitoring of demonstrations of climate resilient cropping patterns in association with water management systems	Demonstration reports of climate resilient cropping pattern monitoring reports	5	410,000	2,050,000	410,000	410,000	410,000	410,000	410,000
3. Assessment of the performance of various for high value, multipurpose tree crops and agroforestry systems	Agroforestry systems and tree crops trail assessment reports.	5	400,000	2,000,000	400,000	400,000	400,000	400,000	400,000
4. Appraise the extent to which the promotion and scaling-up of climate resilient cropping practices are appropriate for different ecological systems in the country	Climate resilient cropping practices adoption studies	1	100,000	100,000	100,000				
5. Appraise the progress in the promoting efforts to scale up conservation agriculture practices such as agro-forestry and sustainable land management	Conservation agriculture adoption road map appraisals	2	80,000	160,000				80,000	80,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
6. Assessment of the impact of promoted locally available climate smart agriculture technologies and practices	Assessment report - CSA technologies & practices adopted.	1	80,000	80,000					80,000
Sub-total				**6,890,000**	**1,410,000**	**1,310,000**	**1,310,000**	**1,390,000**	**1,470,000**
strategy 1.1.3 Strengthen water harvesting and irrigation farming to build resilience to droughts									
1. Record of identified suitable sites for rainwater harvesting and agricultural water management schemes	Survey report on rain water harvesting and agriculture water management technologies	1	100,000	100,000	100,000				
2. Impact assessment of training provided to farmers in water harvesting and agricultural water management technologies	Farmers trained in water harvesting and agriculture water management technologies	2	210,000	420,000				210,000	210,000
3. Report on progress made to facilitate the construction of water harvesting structures at household and community levels	Water harvesting structures at all levels constructed.	2	30,000	60,000		30,000	30,000		
4. Studies on the irrigation potential and identify sites in various river floodplains and underground water sources for micro-irrigation systems	Irrigation feasibility reports	2	100,000	200,000				100,000	100,000
5. Impact felt by recipients of developed appropriate efficient small-scale irrigation technologies and packages	small scale irrigation technologies developed	2	100,000	200,000				100,000	100,000
6. Impact of train extension workers on irrigation and water management technologies and impart skills to enable them undertake irrigation extension	Extension workers on irrigation and water management technologies trained	2	250,000	500,000			250,000	250,000	
7.Undertake comprehensive management needs assessment of existing large-scale irrigation schemes	Large scale irrigation schemes need assessment report.	1	100,000	100,000	100,000				
8. Assessment of the impact of train farmers and private sector in the installation, operation and maintenance of recommended irrigation technologies	Farmers /private sector trained in irrigation technologies	2	100,000	200,000				100,000	100,000
9. Disseminate and scale up appropriate efficient small-scale irrigation technologies and packages	Small scale irrigation technologies and packages adopted.	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
10. Appraise established links to input and output markets and service providers of irrigation technologies	Irrigation technology service providers accessible.	5	40,000	200,000	40,000	40,000	40,000	40,000	40,000
11. Assess the value added by the capacity efforts to improve performance of water committees in watersheds to manage water for irrigation and other production purposes	Water committees trained through IWRM courses for climate smart agriculture	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
12. Report on innovative production techniques that can increase productivity, better manage water resources, and reduce GHG emissions	Production techniques that are climate smart adoptive.	2	25,000	50,000			25,000		25,000
Sub-Total				**2,230,000**	**280,000**	**110,000**	**385,000**	**840,000**	**615,000**
Strategy 1.1.4 Promote and encourage agricultural diversification and improved post-harvest handling, storage and value addition									
1. A routine assessment of the performance of diversification and integration of agricultural enterprises at all levels to spread climate risks	agricultural enterprises diversified	5	160,000	800,000	160,000	160,000	160,000	160,000	160,000
2. Documentation of improved appropriate storage facilities (including those for bulk and long term storage) and technologies along the value chain	storage facilities set-up for bulk storage	5	80,000	400,000	80,000	80,000	80,000	80,000	80,000
3. Record of rehabilitated existing warehouses and silos and establish public-private-partnerships management for long term food/grain storage and supply	warehouses and silos report	5	20,000	100,000	20,000	20,000	20,000	20,000	20,000
4. Assessment of the performance of warehousing receipt system and link smallholder farmers to warehousing receipt system in the grain supply chain	warehouse receipt system linked to small scale farmers	5	200,000	1,000,000	400,000	400,000	200,000		
5. Assessment of the impact of training provided to producers, processers and marketers in post-harvest management, preservation and long term storage of food and seed	Trainings on post-harvest management for producers, processors and marketers conducted	1	300,000	300,000					300,000
6. Documentation of use of regular market information to improve distribution of agricultural commodities and food stuffs	Market information channels created	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
7. Impact of innovative micro-financing packages to facilitate food and cash crop farmers to access credit	Micro finance packages for farmers to access credit available.	5	25,000	125,000	25,000	25,000	25,000	25,000	25,000
8. Assessment of the importance of marketing centres in rural areas, with the appropriate infrastructure	Market centres in rural areas created	5	40,000	200,000	40,000	40,000	40,000	40,000	40,000
9. Documentation on introduced technologies and practices for more efficient harvesting, drying and handling of crops	Efficient post-harvest technologies adopted	5	15,000	75,000	15,000	15,000	15,000	15,000	15,000
10. Assessment of the support provided to support private sector to invest in food processing as well as value addition, including packaging and branding	Private sector investments in the value chain (packing and branding)	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
Sub-total				**3,550,000**	**850,000**	**850,000**	**650,000**	**450,000**	**750,000**
Strategy 1.1.5 Support community-based adaptation strategies through expanded and climate smart extension services									

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
1. Assessment of mainstreaming climate change into agricultural extension and community management	Climate smart agricultural extension and community management programme launched	1	3,000,000	3,000,000			3,000,000		
2. Assessment of training and the impact of the capacity built through extension of deliver climate smart agricultural technologies and practices to farmers	Extension and community development workers trained.	4	500,000	2,000,000		500,000	500,000	500,000	500,000
3. Assessment strengthen platforms, through which small scale farmers can access agricultural information and extension services	Radio programmes , workshops conducted	5	80,000	400,000	80,000	80,000	80,000	80,000	80,000
4. Impact assessment of innovation platforms that build on indigenous knowledge and partnerships along the commodity value chains	Platforms formed on indigenous knowledge and partnerships.	5	80,000	400,000	80,000	80,000	80,000	80,000	80,000
5.Assessment of integrated crop-livestock systems on community resilience to a changing climate	crop livestock systems adopted for resilience	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
6.Assessment of the impact of wise use of early warning information by communities to enhance resilience	Early warning information usage	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
7. Assessment of the capacity built and equipment for extension service delivery/ dissemination of climate smart agriculture technologies and practices.	Extension services and CSA technologies training done and equipment purchased	2	80,000	160,000				80,000	80,000
Sub Total				**6,160,000**	**200,000**	**700,000**	**3,700,000**	**780,000**	**780,000**
Component Total				**21,130,000**	**3,180,000**	**3,210,000**	**6,285,000**	**3,700,000**	**4,755,000**
Component 2: Livestock Development									
Objective 2.1: To promote climate resilient livestock production systems and value chains									
strategy 2.1.1 Promote and encourage highly adaptive and productive livestock breeds									
1. Conduct a baseline survey on climate change risk and vulnerability assessment for the livestock sector in all agro-ecological zones	Risk and vulnerability assessment baseline report for livestock sector.	1	200,000	200,000	200,000				
2. Assess the level of awareness on climate change impacts on the livestock sub-sector and the need for highly adaptive livestock breeds	climate change impacts on livestock campaigns conducted	5	40,000	200,000	40,000	40,000	40,000	40,000	40,000
3. Document and report on identified, pilot and introduce improved livestock and poultry breeds and management practices	improved livestock and poultry breeds and management practices enhanced	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
4.Document and promote climate resilient indigenous livestock and poultry breeds and management practices	climate resilient indigenous livestock and poultry breeds and	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
	management practices documented								
5. Inspect work to support the acquisition of improved breeding stocks by men and women farmers	improved breeding stocks acquired	5	60,000	300,000	60,000	60,000	60,000	60,000	60,000
6. Assess work to rehabilitate, restock and build capacity of livestock breeding centres to produce improved breeds of livestock for farmers	breeding centres in good working conditions set up and others upgraded	5	60,000	300,000	60,000	60,000	60,000	60,000	60,000
7. Monitor and report on efforts to enhance selection and breeding of animals to increase adaptation to climate change	breeding of animals for adaption to climate change	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
Sub-total				**1,350,000**	**430,000**	**230,000**	**230,000**	**230,000**	**230,000**
Strategy 2.1.2. Promote sustainable management of rangelands and pastures through integrated rangeland management									
1. Document and report on issues in areas with acute problems of water for livestock and support construction of watering points and water systems	water accessibility report for livestock support and construction of water points	2	20,000	40,000		20,000			20000
2. Assessment of the impact felt in communities as a result of capacity built for water committees in watersheds to manage water for livestock rearing	water committees trained on watersheds to manage water livestock rearing	1	80,000	80,000					80,000
3. Assessment of the uptake of indigenous best practices in range land management and drought coping mechanisms	indigenous best practices in range land management and drought coping mechanisms documented	2	350,000	700,000				350,000	350,000
4. Assess impact of capacity building initiatives in indigenous knowledge, early warning systems, early action, stocking rates, vaccination campaigns, disease control	farmers trained in early warning systems, early action, stocking rates, vaccination campaigns and disease control	2	80,000	160,000				80,000	80,000
5. Report on establishment of quality pastures (grazing and fodder), feed resources, fodder banks and strategic reserves	Quality pastures, feed resources, fodder banks and strategic reserves in place.	5	50,000	250,000	50,000	50,000	50,000	50,000	50,000
6. Appraise work done to strengthen livestock disease surveillance and veterinary and entomological services to control pests and diseases	Livestock disease surveillance services to control pests and diseases strengthened.	5	50,000	250,000	50,000	50,000	50,000	50,000	50,000
7. Evaluate the impact of training done for farmers on livestock disease management and increase access to veterinary services (drugs, diagnostic services) and livestock disease surveillance and control	farmers trained in livestock disease management and disease surveillance & control	2	30,000	60,000				30,000	30,000
8. Appraise the impact on training conducted in management skills and practices of farmers, pastoralists and herders in diseases, feeding, breeding and integration under intensive and extensive systems	farmers given skills in management practices	2	80,000	160,000				80,000	80,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
Sub-total				**1,700,000**	**100,000**	**120,000**	**100,000**	**640,000**	**740,000**
Strategy 2.1.3 Promote and encourage diversification and improved livestock value chains									
1. Appraisal on the extent to which livelihood diversification (e.g. raising of camels, indigenous poultry, beekeeping, rabbits, emerging livestock - quails, guinea fowls and ostriches) has taken place under vulnerable communities	Livelihood diversification practiced	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
2. Assess at the marketing stage the functionality of established price stabilization schemes and strategic livestock based food reserves	Price stabilisation scheme and strategic livestock based food reserves.	2	40,000	80,000				40,000	40,000
3. Assess and report on the level of mobilization capacity built for livestock farmers for collective and cooperative effort to engage more efficient handling, storage, agro-processing and marketing	Livestock farmers trained in more efficient handling, storage, agro-processing and marketing.	4	80,000	320,000		80,000	80,000	80,000	80,000
Sub Total				**900,000**	**100,000**	**180,000**	**180,000**	**220,000**	**220,000**
Component Total				**3,950,000**	**630,000**	**530,000**	**510,000**	**1,090,000**	**1,190,000**
Component 3: Fisheries and Aquaculture									
Objective 3.1: To Promote climate resilient fisheries and integrated fisheries resource management.									
Strategy 3.1.1 Promote climate resilient fisheries sector and integrated fisheries resource management									
1. Document risk and vulnerability assessment of the fisheries sub-sector and value chains	Risk and vulnerability assessment report for fisheries and aquaculture sectors	2	210,000	420,000	210,000			210,000	
2. Assess the level of capacity to address the impacts of climate change on fisheries and aquaculture	fisheries sector able to respond to climate change impacts	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
3. Appraise efforts to encourage climate change resilient fishing practices, including fish farming, training in building fish ponds and making fish fodder	Climate resilient fishing practices adopted	5	25,000	125,000	25,000	25,000	25,000	25,000	25,000
4. Monitor activities supporting fish farming in order to promote climate resilient aquaculture	climate resilient fisheries and aquaculture activities promoted	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
5. Appraise economic incentives to diversify livelihood options and reduce dependence on climate-sensitive fisheries resources	economic incentives for diversification documented	2	100,000	200,000		100,000		100,000	
6. Inspect efforts to promote the breeding of climate resilient fish breeds/species, appropriate to particular ecosystems and communities	fish breeds/ species that are climate resilient adopted	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
7.Strengthen monitoring capacity and the capability to prevent over fishing and unauthorized exploitation of water bodies	Over fishing and unauthorised exploitation of water bodies curtailed	5	10,000.00	50,000	10,000	10,000	10,000	10,000	10,000
8. Document cases on Up-scaling of climate resilient strategies/technologies in fisheries and climate resilient fish varieties	climate resilient strategies mainstreamed in fisheries and aquaculture sector	2	300,000	600,000		300,000			300,000
9. Record and report efforts being made to establish, restore and maintain the bio-physical health of water bodies	bio-physical health of water bodies maintained	2	28,000	56,000		28,000	28,000		
Component Total				**2,251,000**	**405,000**	**623,000**	**223,000**	**505,000**	**495,000**
Component 4: Climate Information, Early Warning and Disaster Preparedness Systems									
Objective 4.1: To improve and strengthen climate information, early warning and disaster preparedness mechanism for a better informed agricultural planning and decision making.									
Strategy 4.1.1 Strengthen climate information, and early warning and disaster preparedness systems to support sustainable agriculture									
1. Document information from automated weather monitoring stations country-wide and integrate use of indigenous knowledge into community early warning systems	Automated weather monitoring stations all around the country	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
2. Document work done in community information platforms for dissemination to facilitate action based on early warning systems	Community information platforms in place.	5	80,000	400,000		100,000	100,000	100,000	100,000
3.Produce and disseminate early warning messages, that include risk information that are easily understood by authorities and end users	Early warning message dissemination mechanism in place.	5	40,000.00	200,000	40,000	40,000	40,000	40,000	40,000
4. Assess the impact of specialized training provided to increase capacity, knowledge and improved accuracy of models for predicting weather and climate	Staff given specialized training on knowledge and improved accuracy of models for predicting weather and climate.	1	20,000	20,000					20,000
5. Study efforts to downscale global and regional climate change models and information to national and local levels to support agricultural planning and decision-making	Personnel trained to down scale climate change models to national and local levels.	1	20,000	20,000					20,000
6. Document report on countrywide vulnerability mapping to support agricultural production, food security and disaster preparedness interventions	vulnerability mapping reports for food security and disaster preparedness intervention	1	150,000	150,000	150,000				
Sub-total				**840,000**	**200,000**	**150,000**	**150,000**	**150,000**	**190,000**

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
Strategy 4.1.2 Support innovative insurance schemes to protect farmers against climate risk related crop and livestock losses									
1. Appraise the level of use of innovative crop and livestock weather-indexed insurance packages	Insurance packages on innovative crop and livestock weather	5	8,000	40,000	8,000	8,000	8,000	8,000	8,000
2. Assess the utilization of agro-meteorological infrastructure and its data in supporting weather-indexed insurance	agro-meteorological infrastructure in place	5	5,000.00	25,000	5,000	5,000	5,000	5,000	5,000
3. Assess the capacity of micro-finance institutions to act as agents to deliver innovative crop and livestock weather-indexed insurance packages	Micro finance institutions supported	4	30,000	120,000		30,000	30,000	30,000	30,000
4. Assess the level of awareness within the insurance industry of extreme weather and climate risks and communicate actions and opportunities	insurance industry sensitized	2	100,000	200,000		100,000			100,000
5. Appraise the extent to which farmers are taking up various agriculture insurance products	farmers educated about whether indexed insurance products	2	200,000	400,000				200,000	200,000
6. Study ways of using other safety nets and alternative risk transfer instruments	study on safety nets and other risk transfer instruments inverted	1	30,000	30,000					30,000
Sub Total				**815,000**	**13,000**	**143,000**	**43,000**	**243,000**	**373,000**
Component Total				**1,655,000**	**213,000**	**293,000**	**193,000**	**393,000**	**563,000**
Component 5: Land Use Land Use change and Forestry (LULUCF)									
Objective 5.1: To promote sustainable natural resources management that enhances the resilience of agriculture and agrarian communities to a changing climate.									
Strategy 5.1.1 Increase water use efficiency and water storage									
1. Appraise the level of awareness promoted on how climate change impacts on water and other aspects of the agriculture sector	campaigns on how climate change impacts water and the agricultural sector	5	20,000	100,000	20,000	20,000	20,000	20,000	20,000
2. Assessment of the extent of public awareness on water conservation and efficient water use for agricultural production	workshops on water conservation and water use for agricultural production	10	8,000	80,000		20,000	20,000	20,000	20,000
3. Extent of the use of developed guidelines to ensure that irrigation plans and designs consider water availability, climate variability and climate change	Guidelines for irrigation designs and plans which take into account water availability and climate change in place.	1	8,000	8,000			8,000		
4. Appraise the level of responsiveness to policy briefs to advocate for updating policies to emphasize water use efficiency improvements in response to climate change	Policy briefs for new policies	3	10,000	30,000		10,000		10000	10000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
5. Assess the extent to which disaster risk reduction measures have been mainstreamed in water sector planning and service delivery, particularly in vulnerable agrarian communities	water sector plans with disaster risk reduction measures incorporated	2	10,000	20,000		10,000		10,000	
6. Review the level of use and installation performance for all water infrastructure installed to support adaptive measures included harvested rain	Farm water storage facilitates constructed	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
sub-total				**738,000**	**120,000**	**160,000**	**148,000**	**160,000**	**150,000**
Strategy 5.1.2 Strengthen catchment management in agricultural planning									
1. Review the performance of agricultural land and water catchment level coordination mechanism	committee on agricultural land and water catchment level coordination formed	2	30,000	60,000		30,000			30,000
2. Appraise the use of conservation management plans upstream and downstream of irrigation scheme catchment areas	conservation management plans for irrigation up and down stream drawn and enforced	5	20,000	100,000		50,000			50,000
3. Assess the performance of stakeholder engagements in various water catchment areas in areas planned for agricultural intensification	Stakeholder engagement platform on water catchment areas protection in place and active.	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
4. Assess the level of awareness on sustainable land and water management on farm lands	trainings on sustainable land and water management on farm lands	5	20,000	100,000	20,000	20,000	20,000	20,000	20,000
5. Appraise the level of effort on upstream water catchments conservation and appropriate forestry and agro-forestry technologies	upstream water catchment conservation report as well as report on forestry and agro-forestry technologies	5	40,000	200,000	40,000	40,000	40,000	40,000	40,000
6. Review performance of work done on sustainable traditional farming systems, indigenous technologies, and farmer initiatives under similar agro-ecological/agro economic conditions	Sustainable farming systems, indigenous technologies adopted.	5	30,000	150,000	30,000	30,000	30,000	30,000	30,000
Sub-Total				**660,000**	**100000**	**180000**	**100000**	**100000**	**180,000**
Strategy 5.1.3 Adopt sustainable agricultural land and water management to reduce degradation									
1. Assess the responsiveness to guidelines and principles on sustainable land and water management	Guidelines on sustainable land and water management developed by consultant	2	12,000	24,000	12,000		12,000		
2. Assess the level of capacity built within local governments and other stakeholders to plan, implement and monitor sustainable land management practices that involve local communities	LGs and stakeholders trained to plan implement and monitor sustainable land management	5	20,000.00	100,000	20,000	20,000	20,000	20,000	20,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
3. Monitor the level of community awareness of sustainable land and water management on farmlands	Trainings for communities sustainable land and water management on farmlands	5	1,000,000	5,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
4. Ascertain the level of support initiatives for community action to control soil erosion, reforest, protect and conserve degraded agricultural landscapes and watersheds	Community actions facilitated to control soil erosion	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
5. Review land use plans at district and local levels, to guide sustainable land use and management and monitoring of both subsistence and commercial farming activities	land use planning at LGs encouraged and facilitated	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
6. Monitor the process of preparation of agricultural land management plans at village level to guide sustainable land use, which should include both subsistence and commercial farming and look at upstream and downstream water users and uses	Agricultural land management plans at LGs levels prepared	5	300,000	1,500,000	300,000	300,000	300,000	300,000	300,000
7. Inspect appropriate agroforestry technologies to improve livelihoods and the environment	Agroforestry technologies adopted	5	200,000	1,000,000	200,000	200,000	200,000	200,000	200,000
Sub-Total				**8,624,000**	**1,732,000**	**1,720,000**	**1,732,000**	**1,720,000**	**1,720,000**
Strategy 5.1.4 Promote appropriate forest and ecosystem management practices to increase the resilience of agrarian communities to the impacts of a changing climate									
1. Inspect establishment of tree nurseries and distribution of tree seedlings in high risk areas	Tree nurseries in place & seedlings distributed	5	150,000	750,000	150,000	150,000	150,000	150,000	150,000
2. Monitor use of management plans for ecosystems in order to encourage sustainable use	Ecosystem management plan developed and implemented	5	100,000	500,000	100,000	100,000	100,000	100,000	100,000
3. Assess the efficacy of the business model for ecosystem management in order to facilitate Payment for Ecosystem Services/ PES (e.g. use of tourism revenue to motivate farmers to conserve wildlife and use of revenue from payment for water in urban areas to pay farmers for conservation of water catchments)	ecosystem business model developed by a consultancy	1	50,000	50,000				50,000	
5. Evaluate the level of adoption of best practices for forest and ecosystem management, to improve and maximize net benefits for the farmers	forest and ecosystem management best practices adopted	1	100,000	100,000					100,000
6.Document biodiversity in the ecosystems, including below ground biodiversity and develop eco-tourism opportunities in such areas	biodiversity documentation report in the ecosystem	1	100,000	100,000			100,000		
7. Appraise the level of Support Local Governments at District and Sub-county levels to undertake	PPPs in afforestation at district and sub-county levels signed	5	200,000	1,000,000	200,000	200,000	200,000	200,000	200,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
afforestation and reforestation through Public-Private Partnerships									
8. Evaluate the extent of scale up and strengthen wetland conservation and restoration of degraded wetlands	Wetland conservation report done by consultant	1	50,000	50,000					50,000
9. Inspect works on planting of woodlots to ensure a steady supply of wood fuel in transition to renewable energy use	Woodlots planting report	5	80,000	400,000	80,000	80,000	80,000	80,000	80,000
sub total				**2,950,000**	**530,000**	**530,000**	**630,000**	**580,000**	**680,000**
Component 5 Total				**12,972,000**	**2,482,000**	**2,590,000**	**2,610,000**	**2,560,000**	**2,730,000**
Component 6: Research for climate resilient agricultural development									
Objective 6.1: To Promote climate smart agricultural research and innovations									
Strategy 6.1.1 Mainstream climate change in agricultural research and innovations									
1. Appraise the performance of a climate change and agriculture research program	CSA Research report by consultant	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
2. Review the performance of the climate smart agricultural research fund	CSA research fund established	2	10,000	20,000	10,000				10,000
3. Assess the level of infrastructural and technical capacities of the agricultural research centres to enable them undertake CSA research and innovations	Agricultural research centre strengthening capacity report	5	15,000	75,000	15,000	15,000	15,000	15,000	15,000
4. Review work done under participatory research work on improved technologies and practices, informed by needs of users and agro-ecological zones	Participatory research report on improved technologies and practices along the value chain	5	10,000	50,000	10,000	10,000	10,000	10,000	10,000
5. Study extent of growth in adaptive research on climate resilient and productivity enhancing technologies, including indigenous knowledge and local innovations, on-farm and on-station demos/trials	Adaptive research report on climate resilient and productivity enhancing technologies.	1	50,000	50,000				50,000	
6. Conduct reviews on platforms through which researchers will have regular contacts with stakeholders and other users at the national, Zonal, District and farm levels.	Platforms for researchers and stakeholder engagement active and regularly meeting	5	20,000	100,000	20,000	20,000	20,000	20,000	20,000
7. Evaluation of climate adaptation projects in vulnerable areas	Framework for mainstreaming vulnerable areas in to climate adaption projects in place	2	100,000	200,000		100,000			100,000
8. Appraise a framework to advocate for increased public sector funding in research and development and innovations	Advocacy report for Climate change funding	2	10,000	20,000		10,000			10,000

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
9. Review and ascertain the extent to which incentives for private sector and civil society investments are yielding intended results	Incentives given to the Private sector and civil society to invest in CSA projects.	2	194,182	388,364	194,182				194,182
Component Total				**953,364**	**259,182**	**165,000**	**55,000**	**105,000**	**369,182**
Component 7: Knowledge Management and Partnerships for climate action									
Objective 7.1: To enhance knowledge on good practices and partnerships to reduce vulnerability of the agricultural sector to the impacts of climate change									
Strategy 7.1.1 Develop knowledge management and communication systems to support climate resilient agriculture									
1. Support the development of a climate smart agriculture communication and awareness strategy as well as communication tools	CSA communication strategy and tools developed	1	5,000	5,000	5,000				
2. Assess the extent of use of CSA knowledge mapping, audit and analysis among targeted stakeholders	Audit and analysis report for CSA	2	2,000	4,000	2,000	2,000			
3.Establish stakeholder engagement and communication networks	Communication network for stakeholders in place	5	900	4,500	900	900	900	900	900
4.Develop, operationalize and regularly maintain a Knowledge Management System and web portal for climate smart agriculture	CSA MIS and web portal in place	1	6,000	6,000	3,000	3,000			
5. Assessment of the level of ICT awareness raised and disseminated targeted information on climate smart agriculture	Social media campaign on CSA	5	736.91	3,685	736.91	736.91	736.91	736.91	736.91
6. Assess uptake of lessons from various trainings held for relevant stakeholders on CCA	CSA stakeholder training plan running and lesson learned	5	900	4,500	900	900	900	900	900
7.Develop and disseminate documentation for lessons learned to policy makers and implementers, researchers, communities and other stakeholders; throughout the project	Handbooks, brochures, bulletins, papers published on lessons learned	1	4,000	4,000	4,000				
Sub-Total				**31,685**	**16,537**	**7,537**	**2,537**	**2,537**	**2,537**
Strategy 7.1.2 Strengthen partnerships and networks to enhance a common approach to climate resilient agriculture									
1. Assess the effectiveness of network of institutions (government, civil society, private sectors, DPs) active in climate smart agriculture	Platforms for institutions active in CSA for stakeholder engagement on CSA	5	3,000	15,000	3,000	3,000	3,000	3,000	3,000
2. Appraise the strength of forums and platforms for engagement between national and local governments, the private sector and civil society on climate change and agriculture	platforms appraised for stakeholder engagement on CSA	5	2,000	10,000	2,000	2,000	2,000	2,000	2,000
3. Evaluate the level of programmatic coordination on climate smart agriculture between GoU and Development Partners	Platform for coordination between gov't and DPs on CSA in place	5	2,130	10,650	2,130	2,130	2,130	2,130	2,130

NAPs for Agriculture M&E framework Components, Objectives, Strategies and Activities	Outputs	No. of units	Unit cost (US$)	Total for 5 years (US$)	Total Year 1 (US$)	Total Year 2 (US$)	Total year 3 (US$)	Total year 4 (US$)	Total for year 5 USD
4. Document issues from, from science-policy dialogues between the academia, researchers, policy makers and decision makers	Science policy dialogue platform formed for policy makers	5	2,000	10,000	2,000	2,000	2,000	2,000	2,000
Sub Total				**45,650**	**9,130**	**9,130**	**9,130**	**9,130**	**9,130**
Component Total				**77,335**	**25,667**	**16,667**	**11,667**	**11,667**	**11,667**
Component 8: Gendered Approach to climate change adaptation									
Strategy 8.1.1 Mainstream gender in climate smart agriculture programme.									
1. Conduct a comprehensive gender specific assessment on climate change impacts on agriculture	Assessment report on gender specific climate change impacts on agriculture	1	5,000	5,000	5,000				
2. Develop and implement a targeted and gender capacity support programme	Gender Capacity support programme implemented	5	1,000	5,000	1,000	1,000	1,000	1,000	1,000
3. Develop a gender and agriculture coordination mechanism	Gender and agriculture working group in place	1	5,000	5,000	5,000				
4. Develop and apply a tool for gender-sensitive climate smart agriculture budgeting and planning	Tool for budgeting and planning in gender sensitive CSA in place.	1	3,500	3,500	3,500				
5. Develop a framework to address/mainstream gender and vulnerable groups issues in agriculture and climate change policies, plans, programmes and projects	Framework to integrate gender and vulnerable groups issues in CSA plans , polices, projects and programmes drawn	1	4,500	4,500			4,500		
Sub Total				**23,000**	**14,500**	**1,000**	**5,500**	**1,000**	**1,000**
Component Total				**23,000**	**14,500**	**1,000**	**5,500**	**1,000**	**1,000**
Grand total				**43,011,699**	**7,209,349**	**7,428,667**	**9,893,167**	**8,365,667**	**10,114,849**
Inflation 7%				**2,506,164**	**-**	**520,007**	**692,522**	**585,597**	**708,039**
GRAND TOTAL				**45,517,863**	**7,209,349**	**7,948,674**	**10,585,689**	**8,951,264**	**10,822,888**

Annex 3 Indicator Descriptor

COMPONENTS	OUTPUT	OUTPUT INDICATORS	OUTCOME	INDICATOR DEFINITION
1. Crop Production	High quality crop output produced	Number of farmers trained and equipped on improved farming methods	Increased crop yields	Opting for better farming techniques that are resilient to climate change
2. Livestock Development	Improved indigenous livestock and poultry breeds and management practices that are climate resilient	Number of improved species variety produced	increased growth rates of livestock population	Increase in livestock population can be achieved through an improved management system within the livestock value chain
3. Fisheries	Climate resilient Fishing practices adapted	Number of fish farmers that have adopted the fishing practices	Increase in fish stock	Capture fisheries or farmed fish increasing in volume and value due to adoption of climate smart practices
4. Climate Information, Early Warning And Disaster Preparedness System	Ability to mitigate, adopt and being resilient to climate change	Number of plans and frameworks integrating climate change issues into national plans and policies	Prior warning and dissemination of climate change information	Raising prior awareness and provision of scientifically proven information on potentiality of occurrence of adverse effects of climate change.
5. Forestry, Land And Natural Resource Management	Sustainable use of LULUCF (Land Use, Land Use Change and Forestry	Number of LULUCF prioritized	Increase of LULUCF prioritized	Restoring the carbon stock in the ground as a measure to support forest, land and resources as a cycle to reduce CO2
6. Research For Climate Resilient Agricultural Development	Established CC patterns, vulnerability, adoptive capacities and agricultural technologies to minimise impacts and risks	Number of resilient agricultural technologies	A resilient agricultural sector	Climate resilient agriculture development built on technologies and resilient capacities for sustainable agriculture
7. Knowledge Management And Partnerships For Climate Action	Efficient and systematic dissemination and communication of climate actions between all stakeholders	Number of dissemination and communication platforms	Acquisition of information and communication systems that will aid decision making process	Information and communication shared among stakeholders
8. Gendered Approach To Climate Change Adaptation	CC adaptation responsive to gender issues	Number of adaptation programmes integrating gender issues	Gender mainstreaming in CSA	Plans/programmes/ on gender issues in CC adaptations