

May Issue 23, 2018

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About Joto Afrika

Joto Afrika is a series of printed briefings and online resources about low emission and climate change adaptation actions. The series helps people understand the issues, constraints and opportunities that they face in adapting to climate change and improving livelihoods. Joto Afrika is Swahili; it can be loosely translated to mean 'Africa is feeling the heat'.

Taking Stock Since the Paris Climate Agreement

Editorial

The Paris Climate Agreement came into force on 4th November 2016 after set thresholds were achieved in October 5th 2016. These were that 55 Parties to the United Nations Framework Convention on Climate Change (UNFCCC) accounting in total for at least 55 percent of the total Green House Gas (GHG) emissions ratify the agreement.

Kenya was part of the historic conference that adopted the climate change agreement in Paris, France in December 2015 and subsequently ratified the agreement in 2016. In the run up to Paris, Kenya like many other countries prepared an Intended Nationally Determined Contribution (INDC) highlighting the country's commitment as far as mitigation and adaptation actions are concerned. INDC's became Nationally Determined Contributions (NDC) at the time of ratifying the agreement.

Priority actions in Kenya's NDC largely build on national policies, strategies and plans on climate change.

The Paris Agreement is largely considered a success because of three things:

1. *Inclusivity* – it brought on board all countries including the big emitters who did not ratify the Kyoto protocol;
2. *Transparency* – coming up with a framework to determine if countries are actually meeting what they committed to and;
3. *Climate finance* – commitment to mobilise funding amounting to USD 100 Billion annually from 2020 to support efforts to cut down Greenhouse Gas (GHG) emissions and adapt to climate change.

It is slightly over 2 years since the Paris Agreement, which brought a lot of optimism in dealing with climate change, came into being.

Kenya is also in the process of finalising and launching strategies and plans to guide its climate agenda over the next 5 years.

This issue therefore looks at how the different tiers of government, economy and society are progressing in meeting both international and domestic climate change commitments. Particular focus is on initiatives that are innovative and potentially transformative.

As part of our stock-taking, we review progress with implementation of the 1st National Climate Change Action Plan (NCCAP) 2013-2017 and preparation of the 2nd NCCAP 2018-2022.

The Council of Governors (CoG) Chair and Governor of Turkana County H.E. Josphat Nanok, shares his thoughts on the role of the council and counties in implementing the Paris Agreement together with an article on Makeni – the first county in Kenya to come up with dedicated climate change fund regulations in 2015 are also included.

The education sector is critical for capacity building. This issue highlights how climate change is being mainstreamed in basic education and the role of youth and institutions of higher learning in the low carbon climate resilient development in Kenya.

Also featured are capacity building and innovations in the private sector that need to be supported and taken to scale. A number of climate smart actions have been included to highlight what stakeholders can jointly execute as part of resilience building.

Victor A. Orindi
Coordinator, Ada Consortium
vorindi@adaconsortium.org



President Kenyatta during the launch of the National Tree Planting Day ©MEF

Developing 2nd National Climate Change Action Plan



The country targets to attain a minimum 10 percent forest cover ©Kenya Forest Service

Kenya developed and launched its first five-year National Climate Change Action Plan (NCCAP) in 2013 as a tool to enhance adaptation to climate change and reduce greenhouse gas emissions. The NCCAP 2013-2017 plan set out 38 priority actions to help the country transition to a low carbon climate resilient development pathway. Nine actions were completed by April 2018, seven did not progress, and 22 are in progress and will carry over to the second NCCAP (2018-2022).

Significant progress was made under the first NCCAP 2013-2017. This includes the development of the National Adaptation Plan (NAP) 2015-2030; establishment of climate change funds to support adaptation actions in five ASAL counties; expansion of renewable energy, including geothermal, solar and wind; establishment of the National Climate Change Resource Centre; and improvement of the legal and policy framework. This will include the Climate Change Act, 2016; National Climate Change Framework Policy; and National Climate Finance Policy.

A key lesson going forward is the need to identify measurable actions that can be monitored to track climate outcomes. The Climate Change Act, 2016 requires that the NCCAP be reviewed and updated every five years.

The Cabinet Secretary, Ministry of Environment and Forestry (MEF) appointed a Task Force (TF) to coordinate the updating of the plan for 2018 to 2022. The Task Force has representation from the National and County Governments, the private sector and civil society. The Ministry of Environment and Forestry through the Climate Change Directorate (CCD), provides technical support to the Task Force.

Adaptation and Mitigation Thematic Working Groups (TWGs) support the Task Force in its work and comprise experts from the National and County Governments, civil society, the private sector, research and academia. These working groups provide information and data on climate change impacts and vulnerabilities, greenhouse gas emission reductions, and needed actions.

The TWGs are developing the Adaptation Technical Analysis Report (ATAR) and Mitigation Technical Analysis Report (MTAR) that provide the technical basis for identifying and prioritizing climate change actions.

While the National Government is leading and guiding the process of updating the NCCAP for 2018-2022, the development and implementation of the Plan is coordinated by the two levels of government, in line with the Constitution of Kenya (2010). The development of the updated plan coincides with the second generation County Integrated Development Plans (CIDPs). County Governments are responsible for several devolved functions, which shall contribute to the achievement of the second NCCAP 2018-2022. This includes agriculture, soil and water conservation, forestry, environment, water and sanitation, and health.

NCCAP enhances adaptation to climate change and reduction of green house gas emissions

Consultations with the County Governments and stakeholders are a critical element of updating the NCCAP. The six county economic blocs that were engaged in updating the NCCAP for 2018-2022 were: Mount Kenya and Aberdares Counties Trade and Investment Bloc, North Rift Economic Bloc, Lake Region Economic Bloc, South Eastern Kenya Economic Bloc, Frontier Counties Development Council, and Jumuaia Ya Kaunti Za Pwani.

Representatives from County Governments, civil societies and target groups provided input on climate change impacts, vulnerabilities and priority actions to address climate change.

In May and June 2018, consultations will be held with Parliamentary Committees, the County Assembly Forum, the private sector and special interest groups

including women, youth, and marginalized groups.

The TF and CCD will then consolidate the input from the consultation processes and the TWGs to develop the draft NCCAP 2018-2022. The draft action plan will be available for public review and input through the Kenya Climate Change Knowledge Portal that can be accessed at <http://www.kcckp.go.ke>.

After the close of the comment and review period, the TF and CCD will incorporate comments and input to produce a penultimate draft that will be presented to the National Climate Change Council and at a National Validation Meeting. The NCCAP II will be finalized in June 2018 after incorporating input from the Council and the validation workshop.

Various partners have supported the updating of the NCCAP, demonstrating the importance of this process. Partners include: USAID-UNDP funded Low Emission and Climate Resilient Development (LECRD) Project; GIZ NDC Assist Programme; NDC Partnership; Transparency International; Kenya Private Sector Alliance; Kenya Association of Manufacturers; and Friedrich-Ebert Stiftung.

Details of progress under the first NCCAP 2013-2017 can be found in two documents: *Addressing Climate Change: Success Stories from Kenya, and Review of Implementation of the Kenya National Climate Change Action Plan, 2013-2017* available at: <http://www.kcckp.go.ke>

The second NCCAP 2018-2022 will assist Kenya to achieve domestic obligations under the Climate Change Act, 2016 and international obligations under the United Nations Framework Convention on Climate Change, including Kenya's Nationally Determined Contribution.

Deborah Murphy
GIZ Consultant
dmurphyisd@rogers.com

Reuben S. Muhanji
Climate Change Directorate
Ministry of Environment and Forestry
muhanji.steve@gmail.com

Progress With National Climate Change Action Plan Implementation



An entrepreneur sun drying briquettes in Kabete ©ALIN

The Government of Kenya has made substantial headway in implementing its first National Climate Change Action Plan (NCCAP) 2013 – 2017. Progress has been made on mitigation and adaptation actions, helping Kenya deliver on domestic and international obligations under the Climate Change Act, 2016, and the United Nations Framework Convention on Climate Change (UNFCCC), including Kenya's Nationally Determined Contribution (NDC).

The NCCAP 2013-2017 identified 38 priority actions in five components namely: mitigation actions; climate finance; enabling policy and regulatory framework; knowledge management and capacity development; and national performance and benefit measurement.

All NCCAP 2013-2017 short-term mitigation actions are either in progress or complete. These short-term actions were designed as critical initial steps to kick-start the process of emissions reduction. Many of the short-term actions were the development of proposals for funding through UNFCCC mechanisms. Action was also undertaken to begin to achieve long-term greenhouse gas emission reduction goals, in such areas as geothermal and tree planting.

To address the capacity needs of the National and County governments, the Country developed a training program on *Climate Change, Policy, Planning and Budgeting at National and County Level*. The program is offered at the Kenya School of Government (KSG) and all public servants are eligible to undergo the training.

The Country is addressing barriers that hinder the development and transfer of climate technologies by channelling technology-related requests to the Climate Technology Centre and Network (CTCN) through Kenya Industrial Research and Development Institute (KIRDI).

Priority adaptation actions were set out in the National Adaptation Plan (NAP) 2015-2030 and will be reviewed under a separate process.

Completed Actions

1. *Geothermal* – Nationally Appropriate Mitigation Action (NAMA) proposal developed and submitted to UNFCCC. The NAMA will directly support 820 MW of additional capacity by 2020, resulting in 3.77 million tonnes of carbon dioxide equivalent per metric tonnes per year emissions reduction by 2020.
2. *Mass Rapid Transit* – NAMA proposal developed and approved for funding by the International NAMA Facility. The NAMA provides modal alternatives and aims to shift significant shares of individual travel to commuter rail and a new Bus Rapid Transit system.
3. *GHG Inventory, Biennial Update Report and National Communication* – Kenya's Second National Communication was submitted to the UNFCCC in 2015. This communication provides information on measures to facilitate adaptation and mitigation actions to climate change.
4. *Climate Change Policy* – The Parliament approved the National Framework Policy on Climate Change in February 2018. The policy adopts a mainstreaming approach to ensure integration of climate change considerations in planning and budgeting.
5. *Climate Change Law* – The Climate Change Act, 2016 provides a regulatory framework for enhanced response to climate change.
6. *Climate Change Directorate* – The Country established the Climate Change Directorate in 2016. It is the lead agency of the government on national climate change plans and actions to deliver operational coordination.
7. *Physical Climate Change Resource Centre* – The country established the National Climate Change Resource Centre in 2015. The centre is the national repository for climate change information in Kenya. The centre provides an avenue for the country to showcase technologies and innovations that address challenges related to climate change.
8. *Kenya Climate Change Knowledge Portal* – <http://www.kccckp.go.ke>.

Actions in Progress

Mitigation

- Rehabilitation of forests on degraded lands
- Restoration of degraded forests
- Improved cook stoves
- Agroforestry
- Measurement of forestry emissions and sinks
- Mainstreaming climate change in sectors

Climate Finance

- National Climate Change Fund
- Climate change budget code
- Harmonize Government and Development partner requirements
- Negotiations to overcome lack of access to carbon market
- Enhance capacity of Designated National Authority (DNA)
- Unit to promote generation of carbon credits
- Improve policy and regulatory environment for low-carbon investment
- Government of Kenya and investor platform for engagement
- One-stop shop for renewable energy permits and information

Enabling Policy and Regulatory Framework

- Miscellaneous amendments bill
- National Climate Change Council

Knowledge management and capacity development

- Capacity building support
- Social mobilization framework
- Integration of climate change in education system

National performance and benefit measurement

- Climate change data tracking and mapping
- Capacity building for national and county governments

For more information on the second NCCAP 2018-2022 contact:

Dr. Pacifica F. Achieng' Ogola
Director Climate Change Programmes and Coordination
Ministry of Environment and Forestry
pacie4@yahoo.co.uk

An overview of Climate Change Finance in Kenya



Inspecting a solar PV system on a building
©Michelle Mung'ata

Climate Finance (CF) is defined as additional or incremental investment made in activities aimed to climate proof programs and projects against climate change impacts including deliberately reducing greenhouse gas (GHG) emissions. CF therefore, refers to additional costs incurred or invested in an activity to make it resilient to climate change.

These may be climate change adaptation (CCA) or climate change mitigation (CCM) activities, capacity building or costs for creating the framework for climate change enabling environment (CCEE) such as development of a strategy, policy and international negotiations on climate change.

Climate Finance in the Kenyan context is about enhancing localized adaptive and low emission green economy development agenda and the full cost of managing the effects of climate change in the economy. Kenya is among the few countries that are the first beneficiaries of the Green Climate Fund (GCF) which became operational in 2013.

The Green Climate Fund (GCF) and enabling policy framework

The GCF was established in 2010 in Cancun, Mexico as a financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC). Kenya is among the 194 countries that are signatories to the UNFCCC. The fund's main goal is to promote low emission and climate resilient development in developing countries.

Engagement with the GCF entails the establishment of a National Designated Authority (NDA) or focal point, development of projects and programmes pipeline for funding through Accredited Entities (AEs). The National Environment Management Authority (NEMA) is one of the accredited entities for direct access for Kenya. However, there also a number of indirect access to accredited entities existing in Kenya, for example, UNEP, UNDP, WWF, KfW, World Bank, Acumen among others. NEMA is also accredited to access Adaptation Fund.

In order to operationalize GCF activities

in Kenya, a National Policy on Climate Finance has been developed, approved by the cabinet and passed by Parliament as Sessional Paper No. 003 of 2017 in February 2018 in line with the institutional structures and framework as set out in the Climate Change Act, 2016.

The Climate Change Act provides mechanisms for the establishment of a Climate Change Fund for Kenya, which will finance priority climate change actions approved by the National Climate Change Council.

Establishment of Kenya Climate Change Fund (KCCF)

The Paris Agreement of 2015 and the National Policy on Climate Finance catalyzed the establishment of Kenya Climate Change Fund and seed money of KShs. 500 million from the National budget has been factored in 2018/19 financial year. Additional KShs. 200 million annually for a period of five years has been allocated to operationalize the National Policy on Climate Finance to promote green economy-low emission investments and build the country's adaptive capacity within the line ministries, county governments and local communities. According to the Climate Finance Policy, all the 47 counties will be required to develop County-based climate finance policy and establish the County Climate Change Fund.

Already, Makueni, Wajir and Garissa enacted legislation establishing these funds while Isiolo, Kisumu and Kitui are in the process of doing the same. Once legislation is in place, each county will be required to allocate at least KShs. 250 Million as seed money for the fund and come up with a country-specific resource mobilization strategy.

Types of Climate Finance Mobilized

Climate Finance can be tailored for adaptation, mitigation or cross-cutting activities, depending on the nature of its intended use. Mitigation includes renewable energy, energy efficiency & fuel switching, forestry & land use, urban transport & carbon sequestration projects. Adaptation includes projects that are partly or wholly dedicated to addressing the impacts of climate change, such as

water scarcity, agricultural resilience and infrastructure to withstand floods and other extreme weather. Technical assistance and capacity building to address climate change are examples of cross-cutting issues.

How to access the funds

A number of preconditions exist in accessing international climate finance. Project proposals must also show impact potential, wider economic, environmental, social (gender) co-benefits, country ownership, systems in place, capacity to implement, cost-effectiveness and co-financing.

The National Government has mobilized funds from external sources for implementation of climate change adaptation and mitigation programmes highlighted in table below.

Programme	Amount USD
Geeref Next Project - EU Investment Bank (MOE)	765,000,000
Universal Green Energy Programme ADB/Netfund	701,000,000
Universal Green Energy Programme Access Prog (Deutsche Bank)	300,000,000
Kenya Climate-Smart Agriculture (World Bank/ MOALF)	250,000,000
Kawi Safi Venture Fund, Acumen – Solar off-grid project	110,000,000
Natural Resources Management - DENMARK	110,000,000
Clean Cook stoves	83,000,000
ARAF (Agricultural Fund)	27,000,000
USAID-UNDP funded Low Emission and Climate Resilient Development (LECRD) Project	8,440,000
NDA / FAO NAP Readiness Support (2018 – 2020)	3,000,000
Readiness Support – UNEP, UNDP GIZ and World Resources Institute	1,350,000
Briquettes Pilot Project (HIVOS)	500,000
NEMA Project Facility	460,000
K Southern Korea	300,000
SimGas – World Bank	150,000

For more information contact:

Peter Odhengo
Senior Policy Analyst/Head of GCF
Technical Unit, The National Treasury
odhengo@gmail.com

Role of Counties in Implementing the Paris Agreement



Launching the Loreng'elup Community water program in Turkana ©CoG

Kenya's Climate Change Act, 2016 provides a strategic opportunity for inter-governmental collaboration between the National and County Governments. The Act provides a regulatory framework to guide National and County Government response actions to address the impacts of climate change.

Following are excerpts from an interview with Chairman, Council of Governors (CoG) and Turkana County Governor H.E Governor Josphat Nanok, on the role of counties in implementing the Paris Climate Agreement.

What are the big agenda items the CoG will be focusing on over the next five years?

The CoG will finalise the setting up of climate change units in the counties. Already 42 counties have appointed County Executive Committee (CEC) Members in charge of climate change.

The CoG will also build the capacity of county governments on climate change and implement the 2nd National Climate Change Action Plan (NCCAP 2018-2022). The CoG has leveraged on the experience of the civil society, private sector and other partners to help counties mainstream climate change into the second generation County Integrated Development Plans (CIDP 2018-2022). We will now work with counties and other partners to support the implementation of climate change actions as stipulated in the respective CIDPs over the next five years.

In addition, we will fundraise to support climate change adaptation and mitigation actions at the counties and form strong committees on climate change.

How are National and County Governments coordinating on climate change matters?

The Chairperson of the Council of Governors is a member of the National Climate Change Council (NCCC). The CoG is also represented in the 2nd NCCAP Task Force and respective technical working groups, namely Adaptation Technical Working Group and Mitigation Technical Working Group. The CoG

also has a representative in the Climate Change Fund Task force.

What is CoG doing to pursue the implementation of the Paris Climate Agreement?

We are working with counties to mainstream climate change into planning and budgeting. We have adopted harmonised indicators and standards for monitoring and reporting set by the National Government. We are also collaborating in coordinating climate change programmes that are implemented across the 47 counties and reporting on progress made in the implementation of climate change actions.

How is the CoG enhancing the institutional and technical capacities of counties to meet their obligations under the Climate Change Act, 2016?

The CoG is working with the Climate Change Directorate to ensure that the 47 counties nominate a CEC Member to be in charge of coordinating implementation of climate change actions. To date, 42 Counties have already nominated their respective Climate change CECs.

Together with the National Treasury, we are building the capacity of county governments to access the Green Climate Fund (GCF). As a member of the Adaptation Consortium, we are also strengthening the capacity of climate change actors on adaptation.

The CoG also collaborated with the Ministry of Environment and Forestry and the Kenya School of Government (KSG) to develop a training program on *Climate Change, Policy, Planning and Budgeting at National and County Level*. The program is offered at KSG and County Government officers are eligible to undergo the training.

Through the Maarifa Centre CoG has been documenting experiences shared by the Counties on best practices including in developing County legislation that supports climate change, and adopting appropriate innovations and tested solutions in programmes that address climate change.

You represented Kenya and the

CoG during COP23. What was your impression of the Conference and how do you foresee the road to COP24?

The CoG and the National Government represented the country as one unified delegation at the Conference of Parties (COP23) in Bonn, Germany in 2017. The CoG is working with the Ministry of Environment and Forestry, national level institutions, the private sector and development partners to ensure that each county contributes towards national targets for adaptation and mitigation.

COP23 was an eye-opener and I feel that every Governor should participate in future COPs. Other countries are ahead in transitioning to a low carbon climate resilient development pathway. We have been sensitizing Governors on the Paris Agreement as it plays an important role towards the realisation of the Sustainable Development Goals (SDGs). The CoG is also encouraging County Governments to allocate some money for the Climate Change Fund.

What are some of the challenges that the CoG is facing when it comes to supporting national adaptation efforts in the Country?

There is weak coordination of climate change actors hence the need for better coordination of climate change programmes to enhance impact and ensure comprehensive reporting on progress as well as for accountability on individual actors.

Capacity gaps have also slowed the mainstreaming of climate change into county policy, planning and budgeting. In addition, limited finance has hindered the implementation of priority climate change actions.

H.E Governor Josphat Nanok
Chairman, Council of Governors (CoG)
Turkana County Governor
info@cog.go.ke

Interview conducted by Bob Aston-ALIN; Sheila Mbiru-LECRD Project; and Victor Orindi-Adaptation Consortium

Domesticating Climate Change policies in Makueni County



Kwa Kilii Sand Dam that was prioritised by communities ©Makueni County

The Makueni County Vision 2025 identifies environment, natural resource management and climate change adaptation as critical emerging issues. The County has put in place elaborate policy, legal and institutional frameworks on climate change. Key among them are the County Climate Change Fund Regulations, 2015 and Makueni Sand Utilisation and Conservation Act, 2015.

From 2015, Makueni County committed one (1) percent of its annual development budget for climate change programmes and activities. The County established structures such as the Ward Climate Change Planning Committee (WCCPC) that has strengthened community participation in identification and implementation of priority climate change actions.

The county in partnership with the Adaptation 'Ada' Consortium that includes Anglican Development Services Eastern was able to implement nine climate change projects within six pilot wards in the fiscal year 2016/17. For the 2017/18 Financial Year, additional six projects are in the process of being implemented.

A total of 35,925 people are benefitting from the public good investments such as rock catchments, earth and sand dams while, 1,025 trained climate intermediaries are disseminating climate information across the County. Ada Consortium is financially supported by the UK's DfID and Swedish Government.

Mainstreaming Climate Change in the County

Makueni County has established a Directorate of Natural Resources, Environment and Climate Change (NRECC) with its own Chief Officer. The Directorate coordinates implementation of climate change actions within the County. The County Climate Change Regulation, 2015 created climate change structures such as the County Steering Committee, Climate Change Fund Board, County and Ward Climate Change Planning Committees to ease coordination of climate change activities. The structures draw their membership from county

government, private sector, CSOs and local communities.

The County Climate Change Fund Board (CCCFB) from its budget was able to establish one WCCPC in addition to the six formed using funding from DFID through Ada. The CCCFB is planning to establish five more Ward Committees whose projects shall be implemented during the 2018/19 financial year. This mechanism is being borrowed by the other sectors to ensure relevant county investments.

To address challenges brought about by sand harvesting, the County formed 6 Sub County and 30 Ward Level Sand Management Committees to oversee sand management. In 2015, the County banned commercial sand harvesting through an executive order by the Governor.

Makueni County is documenting and sharing its climate change experiences

The County has domesticated the Climate Change Act, 2016 by implementing some actions that include mainstreaming climate change into the county planning and budgeting; establishment of the NRECC Directorate and under it the CCCFB; designation of a County Executive Committee (CEC) Member in charge of climate change; and implementation of climate change adaptation and mitigation actions.

Climate change has been mainstreamed into the second County Integrated Development Plan where each sector is expected to address climate change issues when implementing their programmes and projects.

Forging Partnerships on Climate Change

Governor Kivutha Kibwana represented Kenya and Makueni County in the Conference of Parties (COP) 23 held in Bonn, Germany. Participation in the COP enabled the County to establish linkages with the World Resource Institute, Kenya

Forest Service (KFS) and the International Centre for Research in Agroforestry (ICRAF). The County is in discussion with these institutions to restore and rehabilitate the Makueni landscapes as part of resilience building. The three partners - ICRAF, KFS and Makueni County have since developed a joint proposal of KSh 1 Billion targeting the Green Climate Fund (GCF).

The County is also in discussion with the Kenya Water Towers Agency to increase the water towers in Makueni County from one to nine through gazettelement of eight new water towers.

Challenges

- Lack of sufficient funding from both internal and external sources limits the roll out of climate change activities.
- Inadequate technical and human capacity to adequately deal with complex climate change related challenges.
- Lack of a functional climate change Monitoring and Evaluation mechanism to track holistically the impact of climate change initiatives across all sectors.
- High poverty levels and the need for subsistence among the majority of the population continues to push the local community sometimes to survival mechanisms that are not environmentally friendly such as charcoal burning and sand harvesting.

The elaborate policy, legal and institutional frameworks put in place by Makueni County has enabled local communities to have a stronger say in coming up with relevant and sustainable climate change adaptation and mitigation actions. The County is now documenting and sharing its experiences to motivate other counties and Countries to embrace climate change strategies that place communities at the centre of decision-making.

More at: <https://www.makueni.go.ke/>

Bob Kisyula

CEC Member Water, Irrigation, Environment and Climate Change Makueni County
robert.kisyula@makueni.go.ke

Adapting to Climate Change in the Maasai Mara Ecosystem



Deep Gully Restoration in Nkoilale in the Maasai Mara ©Philip Odhiambo

The Maasai Mara ecosystem (MME) is home to Maasai Mara National Reserve (MMNR), world-renowned for its diverse and abundant wildlife. With approximately 25 percent of Kenya's wildlife, the reserve hosts more than 95 mammal species besides being a recognized Important Bird Area (IBA) with 550 bird species. The rich natural resources of the MME are crucial to national and local economies particularly tourism, which depends heavily on the recreational opportunities presented by the natural environments.

Surrounding the iconic reserve are wildlife conservancies on land owned by local communities, mainly Maasai pastoralists. These conservancies form key wildlife dispersal and diversity areas. In Kenya, about 70 percent of wildlife live outside gazetted areas. The Wildlife Conservation and Management Act, 2013, created the enabling environment for conservation to become a viable land-use.

However, several interlinked factors compromise this possibility. Exponential human population growth creates ever-growing demand for land and other resources, for the proliferation of sedentary agriculture and the growth of unplanned development infrastructure among others.

While traditional Maasai livelihoods depend on livestock raised on communal rangelands, which in turn maintains habitat for wildlife, a number of socio-economic changes are threatening the sustainability of customary rangeland management systems.

Land sub-division and fencing, results in widespread fragmentation, negatively affecting continuous landscapes for livestock and wildlife migrations. Areas under fencing and cultivation also become inaccessible to wildlife. Fragmentation and unregulated water use increases the risks brought about by erratic and unpredictable rainfall.

Climate change impacts in the Mara ecosystem include:

- Reduced availability of fresh water for domestic, livestock and wildlife use.

- Malnourishment and death of livestock
- Increased prevalence of climate sensitive diseases and risk of disease transmission from frequent livestock-wildlife interactions
- Increased Human-Wildlife Conflict: These include invasion of community water pans by elephants and predation of livestock at night by carnivores (mainly lions, leopards, cheetahs and hyenas).
- Habitat encroachment and degradation: Communities transgress inside the protected reserve area (MMNR) in search of pasture. Illegal grazing take place at night.
- Decrease in wildlife numbers, caused by death and migration out of the area

The widespread fencing restricts wildlife movement through blocking important migratory corridors and inhibiting mobility – a vital adaptation strategy.

Since 2014, the World Wide Fund for Nature in Kenya (WWF Kenya) in partnership with local communities has been carrying out climate-smart interventions within the Mara ecosystem through a Holistic Management (HM) approach for restoration of degraded rangeland and water resources.

The HM approach involves dividing land into grazing blocks with a given number of livestock bunched together and use of mobile herds, which are guided by well-trained professional herders. Both the wet and dry season grazing plans guarantee adequate pasture for livestock in all seasons, making it unnecessary to erect fences that exclude wildlife, thus coining the slogan “growing grass without borders.”

There are four key outcomes and successes of this WWF-led HM:

1. *Increased area of land secured* under sustainable rangeland management resulting in improved livelihoods: Over 35,900 acres of rangeland has been secured through HM in community wildlife conservancies of Siana, Enonkishu, and Oloisikut. Secured land, with working grazing plans, acts as buffer zones for conservancies, opens up important wildlife migratory

corridors, and provides suitable habitat for both livestock and wildlife.

2. *Livestock value chain development* enhanced through successful livestock fattening and linking landowners to high-end markets: Communities are prioritising goat keeping, with higher adaptive capacity than cattle and ecotourism. The programme has enhanced market access through linkage with the private sector. Consequently, more landowners are pulling down fences, while ‘pooling together their individual parcels of land’, creating more space and opening wildlife migratory corridors.
3. *Mitigation of human-wildlife conflicts*: In partnership with the Wildlife Foundation, the HM programme has continued to disseminate solar-powered LED predator deterrent lights to over 40 households in Mara Siana Conservancy. This has led to a reduction in livestock losses, more income to beneficiaries and landowners becoming more tolerant to wildlife.
4. *Restoration of degraded land* in Mara river catchment and increased water accessibility: In Enonkishu, a 1.5Km long gully which had lost more than 4,000m³ of soil (equivalent to restoring one-acre pastureland) was healed; preventing injuries to people, livestock and wildlife. This has led to increase in soil cover/grass biomass, reduced erosion and sedimentation of the Mara River and its tributaries. Additionally, water has been re-distributed in the HM grazing blocks through piping, water tanks, and livestock drinking troughs. This increased access to water by people, livestock and wildlife while reducing human-wildlife conflicts in the HM pilots also enable communities to cope better with drought.

Philip Odhiambo

Programme Coordinator - Energy & Climate Change
World Wide Fund for Nature Kenya
podhiambo@wwfkenya.org

Joseph Kathiwa

World Wide Fund for Nature Kenya
Jkathiwa@wwfkenya.org

Capacity Building for Eco-Entrepreneurship in the Agricultural Sector



Kiambu Strawberry Processors picking fruits for processing ©Alex Nene

Over the last five decades, Micro, Small and Medium-sized Enterprises (MSMEs) have emerged as a highly vibrant and dynamic sector driving Kenya's economy. MSMEs provide large employment opportunities as well as facilitate acceleration of rural areas' economic development.

According to Kenya National Bureau of Statistics (KNBS) MSME survey 2016, there are about 7.41 million MSMEs in the country with an estimated output of KSh 3,371.7 billion against a national output of KSh 9,971.4 billion representing a contribution of 33.8 percent as at 2015. The MSME sector is highly informal with 5.85 million unlicensed businesses compared to about 1.56 million licensed MSMEs.

Capacity Building Solutions for MSMEs

MSMEs by their nature are particularly vulnerable to both economic and environmental challenges and climate change only makes things worse. MSMEs are constrained by low start-up capital, cut-throat competition from other similar businesses, limited market access and insufficient skills to seize opportunities for green growth. For these reasons, MSMEs require hands-on solutions to build climate resilience and business sustainability.

Through the SWITCH Africa Green project, Kenya Private Sector Alliance (KEPSA) together with its partner Kenya Agribusiness Agroindustry Alliance (KAAA) has been supporting MSMEs through capacity building to adopt Sustainable Consumption and Production (SCP) practices in their businesses. This would potentially increase their profit margins, improve their competitiveness and reduce their impact on the environment.

SWITCH Africa Green is a pilot programme funded by the European Union and implemented in Kenya through UNEP, UNDP & UNOPS. KEPSA is a grantee of this programme and has partnered with KAAA to implement the action Capacity enhancement for green business development and eco-entrepreneurship in the agricultural sector in Kenya

The project has supported 16-selected MSMEs that are supporting 2,845 farmers operating in Kiambu, Machakos, Kitui, Tharaka Nithi, Kisii, Migori and Nyandarua counties. The farmers are involved in growing a diverse set of value chains namely: bananas, potatoes, cereals, dairy, vegetable, herbs and spices.

The interventions include gap analysis, mentorship, networking, technical monitoring, sustainable consumption and production practices (SCP) toolkits development and training on SCP like resource (i.e. energy and water) efficiency, waste management, record keeping, costs analysis, sourcing and green marketing.

Sustainable Consumption and Production practices adopted

1. *Energy Efficiency*: Adoption of solar driers which have zero carbon emissions, installation of energy saving bulbs, regular cleaning of motors & servicing of machinery, powering machines only when necessary and bulk processing to optimize energy use.
2. *Water efficiency*: Reusing wastewater for irrigation, fixing leaking pipes, water use tracking and separating meters from household use and rainwater harvesting. Many MSMEs operate from their homesteads and hence utilities are shared between households and business. Separation of meters allows the MSMEs to track water & electricity use, calculate unit cost for their produce and identify hot spots.
3. *Waste management* including reduction at source: Leaving banana stalks at farm level hence reducing their waste by 10 percent for every 100 kg of raw produce supplied while at the same time generating 50 percent savings on transport costs and improving soil organic matter.
4. *Eco-innovation*: Nyangorora Banana Processors and Pamat Foods Ltd are processing ripe bananas into banana wine and jam. The products are made from overripe bananas, which would otherwise be discarded.

Results

- MSMEs have adjusted their businesses, adopted alternative

livelihoods and new business models enhancing their adaptive capacity.

- Overall MSMEs have recorded 38 percent increase in sales and reductions of 51 percent of waste, 49 percent in water consumption and 24 percent in electricity costs.
- Knowledge products (SCP toolkits and resource flow charts) have been developed and can be shared for replication.
- 31 direct and 130 indirect jobs created by participating MSMEs
- 43 staff of participating MSMEs and 120 farmers supplying the MSMEs have been trained on SCPs.

Lessons Learned

- MSMEs do not always understand green growth or the impacts of climate change hence mostly unaware of opportunities for greening their enterprises and often associate protecting the environment with technical complexity and high costs.
- Even when the MSMEs are aware, the lack of appropriate skills prevents them from seizing opportunities. Which could enhance competitiveness.
- Limited resources leads MSMEs to be risk-averse and less willing to invest in new technologies, partly because of uncertainty about payback period.
- Interventions need to fit current business activities. There has to be a business case for MSMEs.
- By adopting eco-innovation, MSMEs can develop new products therefore maximizing resources.
- Facilitating adaptation to climate change takes time and will require awareness, technical and financial resources and support.

More at: <http://www.switchafricagreen.org/KE/>

Alex Nene

Project Officer
SWITCH Africa Green Project
Kenya Private Sector Alliance
anene@kepsa.or.ke



<https://twitter.com/jotoafrika>

Entrepreneurship and Green Energy Innovations



Arranging dried briquettes ©Vincent Mumo

National Environment Trust Fund (NETFUND) through its flagship program Green Innovation Awards (GIA) has created a niche in promoting best practices in the environmental management. This has been realized through its green growth initiatives being part of improving communities' livelihoods. One of the key thematic areas the organization focuses on is renewable energy through its GIA beneficiaries.

NETFUND provides incubation and upscaling services to Kenyan entrepreneurs and innovators that are providing solutions in green energy, Agribusiness, waste management and water to address the issues of climate change. The Fund works closely with potential partners and donors to provide an array of business support services for green start-ups to realize their full market potential, through an incubation program that runs for a period of 2-4 years.

This program contributes to operationalization of the Kenya's Green Economy Strategy and Implementation Plan (GESIP) 2016-2030 through the development of low carbon projects and resource mobilization. This includes supporting the development of projects in the areas of climate smart agriculture, green innovations and forestry and facilitating resource mobilization for the same.

Since the GIA programme began, NETFUND has supported 47 innovative enterprises as part of capacity building. These green enterprises have created 9738 direct and indirect jobs, provided clean energy to 7,659 people and raised over KSh 300 million from donors.

A NETFUND study on "Factors influencing household adoption of renewable energy technologies in rural Kenya in Elgeyo Marakwet, Narok and Tharaka-Nithi Counties" in 2016 found that 95 percent of households in rural areas use wood fuel as their primary source of energy.

The organization is therefore, advocating for the integration of clean and energy efficient policies of Renewable Energy Technologies (RET) in the Counties by way of influencing county energy planning processes and formulation of energy policies and renewable energy action plans and mapping of county energy development actions and needs.

Kenya's Medium Term Plan 2013-2017 recognizes the need for adoption of renewable energy that can increase the forest cover to the globally recommended level of 15 percent.

NETFUND provides incubation and upscaling services to Kenyan entrepreneurs and innovators

Two Green Energy innovative enterprises are highlighted below:

1. The Magiro Hydro- electric Power plant in Murang'a County began operating in 2014. The plant utilizes old bicycle parts and simple motors to produce hydroelectric power from a nearby river. Through incubation support by NETFUND, power generation capacity

from the plant has increased from 75kwh to 300kwh translating to 400 percent increase in productivity. The mini-grid currently connects 110 households from the initial 30 households in 2016. The Energy Regulation Commission (ERC) has licensed the innovation as part of Mini Hydro's in Kenya. The founder was part of the Tony Elumelu Entrepreneurship Program (TEEP) 2016.

2. The Maa briquettes is a local enterprise based in Narok County. The innovation involves the use of charcoal dust, maize cobs and vegetables to make high-energy calorific briquettes that burn three times longer than the normal charcoal. The briquettes offer environment friendly and affordable alternative energy source for households, institutions, restaurants and industries. The enterprise serves more than 60,000 Narok town residents. It has helped to reduce fuelwood demand in Narok town leading to lower levels of deforestation and devegetation.

Creating an overall enabling environment for renewable energy technologies in Kenya requires aggressive awareness campaigns and multi stakeholder collaboration at all levels. At the same time, leveraging on renewable energy innovations would facilitate a cost effective transformation to a more sustainable energy sector.

Mumo Vincent

Communications and Awards Department
National Environment Trust Fund
Vincent.mumo@netfund.go.ke

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Forest Landscape Restoration in Mt Elgon and Cherengany Water Towers



Interventions by the Ministry of Environment and Forestry to increase cover ©MEF

Kenya's economy has a very strong dependence on natural resources and the environment. Many sectors such as agriculture, environment and energy are directly affected by climate change acting in concert with human activities.

Globally, consensus has been established that forests are part of the solution to climate change, through sequestering or sinking greenhouse gases and in particular carbon dioxide. They also provide critical environmental services and products.

The Economic Survey 2018 by Kenya National Bureau of Statistics (KNBS), indicates that the share of forest cover marginally increased from 7.22 percent in 2016 to 7.29 percent in 2017. However, unsustainable utilization of forests, forest fires and shifting cultivation is still a challenge that the country is grappling with.

To reverse these negative trends, a number of measures such as Forest Policy, 2014, Forest Management and Conservation Act, 2016, and National Forest Programme (2016-2030) have been rolled out to ensure that the country's forests cover is increased to minimum 10 percent and they are well protected and conserved going forward.

Recently, the Cabinet Secretary, Ministry of Environment and Forestry gazetted a multi-sectoral taskforce to look into forest resources management and logging activities in Kenya. The taskforce recommended the ban on Cedar trees logging and use of cedar products; establishment of core conservation zones and; development of a clear framework for collaboration in forestry functions between the National and County Governments.

In 2014, Kenya committed to restore 5.1 million hectares of degraded forest and landscapes as a target towards the African Forest Landscape Restoration Initiative (AFR) 100 - a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030. This target is envisioned to move the country towards achieving minimum 10 percent forest cover meeting, the target in the National Adaptation Plan (2015-2030) and National Climate Change Action Plan (2013-

2017). This contributes towards Kenya's Nationally Determined Contribution (NDC) target to the Paris Climate Agreement of reducing greenhouse gas emissions by 30 percent by 2030.

The actualization of the 5.1-million-hectare target towards AFR100 and 10 percent forest cover has commenced with the rolling out of Kenya's Water Tower Protection and Climate Change Mitigation and Adaptation (WaTER) Programme within Mt. Elgon and Cherangany Forest Ecosystem.

The main objective of the programme is to support Kenya eradicate poverty through enhancing the productivity of ecosystem and building resilience to climate change within Mt. Elgon and Cherangany forests and adjacent landscape. These goals will be achieved through increased forest cover, improved landscape and natural resource management, and waste management systems leading to increased benefits to rural communities from forest, agriculture and agroforestry land use systems.

Kenya targets to achieve minimum 10% forest cover by 2022

The uniqueness of the programme includes the strong participation and engagement of the local community, the landscape approach in the implementation of projects and the multi stakeholder approach in the delivery of programs and projects.

Building on already existing statistics of restoration opportunities, the programme has undertaken detailed analysis and mapping to isolate site-specific challenges and differences. This is with a view of delivering a suite of site-specific solutions and restoration works within the landscapes.

This process is following the elaborate methodology as documented in Restoration Opportunities Assessment Methodology (ROAM), famously dubbed Restoration Diagnostic Assessment Tool.

This framework helps the government synergize restoration information from all the actors including the private sector, civil society, communities and development partners.

When applied prior to a restoration effort, the diagnostic assessment can help decision makers and restoration supporters focus their efforts on the most important factors to get in place before large amounts of human, financial, or political capital are invested. Based on the above key points, the programme plans to carry out rehabilitation and restoration of degraded hotspots including the reintroduction of appropriate cultivars and germplasm with immense benefits.

The other important deliverable for the WaTER programme is the provision of technical support to County Governments and help to identify investment opportunities, barriers and policy intervention measures and strategies. This is aimed at improving landscape management that will lead to enhanced communities livelihoods. The detailed diagnostic assessment based on the restoration statistics will isolate the key issues to ensure achievement of the above goal within Bungoma, Busia, Kakamega, Elgeyo Marakwet, Kisumu, Nandi, Vihiga, Trans Nzoia, Uasin Gishu and West Pokot.

This five-year programme within the Mt. Elgon and Cherangani water towers is expected to contribute immensely to the 5.1 Million hectares restoration targets through an integrated landscape approach as well as delivery on a suite of environmental goods and services to the communities living in the two landscapes.

David Njoroge Chege

Component 2 Project Manager: WaTER Towers Programme
njorogec6@gmail.com

George Tarus

Assistant Conservator of Forests-Climate Change Response Programme
tarus2014@gmail.com



www.facebook.com/jotoafrikamag

Mainstreaming Climate Change in Basic Education



President Uhuru Kenyatta during the launch of textbooks to schools
©KICD

The Government of Kenya through the Kenya Institute of Curriculum Development (KICD) initiated Education reforms in 2014 in tandem with the global trends in education and training. The reforms are a paradigm shift whose focus is programmes that inspire optimal development of human capital.

A robust learning infrastructure that takes cognizance of gender and special needs to compliment lifelong tangible careers and sustainable futures is a perfect strategy for addressing environmental issues and climate change.

The Kenya Vision 2030 focuses on integrating early childhood into primary education, reforming secondary curricula and modernizing teacher training. KICD carried out research in 2011 to establish the status of Education for Sustainable Development (ESD) in learning institutions in Kenya.

The findings revealed a gap and the need to integrate ESD, specifically environmental education and climate change in the curriculum, to address climate change related challenges.

The 1st National Climate Change Action Plan (NCCAP 2013-2017) recommended that formulators of Primary School curriculum makes a conscious effort to introduce climate change into all primary school subjects. Similarly, the Climate Change Act, 2016 obligates the KICD to integrate climate change into various disciplines and subjects of the national education curricula at all levels.

The Ministry of Education in liaison with UNESCO developed ESD Policy in 2017 as a strategy to integrate climate change in learning institutions. The strategy is in recognition of the role education plays in bringing about sustainable development and re-affirms other recommendations such as those in Agenda 21, Rio+ 20 and Sustainable Development Goal (SDG) 13 on Climate Change.

Article 6 of the United Nations Framework Convention on Climate Change (UNFCCC) on Education, Training and Public Awareness calls on governments

to develop and implement education and training programmes, including the strengthening of national institutions, training of scientific, technical and managerial personnel, as well as implementing public awareness programs on effects of climate change to improve capacity to implement mitigation and adaptation actions. Article 6 seeks to reduce the impact of climate change by enabling society to be a part of the solution.

In the curriculum reform, issues of climate change have been taken into consideration by introducing Environmental Activities (EA) as a learning area right from the formative years. The subject integrates concepts of Agriculture, Social Studies, Science and climate change.

The Environmental Activities subject will introduce, engage and expand young learners' awareness and interest on climate change. The subject will help to inspire young people to find solutions to climate change challenges.

The subject has been allocated five lessons per week. It integrates community service learning activities like collecting and sorting litter and observing how it is disposed; participation in community environmental activities like cleaning, planting and watering trees and flowers around institutions and homes.

The curriculum is currently under trial and feedback obtained from stakeholders will be used to enrich it before national implementation in 2019. Piloting began in 2017 in 470 select schools, 10 from each county. This year, the programme escalated to cover pre-school, Grade 1 and 2 with a few Grade 3 schools also taking part.

The curriculum takes cognizance of learners with special needs and incorporates Pertinent and Contemporary Issues.

KICD has embarked on the development of Curriculum Designs for Grades 4-6. The Basic Education Curriculum Framework integrates environmental education elements in all the learning areas. All the subject panels have incorporated

environmental experts to provide the relevant content as per the levels.

Environmental Education and Climate Change for the Early Years

Learning is organized sequentially from Early Years Education, Middle School Education, Senior School and tertiary and University Education. Early Years Education is further divided into Pre-primary and Lower Primary. Children in Pre-primary 1 - 2 and Lower Primary Grade 1-3, will be exposed more to Environmental Activities once the new curriculum kicks in.

The emphasis on Environmental Activities during their formative years is a clear indication that curriculum reforms will play a critical role in addressing climate change. Further, teachers will utilize ICT, video clips and pictures to guide learners identify various climate change issues in addition to listening stories about different weather conditions and how these observations are linked to climate change. The formative learning assessment approach will be utilized throughout these levels.

KICD is keen on addressing the challenges in mainstreaming age appropriate climate change content, training teachers, addressing the 17 SDGs and their interrelationship, supported by parents and teachers in the proposed assessment methods and acquiring relevant county diversified environmental resources. All stakeholders are therefore called upon to join hands with KICD to enable learners acquire skills that will aid in optimally addressing climate change.

Dr. Lucy Ogol

Deputy Director - Educational Resources Division

Kenya Institute of Curriculum Development (KICD)

logol@kicd.ac.ke

Michael Muriuki

Kenya Institute of Curriculum Development (KICD)

mmuriuki@kicd.ac.ke

Institutions of Higher Learning Responding to Climate Change



Such interventions can help the country to adapt to climate change ©Alex Nene

The 1st National Climate Change Action Plan (NCCAP 2013-2017) outlined the importance of mainstreaming climate change into various professions at university level. It also stressed the need for institutions of higher learning developing policies to ensure that all students educated there are familiar with climate change, its impacts and strategies for adaptation and mitigation.

Similarly, the Kenya National Adaptation Plan (NAP) states that academia and research institutions should play a key role in building the country's adaptive capacity. They will provide the evidence for knowledge-based decision-making by the national and county governments, private sector, development partners and civil society.

This is done through research conducted on different aspects of climate change including improving the understanding of climate change impacts in Kenya and providing information on the appropriate mix of actions.

In this regard, institutions of higher learning need to lead the way and collaborate with other institutions in addressing climate change nationally and globally. Funding from the Ministry of Education, National Research Fund and UK Utafiti Fund has seen the introduction of post-graduate courses in climate change and renewable energy in Kenyan universities.

Institutions of higher learning are represented in the National Climate Change Council (NCCC). The Council chaired by the President provides an overarching national climate change coordination mechanism in the country.

The NCCC representation provides institutions of higher learning with an opportunity to inform policy direction on research and training on climate change matters among others.

The Ministry of Education assists in environment research through the National Research Fund. The Ministry also collaborates with Universities on research, innovation, and commercialization of emerging technologies.

Some of the universities in Kenya that are involved in activities that address climate change are highlighted below.

Jomo Kenyatta University of Agriculture and Technology (JKUAT), the Institute of Energy and Environmental Technology in collaboration with the Japanese International Cooperation Agency started the "BRIGHT" Project whose aim was to strengthen the capacity of JKUAT in Research and Development, Education (curriculum development), and Training in the field of rural electrification using renewable energy.

Universities are leading the way in addressing climate change nationally and globally

This together with the development of a new curriculum in the post-graduate course (Msc in Climate Change and Governance) contributes to capacity building.

The institute also builds capacities by offering short-term training for communities in biogas installation, solar power, biogas digesters and the use of wind power. There are demonstration projects on site at the Institute for engaging learners with hands on practical experience.

The University has also been selected to host the regional Maritime Technology Cooperation Centre (MTCC) for the Africa region, funded by the European Union and implemented by International Maritime Organisation (IMO), to help mitigate the harmful effects of climate change.

At *Moi University*, the SUCCEED-EnRich Project promotes the East African Universities as living laboratories for sustainability and energy efficiency. The Universities collaborate and network to share materials, knowledge, experiences, and good practice on energy efficiency and renewable energy.

The *University of Nairobi* through the Institute of Climate Change and Adaptation (ICCA) has developed a Post-

graduate and Doctorate programmes in Climate Change and Adaptation. ICCA is also engaged in research activities and consultation on climate change issues.

Dedan Kimathi University of Science and Technology (DeKUT) was the first in Africa to open a Geothermal Energy Training and Research Institute (GeTRI) in 2014. Similarly, Maseno University offers a wide range of courses leading to a Bachelor of Science Degree in Climate Change and Development with IT while climate change and agriculture is a major research topic at Egerton University.

Strathmore University hosts the Kenya Climate Innovation Centre (KCIC) which is a consortium consisting of Strathmore University, Global Village Energy Partnership (GVEP) International, Price Waterhouse Coopers (PWC) and the Kenya Industrial Research and Development Institute (KIRDI).

The University is the first in East Africa to invest in a 600kW grid-tied rooftop solar PV to meet all its daily energy needs and the surplus is sold to the National grid. This is facilitated by the Strathmore Energy Research Centre. Jaramogi Oginga Odinga University conducts energy audits and is focusing on market-based technology on cook stoves with the support of the National Research Fund.

Other higher learning institutions offering Climate change related courses include Kenyatta University, Maseno University, Africa Nazarene University and Maasai Mara University,

Whereas it is already the case that climate change as a subject is now being taught at many Kenyan universities, there is need for institutions of higher learning to develop policies to ensure that all students trained are familiar with climate change and its impact and integrate climate change into Kenya's education system.

Dr. Margaret Wachu Gichuhi
Research Fellow
Jomo Kenyatta University of Agriculture and Technology
maggiewachu1@gmail.com

Industrial Symbiosis in the Manufacturing Sector



One of the workstations that generates garment textile off cuts ©Dr. Kelvin Khisa

Kenya's current industrial development model is largely linear. It is based on the wasteful linear development economic model of extracting raw materials, converting them into consumable products and discarding the resultant wastes into landfill.

Such a model can only be sustainable if we had limitless resources and that land is always available for landfilling, a position that is not true for most densely populated urban centres. As a result, there is a strong international consensus that over-reliance on wasteful linear economic development models is no longer sustainable.

A much more promising economic development model will be one that seeks to promote a circular economy powered by enhanced resource use efficiency, the adoption of the 3R philosophy of reducing, reusing, and recycling wastes, before engaging industrial symbiosis to deal with the inevitable residual wastes and by-products.

The circular economy is part of Sustainable Development Goal (SDG) 12 on responsible consumption and production. The eco-industrial park concept is working in South Korea, Japan, China and South Africa among others.

The circular economy not only helps divert waste streams from the landfill but also reduce pressure on the use of limited virgin raw materials. Given the great danger posed by a changing climate, promoting resource use efficiency, diverting wastes from the landfill, and re-circulating materials in closed loop manufacturing value addition cycles will definitely reduce the amount of greenhouse gas (GHG) emissions.

Through industrial symbiosis, it is possible to design, construct, and operate industrial plants in a way that waste from one becomes raw material for another.

Industrial symbiosis refers to "business-to-business" relationships that emulate symbiotic relationships between organisms in natural ecosystems, where waste from one organism forms food for the other. It involves waste from one or more businesses being directed to

become an important input for one or more business operations. This waste and by-product exchange can happen in one sector or in several sectors.

Industrial symbiosis fulfils Kenya's National Solid Waste Management (NSWM) Strategy of *Zero Waste Principle* whereby waste is a resource that can be harnessed to create wealth, employment and reduce pollution.

Kenya Vision 2030 recognizes the need for efficient and sustainable waste management systems in transforming Kenya into a newly industrialized middle-income country. The Nationally Determined Contribution (NDC) has also outlined the promotion and implementation of a sustainable waste management system as a mitigation action that would help the country meet its target to reduce GHG emissions by 30 percent by 2030.

Industrial symbiosis fulfils Kenya's National Solid Waste Management Strategy of Zero Waste Principle

Since 2010 at the Athi River Export Processing Zone (EPZ), there has been a spontaneous evolution of waste and by-product exchange in three clusters namely agro-processing, garment making, and plastics manufacture that all operate within an industrial zone setup.

In Agro-processing, the primary manufacturer extracts oil from nuts with the resultant seed cake by-product being used as a raw material for the manufacture of animal feeds. The textile offcuts from garment making are graded and used as boiler fuel as well as in the manufacture of sofa sets and cleaning mops. In the plastics clusters, the tarpaulin plastic offcuts are used for the manufacture of plastic water tanks and chairs.

The management of the industrial zone can help accelerate investments in industrial symbiosis by working to set up a zone-wide infrastructure for waste

segregation, recovery and reuse. This should be accompanied with stakeholder awareness and development of low-carbon zone operation guidelines.

The full realization of the industrial symbiosis potential will need to be supported by extensive material flow research to quantify all zone company raw material inputs and outputs in terms of desired products, by-products, and waste streams.

This research outcome will need to be put into a waste exchange clearinghouse database that will help facilitate waste and by-product exchange through inter-company negotiations and matchmaking schemes.

Some of the Kenyan infrastructural limitations for a circular economy include the limited application of green and promising business models; weak information exchange systems; confidentiality and trust concerns hampering information exchange; limited reverse logistics to promote waste and by-product exchange; and the fact that linear technologies are deeply rooted in our mindsets.

In order to promote circular economy thinking among the Kenyan Private Sector, attention will need to be put on the following observations. That an industrial symbiosis journey begins with the commitment of top management. It should be fully convinced that investing in industrial symbiosis makes good business and environmental sense. In the promotion of the industrial symbiosis practice, companies need to leverage on teamwork.

In conclusion, there will be need for technical assistance and capacity building to ensure manufacturing companies adequately invests in metering material flows to enhance environmental pollution analysis trends for informed decision-making.

Dr. Kelvin Khisa

Senior Research Scientist
Kenya Industrial Research and Development Institute (KIRDI)
kelvin.khisa@kirdi.go.ke

Resolving Environmental Conflicts in Kenya



Inspecting gold mining activities in Rostaman area in Kakamega County ©NECC

Every person in Kenya is entitled to a clean and healthy environment and has the duty to safeguard and enhance the environment. When this fundamental right is violated most Kenyans rarely know how to lodge a complaint and how environmental matters are resolved.

The enactment of the Environmental Management and Co-ordination Act (EMCA), 1999 provided an appropriate legal and institutional framework for the management of the environment. The Act, established a Public Complaints Committee (PCC) as an avenue for public interest litigation on behalf of Kenyans on environmental matters.

The EMCA (Amendment) Act, 2015 renamed the PCC the National Environmental Complaints Committee (NECC). The Committee facilitates access to environmental justice for the public through prompt and affordable environmental conflict resolution. It also contributes to environmental policy development.

The Semi-Autonomous Government Agency operating independently with power to regulate its own procedure started full operations in January 2003. The committee has investigated a total of 1,102 cases since its inception, to March 2018.

The number of addressed complaints is even higher as one set of recommendations may address several complaints. In addition, one complaint may contain several aspects of environmental degradation, hence resulting in multiple recommendations. This ensures that no gap is left especially when dealing with emergent issues. In some instances, the complaints are resolved administratively by NECC engaging the key stakeholders and letting them handle the cases.

The Committee investigates complaints of allegations regarding the condition of the environment in Kenya and suspected cases of environmental degradation: pollution, poor waste management, non-compliance with EMCA among others.

It provides a simple avenue for alternative environmental conflict-resolution without resorting to vigorous technical and

procedural court process. It accords the public an opportunity to ventilate their grievances in a speedy and fair manner, which helps in promoting compliance with environmental law, and reducing environment related complaints.

The NECC seven-member committee consists of a Chairman appointed by the Cabinet Secretary (CS) for Environment and Forestry; a representative each from the Attorney General, Law Society of Kenya and business community; a nominee of the Council of Governors as Secretary of the Committee and two members active in environmental management.

Complaints can be lodged through the NECC Hotline +254722510510

The law requires the committee to investigate any suspected case of environmental degradation and make a report of its findings together with recommendations to the CS for Environment and Forestry.

The CS then escalates the implementation of the recommendations to the relevant government agencies mandated by law to address them, namely; National Environment Management Authority (NEMA), Lands and Environment Court, Water Resources Authority, Kenya Forest Service, Kenya Wildlife Service or any other agency dealing with the environmental matters.

The CS also initiates establishment of legal frameworks when the Committee submits recommendations that require change of policies.

In carrying out its mandate, the Committee has contributed to the development of policies that are geared towards achievement of a clean and healthy environment. It recommends the adoption of an ambitious policy on sustainable land use along with the provision of proper planning, clean piped water, modern and efficient sanitation including sewer and drainage systems in all urban areas. The work compilation contributes towards the State of Environment Report.

The committee contributed towards the ban on plastic carrier bags in 2017 and submitted a report on forest degradation in the country to the Forest taskforce that looked into forest resources management and logging activities in Kenya. NECC recommendations were captured in the task force final report.

The Committee has provided various ways of lodging complaints. Citizens are able to file complaints through writing to the committee using a one-page complainant form from the NECC website <http://pccenvironment.or.ke/download/pcc-complaint-form/>. The complainant then sends the form to the Committee after filling it.

Once the Committee receives a complaint, they acknowledge and set a date to invite the complainant and the accused for a joint meeting. To ensure increased public confidence the committee always ensures that complainants receive protection and that an appropriate action follows whenever a complaint is lodged.

The Committee has the power to request assistance from any person in Kenya in the course of its investigation and failure or refusal to give such assistance is an offence that carries severe penalty of a fine not exceeding KSh 50,000.

The Committee faces some challenges including inadequate personnel to undertake public interest litigation on environmental matters and difficulty for people from far-flung areas to lodge complaints as it based in Nairobi.

The Committee, in collaboration with the Ministry of Environment and Forestry, is currently seeking to amend EMCA 2015 so that it can have more powers to effectively gather, listen, and address environmental issues. It is also building partnerships with other agencies to address various challenges that it faces.

Dr. John Kipkorir Chumo
Secretary, National Environmental Complaints Committee
kipkorirchumo@yahoo.com

Youth and Climate Change in Kenya



Climate simulation exercise at Kenyatta University ©AYICC

The African Youth Initiative on Climate Change (AYICC) is a network comprising of university groups, rural youth groups, schools and like-minded individuals. It was formed in 2006 during COP 12 in Nairobi following realization that the youth had no structured way of engagement and contributing towards the climate change dialogue. The network is in 45 African countries with its headquarters in Gambia.

The youth as primary stakeholders are playing a vital role in creating lasting solutions in addressing climate change. Based on this, AYICC provides an entry point for this generation to participate in policy formulation and implementation.

The network has provided a platform to connect, share knowledge, ideas, experience skills and strategies on youth action on climate change around the world.

Since 2006, the Kenyan Chapter of AYICC has made significant achievements especially in influencing the policy landscape, capacity building and implementation of climate change projects across the country. AYICC-Kenya has also expanded its local networks and has focal points in 15 counties.

AYICC was actively involved in the enactment of the Climate Change Act, 2016, especially during public participation stage where it mobilized the youth. The initiative was also involved in the Medium Term Plan (MTP III) process including preparation of the CSO's submission; the EMCA 1999 review process and the 2nd National Climate Change Action Plan (2018 – 2022) development process where it made its submission through the Kenya Climate Change Working Group (KCCWG).

AYICC and other youth networks in the country are also working with the Ministry of Environment and Forestry to establish a Young Negotiators Mentorship program to mentor young people interested in Climate Negotiations. The programme has been designed to fit within the existing structures at the continental level like the Africa Working Group on Gender and Climate Change (AWGGCC) and the

Committee of African Heads of States on Climate Change (CAHOSCC) Youth Programme. The pilot of the programme is almost complete, after which a review and official launch will be undertaken.

On international fronts, AYICC-Kenya participates in drafting different UNFCCC submissions whenever invited by government and other responsible stakeholders.

As a member of the official Youth Constituency under the United Nations Convention on Climate Change, Young NGOs (YOUNGO), members are actively engaged in drafting different policy documents within thematic working groups. African Youth Conference on Climate Change (AfriYOCC), a programme initiated by the continental secretariat to among other things prepare the youth position to COPs, was also hosted by AYICC-Kenya in the year 2016.

Innovative ideas by the Youth should be tapped towards addressing the impacts of climate change

On capacity and advocacy, AYICC-Kenya in collaboration with partners, key among them the Climate Change Directorate continues to implement different programmes with relevance to the youth such as the University/National Dialogues, Art Caffles, Monthly write shops and Weekly presentations on different aspects of environment and climate change.

It is also involved in the deCOALonize campaign against Coal Energy. These initiatives are used to engage the literate youth on critical environmental issues and to equip members with technical skills necessary for effective advocacy.

The University/National dialogues have exposed university students and other junior members of the society to the challenges brought about by Climate Change. This has instilled some sense of responsibility and urgency while also presenting income opportunities, for

example, green jobs and entrepreneurship.

Initiatives and youth organizations like AYICC have provided formal and informal content delivery to ensure the younger generation is aware of climate change issues. The informal climate change education targets young people without tertiary education or whose profession lacks climate change component. It has been delivered through Art Caffles where information is packaged and delivered through art.

As an organization, AYICC continues to work with like-minded organizations to implement environmental projects. Examples include tree planting and energy campaigns the network has been working on since 2016. AYICC has mapped youth projects that qualify as best practices in the country and seconding them for exhibitions at the annual AfriYOCC, an initiative of the AYICC – Continental.

In 2016, five projects on adaptation, mitigation, gender and climate change, and innovation from across the country were presented at the annual conference during its second edition in Kenya for transferability purposes across the continent.

Towards the implementation of the Paris Agreement, the government should invest more in implementing article 12 of the Paris Agreement i.e. climate change education, training, public awareness, public participation and public access to information commonly referred to as Action for Climate Empowerment.

This will ensure the skills, talents, energy and innovative ideas by the youth are tapped towards addressing the impacts of climate change.

More at: <http://www.ayicc.net/>

Fred Ouma
National Coordinator
Africa Youth Initiative on Climate Change (AYICC)
fredrickmbima@gmail.com

Are you a Climate Change Champion?



Children from Kibera KIDS4PEACE painting
©Harambee Arts

The participation of young people in climate change discussions is a necessity in safeguarding the interests of future generations. It provides an avenue for children to participate in the discussions while fostering environmental stewardship and developing their capacity to be agents of change.

In this regard, the Ministry of Environment and Forestry with support from the Low Emission and Climate Resilient Development (LECRD) Project, has organized the Kenya Climate Change Art and Essay Competition 2018 to enable children present their understanding and interpretation of climate change through creative works of arts and written essays.

The art competition provides a unique opportunity to listen to and act on children's perspective on climate change. The competition provides a platform to tap into children's creativity as a catalyst for change and a call to action making them climate change ambassadors.

Creating awareness about climate change among children and the youth requires all stakeholders to work together. The Ministry of Environment and Forestry would like to invite stakeholders to be part of the Kenya Climate Change Art and Essay Competition. Stakeholders who would like to engage and inspire children to find solutions to climate change related challenges can write to ccartcompetition@environment.go.ke or call +254721527994

Kenya Climate Change Art and Essay Competition 2018

Open to Public and Private Primary & Secondary Schools

Are you a Climate Change Champion?
Jitokeze Ushinde!

The Ministry of Environment and Forestry invites you to share your creativity and artistic talent by showcasing your level of awareness, knowledge, skills and activities on Climate Change by drawing, painting or writing.

Climate Change *Dream, Express, Act!*
Ota, Jieleze, Tenda!

Painting and Drawing
Category 1: 5-11 Years
Category 2: 12-14 Years
Category 3: 15-19 Years

Essay Writing
PLEASE NOTE:
Essay writing is restricted to category 3 and number of words is 700-1000 words

Submission deadline is 10th August, 2018
Winners will be announced during the Award Ceremony in September 2018

Entry forms are available for download at: www.kcccp.go.ke

Send or drop your application to:
The Principal Secretary,
Ministry of Environment and Forestry,
NHIF Building, 12th Floor, Ragati Road, Upperhill, PO Box 30126-0010, Nairobi, Kenya.
Email: psoffice@environment.go.ke | ccartcompetition@environment.go.ke
Tel: +254 20 2720888/9 +254721527994 +254 7204872008
www.environment.go.ke

Other drop off points:
• The National Climate Change Resource Centre (NCCRC) located at the Kenya Meteorological Department Headquarters, along Ngong Road, Nairobi.
• National Environment Management Authority (NEMA) offices, Popo Road, South C, off Mombasa Road.

MINISTRY OF ENVIRONMENT AND FORESTRY
USAID FROM THE AMERICAN PEOPLE
UNDP
(An initiative of the Low Emission and Climate Resilient Development Project)

#CCArtCompetition Kenya Climate Change Art and Essay Competition Kenya Climate Change Art and Essay Competition

This edition is produced as a joint effort between ALIN and the Ministry of Environment and Forestry, through the Low Emission and Climate Resilient Development (LECRD) Project. The Project is implemented by the Ministry of Environment and Forestry with funding by USAID through UNDP.

This edition is supported by the LECRD Project. Articles from this edition of Joto Afrika may be re-used, provided the materials are distributed free of charge and the author(s) are credited. Please send copies to ALIN and LECRD.

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Design & Layout
Francis Muchiri

Guest Editor
Victor Orindi, Ada Consortium
vorindi@adaconsortium.org

Editorial Team
James Nguo - Chief Editor ALIN
Bob Aston - Editorial Coordinator ALIN
Noah Lusaka - ALIN
Harun Warui (PhD) - LECRD Project
Sheila S. Mbiru - Editorial Coordinator, LECRD Project
Phillip Dinga - LECRD Project

The Principal Secretary, Ministry of Environment and Forestry
P. O. Box 30216-00100
Nairobi, Kenya
Email: psoffice@environment.go.ke

Arid Lands Information Network
P.O. BOX 10098-00100 G.P.O.
Nairobi, Kenya
Tel: +254 20 2731557
Email: jotoafrika@alin.net
www.alin.net
ISSN 2075-5562

