



MINISTRY OF ENVIRONMENT  
AND FORESTRY



## CASE STUDIES ON CLIMATE CHANGE RESPONSE ACTIONS IN SELECTED DEVOLVED UNITS



### **Victor's Farm**

An Oasis of Plenty in a Dry Land  
Malomani Village, Kilifi County

## *Citation*

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## Background

The inaugural climate change training program, *Climate Change Policy, Planning and Budgeting at National and County Level*<sup>1</sup> was held in June 2017. As a follow-up to the Inaugural Training Program, the USAID – UNDP funded Low Emission and Climate Resilient Development (LECRD) Project in collaboration with the Kenya School of Government developed training case studies for use during future climate change training sessions. The training case studies are designed to complement training programs on climate change to enable trainees tease out and practically relate with concepts, theories and ideas presented in class. The cases document climate change initiatives and response actions in the Counties. Based on county presentations made during the climate change training, two counties namely; Kilifi and Narok were selected to showcase progress made and initiatives implemented in response to climate change in their respective counties. The county representatives (*Climate Change Champions*) who attended and successfully completed the training program were involved in the entire case study development process. The *Champions* planned the data collection visits to and identified exemplary climate change initiatives in their respective counties.

The case study development process entailed; a two week data collection exercise in Kilifi and Narok counties in October 2017 and a one week case study writing workshop in November 2017. The data collection exercise involved; Visits to the respective county offices, Focused Group Discussions with county officers and communities and Key Informant Interviews.

During the data collection visits; the case study team explained the purpose of the visit, interviewed the respective officers to identify and select exemplary climate change adaptation and mitigation initiatives in the county to focus on, made field visits, collected relevant information, conducted interviews and collected secondary data. The main areas of focus included clean energy, climate smart agriculture, forestry and water resources.

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1 The Ministry of Environment and Forestry and relevant stakeholders including Kenya School of Government developed a training program on “*Climate Change Policy, Planning and Budgeting at National and County Level*” to enhance the capacity of the public service to comprehensively address climate change challenges. The program targets middle level managers and technical government officers involved in policy formulation, planning, budgeting and implementation of programs in sectors vulnerable to the effects of climate change

During the case study development workshop six (6) training case studies; four (4) in Kilifi County and two ( 2) in Narok County, and their respective teaching guides were developed namely;

1. Victor's Farm: An oasis of plenty in a dry land, Malomani Village, Kilifi County
2. Greening Kilifi County: The Magical Woodlots, Kilifi County
3. Tapping on Clean Energy Sources: Solar Water Driven Borehole Pump Mwawesa, Kilifi County
4. Waste Becomes an Energy Mine: A Case of Biogas Project at Kombeni Girls Secondary School, Kilifi County
5. Towards Food Sufficiency: Exploring Irrigation Potential – The Case of Maji-Moto, Narok County
6. Breathing Life into Enosupukia ridges: Re-claiming the Sweet Flow from the Hills, Narok County.

The case studies and teaching guides were then presented to the respective County Governments for validation and case release in February 2018.

## **Objectives of the Training Case Studies**

- 1) To document practical initiatives undertaken in the counties to adapt and mitigate on climate change;
- 2) To provide a practical training aid on climate change in Kenya and elsewhere around the world;
- 3) To publish and publicize lessons learnt, best practice and experiences on climate change initiatives from Kenya's devolved units.

## Target Audience

The cases targets global, regional, national and county audiences undertaking assignments involving climate change aspects. The targeted audience should possess prior introductory knowledge, skills and competencies on climate change.

The case is suitable for participants undertaking:

- a) Specialized training and sensitization programs on climate change;
- b) Educational programs on climate change;
- c) Conferences, Workshops, Symposia and other forums discussing the climate change agenda at county, national or global level.

## Assumptions

It is assumed that at the time of going through the case, the trainee shall have been introduced to basic concepts on climate change and/or have background information on the climate change agenda, discussions and debates.

## Acknowledgements

The financial support from United States Agency for International Development (USAID) and United Nations Development Program (UNDP) through the Low Emission and Climate Resilient Development (LECRD) Project and the technical guidance from the Kenya School of Government (KSG) and the Climate Change Directorate is highly acknowledged.

The teaching case studies and accompanying teaching guides were designed, developed and documented through the dedicated efforts of several people who are highly appreciated for their invaluable input throughout the process. A full list the people involved is given in Annex 1.

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# Victor's Farm: An Oasis of Plenty in a Dry Land in Malomani Village Ganze, Kilifi County

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## 1. Case Synopsis

The case focuses on a climate smart agriculture initiative by a farmer in Ganze, Kilifi County. The farmer has innovatively navigated through the harsh climatic conditions of the Ganze Sub-county to create an oasis of plenty within a county heavily reliant on rain fed agriculture. Through his localised conservation initiatives, he has created an abundance of vegetables to the community. Not only has he increased his income, he has also become a consultant on climate smart agriculture.

## 2. Case Methodology

The case has been developed based on primary data collected from Kilifi County in November 2017 - February 2018. The data was collected through a focused group discussion with the Member of County Executive Committee and Directors in charge of Agriculture, Water, Environment and Climate Change. A structured interview guide was used for the focus group discussion. Face to face interviews with the farmer, Mr. Victor, and with members of the community also aided in collection of the primary data. Secondary data was also reviewed in development of the case. The case was presented to representatives from the County Government of Kilifi in February 2018 for review and validation. Feedback from the review and validation exercise has been adapted in the finalization of the case. The final draft of the case was presented to the County Executive Committee Member for Water, Forestry, Environment and Natural Resources for approval and case release to allow for publication.



### 3. Case Introduction and Context

Climate change is very likely to affect food security at the global, regional, and local level. Climate change can disrupt food availability, reduce access to food, and affect food quality. For example, projected increases in temperatures, changes in precipitation patterns, changes in extreme weather events, and reductions in water availability may all result in reduced agricultural productivity. Increases in the frequency and severity extreme weather events can also interrupt food delivery and resulting spikes in food prices after extreme events are expected to be more frequent in the future. This results into poor farming practices that ultimately lead to low agricultural productivity and overuse of natural resources (MoALF, 2016). Climate smart agriculture (CSA) interventions help to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA aims to achieve three main objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing greenhouse gas emissions.

According to the Ministry of Agriculture, Livestock and Fisheries (MoALF, 2016) report, agriculture is the main income earning activity in Kilifi County, contributing about 52.7% of household incomes and employing half of the County's total population. Most livelihoods in Kilifi County are based on crop and livestock farming. Rain-fed agriculture is the predominant form of farming with only 2% of farmers in the county using irrigation water. This case magnifies Mr. Victor's use of climate smart agriculture to boost food production in his farm, in Ganze Sub County, Kilifi County.

Mr. Victor's journey towards adopting climate smart agriculture started in 2008 after leaving his public service job. Driven by a deep desire to create an alternative source of livelihood, he sought self-employment in his small rural farm. However, to realize his dream, he had to surmount the harsh dry climatic conditions in his home village. As fate would have it, a team of about 20 farmers from his village had just been trained by Plan International on smart agricultural practices that could be sustained by the little available water resources in the area and he was not among them.

However he approached his neighbour who had been a beneficiary to get tips from the training. The knowledge tips he gained from his neighbour were the seeds of his marvelous and impressive journey 10 years later. Victor's now 10 year project has adopted water-efficient technology to address the recurrent drought and water scarcity in the County.


## 4. Adoption of Localized Water Efficient Technology

One of Victor's agricultural conservation innovations involved recycling plastic jerricans and turning them into small gardens. In each jerrican he planted 1 – 4 seedlings of vegetables depending on the size of the jerrican and the recommended crop spacing of the particular vegetable type. However, to grow his farming venture, he needed more jerricans than could be sourced from his household. Efforts to source more from his neighbours were not initially fruitful. He devised an innovative barter trade for the jerricans, exchanging a new jerrican for two (2) old broken ones from his neighbours. He also partnered with local shopkeepers for the larger, more durable polythene packets used to package merchandise.

His second innovation involved moisture bed gardening, which he recently successfully piloted and which proved to be more efficient than jerrican gardens. The moisture bed is made by enclosing polythene liner, measuring 1m x 1m x 0.3m and holding it up with sticks to make a frame. Locally found stones are placed at the bottom of the bed to help provide aeration for the roots and to give space between the roots and any water that may accumulate at the bottom.

The remaining space is filled with good quality soil and manure in the following ratio: 1½ wheelbarrows of stones, 2 wheelbarrows of top soil and 2 wheelbarrows of manure. The polythene liner prevents seepage of water while the top is mulched to prevent moisture loss. The moisture in the bed is maintained by watering once every week and mulching with grass during the dry season. The size of the bed allows for weeding and harvesting without stepping on it. Mulching helps to control weeds, increases warmth and also prevents moisture loss. Vegetables with shallow roots such as kale, spinach and other





indigenous vegetables are planted inside the moisture bed in rows, much closer together than in conventional row gardening. The spacing is such that when the vegetables are fully grown, their leaves just barely touch each other, creating a microclimate in which weed growth is suppressed and moisture is conserved. Since the farmer does not walk on the raised beds, the soil is not compacted and the roots have an easier time growing. The close plant spacing and the use of compost generally results in higher yields in comparison to conventional row gardening. The moisture beds can also be raised above the ground, enabling the elderly and persons living with disability (PWD) to grow vegetables without having to bend over to tend the moisture bed (Leslie S. 2015).

## 5. The Model Farm

Mr. Victor's farm is now his main source of income through the sale of vegetables to his neighbours and the surrounding shopping centers. This earns him a minimum of USD3 daily throughout the year. Besides the sale of vegetables, he has entered into a lucrative consultancy service through farm demonstrations and facilitation in workshops not only within the County, but elsewhere in Kenya. In addition to the crop growing and consultancy successes, he has continued to innovate along the value chain. He has developed a solar drier to preserve the excess vegetables and thus extending their shelf life. This has minimized post harvest losses, cushioned him against low demand gluts common within the vegetable market cycles and assures continuous supplies to his customers.

The farm has also attracted the attention of Community Based Organizations, who have offered him technical support and at times supplied him with equipment. Plan International for example provided him with two (2) large water storage tanks after he attended a training session on recycling of domestic waste water. The farmer says that the tanks help in re-using water in his nursery apart from conserving the precious and scarce resource. The farmer offers several benefits to the local community such as recycling plastic containers, providing a practical model farm to improve agricultural practices that increase resilience and food security, and enhancing adaptive capacity to better deal with climate change. He also provides an opportunity to enhance agricultural production in order to reduce poverty and increase economic viability around his locale.

## 6. Lessons Learnt and Sustainability

Using both the jerricans and the moisture beds, Mr. Victor has planted a wide variety of vegetables including the traditional high nutritious indigenous ones in about a ½ acre plot. His small farm is now the sole supplier of fresh vegetables in several villages and shopping centers in Ganze Sub-county. In addition, he also grows a few tree seedlings which he sells to his neighbors and also the neighboring schools. Besides, his farm has been adopted as a model farm by both the Kilifi County Department of Agriculture and Non-Governmental Organisations supporting improvement of agricultural practices in the County. In addition, he has become a consultant, widely sought after to facilitate in community based workshops/training to build capacity of farmers to improve their agricultural productivity and household incomes. Recently, the local community is slowly warming up to his model farm innovations and some neighbours have formed groups that grow seedlings on his farm and later transplant into their jerrican gardens.

## 7. Conclusion and Recommendations

Despite the notable successes from this model farm, there still exists opportunities for improvement in water conservation for increased food security and subversion of climatic conditions which hamper agricultural practices. These include; the need to rethink about the supply of the water from the current piped water to harvesting rain water, engaging in agroforestry by growing more trees, the transferability of the technology and lessons learnt to the community and beyond such as schools. There is also need to enhance the knowledge exchange platforms and build capacity of Agricultural Extension Officers on climate change, its impacts and response actions, to prepare the farmers for the impacts of climate change. A notable opportunity in the future is to tap on the vegetable preservation technology and commercialize it. This would however require a suitable partner and quick intervention to protect the copyright of this innovation if it is to be realized at a commercial level.

### Case Synopsis

The case focuses on a climate smart agriculture initiative by a farmer in Ganze, Kilifi County. The farmer has innovatively navigated through the harsh climatic conditions of the Ganze Sub-county to create an oasis of plenty within a county heavily reliant on rain fed agriculture. Through his localised conservation initiatives, he has created an abundance of vegetables to the community. Not only has he increased his income, he has also become a consultant on climate smart agriculture.

### Case Objectives

By the end of analyzing and discussing this case, the participants should be able to:

- 1) Tease out the climate change issues presented in the case;
- 2) Describe the innovations at Victor’s farm and how they address climate change at Ganze sub-county;
- 3) Identify and describe climate change adaptation and mitigation measures highlighted in the case;
- 4) Discuss the strategies adopted by the farmer to ensure success of the his farm;
- 5) Discuss challenges and opportunities on climate change emanating from the case.

### Target Audience

The target audience for the case includes:

- a) Participants undertaking specialized training and sensitization programs on climate change;
- b) Students undertaking educational programs on climate change;
- c) Workshops and other forums discussing the climate change agenda at county, national or global level.

## Assumptions

It is assumed that at the time of going through the case, the trainee shall have been introduced to basic concepts on climate change and/or have a background information on the national, regional and global climate change agenda, discussions and debates.

## Case Teaching Strategies

### Case Format

The case can be distributed in printed or multi-media versions that incorporate innovative didactic tools. A “soft copy” template for responding to discussion questions can also be availed to programme participants

### Case Discussion Strategy

The case may be presented to trainees as preparatory work given in advance, within a training session or as takeaway assignment after the session. The trainer can organize the trainees into groups of 3 -5 depending on the size of the class.

The suggested duration for each activity is:

- |                                    |   |                          |
|------------------------------------|---|--------------------------|
| i) Case briefing                   | - | 5 minutes                |
| ii) Case Reading                   | - | 5 minutes;               |
| iii) Case discussion               | - | 15 minutes;              |
| iv) Individual/Group presentations | - | 30 minutes               |
| v) Comments at Plenary             | - | 10 minutes, and          |
| vi) Debrief                        | - | 5 minutes.               |
|                                    |   | <b>1 hour 10 minutes</b> |

## Opportunities for Scalability

The trainer is at liberty to scale up the depth and breadth of the exercises depending on the program for which the case is being applied. For instance, in formal academic programs, the trainer can allow the trainees/students to do in depth analysis of the case in relation to the National Determined Contribution (NDC), National Adaptation Plan, National Climate Change Action Plan and the Global Climate Change Agenda.

## Suggested Discussion Questions

1. Discuss the impacts of climate change in Ganze, Kilifi County that necessitated the improved water management system adopted by the farmer?
2. In the climate change context identify the climate change response actions in this case study?
3. Discuss how the farmer enhanced his adaptive capacity to the impacts of climate change?
4. Discuss the benefits of the innovative water management system in responding to the climate change impacts?
5. What opportunities exist for the farmer in the national and global climate change context?

## Annex 1

Ministry of Environment and Forestry			
	Name	Designation	Role in Case Development
1.	Sheila Shefo Mbiru	LECRD Project – Knowledge Management and Capacity Development Officer	Concept development, data collection, case writing, editing and documentation
2.	Mr. Adegu	Directorate of Climate Change – GHG Officer	Case Writing
3.	Phanice Mokeira	LECRD Project – Research Assistance	Case Writing
Kenya School of Government			
4.	Dr. Rachel Ngesa	Head of Centre for Research and Advisory Services	Concept development, data collection, case writing, editing and documentation
5.	Mr. Humphrey Mokaya	Director, Learning and Development	Concept development, data collection and case writing
6.	Dr. Patrick Mumo	Senior Lecturer	Data Collection, case writing and editing
7.	Mrs. Jane Mwangi	Deputy Director, Academic Affairs	Case writing
8.	Ephline Okoth	Communication Officer	Editing case studies and teaching guides
County Government of Kilifi			
9.	Elizabeth Sidi Jilani <i>Climate Change Champion</i>	Assistant Director, Environment, Kilifi County	Data collection, case writing and validation
10.	Mwachitu Karisa Kiringi	CEC Member	Case validation and release
11.	Wilfred Baya, Irine Jumwa Kenga, Mary M. Kabani, Victor M. Tsenga, Adam Kheri, Tsuma J. Tembo	Kilifi County Officers	Case validation
12.	Mr. Banda Were Mr. Victor Ngowa	Kilifi County Citizens	Data Collection
13.	Ms. Pamela Onyachi	Principal -Kombeni Girls Secondary School	Data Collection
14.	Mr. Newton Mwagambo Sadi	Principal – Basi Primary School	Data Collection





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