



KEFRI *Newsletter*

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Cabinet Secretary for Environment, Climate Change and Forestry Hon. Soipan Tuya visiting KEFRI exhibition during the World Wetlands Day held at Enkung'u Enkare in Narok County



The PS, State Department of Forestry, Mr. Ephrim Kimotho accompanied by Ministry and SAGAs officials planting a commemorative tree at Kereita Forest in Kiambu County to Mark the International Day of Forests 2023

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Enkongu Enkare Spring in Naroosura, Narok County, hosted the national celebrations for World Wetlands Day, 2nd February 2023 where around 7,000 trees were planted at the wetland.

The Cabinet Secretary for Environment, Climate Change and Forestry, Hon. Soipan Tuya, officially presided over the annual global event, under this year's theme 'its time for wetland restoration'.

The World Wetlands Day is commemorated annually to mark the Ramsar Convention aka the Convention on Wetlands, an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and prudent use of wetlands and their resources.

"Today we create awareness of conserving the environment and mitigation to climate change, we are marking this day by planting trees concurrently in the 47 Counties," the CS said.

Enkong'u Enkare wetland will soon be gazetted as a protected area. CS Soipan Tuya.

"All SAGAs shall adopt a forest or such like ecosystem and restore it as part of the strategies to mitigate environmental crisis within the next three years," said the CS.

The CS further noted that the national Government is providing seeds and potting tubes to support tree growing in schools, prisons and related public places.

“The national Government through my ministry will rollout ‘Green Army program’ that aims to create employment to youth in the 15billion National Tree Growing Restoration ambition target 2032,” said CS Tuya.

There is need to conserve all the Kenya’s wetlands as they are important catchment areas,” said Governor Patrick Ole Ntutu.

Enkong’u Enkare, a Maasai phrase meaning the source of water, is such a crucial wetland sustaining the lives and livelihoods of thousands of residents in Narok county and Transmara ecosystem.

The Governor further said Narok County has so far planted around 1.2 million trees in Mau and Transmara, towards achievement of the 15billion trees campaign, 2032.

Narok County, which has 14.1 per cent forest cover and 20 per cent tree cover, still has 300,000 hectares available for rehabilitation and the government plans to significantly increase these numbers in its plans to plant at least 15 billion trees over the next decade.

“NEMA in collaboration with communities and other stakeholders will develop management plan and gazettement of the Enkongu Enkare Wetland as Ramsa site,” said PS, Environment and Climate Change, Engineer Festus Ng’eno.

At the same time the County Commissioner, Isaac Masinde instructed all area chiefs to lead their respective location to plant 3,000 tree seedlings each month.

Wetlands occupy between 3-4 percent of total land mass thus providing livelihoods to many communities as well as ecosystem services to plants and animals.

Narok County has 15.1 percent tree cover 20 percent 3000ha available for forest development.

Both the national and county governments will facilitate establishment of Green spaces in urban areas to expand tree in Narok County.

KEFRI donated 2 (10,000 litres) water tanks and some of 7,000 tree seedlings including bamboo and Vetiver grass to restore Enkongu Enkare Wetland.

International Day of Forests

On 21st March 2023, Kenya joined the rest of the world in marking the International Day of Forests (IDF) 2023 under the theme "Forest and Health" at Kereita Forest, Kiambu County.

The chief guest, Principal Secretary (PS), State Department of Forestry Mr. Ephantus Kimotho stated that this year's celebration comes at a time when land degradation, biodiversity loss, climate change, are among other lead challenges that calls for global action.

According to United Nations: Forest sustainable management and their use of resources are key to combating climate change, and to contributing to the prosperity and well-being of current and future generations.

Kimotho called upon the citizens to liaise with KFS and the Community Forest Association (CFA) for provision of tree seedlings and guidelines to adopt a forest.

“The Government is in the process of implementing 'Adopt a Forest policy' which outline partnerships process and requirements to adopt forest for the attainment of 15 billion trees target,” said the PS.

“KEFRI is providing tree seeds and seedlings through partnership with the communities, County governments to ensure the country achieve the 30% tree cover by 2032,” said Director KEFRI, Dr. Joshua Cheboiwo.

During the function, KEFRI donated 400 assorted indigenous tree seedlings and 2000 Bamboo to rehabilitate Kereita Forest.

According to United Nations, Forest sustainable management and their use of resources are key to combating climate change, and to contributing to the prosperity and well-being of current and future generations.

KEFRI demonstrated the use of JazaMiti App - a species to site matching tool based on modelling altitude, rainfall, temperatures, and soil type, plant type among other factors.

“The App which is available on Google Play Store is supported by the Ministry of Environment Climate Change and Forestry and KEFRI,” said Dr. Jane Njuguna

On the road towards 15billion trees, every tree counts and therefore each tree must be planted on a suitable site to guarantee survival.

Use Jazamiti App to monitor Tree Growing

JazaMiti App is an application developed based on the science of matching species to site to guide tree growers in choosing the right tree species for a particular site for the right purpose and environmental sustainability. It also helps to track the trees planted and monitors and verifies survival of trees.



Addressing staff at Muguga headquarters, the CS (Inset picture) urged to increase tree seed production to boost the 60 million seedlings stock available in the country.

The tree growing session where she planted *Olea africana* an evergreen, drought resistant indigenous tree commonly used for high quality timber, medicinal and ornament.

“There is an urgent need to increase the tree seed stock to support the seedlings national stock,” said the CS.

The CS challenged KEFRI to take lead in agroforestry, saying it presents an opportunity of translating their scientific knowledge into realistic socio-economic outcomes.

"Let us leave our comfort zones and be proactive in giving practical solutions to the mwananchi, on how to contribute to the national strategy," the CS said.

She asked KEFRI to bring life to the strategy by creating awareness of valuable trees that will improve to farmers livelihoods saying this would make them buy-in to the tree growing efforts.

The CS further said KEFRI and KFS to strengthen their collaboration in order to meet the national target of growing 15 billion trees in the next 10 years.



State Department of Forestry Principal Secretary, Mr Ephantus Kimotho presented the 15 Billion National Tree Growing Campaign marketing plan that requires KEFRI to produce 500 million seeds this year and another 800 million seeds per year in the subsequent years.

PS Kimotho asked KEFRI to prepare itself for the challenge of the seed distribution to the grass-roots which will include schools and chiefs' camps.

He also said the institution is expected to train a 'Green Army' to be drawn from youth and women.

The green army will then champion the tree growing campaign countrywide.

PS Kimotho said that by growing 300 trees per person by 2030, from a population of an approximately 48 million people, the country will achieve its target of the 15 billion trees.

Director KEFRI, Dr Joshua Cheboiwo led the Senior Management team. Also present was the new KEFRI Board Chairman, General (Rtd) Samson Mwachethe.



Conserving and sustainably using forests is one of the best ways of protecting our planet and ourselves. Healthy forests are vital for all aspects of a healthy planet, from livelihoods and nutrition to biodiversity and the environment, but they are under threat. It's up to us to safeguard these precious natural resources.

DOWNLOAD the APP from Play Store:

“Blessed is he who plants trees under whose shade he will never sit.”

Let the old men plant trees, though they may never expect to eat the fruit of them. Indian proverb.

Tree planting in Drylands of Kitui

JICA Ex-Participants Alumni of Kenya (JEPAK) joined hands with parents, teachers and pupils of Katheka Primary School in Kitui West District where about 1,000 tree and 150 fruits seedlings were planted on Saturday, February 11, 2023.



Prof. Ratemo Michieka and Mr. Benard Kigwa (KEFRI) during the tree planting exercise led by JEPAK alumni

The JEPAK team leader Mrs. Agnes Chika said JEPAK also promotes friendly relations, culture and understanding between the Kenyan and Japanese peoples while enhance interaction and exchange of experiences of the members of the Alumni.

JEPAK, which is a network of Kenya professionals who have benefited from Kenya/Japan technical assistance through the Japan International Cooperation Agency (JICA), mobilise and utilise its varied human resource for grass root community empowerment, alleviation of poverty in the country and enhancing the friendly ties, technical cooperation between Kenya and Japan.

It is estimated that over 4,500 Kenyans representing all shades of professionalism have gone through various programmes offered by JICA since its inception in 1983.

“The world is experiencing effects of global warming and that is why our visit to Kitui County to plant trees is one of the many activities we offer to support communities and to improve the environment,” Chika said.

“What we are doing here today is historical. Tree growing is one of the thing that has so much impact on the environment, as we face climate change and global warming,” she went on.

According to Chika who is a medic at Kenyatta National Hospital, JEPAK was started in 1983 with current 5,000 membership.

JEPAK Patron, who is also the National Research Fund (NRF) Chairperson, Professor Ratemo Michieka told the gathering that

“Planting a tree is one of the best means we can do to save our environment. The seedlings that you are planting will change the area to become a different place than it is today,” he added.

KEFRI research scientist at Kitui, Mr. Bernard Kigwa also addressed the function where he urged the locals to grow more trees onfarm and conserve indigenous trees, a way of achieving a 10 per cent forest cover in the county.

“This is the only way of fighting this climate change. Climate change is very real,” the expert said

“Let us grow the trees, take care of a them until you see its final products, the protection is paramount,” the expert said.

“Trees are food and that is why we are supplementing them with fruits trees,” Kigwa said. The forester hit out at charcoal burners and woodcarvers in Kenya for their widespread degree of the forests and trees destruction in the country.

“They are very skilled in charcoal burning and woodcarving but they don’t know how to plant trees. They don’t plant trees. Theirs is to destroy the trees that were planted by other people,” the KEFRI official complained.

In her speech, the Katheka Primary School head teacher Ms. Elizabeth Muthusi disclosed that currently the school has a total of 450 pupils, 22 teaching staff members, thirteen board of management members and 6 workers.

Some 148 of the 450 learners are the 8 pupils, according to the head teacher. The Katheka Primary School BOM Chairman Christopher Ngungu and the Kauwi Location Chief Thomas Munyao also addressed the event among others.

**HAPPY
INTERNATIONAL
WOMEN
DAY**

Observed on Wednesday, March 2023



CS Hon. Soipan Tuya, with County CECs in charge of Lands and Environment, County Directors for Planning from eight severely affected counties by Prosopis in Kenya, Development partners and officials from National Government

Streamline Prosopis Management in Kenya

The Ministry for Environment, Climate Change and Forestry has approved the National Prosopis Strategy and Safe Guard (2021-2030) to be launched and distributed for implementation by stakeholders in counties.

The Cabinet Secretary for Environment, Climate Change and Forestry, Hon. Soipan Tuya said when she officially opened a workshop to streamline *Prosopis juliflora* Management Strategy and Action Plan 2022-2030, at KEFRI Headquarters, Muguga, on 3rd March 2023.

The CS was addressing the meeting that had brought together County Executives CECs in charge of Lands and Environment, and County Directors in charge of Planning in 8 of 22 severely affected counties by Prosopis in Kenya, the National government officials, who were to discuss control and management of Prosopis in Kenya.

“The Government has prioritized the management and control of *Prosopis juliflora* which has affected 2 million hectares in the 8 most affected Counties and is threatening 7 other counties,” CS Tuya said.

The CS further urged Counties to anchor the strategy in their County Integrated Development Programme (CIDP) and fastrack utilization of Prosopis in the affected counties of Marsabit, Baringo, Garissa, Taita Taveta, Tana River, Turkana, Kajiado and Isiolo.

The Ministry will mobilize KES 10 billion through community and private sector investment initiatives to grow 15 billion trees to restore rangelands by 2032. , said the CS.

Forestry Principal Secretary, Mr Ephantus Kimotho said that management of Prosopis calls for multisectoral approach involving various stakeholders. KEFRI must upscale tree seeds and seedlings production in line with the achievement of 15 billion trees growing campaign by 2032.

“The government will lift the ban on production of charcoal mainly from Prosopis to enable communities in those regions to utilize the invasive wood using modern kilns,” said Kimotho.

The PS Kimotho also noted that over 200 registered Charcoal Associations in the country can generate both income and jobs through controlled charcoal production.

Director KEFRI Dr. Joshua Cheboiwo speaking at the same event appealed for KES 4.5 billions from GoK and donors to implement the National Prosopis Strategy 2022-2030.

According to Mr. Simon Choge, a long serving researcher at KEFRI, *Prosopis juliflora* and *P. palida* was first introduced in Taita Taveta and Tana River in 1948 and 1975 respectively. However, *P. juliflora* became invasive due to 1997 El nino and other current climate change effects that need to be addressed before further spread.

UCLan supports forest adjacent communities in Kenya

KEFRI Director Dr. Cheboiwo accompanied by Assistant County Commissioner - Kikuyu, Ms Felistus Ngumbau handed over the donation of tree seeds, beehives and dairy goats to forest adjacent communities leaders in Kiambu County, on 17th February 2023.

KEFRI is implementing the project activities through collaboration with Muguga, Thogoto, Uplands in Kiambu County, and Ngong Hills Metro in Kajiado County, Friends of Karura in Nairobi County.

The CFAs activities form part of the interventions by the University of Lancashire (UCLan) United Kingdom through Quality Related Global Challenges Research Fund (QR-GCRF).

The project aims to enable the communities adjacent these forests improve their livelihoods through activities that contribute to zero carbon transition, a critical response to the challenges posed by the inter-sectionality of United Nations Sustainable Development goals (UN SDGs).

“KEFRI researchers have contributed greatly in the formulation of policies that eventually led to formation and adoption of CFA in the country,” said Dr. Cheboiwo.

This will enable communities prevent, or be resilient to, future environmental shocks brought about by climate change.

“Forests and tree outside natural forests play a critical role in climate change mitigation as they provide wood and non-wood products including fodder, foods, fuelwood and many other services,” added Dr. Cheboiwo.

The Director further said KEFRI will continue to partner with various stakeholders to develop forest initiatives contributing towards achievement of 30 percent tree and forest cover, Vision 2030 objectives, and 15 billion trees campaign 2032.

The Assistant County Commissioner urged communities to ensure the project succeed.

Youth and women should take lead in protecting the forests as well as other ecosystems, to ensure they are not left behind by economic growth, said Ms. Ngumbau.

“Climate change has negatively affected the food basket in Kiambu County due to interference of natural forests, exacerbated by excessive drought and fire breaks,” said Ngumbau.

Others who addressed the event are representatives for Agriculture, Fisheries and Livestock, as well as Environment and Natural Resources, Kiambu County.



CFA leaders and Project officials receiving dairy goats

Deforestation, forest degradation, impacts of climate change and habitat destruction are persistent problems despite initiatives to improve the situation.

According to KEFRI recent studies, over 70% of the rural population in Kenya rely on forests for various goods and services. The forestry sector contributes 19% of Kenyan Gross Domestic Product (GDP).

According to the Project coordinator Dr. Vincent Oeba, interventions are urgently required that promote nature-based employment opportunities in the forestry sector. Sustainable change to occur and community resilience to grow during the zero-carbon transition, individuals must have agency, capacity and the ability to enact.

“In this regard, there is need for inception event on validation of interventions for exploring the contribution of Kenya's community forest associations to the zero carbon transition, in response to the challenges posed by the inter-sectionality of united nation sustainable development goals,” said Dr. Oeba.

The University of Central Lancashire (UCLan) is a government-run institution offering higher education, based in the city of Preston. Initially known as the Harris Art College, UCLan has its roots in the institution for the Diffusion of Useful Knowledge, set up in the year 1828.

Mangrove Afforestation in Kenya's coast

Environmental degradation whose main drivers are agricultural expansion, deforestation and urbanization, is one of the greatest threats to Africa's landscapes. KEFRI has always endeavoured to improve the lives of communities and the landscapes through transfer of technologies and best practices such as afforestation and reforestation.

It is on that perspective that KEFRI Lamu sub-regional centre on 16th February 2023 held a learning exchange forum to create awareness on proper mangrove nursery establishment and management towards sustainable restoration.



KEFRI brand visual banner - to generate awareness and to drive traffic to the site

KEFRI organised the capacity building training in collaboration with Kenya Forest Service, Lamu Mangrove Community Forest Association, WWF-Kenya, Wetlands International East Africa, Lamu County Government and community members from 11 villages in Lamu.

“The forum covered several topics covering tree nursery establishment and practices: selection of viable propagules/seeds, appropriate soil type, potting, watering and management of the established nurseries,” said Lamu Assistant Regional Director, Henry Komu.

In Kenya, there are 9 species of mangroves and they form a transitional zone between the coastal marine and coastal forest eco-regions. The most dominant species are *Rhizophora mucronata* locally identified as 'mkoko'. Other distribution of species or zonations comprise of *Sonneratia alba* (Mlilani), *Ceripos tagal*, *Lumnitzera racemosa*, *Loop-rot*, *Bruguiera gymnorhiza*, *Avicennia marina*, *Xylocarpus granatum*, *Xylocarpus moluccensis* that are also found in the creeks.

KEFRI has initiated various tree growing projects in arid and semi arid parts of Ukambani and the coast region including Kwale.

A tree nursery increases survival chances of seedlings because they can be taken care of in the nursery-young trees are nurtured until mature enough to be moved to the field.

A nursery is also important for convenience reason, the seedlings can be managed to be planted at the desired time.

Tree nursery operations involves various activities such as: seed bed preparation, sowing seeds, potting, pricking out, shading, watering, weeding, root pruning, application of fertilizers or manure. and management of pests and diseases.

Water, air, light, nutrients and correct temperature coupled with care (plant management) are the basic requirements that make plant grow faster and bigger in the nursery.

Tree nurseries should be objectively raised informed by restoration plans, to avoid cases of overgrown and excess seedlings in nurseries, said the Assistant Regional Director, Henry Komu.

Establishment of mangrove nurseries is essential where natural regeneration is not feasible and human intervention is required to initiate recovery of any degraded site, further noted Mr. Komu.

The seedlings are critical where seeds are naturally unavailable in a given site and when seeding patterns fail to coincide with optimal planting period.

The nurseries also do provide temporary storage for excess seeds and propagules produced during the fruiting season which otherwise would be lost.



Mr. Samuel Kirumba, KEFRI staff watering Pencil cedar (*Juniperus procera*) seedlings at Muguga research tree nursery

The training also was to encourage rural communities to plant trees onfarm, change their environment, and mitigate climate change. This comprises trees on farms and in agricultural landscapes also called agroforestry.

KEFRI support PhD graduate at Ghent

Constantin Dushimimana has graduated with a Doctorate in Philosophy (PhD) at Ghent University.

Dushimimana conducted part of his study in Ghent at Ghent University, Institute of Agricultural and Fisheries Research (ILVO), and in Kenya at the Faculty of Agriculture, University of Nairobi, Better Globe, Kenya Forestry Research Institute, and National Museum of Kenya; Ghent University was a proud moment! VLIRUOS, thank you for financing my study.

I'm grateful to my promoters, Prof. Dr. ir. Stefaan Werbrouck and Dr. Tito Magomere, for making my idea a reality and teaching me how to be consistent and focused every day. You're smart and enjoy teaching others.



Constantin Dushimimana (Centre) with supervisors during his Phd defense at Ghent University

I also like to thank Prof. dr. ir. Guy Smagghe and Prof. Olubayo Florence for their assistance and advise during my studies.

I want to express my gratitude to the members of the jury, Prof. Dr. ir. Godelieve Gheysen, Prof. dr. ir. Geert Gheysen, Prof. Danny Geelen, Prof. dr. ir. Emmy Dhooghe, Dr. Jackson Mulatya and Dr. Joyce Jefwa, for their contributions to the improvement of my thesis.

"I am grateful to these institutions for their direction and assistance. I had a great time staying in the ANP hostel in Kenya and the OBSG friends - info page in Ghent.

I was able to establish connections with people from around the globe. I am also grateful to my colleagues at Applied InVitro Plant Biotechnology for providing the laboratory space and making my work simpler.

Finally, I want to express my gratitude to my family for their unwavering support.

I'm quite optimistic about the future," said Constantin

Abstract

Before in vitro propagated *Melia volkensii* plants can be used for mass planting, the transition phase to in vivo conditions needs to be better controlled because too many plants are lost during acclimatization and in the field. Two experiments were set up to evaluate the effects of biological agents on the establishment of *M. volkensii* in vitro plantlets. The biological agents consisted of Trichotech®, Bio-cure B®, Rhizatech®, *Bacillus subtilis*, a Trichoderma isolate and self-isolated native arbuscular mycorrhizal fungi (AMF). Regarding the latter, in soil from the nursery, the number of AMF spores increased from six spores to 400 per 100 g of soil using a trap culture, in which thirteen AMF morphotypes were identified and root colonization assessed through observation of hyphae, vesicles, coils and appressoria. The first experiment was set up in the greenhouse to investigate the efficacy of the biological agents on the hardening off. In the second, a field experiment was set up to study their effect on the early establishment of the plantlets in the field compared to seedlings. All biological agents significantly ($p \leq 0.05$) improved in vitro plant survival and growth compared to the control. The highest plant height and number of leaves per plant were recorded in plants treated with Rhizatech®, Native AMF, Bio-cure B® and Trichoderma isolate. The treatments with Rhizatech®, Bio-cure B® and native mycorrhiza recorded a significantly wider stem. The root diameter of the plants treated with Rhizatech® and Bio-cure B® was the largest, but the plants inoculated with the native AMF had the longest roots. Moreover, the inoculated plants generally developed multiple secondary roots. After two months, AMF had clearly colonized the acclimatized plantlets. In the field experiment, the biologicals made no difference in survival rate but did produce a significantly larger leaf area after two months, with the largest leaves recorded with Rhizatech®, native AMF and Trichotech®. They also increased the quality index of the plants from 0.21 to 0.52. The performance of in vitro grown *M. volkensii* plants six months after planting in semi-arid conditions in Kiambere was better than that of seedlings. Inoculation of plants increased plant height and diameter. Thus, inoculation of biological agents is an efficient approach for improving the early growth of in vitro propagated *M. volkensii* plants.

twende

towards ending drought emergencies

Towards Ending Drought Emergencies (TWENDE), is a 5-year project {2021-2024}, co-funded by the Green Climate Fund (GCF), the Government of Kenya and other partners, to help reduce the cost of climate change induced drought on the national economy.

The project has 3 components:

- Component 1: Climate change adapted planning for drought resilience
- Component 2: Restoration of rangelands landscapes for ecosystem-based adaption
- Component 3: Climate Change resilient ecosystem management for investment

KEFRI is implementing Component 3 as a service provider to Conservation International (C.I) through a 3-year contract agreement.

Objectives

The KEFRI TWENDE Project aims to:

- = Build capacity of institutions and stakeholders in Gums and Resin value chain in Kenya's arid and semi-arid lands (ASALs).
- = Provide investments and incentives for climate resilient ecosystem management through supporting the gums and resins value chain.
- = Provide value chain support and market development for the gums and resins harvested from natural habitats.
- = Diversify local communities' (cooperatives and groups) sources of income and livelihoods within two landscapes of (Sabarwawa and Mid-Tana).

The Project collaborators are Kenya Forest Service (KFS), Ewaso Ng'iro North Development Authority (ENNDA), World Food Program (FAO), County Governments among others.

Gums and Resins in Kenya

Gums and Resins are among key natural resources found in the Arid and Semi Arid lands (ASALs) which can be harnessed sustainably for income generation, livelihood improvement and poverty reduction. These resources include gum arabic from *Acacia senegal* or *Acacia seyal* and commercial gum resins such as myrrh (*Commiphora myrrha*), hagar (*Commiphora holtziana*) and Fankincense (*Boswellia neglecta*).

The main Gum and Resin producing counties in Kenya are Marsabit, Wajir, Garissa, Mandera, Turkana, Samburu and Isiolo. Other counties with resources are Kitui, Meru, Tharaka Nithi. Currently the global demand for Gums and Resins surpass its supply.

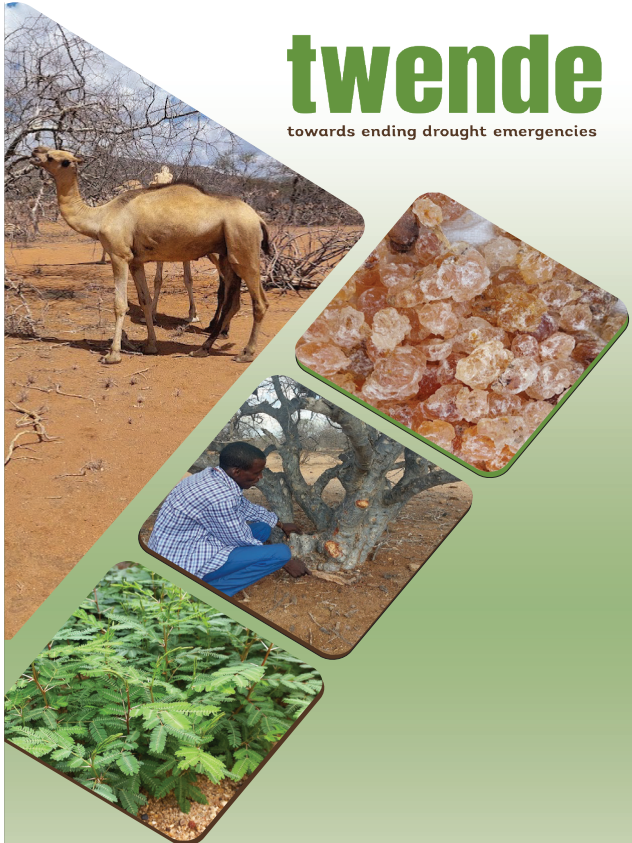
Current Activities

The project is supporting Gums and Resins value chain in Mid-Tana and Sabarwawa through:

- Organizing value chain actors to explore value chain opportunities
- Building the capacity of gums and resins cooperatives and groups
- Linking producers and buyers to markets
- Training on sustainable natural production and post-harvest handling practices
- Supporting with storage infrastructure and establishment of demonstration plots

Project Sites

The project focus on four of Kenya's Arid and Semi-Arid (ASAL) counties; Garissa, Isiolo, Marsabit and Samburu.



twende
towards ending drought emergencies

SUPPORTING THE GUMS AND RESINS VALUE CHAIN AND MARKET DEVELOPMENT

- Capacity Building of Value Chain Actors
- Infrastructural Support
- Market Development and Linkage
- Landscape Restoration Initiatives
- Development of sustainable Harvesting Protocols

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KEFRI and JICA Meet on the Projects activities

JICA's Chief Advisor Mr. Katsuro Saito on 19th January 2023, led a delegation that paid a courtesy call to the Director KEFRI Dr. Joshua Cheboiwo to update him on the progress of the project on Strengthening Forestry Sector Development and Community Resilience to Climate change through Sustainable Forest Management and Landscape Restoration.



KEFRI Director Dr. Cheboiwo meeting with Katsuro Saito and Ms. Ayaha Mochizuki at KEFRI headquarters

Saito also used the opportunity to introduce the new JICA expert of the ongoing project Ms. Ayaha Mochizuki.

JICA in collaboration with KEFRI is implementing a 5-year project (2022-2027) entitled: "Project for Strengthening Forestry Sector Development and Community Resilience to Climate Change through Sustainable Forest Management and Landscape Restoration,"

"The project aims to achieve multiple objectives, namely, strengthening policy-planning processes, promoting commercial forestry, upgrading breeding of drought tolerant tree species and enhancing Kenya's capacity for regional contribution to Sub-Saharan countries.

In order to achieve these purposes, we call for the involvement of a wider range of stakeholders including National and County governments, NGOs/CBOs, private companies, academia and individuals.

"I'm looking forward to working together with everyone who is committed to promoting forestry sector development in Kenya." Saito said.

The Project for Enhancing Sustainable Forest Management in Collaboration with REDD+ Programs and REDD+ Funds, aim to support many poor people in Kenya, who have been left behind by economic growth, such as the deterioration of the living environment due to rapid urbanization and the problem of unemployment among young people, and to respond to natural disasters such as drought and climate change.

KEFRI espy a station in Wajir County

KEFRI has received allotment letter for 5 acres research land in Wajir County. The land will be used to expand the seed production unit, expand tree nursery, demonstration plot and other official infrastructures.

The Director KEFRI, Dr Joshua Cheboiwo received the allotment from the county Government during his familiarisation tour of research and development activities in Wajir County on 22nd February, 2023.

During the tour, the Director met with various stakeholders in the county among them the Base Command Unit in KDF Camp where he observed the progress of various species planted in the camp.

The Director also visited the ENNDAs gum and resins factory supported by the Ewaso Ng'iro North Development Authority (ENNDA) through Ewaso Ng'iro North Gum Arabic and Gum Resins Development Project.



Wajir CEC for Lands, Ms Saadia Ahmed (left) handing over the sketch of the 5 acres KEFRI land in Wajir

The project intends to alleviate poverty, create employment, community empowerment, environmental management and socio-economic development in the Basin.

The Director also met the County Government lands officials where he discussed potential areas of further collaboration and the progress of the *Melia volkensii* demonstration plot.

"KEFRI is implementing several forestry activities in the County including establishment of seed centre which is expected to be operational before the end June 2023," said Dr. Cheboiwo.

The Director was accompanied by Dr. Albert Luvanda, Regional Director Drylands, Mr. Elyas Hassan, the Assistant Regional Director Garissa and Mr. Juma Jullo, the Forester Wajir.

Baobab leaves for school feeding programme

KEFRI is providing seedlings to support a 5-year pilot project entitled 'School Lunch and Tree Growing Club Forest Carbon Project in Kitui and Turkana Counties'.



Mr. Kigwa, a scientist based at KEFRI Kitui demonstrating the best practice to plant tree seedling

'The Project for Improvement of Food and Nutrition Security through Building Adaptive Capacity to Climate Change in Arid and Semi-Arid Lands in Kenya (IFNuS)' and Change Through Sustainable Forest Management and Landscape Restoration (JICA SFS-CORECC Project) is the funding whereas Japan International Cooperation Agency (JICA) is partnering with the Ministry of Environment Climate Change and Forestry, KFS and KEFRI are the main collaborators.

"The project builds on the outcomes and lessons of ECORAD2 project, and adopts a multi-sectoral approach, focusing on food and nutrition security in ASALs where agricultural potential is low," the acting ASALs State Department's Strategic Programmes Development Director, Dr. Monica Kinuthia.

Dr. Kinuthia who was speaking during a tree planting exercise at Mutomo Primary in Kitui County further stated that; one of the objective is to bridge the gap between the agribusiness approach to farming and food and nutrition security at the household level. The main activities include growing suitable trees such as baobab whose leaf can support school feeding programme.

The project's County Coordinator Anne Thuita, KEFRI scientist Mr. Bernard Kigwa, IFNuS' Nutrition Improvement, Health and Sanitation Deputy Team Leader Ayako Mitsui and the Project Technical Advisor Emmanuel Kisangau, graced the event.

The project has so far planted about 300 Baobab, Melia, Tamarind and Moringa seedlings in Voo, Makosi, Mutomo and Vote Primary Schools in Mutomo District. The four schools are the programme's pilot sites selected from a total of 1,282 schools (1,099 primary schools and 183 secondary schools) in Kitui County.

The baobab, scientifically aka *Adansonia digitata*, has its origin in Madagascar and Australia. In Kenya, baobab is abundant in Kitui, Kilifi, Makeni, Tana River, Taita Taveta, Tharaka Nithi and Kajiado Counties.

The tree is ready for harvesting of leaves at age five. The leaf is a staple of many populations in the Africa savanna. Sometimes used as forage for ruminants in dry season. The bark, fruit pulp and seeds have been traditionally used to treat "almost any disease, including malaria, tuberculosis, fever, microbial infections, diarrhea, anemia, toothache, dysentery and to stimulate the immune system.

Previous studies have indicated baobab leaves contain (terms of Dry Matter) proteins (13–15%), carbohydrates (60–70%), fat (4–10%), fiber (11%), ash (16%), minerals (calcium, magnesium, potassium and iron), and a significant level of vitamins (A, B1, B2, and C); 80% of the energy value which ranges from 1180 to 1900 kJ/100 g is metabolizable energy (Becker 1983; Yazzier et al. 1994; Nordeide et al. 1996; Wickens and Lowe 2008). The existence of significant variation of the content of vitamins B1 and B2 and minerals - (Ca, Cu, Fe, Mg, Mn, K, Na, P, and Zn) may indicate a possibility for a potential selection and domestication of superior tree for production of seeds to be used in vegetable gardens.

The leaves from the superior tree have high nutrient content with potential to alleviate malnutrition in most African countries (deficiencies in micronutrients such as vitamins, iron, and zinc).

The project is promoting *Melia volkensii*, which is harvestable as from age ten for high quality timber and emphasized the importance of using the Bio-char-charcoal dust in tree planting.

"Biochar is considered one of the best organic fertilizers used in agriculture due to its stability and ability to retain nutrients, enhance soil fertility, improve plant growth, and in conservation of water for the plant," Kigwa said.

KEFRI and NaFORRI partner to develop forestry research in E. Africa

The National Forestry Resources Research Institute, NaFORRI, Uganda Dr. Hillary Agaba, on 15th March 2023 signed an agreement with KEFRI Director Dr. Joshua Cheboiwo to undertake joint research in agroforestry, natural resources management and climate change effects.



Dr. Hillary Agaba (centre) and Mwodi Martin with KEFRI officials visiting tree seed testing laboratory, green house and

Further, the two CEOs agreed to embrace strategic partnership with other bodies with similar interests within the East Africa region to improve forestry.

“KEFRI and NaFORRI have a long collaboration and will strengthen the partnership through sharing scientific knowledge, exchange of plant germplasm and capacity building,” said Dr. Cheboiwo.

In a presentation, Dr Cheboiwo said that research data has shown application of modern technology and raw materials such as quality seeds, use of mechanised tools will improve tree growing and enhance achieving of 15billion National Tree Growing Campaign.

“Over the years, Uganda has strongly embraced commercial forestry with over 400 ha of Pines and Eucalyptus plantations currently established,” said Dr. Agaba.

Dr Agaba who was accompanied by manager of the National Tree Seed Centre -Uganda, Mwodi Martin, visited research laboratories and tree seed processing unit.

On 14th March 2023, Director for Centre for Ecosystem Restorations Kenya (CER-K) Mr. Jonathan Jenkins from Brackenhurst Limuru, signed an MoU with KRFI for joint research in forestry biodiversity and conservation targeting Kenya’s highlands and Savannas ecosystems. Dr. Cheboiwo said that data is key enabler for scientists to make informed decisions. Jenkins stated his organization and KEFRI aim to test seeds and collect data to understand how climate change is affecting biodiversity and tree morphology.

KEFRI partner with DeKUT to fabricate Seed Haulier

KEFRI partnered with Dedan Kimathi University of Technology (DeKUT), through the Centre for Mechanical Designs, School of Engineering to locally manufacture a seed hauliers.



VC, Prof. Ndirangu Kioni, officially handing over seed haulier to KEFRI officials in a function held at DeKUT, Nyeri County

The Vice Chancellor, Prof. Ndirangu Kioni officially handed over the haulier to KEFRI on January 25, 2023 during a ceremony attended by delegation from KEFRI and University department heads.

The School of engineering department boasts of having arguably the most modern and trendy facility for training in production technology and engineering design both in Kenya and East Africa.

The haulier is one of the products assembled by the Advanced Design and Manufacturing and Training Centre (ADMATC) which is the first of its kind in country universities and technical colleges and its the jewel of DeKUT.

“We have worked in close collaboration with University of Siegen through Erasmus programme to ensure that all applicable provincial and federal laws and regulations were complied with and therefore the haulier is environmentally friendly safe for our customers, as it has met the highest quality standards,” said Prof. Kioni.

The machine will be mainly used for rotary threshing of small capacities of seeds out of plants/capsules or heads as well as breeding material or stock seeds.

DeKUT, a public, coeducational technological university in Nyeri County, is one of 22 public universities in Kenya, having been a constituent college of Jomo Kenyatta University of Agriculture and Technology since 2007 until it was chartered to become a fully fledged public university 2012.



Director KEFRI Dr. Cheboiwo (Centre) with KEFRI staff after meeting with CINAREMA Director Ms. Mborra, Ms. Leila Ndiema, Head of Programme Support Farm Africa and Dr. Diana Onyango, Technical Manager Programme in Kenya

The Executive Director of CINAREMA Ms. Ann Mborra, accompanied by Ms. Leila Ndiema, Head of Programme Support Farm Africa and Dr. Diana Onyango, Technical Manager Farm Africa held joint discussion on 13th January 2023, with Director KEFRI Dr. Joshua Cheboiwo on means to strengthening institutions, communities and stakeholders undertaking Participatory Forest Management in Kenya.

The project's main objective is to enhance capacity and governance for institutions; sustainable forest management and improvement of CFA members and community livelihoods.

Further, the project targets to improve natural resources, biodiversity and ecosystem services management, enhanced environmentally sustainable inclusive livelihood development and improved capacity building, awareness and information sharing. Enhance capacity for community forest association (CFA) and strengthening coherence between forestry

Kenya Forest Club (KFC) National Coordinator, Mr. Kaara Waithaka on 2nd March 2023 held a discussion with KEFRI on partnership to conserve and manage forests in Kenya.

The Club is a non-governmental organization that has been in existence since 1907, with 250 members, spread across the 47 counties in Kenya. The organization aims

The collaboration with KEFRI is expected to enhance KFC's capacity to achieve its objectives to establish tree nurseries, seed collection, processing and preservation, as well as development of a user guide manual for KFC.

Staff Compliant Seminar

Sensization on Access to Information Act, 2016 and Effective Public Complaints Management for KEFRI staff was held on 6th March 2023 at the Headquarters.



Ms. Wanjiru Kibaki (Pictured) from the Office of the Ombudsman also known as Commission on Administrative Justice (CAJ) in her

presentation stated that the Office aims to rebuild confidence in the Judiciary from the people it serves and assess the institutions performance from the public point of view by obtaining feedback from the public.

"Complaints are inevitable and critical factors that strengthens institutional processes," Wanjiru said.

She urged KEFRI to enhance integrity of its processes and build capacity of staff to handle and manage complaints effectively.

Access to Information vis-a-vis Data protection is one of the key challenges that the Institute faces daily.

Quell Forest Fire



A forest fire that threatened Muguga Forest Estate was extinguished before it escalated to uncontrolled levels.

KEFRI Emergency Preparedness Team (KEPT) together with, Fire Brigade-Kiambu, Kenya Forest Service and the adjacent communities led by Muguga Forest Research Community Forest Association (MERCFA), intervened before the fire caused significant damage to the forest blocks containing very significant Eucalyptus trials.

In Kenya, from January to mid-March, fires scours sections of forests, threatening both plantations and natural forests. Such fires not only affect trees but also cause changes in ecosystems resulting in both stress and relief to plant and animal life - both to individuals.

According to the fire weather warnings, the Red Flag Warning was already issued due to the hot, dry, and windy conditions experienced in most parts of the country.

During red flag warnings, use of even chainsaw is prohibited simply because running a motor in the woods can be too risky.

Although, forest fire affects biodiversity - cause loss of valuable habitat, other school of thought advance that forest fire like other natural disturbances such as insect, disease outbreaks, drought, wind throw and floods are not necessarily catastrophic.

Disturbance is part of the natural life cycle of the forest and most often helps the forest to renew itself. Sometimes, fire affects ecosystems positively. Fires eliminate weak trees and give new species a chance to thrive. The positive environmental fire effects include removing low-growing underbrush, cleans the forest floor of debris, opens it up to sunlight, and nourishes the soil.



Members of Ukulima Savings and Credit Cooperative Society (SACCO), Muguga branch elected Chairperson Alice Akinyi Rawago, Secretary Mercy Kivuti, and Treasurer Hudson Obuya as new officials. The post had attracted 8 competitive aspirants including Beatrice Ndakwe (outgoing chairperson), Thomas Ondiek Nyairo, John Ochieng Otieno, Thomas Kiplagat.

Copertative officer Ms Roseline Nyamache and Gladys Adero from Ministry of Cooperative Development and Marketing, officiated the process.

Nyamache urged members to optimize their saving for economic, social and cultural needs.

“In so doing, the cooperatives will continue to strength the members and communities in which they operate,” said Nyamache.

Performance contrsct 28th February 2023

The Principal Secretary, State Department of Forestry Mr. Ephantus Kimotho today held negotiations with KEFRI Management on Performance Contract for 2022/2023 Financial Year.

The Director KEFRI Dr. Joshua Cheboiwo led the KEFRI team in the negotiation process as they aligned it with the Kenya Kwanza priority areas.

During the negotiation session KEFRI was urged to ensure they meet their Research mandate focusing on distribution of seeds, raising seeds that are difficult to propagate, establishment of tree nurseries and development and publicity of forest technologies.

In attendance were the KEFRI Board of Directors representative Mr. Elly Ongei, Senior Deputy Director, Research and Development Dr. Jane Njuguna, the Deputy Director, Corporate Affairs and Quality Assurance Dr. Jackson Mulatya, Principal Quality Assurance Officer Dr. Victor Jaoko among others.



World Wetlands Day

2 February 2023



Enkongu Enkare, Narok County

Theme: Wetlands Restoration



Ministry of Environment, Climate Change & Forestry

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