



MINISTRY OF ENVIRONMENT  
AND FORESTRY



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



## Greening Kilifi County The Magical Woodlots

## *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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# Greening Kilifi County: The Magical Woodlots

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## 1. Case Synopsis

It documents a county wide initiative by the Kilifi County government to plant thousands of trees in response to emerging drought and desertification attributable to the changing climatic conditions. The program is being implemented at the ward level mainly through schools, organized groups of the local communities and individual farmers. At least 2 woodlots have been done per ward and over 150000 seedlings of different varieties distributed over the past 2 years.

## 2. Case Methodology

This case has been developed based on primary data collected from the County in November 2017 - February 2018. The data was collected through a focused group meeting with the Management of Basi Primary School; and a meeting with a farmer, Mr. Were. A structured interview guide was used during the meetings. The data collection also employed observation method. 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

Kilifi County is one of the six coastal counties in the Republic of Kenya. The County lies between latitude 2° 20' and 4° 0' South and between longitudes 39° 5' and 40° 14' East. It borders Kwale County to the southwest, Taita Taveta County to the west, Tana River County to the north, Mombasa County to the south and Indian Ocean to the east. The County covers an area of 12,609.7 km<sup>2</sup>. It can be divided into five (5) Agro-Ecological Zones (AEZ), which define areas that have similar characteristics such as annual mean temperature, vegetation and humidity.

Like some of the other counties in Kenya, Kilifi has experienced unpredictable weather patterns attributable to climate change. In response to the frequent droughts, unpredictable rain patterns and flash floods occasioned by unusual heavy rains, the county government, together with other partners has initiated a tree planting program (woodlots) across the county to manage the emerging challenges and address climate change related challenges in the medium and long term.

Over the recent past, the County has experienced unreliable rains, unexpected rains, deforestation and unusual long dry spells. These conditions have affected crop production and livestock in the County, necessitating adoption of drought tolerant crops and alternative farming systems. The woodlots initiative in Kilifi County seeks to address drought and desertification arising from the changing and un-predictable climatic conditions.

### 4. The Kilifi Woodlots Initiative

The woodlots initiative is being implemented in all wards across the County. The program targets institutions mainly community groups, individual farmers, households and schools under the “Green School” Sub program. Phase one of the program involved the establishment of at least two community woodlots in each of the 35 wards with approximately 1000 seedlings per woodlot. Cumulatively, the County Government distributed over 150,000 seedlings across the County between 2015 and 2017. This County initiative has been complemented by private sector companies, like the Bamburi Cement Co. Limited, that have supported tree planting in the County.

While there is still no concrete data on the survival rates of the distributed seedlings due to geographical dispersion and the large number of participating farmers and institutions, there has been a growing acceptance of the initiative, demonstrable by the high demand for seedlings in the 2017 short rain season. During this season, the County distributed approximately 150,000 seedlings and the nurseries ran out of seedlings and could not meet the demand from the local communities. A notable excitement and support for the program was experienced at Ruruma Ward, where the then Member of County Assembly (2013-2017) was particularly passionate about the program and this has seen the Ward record the highest uptake of the seedlings.

There have been outstanding cases at institutional and individual farmer levels. For instance, Basi Primary School's greening initiative has planted an estimated 3000 trees of diverse varieties including *Casuarina (Mvunje)*, *Terminalia mantaly*, *Leucaena*, *Azalia quanzensis* (Bambakofi) and *Azadirachta indica* (Mwarobaini/Mkilifi) among others over the past 2 years. Each pupil has planted and adopted a tree, with an additional tree given to them to plant at home, trees which they explicitly take care of. Everyday each student carries to school, a bottle of water to water his/her tree. The parents have been sensitized on the importance of the Green School initiative and are supportive of their children. The school targets to increase the tree population to 6000 by April 2018 and plans to harvest the trees, once they mature, for timber to make desks and other furniture items. However, sometimes, the small trees are damaged by the pupils and this affects the growth process.

At individual farmer's level, one farmer, Mr. Were and his wife have planted an estimated 10000 trees of *Casaurina*, *Azalia* and *Eucalyptus* in Tezo and Maweni villages, Tezo Ward. These trees have been inter-cropped with maize, ground nuts, okra and moringa in an estimated 12 acre farm. Mr. Were's neighbors have also picked up agroforestry practices and have started intercropping trees with crops. The seedlings for Basi Primary and Mr. Were's farms have been supplied by the County Government, from the tree nurseries in Tezo Ward.



## 5. Climate Change Response Actions

In addition to the County wide interventions, the County Government has also deliberately targeted special interest areas where the County and other partners have drilled boreholes to conserve those catchment areas. Generally, Kilifi County has large areas classified as semi-arid. The County has invested a lot of resources to provide clean and safe water for both human and livestock consumption. The woodlots initiative has been undertaken deliberately in most of the locations where there are boreholes and other water sources as a component of these water projects. The Department of Agriculture has also complemented the woodlot initiative through the implementation of the government policy of at least 10% tree cover under the Agricultural Farm Forestry Rules that require every land holder to maintain a compulsory farm tree cover of at least 10% on any agricultural land holdings. Farmers have therefore planted crops, majorly cash crops like mangoes, oranges and coconuts among others that contribute to total farm output.

## 6. Lessons Learnt and Sustainability Measures

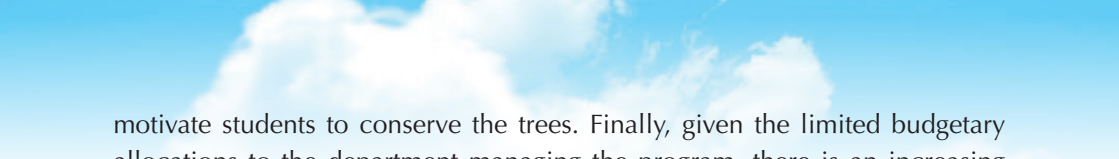
To ensure success and sustainability of the initiative, the County employed varied strategies to get buy-in of the program from the local community. First, the County undertook aggressive sensitization campaigns through barazas, community engagements, distribution of pamphlets and green school interventions to educate and inform local communities on the need to conserve the environment and the adverse effects of the changing climate. Second, the County Environment Officers lobbied for the local elected leaders, mainly the Members of the County Assembly to support the initiative at their wards. Given their political clout among the local communities, these elected leaders were instrumental in pushing for the wide acceptance of the initiative in all the wards. Finally, the County established nurseries in various wards and employed young people in those localities on a casual basis to take care of and distribute the seedlings. This has enhanced the acceptability of the project as the local communities can practically see and witness the income generation side of the program.

Since the inception of the program, there have been notable achievements and successes. First, there has been a growing awareness on climate change, significant attitude change towards environmental conservation and acceptance of the program. This is evidenced by the excess demand for seedlings such that the County was unable to meet the demand from the community during the 2017 short rain season. Second, there has been ownership of the program by the local elected leaders, giving the program the necessary impetus to kick-off and the political goodwill for long term sustainability. Third, in addition to the efforts by the County Government, there have been individual farmers, households and group efforts to expand the tree cover emanating from the sensitization programs undertaken under the woodlots initiative. Fourth, there have been notable changes in the ecosystem, creating a clean and healthy environment in the schools and farms where the tree cover has increased significantly. Finally, the mature trees have enhanced farm productivity thus increasing household incomes.

## **7. Conclusion and Recommendation**

Overall, the woodlot initiative, which has been owned by institutions, individuals, farmers and groups, has marvelously seen changes in the ecosystem, creating a clean and healthy environment across Kilifi County. Coupling the clean and healthy environment is increased household incomes due to enhanced farm productivity among individuals and farmers.

In the face of the great success, the initiative has not been without challenges. The main challenge has been the survival rates of the planted seedlings, especially when the timing of planting does not coincide with adequate rainfall. This is a recurring problem given the shortage of water in most parts of the County and the unpredictable rain patterns attributable to the climate change. The Green School initiative has also often suffered from what could be termed as “malicious destruction” of the young trees given the occasional teenage mischievous tendencies. This can be addressed by planting more fruit trees to



motivate students to conserve the trees. Finally, given the limited budgetary allocations to the department managing the program, there is an increasing challenge to grow enough seedlings to meet the huge demand from the local community.

To address these challenges, some possible solutions include: - the use of improvised “bottle” drip irrigation, installation of gutters for rain water harvesting and introduction of drought tolerant tree species such as *Melia volkensii* (*Melia*), and use of climate information services. The improvised “bottle” drip irrigation can help conserve the scarce water resource used to irrigate the young trees under the “Green School”, groups and the individual farmer initiatives. Drought tolerant crop species help sustain farm outputs and household incomes even with insufficient rainfall. The provision of accurate and timely weather forecast information shall ensure farmers and institutions make the right crop choices and decisions on when to plant. The rain water harvested can be used directly for domestic purposes and irrigation.

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### Case Synopsis

The case documents a county wide initiative by the Kilifi County government to plant thousands of trees in response to emerging drought and desertification attributable to the changing climatic conditions. The program is being implemented at the ward level mainly through schools, organized groups of the local communities and individual farmers. At least 2 woodlots have been done per ward and over 150000 seedlings of different varieties distributed over the past 2 years.

### Case Objectives

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

- 1) Identify issues attributable to climate change being experienced in Kilifi County;
- 2) Describe the objectives of Woodlots initiative being undertaken by the County Government of Kilifi;
- 3) Identify and describe climate change adaptation and mitigation measures highlighted in the case;
- 4) Discuss the strategies adopted by the county government to ensure success of the program;
- 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                |
| li) Case Reading                   | - | 10 minutes;              |
| iii) Case discussion               | - | 20 minutes;              |
| iv) Individual/Group presentations | - | 30 minutes               |
| v) Comments at Plenary             | - | 15 minutes, and          |
| vi) Debrief                        | - | 5 minutes.               |
|                                    |   | <b>1 hour 25 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) a) Discuss the impacts of climate change in Kilifi County that have necessitated the woodlot intervention by the County government.  
b) What are the expected benefits both in the medium and long term from this intervention?
- 2) Identify the key stakeholders in this program and discuss their individual and collective roles and responsibilities in ensuring the success and sustainability of the program.
- 3) a) Discuss the main strategies employed by the county government of Kilifi to achieve the present notable successes of the program.  
b) Discuss their relevance and replicability in your home county/institution.
- 4) In the context of the climate change agenda, identify the resilience, adaptation and mitigation response actions in this case study.
- 5) Identify the challenges the programme has faced and suggest some possible interventions.
- 6) What opportunities within the national and global agenda on climate change emanate from this program?

## 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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