



JULY ISSUE - 2019

Kenya

farmer

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On the inside

- Bee farmers decry empty hives
- New hybrid rice
- *Return of white Gold*

Exploring The Agribusiness **Baby Boomer,** Fish Farming





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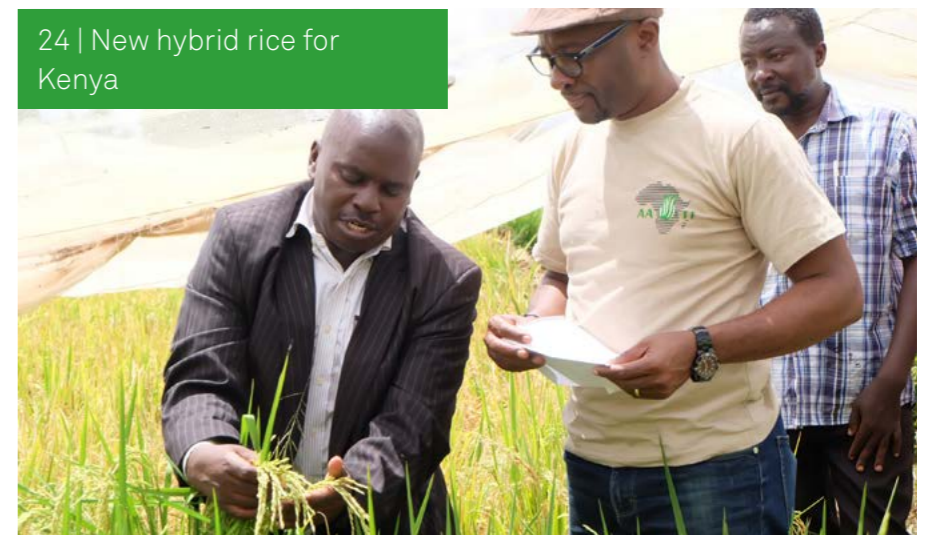
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Kenya farmer

Welcome to issue 201

A Different Outlook in Farming Methods Bearing Fruit

Adapting to change when necessity requires is critical towards survival especially when tackling matters Agriculture. It would be folly not to embrace change, considering we have technological, climate and resource change that is defining the future of agriculture.

The Kenya Farmer Journal team is conscious of the change within the agricultural sector and is keen to seek the farmers and other stakeholders who are involved in contributing towards sustainable agricultural that will secure people's livelihood. However, this does not mean that we are not on the lookout for traditional farming methods that have proved to be successful over the years.

In this edition, we have a mix of the new and the traditional. Beekeeping has been with us from time immemorial but now due to the dwindling bee numbers, there are new changes occurring in the sector such as training farmers on how to pollinate beyond just growing the right crops that help increase the bees.

Pyrethrum that in previous years was a major cash crop in the country has in the recent past been dwindling, however now it is the new white gold as its gaining ground in the market. In the fisheries sector, some are also contributing to the value chain in unique ways. Make sure you look out for these



Joseph W. Mugo
Editorial Board Chairman

stories and many more as you attend the Agricultural Shows and Trade Fairs in Nakuru, Kisii and Kisumu.

If you have any questions or comments, do let us know so we can scout for more stories that are of interest to you. I leave you with these words: **"Holding onto something that is good for you now, may be the very reason why you don't have something better."**

— **C. JoyBell C.** Reflect on this as you keep making your contribution to the agricultural and trade sectors.

Happy reading.

ADVERTISING

Juliet Wamiri Karung'o
Marketing and Publicity Manager
Cell: +254-722-621-588
Email: prn@ask.co.ke

MARKETING EXECUTIVE
Email: marketing@ask.co.ke

DESIGN & LAYOUT
Jomac Media Ent.
Cell: +254-721-715-914
Email: design@jomacmedia.co.ke

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The Agricultural Society of Kenya
P. O. Box 30176 - 00100 Nairobi - KENYA
Telephone : 020-807080/9
Website: www.ask.co.ke
Email: prn@ask.co.ke



"Agriculture is the largest employer in our economy. In recognition of its central role, my Administration earmarked the sector as a key pillar of the Big Four, as we seek to ensure Food Security and Nutrition for all Kenyans."

Patron,
Agricultural Society of Kenya
H.E. Hon. Uhuru Kenyatta, CGH

"Tech savvy youth are developing products that are transforming the way we practice agriculture. The paradigm is slowly shifting from practicing agriculture as a way of life to seeing it as a business that can provide gainful employment."

Deputy Patron,
Agricultural Society of Kenya
H.E. Hon. William Ruto, EGH



"My Ministry intends to achieve the transformation agenda and growth of the agricultural sector by focusing on growing incomes of farmers and agricultural SME's through commercialization and access to better technologies."

First Vice Patron,
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Hon. Mwangi Kiunjuri, EGH, MGH



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Embracing Technology In Agriculture For Food Security



Annabel Kiriinya (Mrs)
NATIONAL CHAIRMAN,
AGRICULTURAL SOCIETY OF KENYA

methods and depending on bimodal rainfall patterns in the country, achieving food security continues to be a taunting challenge. Global warming has led to shifts in the rainfall patterns making it difficult for farmers to forecast. The ever-challenging and highly unpredictable weather conditions have crippled farmers ability to plan their activities, thus remaining a major challenge to achieving food security.

As key stakeholders in the agriculture industry, it is our due responsibility to work together with other stakeholders in making sure that our farmers adapt to climate change. The society supports the climate smart agriculture programme that aims at increasing agricultural productivity and building resistance to climate change risks while providing an immediate and effective response in case of an emergency.

Technology can positively impact on food security in the country. Embracing technology will enable most farmers to exploit the otherwise un-cultivable arid and semi-arid lands which make up more than 50 per cent of the country. Such technologies will focus on developing and availing to farmers drought resistant seed varieties, which can withstand long and seasonal droughts.

The Society guided by its objectives and mandate, continues to play a pivotal role in advocating and lobbying for the adoption and use of new technologies in farming to improve food security. Our shows have continued to be a key platform where various players showcase inventions and innovations that merge technology and agriculture for food security.

As a key player in the agricultural sector and in line with this year's theme we will continue to promote innovation and technology in agriculture for food security.

Karibuni Kwa Maonyesha.

I am delighted to welcome you to the Nakuru National Agricultural Show, Kisii Branch show and the Kisumu Regional Show.

Food security in the country continues to be one of the major goals of the National Government as well as the County Governments. The Government has continued to implement key programs while formulating favorable policies to ensure the whole country is food secure.

Climate change plays a big role in the current low levels of agro-productivity in our markets. With most farmers using traditional farming

Promoting Sustainable Development



Batram M. Muthoka,
CHIEF EXECUTIVE OFFICER,
AGRICULTURAL SOCIETY OF KENYA

The Agricultural Shows and Trade Fairs have continued to accord our stakeholders the perfect platforms to showcase new innovations and emerging technologies. Through our fora we have also continued to offer digital literacy training, entrepreneurship training as well as access to market linkages to support and encourage entrepreneurs to scale up their businesses.

The pivotal role played by the agriculture and trade sectors in addressing the growing economic aspirations and overall well-being of our people cannot be underscored. The sectors require strong, viable and sustainable investments in infrastructure, the country's innovation system as well as research. The Society continues to encourage entrepreneurs to invest across the entire value chain thus integrating small scale farmers and other industry players into the investment process. This enables the players to gain access to post harvest handling technologies, good agro economic practices as well as technology transfer, attaining high levels of efficiency while influencing price stabilization.

The Agricultural Society of Kenya shall be at the forefront in enabling enhanced stakeholder partnerships through her re-stated vision, mission, mandate as well as her Business Model.

It is imperative to note that sectoral reforms at the two levels of Governance (National and County governments) are geared towards new innovative and sustainable development strategies that resonate with the current and emerging socio-economic and environmental challenges. Some of these reforms speak out for women and youth to be part of the regional free trade that delivers on aspirations of inclusive green growth.

Through our Agricultural Shows and Trade Fairs the Society has continued to encourage agri-preneurship, adoption of climate change mitigation strategies, creation of business linkages; ultimately contributing to the overall economic development of our economy while addressing the crucial area of food security and nutrition.

Karibuni nyote kwa maonyesha.

Once again welcome to the Nakuru National Agricultural Show, Southern Kenya Branch Show - Kisii and the Kisumu Regional Show.

Our theme this year, "Promoting Innovation and Technology in Agriculture and Trade" is timely and a catalyst for the country to strengthen activities that guarantee sustainable economic development. The theme aims at encouraging our stakeholders to contribute to the attainment of the National Government's big four Agenda.



Margaret Amani
Branch Chairman - Nakuru

WELCOME TO NAKURU NATIONAL AGRICULTURAL SHOW

It gives me great pleasure to welcome and appreciate all exhibitors at this year's A.S.K Nakuru National show.

The show will take place on **3rd to 7th July, 2019**. The theme of the show is **"Promoting Innovation and Technology in Agriculture and Trade"**.

The show continues to provide a platform to exhibitors and stakeholders to showcase their products, Services, Innovations and Technologies in Agriculture and Trade.

This year's show has attracted over 150 exhibitors in the sectors of Agriculture, Livestock, Fisheries, Horticulture, Trade, Finance, Manufacturing, Institutions of higher Education, Motor vehicle companies, Textile companies, Research, Hospitality, Health, Insurance, Parastatals and Government Ministries.

Among those are 30 exhibitors participating for the

first time. This is an indication of the continued growth in the standards of the show.

I wish to urge all exhibitors to display Innovations and technologies to attract more visitors to their exhibition stands.

The A.S.K Nakuru Branch has partnered with the County Government to organize training programmes for farmers. This is a grand scheme to bring back farmers to the show to learn modern Technologies. So far we have had 2 training sessions held on 20th March, 2019 and 11th June, 2019. A third training will be held in September.

Lastly, I wish to call upon the residents of Nakuru County and the neighboring Counties to attend the show and enjoy the diversity of displays, Funfairs and Arena entertainment events that will be on offer.

Thank you and May god bless you.

WELCOME TO SOUTHERN KENYA BRANCH SHOW

of the public on Thursday 11th July, and will run up to Sunday 14th July, 2019.

ASK Kisii show has continued to play a key role in the promotion of agricultural development and trade in this region. The trade fair gives opportunities to farmers, manufacturers, traders and others to interact and share information on various products, appropriate technologies and available investment opportunities. The need for new innovations and Technologies is paramount for any farmer to do agriculture as a business. In line with the government's big four agenda, Kisii show will continue serving the larger purpose of contributing to achieving food sufficiency, self-sustainability and national growth.

Agricultural production is directly linked to financial and economic growth. The importance of agribusiness and trade expansion in the growth of the agriculture sector is emphasized. This calls for the development of farmer agribusiness linkages which play an important role in the development of small holder commercial agriculture and in development of domestic capacity for increased value addition for agricultural produce through processing.

With these right set of exhibitions displayed, we expect show goers to innovate solutions to the emerging

and recurrent problems facing farmers and the business community in this region.

This will also be a networking opportunity and learning experience for students and the youth by meeting stakeholders in our various industries. To the families, there will be plenty of entertainment activities from the funfair area and Arena.

I want to assure our show goers of their safety by beefing up security within and in the show ground, in conjunction with the County Commissioner and the Kenya Police.

The success of preparing and staging this year's show would not have been possible without the support from the national office, my able Council members, Branch committee members, show committee and staff members.

Once again, I wish to express my sincere gratitude to His Excellency the Governor of Kisii County, His Excellency James Ongwae, in his effort towards stadium development. The magnificently constructed Gusii stadium presents a modern dais and auxiliary facilities fit for hosting the guests and arena participants thus boosting the show attendance.

God Bless you all and welcome to 2019 A.S.K Kisii Regional show.



Julius Bosire
Branch Chairman - Kisii

I am humbled once again to welcome you to 2019 ASK Kisii show. Yet another year has passed and God has been great to us all. I want to welcome all exhibitors, show goers, participants and all visitors to this year's Kisii show. This will be a forum showcasing current Innovations and Technologies which are implemented by the various Agricultural and business sectors participating.

Our show this year will open its gates to members



Caleb Oguya
Branch Chairman - Kisumu

WELCOME TO KISUMU REGIONAL SHOW

President Uhuru Kenyatta's agenda four and eventually in the attainment of the country's Vision 2030.

In line with the Society's mandate, the Kisumu Branch has taken a deliberate approach to sensitize the youth on the need of embracing agriculture. The Youth remains the most important equation in the attainment of food security and indeed sustainability of agriculture. This was the clear message at this year's Young Farmers Clubs of Kenya (YFCK) Tree planting ceremony on 11th May at St. Elizabeth Mary Secondary School that was conducted by the ASK Kisumu Branch and graced by the CEC Member for Environment, Water, Irrigation and Natural Resources of the County Government of Kisumu, Hon. Salmon Orimba, who was our chief guest. ASK in collaboration with the County Government of Kisumu will be setting up tree nurseries in various schools to assist in increasing forest cover and secondly, to inculcate students in the practice of Agroforestry and horticulture. By so doing we envisage to raise interest of the youth in agriculture and eventually have more youths join farming as a profession and thereby reduce the average age of the farmer in this region that has risen to dangerously high age bracket and threatens food security in the county.

The Big Four agenda; Food Security, Manufacturing, Universal Healthcare, and Affordable Housing are indeed the basic pillars we require to grow our economy to double digit rate.

In supporting agricultural sector towards realization of food security, the Branch, apart from bringing the youth on board, also encourages irrigation farming practices from total reliance on rain fed agriculture particularly in

this error of unpredictable rainfall patterns. There are a number of new innovative irrigation practices and indeed fish farming, fishing, livestock production and farm produce & Dairy at the showground this year.

The branch was able to attract new exhibitors in virtually every sector of the economy.

I also wish to appeal to the schools to facilitate students to attend the show in large numbers. The show provides the students opportunity of obtaining invaluable information on career development as well as academic through the various exhibition and displays, all within an enclosed area as opposed to travelling and visiting far flung areas to achieve much less. We have also programmed lectures on different topics for students and farmers on various topics on agriculture, trade and industry.

Kisumu is opening up, great developments are taking place around Kisumu's Mamboleo Showground and with it bigger opportunities exist for the business community to take up business premises at the showground. The show facilities are available for use throughout the year. The grounds are also good for church functions, weddings, music concerts, picnics, sports and corporate team building sessions.

Finally, I wish to acknowledge and thank the sponsors, exhibitors, the National Government and County Government of Kisumu for their unflinching support in the staging of this show. I also wish to thank all those who have made it possible to successfully hold this year's show.

Thank you once more.

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Theme
"Promoting innovation and technology in agriculture and trade"

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To provide a platform for exhibitions and networking that spur development in agriculture, trade and allied sectors

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2019 CALENDAR OF EVENTS

THEME: "Promoting innovation and technology in agriculture and trade"
"Ukuzaji wa uvumbuzi na teknolojia katika kilimo na biashara."

EVENT	DATE	VENUE
Eldoret National Show	March 6th - 9th	Eldoret
Eastern Kenya Branch Show	March 14th - 16th	Embu
A.S.K Annual General Meeting	March 29th	J/park
Y.F.C.K National Camp	April 8th - 12th	Nakuru
Y.F.C.K Tree Planting Day	May 18th	Nanyuki
Mt. Kenya Branch Show	May 23rd - 26th	Nanyuki
Western Kenya Branch Show	May 30th - 1st June	Kakamega
Meru National Show	June 5th - 8th	Meru
Makueni Satellite Show	June 13th - 15th	Makueni
Royal Highland Show	June 20st - 23rd	Edinburgh
Y.F.C.K National Rally	June 22nd	J/Park
S.E. Kenya Branch Show	June 26th - 29th	Machakos
Nakuru National Agricultural Show	July 3rd - 7th	Nakuru
Southern Kenya Branch Show	July 11th - 14th	Kisii
Kisumu Regional Show	July 24th - 28th	Kisumu
National Agriculture Teachers Conference	August 14th - 16th	JKUAT
Mombasa International Show	Sept 4th - 8th	Mombasa
Kabarnet Branch Show	Sept 12th - 14th	Kabarnet
Central Kenya National Show	Sept 11th - 14th	Nyeri
Kitale National Show	Sept 18th - 21st	Kitale
Bungoma Satellite Show	Sept 26th - 28th	Bungoma
Nairobi International Trade Fair	Sept 30th - 6th Oct	J/park
S. W. Kenya Branch Show	Oct 10th - 12th	Migori
National Ploughing Contest	Nov 22nd - 23rd	Kitale
N. E Kenya Branch Show	TBA	Garissa



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Bee Farmers

decry empty hives as bee population decline

By Leopold Obi

When Justin Kiprono ventured into bee farming sometimes in 2012 he never knew his bee-hives would stay for several months without bees.

Baringo County expanse where he plied the trade is renowned for its high yields of quality honey, therefore for Kiprono the thought that one would have to hassle for the bees was unimaginable.

The Bogoria Special honey proprietor construed a long shade which he thatched with grass then hanged the hive, suspending them several metres above the ground.

He waited for months in anticipation that the bee-hives would be occupied, but was shocked to learn that only a third of the hives had been occupied after six months.

Some years back Kiprono recalled,

the expansive Baringo had a lot of bees which occasionally buzzed around and parched on the people's rooftops.

"The pollinators dotted everywhere. The area is characterized with indigenous trees, many of which are different acacia tree species which gives our honey a good and unique taste," explains the farmers who currently has over 80 fully colonized bee hives.

The bee farmer packages and supplies his honey to leading hotels in Nairobi and government institutions.

To ensure he has enough honey to supply, he has partnered with several bee farmers across the area bringing his bee-hive tally to about 400.

The farmer observes that bee population has rapidly declined in the area so much that one can install 100 bee-hives but only three of will be

colonized after 6 months.

"There has been rampant charcoal burning leading to deforestation. Many people have also ventured in fruits and vegetables farming so they tend to apply too much pesticides which is harming bees," he noted.

Like Kiprono, there are hundreds of farmers across the country whose bee farming business are facing major hiccups after bees fail to colonize the hives. And bee farming could facing hard times in the future as the bee population continue to drop across the world due to climate change and massive deforestation.

The declining bee population in the country has seen the country's annual honey production drop from 35,000 metric tonnes to 25,000 tonnes leaving the country with a consumption deficit of 13,000 metric tonnes.

Never the less, scientists are also working tirelessly to solve bee scarcity mystery through a raft of measures.

On Monday during the second world bee day celebrations, stakeholders in the bee farming and research sector organized a march in city to raise awareness on declining bee colonies in the country.

Stephen Kagio, apiculture platform chairman, says the main purpose of bee is pollination, but most of us do not know that.

"We tell farmers to grow sunflowers and avocados which require pollination but we are not telling them how the crops will be pollinated. This is why we must address the pollination service," he said the agriculture lecturer at Egerton University.

The Food and Agricultural Organisation (FAO) says that 75



James Ng'ang'a, a researcher on stingless bees displays a how a stingless bee-hive looks like

per cent of all food crops depend on pollination, adding that the total economic value of pollination worldwide is 153 billion euros.

A number of crops grown in Kenya such as legumes (beans, nuts, peas); and horticultural produce such as vegetables, tomatoes, onions, passion fruit, apples, citrus heavily relies on pollination.

Without these bees, the chances of cross-pollination dim, drastically reducing food production. And that is what worrying agriculturalists is as the pollinators vanish from Kenyan farms, threatening to push food production even lower.

Scientists attribute the decline to land degradation, habitat loss and climate change which has led to prolonged drought forcing bees migrate to other areas.

"Many farmer are complaining that their hives are not colonized, we need queen bee propagation technologies to boost bee farming," Kagio remarked.

Researcher at Egerton University are currently working on a queen bee propagation project that will see farmers buy mature queens to start up their farms instead of waiting for bees to colonize their hives.

Joel Masobo, a bee researcher at Egerton University who is working on the project say that one a farmers has a queen bee and a small brood he will no longer have to wait for bees.

The technology involves picking 10 hours-old bee larvae which are then taken to virgin queen bank where they are bred in compartments.

Once they are gown they are taken to separate compartment, after which they are mated and left to lay eggs.

He explains that the young queen bees can be used to replace aging ones, or used in a new bee-hive.

"While the life expectancy of a queen bee is 4-5 years, the mother bee is mainly prolific in the first two years. So we want to encourage farmers to keep young queens for a constantly high production,"

With this technology farmers can also avoid variability in quantity of honey where one hive has no honey due to lack of a colony, while the other have so much.

"We also have the bee-soft programme which act like a bee farming calender for bee farmers. Farmers can use it to link the flowering season with bee management," he said.

Joel Masobo, a bee researcher at Egerton University, poses with a virgin queen bee bank



Besides the African-honey bee, scientists are also promoting the rearing of the stingless bees to enhance honey production and pollination.

Sheila Koech, a researcher at international center for insect physiology and ecology (Icipe) say they have trained several groups of farmers around Kakamega Forest, Taita Hills and Mwingi on rearing the stingless bees.

These species of bees she said visit several trees hence they produce high quality and medicinal honey compared to the African-honey.

"We have identified various species of bee such as the carpenter bee which do not produce honey, and 12 species of stingless bees which we are currently training farmers to adopt,"

MsKoech explained that they train farmers on making hives meant for these variety of bees.

"These bees nest differently so we have to model their hive according to how they live naturally," explained the researcher. **KFI**



Joel Masobo, a bee researcher at Egerton University, poses with a virgin queen bee bank



Tebesonik Tea Factory in Kericho County has commenced operations, offering a major boost in the area's tea production capacity and efficiency.

The new facility which is a satellite of Kapkatet Tea Factory becomes the 69th KTDA-managed factory as smallholder tea farmers continue to invest in expanding production capacity to cope with increased tea output.

Tebesonik is expected to ease congestion at Kapkatet leading to a reduction in greenleaf losses and improving efficiency and quality of tea at the two factories.

The factory is designed with three production lines but will initially run two production lines for black CTC (crush, tear, curl) tea with a processing capacity of 10 million kilos. The third line will be introduced later on a need basis.

The factory has been equipped with modern equipment and machinery to



Tebesonik Tea Factory Commences Operations

boost efficiency and reduce running costs.

It is expected to boost the economy of the area through supporting small businesses that will supply goods and services, as well as employing locals who will support factory operations.

Ragati Tea Factory which was set up in 1957 in Nyeri County was the first of the now 69 KTDA-managed factories.

KTDA has been working with factory companies on expanding capacity to cater for increased crop production which has risen from three million

kilogrammes of green leaf in 1964 to 1.18 billion kilogrammes in the year ending June 2018.

KTDA was established as the Kenya Tea Development Authority in 1964 but was privatised in 2000 handing the over 560,000 farmers ownership and stewardship of the factories in their areas.

The continued expansion and maintenance of top quality by KTDA has seen Kenya become the biggest exporter of Black CTC tea in the world.

North Mathioya Hydropower Plant Switched On

Four tea factories in Murang'a County are set to enjoy more reliable and competitively priced power supply after KTDA Power switched on the 5.6MW North Mathioya power plant.

The plant, still on a test-run basis, will supply power to four KTDA-managed factories: Kiru, Githambo, Gatunguru and Kanyenyaini.

The station is the fourth completed power plant in the power firm's portfolio, after Gura, Imenti and Chania small hydropower plants in Nyeri, Meru and Kiambu counties respectively. Other plants at advanced stages of completion include South Mara, Iraru, Nyambunde in TharakaNithi, Meru and Kisii counties respectively.



KTDA Power, the electricity generation subsidiary of KTDA Holdings, continues the journey on renewable energy by investing in alternative power projects that reduce energy costs in KTDA-managed factories and generate revenue through

sale of surplus power to the national grid.

The company is also exploring solar power generation and has recently concluded feasibility studies on solar power generation capabilities in 30 tea factories.

TWAFANIKISHA MAISHA YA WAKULIMA

Investing in social impact

KTDA Foundation is a subsidiary of Kenya Tea Development Agency Holdings Limited that spearheads the corporate social investments of the organisation and its subsidiaries.

Vision

Enabled and progressive smallholder tea farmers.

Our pillars

To empower the smallholder tea farmers and their communities through sustainable programmes and partnerships in environmental sustainability, economic empowerment, health and education.

Environmental Stewardship

Conserving the environment through tree growing 'Greening Kenya one tree at a time initiative'



Over 1.9 million indigenous and fruit trees planted across the country

172,000 energy saving stoves installed in rural homesteads

Economic Empowerment



105,100 tea farmers trained on financial literacy in the past 2 years through 'Mkulima bingwa ni kujipanga' which is an 8 month-long programme.

Capacity building for diversification into other enterprises.

Health

Afya Bora kwa Wakulima na Jamii Zao



30,000

Community members receive health services

24

medical camps organized in tea zones

168

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Fish farming contributing to sustainable income

By Wesley Langat

Ngbor village, 3 kilometer off Njoro-Nakuru highway, is a home of Philemon Terer a passionate agribusiness entrepreneur and also a tutor by profession who devices all means to ensure that his fish farming business is successful in a half an acre piece of land.

"Even with a small piece of land, you can do much and farming is enterprising business." He said. Terer says that with his small piece of land he can carry out farming and already established poultry, vegetable and fish farming which earns him a stable income.

Nakuru county is endowed with favourable climatic conditions for both large scale and small-scale commercial farming. But with the current problems affecting maize farming, farmers start to diversify their food crop production to fish, poultry and dairy farming.

Ready market for fish motivated him to start fish farming. "I have done several crops like tomatoes but my interest in fish farming is a driving factor". He started, fishing "I bought finger lings from Kisumu with the help of fisheries office in the county" He explained.

Agriculture sector is a key to attaining government's Big 4 development agenda where the sector targets to attain 100% food and nutritional security for all Kenyans by 2022. While the latest estimates from World Bank indicate that agriculture remains the largest income sources for the majority of the households in rural areas in Kenya contributing to 31.4% reduction of rural poverty.

According to Terer, any one can do fish farming provided that one has constant supply of fresh water and feeds. He compared poultry keeping to fishing which is much easier. "It only needs 30 mins of my time in the morning and evening"

Unlike before where fish farming was located near the river but for Philemon, fishing can be done anywhere. "In 2019 February, I established my fish pond just outside my house using polythene lining" He paused.

Additionally, fish farming and poultry has built an ecosystem that enable other farming activities such as vegetable cultivation thrive well. Water from the fish pond is emptied into a vegetable garden as it is another form of organic manure.

Challenges facing fish farmers.

Fish farming still encounters some of the challenges like low production/productivity, limited supply of fingerlings, lack of value addition, limited quality feeds and poor market access.

Fishing is equally affected by the drought. The entire fishing project for Terer is reliant on water from seasonal river and therefore during prolonged droughts refreshing water is much difficult.

"What affect this farming is shortages of water" Terer noted while referring to previous drought which affected a nearby river. "Last few months, there was extreme drought, I almost gave up, no water and even the available water wasn't so clean" He complained.

According to Mr. Kahareri Kiarie, fish farming coordinator under the county director of fisheries says that the nature of soils in Nakuru county is porous hence a challenge to many fish farmers as it doesn't retain water for long. Farmers need to buy a wall lining at a cost of Ksh.10,000 which is quite expensive to local farmers.

Lack of information about the sector has contributed largely to low production. He says that there is need for more demonstration centres for farmers to learn as well interact with skilled personnel.

Kiarie also agreed that few extension

officers and transport problems is also making it difficult for the officers to reach out and adequately address the concerns of the farmers in expansive Nakuru county.


County's efforts to revamping fishing industry in Nakuru county

He mentioned that the fishing department under the ministry of agriculture has been carrying out major reforms on various programmes towards improvement of the fishing sector in the county.

He added that the county is availing wall lining for the fish ponds at a subsidized rate as well as availing feeds to the major deports in Nakuru town where farmers can access easily. To solve the issue of finger lings shortages, farmers are mobilized into groups or cooperative thereby select a fingerlings producers groups then build their capacity.

Within such arrangements, the extension officer can easily reach out to the farmers. "Extension officers will visit them in a weekly basis and train them on good agricultural practices (GAP) that include supply of quality water, fingerlings and feeds plus control of predators." He said

To facilitate the flow of information, the director also pointed out the he is leveraging of mobile technology using "Whatsapp" an interactive platform where fish farmers can interact with expert, share information as well as asking questions regarding fish farming.

Learning institution is also a prime ground to nature and offer training to farmers as it establishes a good demonstration centres. However, to avoid over exploitations of aquatic resources, county government has carried out massive restocking of dams. "We restocked Kuresoi and Solai dams with 40,000 and 30,000 fingerlings respectively." Mr. Karachi said 



PROTECT KENYA'S AGRICULTURE BY DECLARING PLANTS AND PLANT MATERIALS AT ALL ENTRY AND EXIT POINTS



Kenya Plant Health Inspectorate Service (KEPHIS) is a government agency whose mandate is to assure the quality of agricultural inputs and produce to promote food security and economic growth. KEPHIS implements this mandate through 3 key areas: seed certification and plant variety protection, phytosanitary (plant health) services and analyses of agricultural inputs and produce through globally accredited laboratories. All this is done to protect Kenya's plant and plant materials from adversely being affected by harmful pests and diseases.

KENYA IS AN AGRICULTURAL ECONOMY

Kenya's economy is predominantly agricultural where over 70% of the population depend on the sector for their livelihoods. Many Kenyans are small scale farmers, youth are involved in agribusiness and agricultural exports such as flowers, fruits, vegetables, coffee and tea form the bulk of Kenya's exports earning the country approximately USD 1 billion in foreign exchange annually.

IMPORTANT INFORMATION FOR TRAVELLERS COMING INTO KENYA

Global travel has been a medium for the spread of pests and disease across boundaries and countries thus affecting trade between countries.

Introduction of pests and diseases in new territories is known to cause disasters and consequent economic losses. To prevent introduction of pests and diseases in Kenya, all guests, whether returning residents, visitors and members of the diplomatic corps must declare all plant and plant materials in their possession. Obtain a Plant Import Permit (PIP) prior to traveling to Kenya. Plant imports must also be accompanied by a phytosanitary certificate from the country of origin. Gifts of plants or plant products must also be accompanied by a phytosanitary certificate. All declarations should be done at all entry or exit points such as Jomo Kenyatta International Airport and all border points. This includes flowers, seeds, fruits such as bananas, mangoes and oranges, nuts and herbs.

No plant material is too small to declare. It is an offence not to declare plants or plants materials on arrival to Kenya. Declarations ensure that Kenya safeguards her agricultural resources and prevents the introduction of harmful pests and diseases into the country which can adversely affect our agricultural resources and environment. In the recent past, the Fall Armyworm was introduced into Kenya affecting our maize production. The fruit fly has greatly affected our mango production and export. Each country has diseases that are specific to them and the diseases could be worse if taken to other countries, and this demonstrates the need to prevent the introduction of pests and diseases into Kenya.



Fruits found in the suitcase of an incoming passenger at Jomo Kenyatta International Airport: incoming passengers are to declare all plant and plant materials to KEPHIS inspectors at all Kenya's entry and exit points

DECLARE ALL PLANT AND PLANT MATERIALS
KEPHIS urges all travellers to play their role in protecting Kenya's agricultural resources for Kenya's continued economic growth and development.

The Centre of Phytosanitary Excellence (COPE) builds capacity for African plant health practitioners to enhance Africa's plant trade globally

Contacts:
The Managing Director | KEPHIS | director@kephis.org
+254 709 891 000 | www.kephis.org
[facebook.com/kephispage](https://www.facebook.com/kephispage) | [Twitter: @kephiske](https://twitter.com/kephiske)



1

The Patron of the Society H.E the President, Hon. Uhuru Kenyatta observes a ploughman displaying his skills at the 64th World Ploughing Contest at Ngongongeri farm, Nakuru. Looking on is the Governor, Nakuru County Hon. Lee Kinyanjui and then CS Agriculture Mr. Willy Bett among other County and Society officials.



5

Governor Laikipia County, H.E Hon. Ndiritu Muriithi when he toured the Presidential Strategic Communication Unit Stand at this year's Mt. Kenya Branch show. He is accompanied by the Society National Chairman Mrs. Annabella Kiriinya among other officials.

Pictorial

Agriculture, Livestock, Fisheries and Irrigation CS Hon. Mwangi Kiunjuri is shown samples of certified seeds at the Kenya Seed Company stand during last year's Nakuru National Agricultural Show.



2



6

Prof. Hamadi Boga PS State Department of Agricultural Research when he toured the Meru University stand at this year's Meru National Show. He is accompanied by the Society Deputy National Chairman Mr. Charles Owelle, A.S.K CEO Mr. Batram Muthoka, Chairman Meru Branch Mr. Stanley Mukaria among other officials.



7

H.E Hon. Kiraitu Murungi, Governor Meru County while on a tour of the KTDA stand at the recently concluded Meru National Show. Looking on are Society and County officials.



3

Governor James Ongwae, Kisii County looks at assorted products during his tour of the KEBS stand at a past Kisii Branch show. Accompanying him is his deputy H.E.Hon. Joash Maangi, Chairman Kisii Branch, Mr. Julius Bosire among other officials.



4

Agriculture Chief Administrative Secretary, Dr. Andrew Tuimur while on a tour of the NITA Stand at the 2018 Kisumu Regional Show. He is accompanied by the Deputy National Chairman Mr. Charles Owelle and Chairman Kisumu Branch, Mr. Caleb Oguya.



8

Western Regional Commissioner, Ann Ngetich while on a tour of the Kalro stand at this year's Kakamega Branch Show. Accompanying her is chairman Kakamega Branch Mr. Ludovicus Okitoi among other officials.

Red/ Purple Cabbage

By KFJ Correspondent



Are you struggling to improve your skin appearance or having a skin condition? Dealing with arthritis?

This Red/purple cabbage might just end your dilemma on the situation since it works wonders on both skin and the body.

Commonly known for salads, this type of cabbage is rich with numerous nutrients. Red cabbage, also known as purple cabbage, is distinguished by its coloring, texture and flavor.

It originated from Europe, but can be locally found in most markets and supermarkets with a kilogram going for about Ksh. 40 to Ksh. 80. Purple cabbage has a relatively high ratio of nutrients and vitamins to calories and fat, which makes it an ideal choice for dieters.

NB: It is important to note that 1-cup serving of chopped raw purple cabbage contains only 28 calories, as 90 % of its mass is water. It is often eaten raw in salads, steamed, braised or sautéed with other vegetables.

Health Benefits:



1. Boosts the Immune System

Red cabbage contains ever-so-important vitamin C, a crucial antioxidant needed in order for our bodies to have strong immune systems. It stimulates the activity of white blood cells, forming the first line of defense for the immune system. Due to its large vitamin C content, red cabbage is a high-antioxidant food that fights free radical damage and strengthens the immune system.

2. Fights Inflammation and Arthritis

Red cabbage contains phytonutrients that may help reduce chronic inflammation. It also contains sulforaphane (found in many cruciferous vegetables), which is a potent inflammation killer.

According to The Arthritis Foundation, eating a diet filled with anthocyanin-rich fruits and vegetables like red cabbage should be a part of an arthritis patient's daily regimen, as they may help to naturally treat arthritis inflammation and arthritic complications.

3. Reduces Cancer Risk

One of the most important functions of red cabbage is its role

in cancer prevention. Dr. Jagdish Singh, Dr. A.K. Upadhyay, et al, Indian Institute of Vegetable Research, BHU, Varanasi published a report in the Scientia Horticulturae Journal, which states that the high levels of antioxidants including anthocyanins and indoles, in red cabbage, make it extremely important as a preventative measure.

4. Weight Loss

Red cabbage is very low in calories, but high in dietary fiber and has a wealth of important vitamins and minerals. This means that it leaves you feeling full and taking care of your nutritional needs, without encouraging you to eat more food or overeat from empty calories. This can be a great addition to your daily diet if you are trying to lose weight, maintain a diet regimen, or simply improve your intake of calories.

5. Anti-aging Property

Antioxidants do more than protecting you from the impact of free radicals in terms of critical disease as they also help reduce the signs of aging that can occur due to free radicals. Antioxidants keep your skin fresh, tight, and flexible, reducing the wrinkles and age spots that so commonly occur. Red cabbage contains high levels of vitamin A, which is beneficial for skin health, regrowth of skin cells, protection from the sun damage and elasticity of the skin.

6. Eye Care

The high levels of vitamin A are not only good for your skin, but also for your eyes. Vitamin A helps keep the eyesight healthy. It can also be converted into beta-carotene, which is very important for maintaining eye health as you age.

7. Treats Ulcers

Red cabbage contains a large amount of glutamine, which

is a specific amino acid that is very good for reducing the inflammation and pain associated with ulcers in gastrointestinal system. Its juice is a great treatment for this condition and has been used as a home remedy for a very long time.

8. Increases Bone Mineral Density

Red cabbage is loaded with vital minerals such as magnesium, calcium, manganese and other minerals that guarantee good bone development, that contribute to optimal bone growth while promoting mineral density that shields against arthritis, osteoporosis and many other kinds of bone disorders.

9. Manage Hypertension

One cup of red cabbage is filled with 243 mg of potassium which improves blood circulation. Potassium also absorbs excess sodium, which is linked with high blood pressure.

10. Helps to prevent Alzheimer's disease

Alzheimer's disease is mainly noticed as we grow old. Studies have been established that red cabbage is very good at protecting the cognitive activity of individuals. Both Anthocyanins and Vitamin K found in red cabbage aid brain function and prevent nerve damage.

11. Sugar level

Red cabbage consists of considerable amount of manganese that showed efficiency in controlling the level of sugar which further prevents the incidence of certain diseases like diabetes. Manganese regularizes insulin and regulates unpredictable drops in blood sugar offering normal and practical life for diabetics.

Cautionary Tips:

Red cabbage should be avoided by pregnant and breastfeeding women as its effects are not well known in such cases. Nursing infants can develop colic if the mothers even sparingly consume this vegetable. Hypothyroidism is a condition which develops when the thyroid gland underperforms. This condition can deteriorate if the patient consumes red cabbage.

Recipe



Heat a pan over medium high heat. Add oil and 1 sliced onion and sauté 2 minutes. Add ½ of the shredded cabbage and turn in pan, sautéing it until it wilts (simmer down in the pan) for 3 to 5 minutes. Add 1/3 cups of vinegar to the pan and turn the cabbage in it. Season with salt and pepper and reduce heat a bit. Let the cabbage continue to cook for 10 minutes or until ready to serve, stirring occasionally. **KFJ**

New Hybrid Rice for Kenya

By Fred Omondi



Dr John Kimani and Kayode Sanni at a national performance trial rice field site

According to Kayode Sanni, a rice breeder, consumers in Kenya prefer the aromatic basmati rice which also has superior cooking qualities compared to the other local and imported varieties. He however said the aromatic scent has no nutritional value but it is a marketing trait. "The aroma is a demand driven trait even if it does not have the nutritional value. We are however developing new hybrid rice varieties that have some of the preferred traits including

the aromatic, slender and long grains," said Sanni who heads the rice project at the African Agricultural Technology Foundation. John Kimani, a rice breeder from the Kenya Agriculture and Livestock Research Organisation said more Kenyans are consuming rice unlike maize hence the need to breed more hybrid varieties. He said the national rice production is at 150, 000 metric tonnes against an annual consumption rate of 650, 000 metric tonnes.

"The country's consumption rate is growing at 13 percent while production growth is at 3.7 percent. The consumption growth rate is attributed to change in lifestyle, urbanization and because it is easy to prepare unlike maize," Kimani said. The rice breeder said Kenya has a rice deficit of 500,000 metric tonnes and that 75 percent of rice consumed in the country is imported from India and Pakistan. Kenya spends about Sh92 billion to import rice annually. According to the United Nations Food

and Agriculture Organisation, there has been a dramatic increase in total rice imports for East and Southern Africa. Kimani said breeders are targeting to increase production to 408, 000 metric

tonnes by 2022. Kenya has a potential of about 540,000 ha under irrigation and one million ha under rainfed production. "With improved water harvesting, storage, underground water resource utilization and innovative management technologies, the current irrigation potential can be increased by a further 800,000 ha to 1.3 m ha," the rice breeder said. The hybrid

rice is currently undergoing the National Performance Trials in Bondo, Ahero, Mwea, Hola and Malindi. The new hybrid rice developed by the African Agricultural Technology Foundation (AATF) has significant yield advantage which can enhance food security and improve farmer's livelihoods. Sanni said that about five hybrid varieties have been released to companies for seed multiplication but some farmers in Mwea have planted

one of the varieties for this cropping season. "We are in the process of licensing companies that will do seed multiplication and later release them to farmers," he said. Sanni said the new hybrids will see small-scale rice farmers in Kenya have access to quality rice seeds that will boost their production. "The promotion of rice production will improve food security, increase smallholder farmers' income, contribute to employment creation in rural areas, and help reduce the rice import bill," said Sanni.

AATF is also working with other partners in developing hybrid rice, with significant yield advantage over the current exhausted seeds in Kenya. He explained that the partnership is developing hybrid rice germplasm that is adapted to African conditions using the two-line rice hybrid system technology, which uses only two-breeding lines to produce hybrids. "We are also developing an information technology tool to predict temperature regimes and manage the hybrid rice production risk. In addition, we are also establishing and training a network of researchers and seed production specialists. The project will develop and distribute hybrids and hybrid parental lines for use by smallholder farmers in selected African countries," Sanni said. Major constraints Benard Omondi, a rice farmer from Ahero rice scheme said most Kenyans living in the rural areas consume limited quantities of rice, but it forms an important diet for the majority of urban dwellers.

Omondi said constraints and challenges vary with production, cropping and farming systems across the country. "Like the rest of the world, the trend of rice cultivation is going towards upland rice production where water use efficiency and conservation is emphasized. The kind of infrastructure which goes with six paddy rice production is expensive to most small

holder farmers," he said. Sanni noted that mechanization and provision of appropriate technologies suitable for farmers would promote rice production. "Investment in processing, branding and marketing activities in rural rice growing areas would create employment opportunities to curb the rural to urban migration by the youth," he said. Research and extension services were also affected by the liberalization of the rice irrigation schemes. This according to Sanni, resulted in loss of genetic purity, poor agronomic practices, low production and inadequate credit services due to limited Public-Private Sector partnerships. The high cost of farm inputs and machinery is a disincentive in increase of rice productivity. In irrigated areas, he said, the main challenge is supply of adequate water, development and rehabilitation of irrigation infrastructure. "Provision of health care services and land ownership rights and environmental concerns need to be addressed. In rain-fed lowland areas the main challenge is erratic rainfall, inadequate skills for both farmers and extension staff and, infrastructure development including processing mills and road networks," the researcher said. "In both regions, provision of high quality seed, technologies development and transfer, strengthening of farmer organizations and management structures will need to be addressed. Low soil fertility, diseases especially blast and pests such as Quelea birds and rodents are also a problem." The release of the 15 new hybrid varieties will help the country boost production of rice, the country's second staple food after maize. The new hybrid varieties, are said to do well under irrigation as well as under rain-fed agriculture, will be released to farmers after the Kenya Plant Health Inspectorate Service gives them a green light, with most of them expected to be with the farmers by 2020.

Solar Powered Irrigation Kits Give Hope to Farmers in Kisumu County



By Fred Omondi

Hakima Mohammed, 57, earns a living through tree nursery farming. She owes her successful business venture to the use of a solar water pump, which has reduced the burden and cost of fetching water using jerry cans.

"Before I got the solar pump, I used to work even on Sundays to ensure I have enough water for the tree seedlings. But with the solar pump and a storage tank, I have a day's rest and enough time to spend with my three children," said the resident of Mwiyeke village in Maseno, Kisumu West sub-County.

She has increased the number of seedlings to 240,000 on her farm, where she has planted 30 tree species, both indigenous and exotic.

"I have no background in forestry, but I learned everything about tree seedlings from my late husband, who was working in the Department of Forestry, Kisumu County," Hakima says.

Mohammed started her tree nursery in 2013 soon after her husband died following a short illness.

Officials at the Forest Institute in

Maseno where she has been working for nearly 30 years as a casual laborer, arranged for her to borrow a piece of land to set up a tree nursery. This is a venture she had hoped to pursue with her husband, before his demise.

"With little experience beyond having watered tree nursery beds at the institute, I started by planting an initial 20,000 seedling trees. I would hire local young men to help carry water from a nearby stream to irrigate the young plants," says Hakima.

However, things got better after she bought a solar-powered water pump in 2016 from Future Pump, a company in Kenya that makes water pumps available through loans.

"I was able to increase productivity and now I have at least 250,000 tree seedlings on my nursery. This has made my work easy since I no longer rely on rainfall and don't have to fetch water manually, which was a daunting task," she says.

The mother of three says the business has enabled her educate two children up to university level, while the

last-born is in secondary school.

On a good day, Hakima makes between Ksh 20,000 and Ksh100,000. She sells each seedling at Ksh 10.

"Customers can buy 2,000 -10,000 seedlings at a time, especially the indigenous tree species, which are preferred for commercial purposes," she said.

Oliver Bill Odhiambo, 24, from Miguye village, Rabuur, Kisumu East sub County, also has a solar water pump which he bought for Ksh 65,000.

He grows tomatoes on one-and-a-half-acres, which he has leased. "I used to use a diesel water pump to irrigate my crops. I would spend Ksh 2,000 for fuel on a daily basis and Ksh 500 to hire a generator," said Odhiambo.

"I have now cut this cost with the solar water pump and I am expecting at least Ksh 200,000 from the tomato harvest."

Victor Ndiege from Africa Enterprise Challenge Fund (AECF) says the petrol pump is labor intensive and a lot of water goes to waste, unlike with the solar pump in irrigation to get maximum yields. **KFI**

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AquaRech to Increase Fish Production

By Wahinya Henry

Fish farmers in Nyanza and Western and regions are set to boost production following introduction of a technology that enables them to monitor ponds to determine the health of the fish.

The Internet of Things Application will at the same time protect fresh water fish populations after Liquid Telecom Kenya, a leading communications solutions provider across 13 countries primarily in Africa introduced the App in the regions on a pilot basis.

The company has connected ten pilot-phase sensors that monitor water temperature and pH values in ponds.

The sensors send information and feeding instructions to farmers through an Android and iOS app called AquaRech, which has been developed by the Kisumu innovation technology hub LakeHub and developers Pinovate.



The partnership plans to equip 5,000 western Kenyan farmers with the sensors and app by the end of 2019.

There are some 20,000 fish farmers in western Kenya with an average of 2 ponds each and around 2,400 fish per pond.

The programme will eventually be rolled out to 30,000 fish pond farmers countrywide helping to increase fish production, which fell by 17% in 2017, according to the Kenya National Bureau of Statistics.

"This is one of a series of

Joel Muigai, head of IoT Strategy, Liquid Telecom Kenya and Aswald Jumira, Group head of Innovation Partnerships, Liquid Telecom installing IoT sensors in one of the controlled fish pond in Lake Victoria, Kisumu



Joel Muigai, Head of IoT Strategy, Liquid Telecom Kenya installing the IoT sensor in a Fish pond, Kisumu.

partnerships we are developing to increase the country's food security as part of the government's big four agenda," said Sajid Ahmad Khan, Chief Operations Officer, Liquid Telecom East Africa.

Using IoT-connected sensors to calculate optimal feeding times was found to reduce fish deaths by 30-40 percent in a one-year study in Iran by information technology company Afarinesh Samaneh Mehr Engineering Co. (ASM).

"Farmers have been closing down ponds and setting aside fish production as they struggle to feed fish correctly due to changing temperatures and conditions," said Dave Okech, who initiated the AquaRech project and partnership, as the founder of a local fish farming group RioFish at a time when Food and Agriculture Organization (FAO) wants efforts to boost fish farming in Nyanza be enhanced in the wake of dwindling fish stocks in Lake Victoria.

According to FAO fisheries coordinator in Kenya Alice Jesse said the country has the potential to produce fish through aquaculture.

The FAO official was speaking in

Kisumu during the closure of a training course for fisheries officers from Homa Bay, Migori, Vihiga and Kakamega.

She said aquaculture had failed due to challenges like unavailability of feeds with those available being expensive, fingerlings not readily available to farmers and also lack of extension services.

She said the government must be ready to address some of the challenges experienced during the implementation of the economic stimulus programme (ESP). The programme was initiated by the national government in 2010 to encourage aquaculture.

On the latest technology seen as a measure to increase food production, Okech says:

"Our sensors transmit data to the cloud, where it is processed before sending specific instructions to farmers on the timing and quantity for feeding."

Liquid Telecom Kenya is continuing to roll-out its Sigfoz IoT network across Kenya, which is being used for a range of IoT applications.

In December, the company partnered with Africa's largest non-profit civic technology network Code for Africa

(CFA) to install air quality sensors at 3,000 sites across Kenya, following warnings that air pollution is killing more than 20,000 Kenyans a year.

"AquaRech offers the hope of delivering thousands of tonnes a year in increased fish production, putting farmers back into a sector many have abandoned on the challenges of adapting feeds," said Adil El-Youssefi, CEO of Liquid Telecom East Africa.

"This partnership is a great example of how our networks and innovative IoT solutions are helping to transform industries and businesses across Kenya."

Aquaculture failed due to unavailability of feeds and fingerlings and lack of extension services.

During her tour of Kisumu, Jesse said FAO is ready to help the government by training field extension officers for them to guide farmers on the best ways to farm fish in ponds.

Fish consumers have been complaining over high prices of local fish due to diminishing supplies. They have resorted to cheap imports, especially from China.

This year, the ban on fish imports from China was lifted after a biting shortage.

The country imports approximately 1.8 million kilogrammes (1,800 tonnes) of fish every month. It produces about 135,000 tonnes annually against a demand of 500,000 tonnes.

Fish imports from China were worth Sh1.7 billion last year.

In 2016, the Kisumu county assembly adopted a motion on the introduction of fingerlings in Lake Victoria in collaboration with neighbouring counties.

The intention was to stock Lake Victoria with 10 million fingerlings of tilapia and Nile perch every year. This, however, came a cropper, hence the deficit and continued fish importation.

The government can increase fish stocks through aquatic farming and stop the importation of fish from China. (KFI)

Desperate Farmers Innovate Ways to Fight Destructive Pest

By Wahinya Henry



Small-scale farmers across the country are tipping each other on how to control the destructive fall armyworm.

Edward Kimuthu, a leader of Murang'a Agricultural Stakeholder's Forum said last year that most farmers are often caught unawares by the pathogen. "We lack funds to buy chemicals to fight the pests and often, there is no information on chemicals to spray to eliminate the worms," he said.

He said some innovative farmers in the county were using organic ways to combat the pests. The farmers use raw tobacco powder, mixed with ash and water to attack the worms. "The concoction, when applied at the right time has proved effective killing the worms and rescued the crop from the aggressive enemy," he said.

Equally innovative is Fridah Kavetsa from Vihiga county. This farmer

prepares a mixture of ash and chilly powder, which she sprinkles on the maize funnel. After several applications, Kavetsa reportedly noticed the pest had disappeared and other farmers in her village followed suit and are now using wood ash and chilli powder with good results.

Agricultural officers have already confirmed the effectiveness of using ash and chilli powder to control the fall armyworms in maize. The method is better than the use of chemicals in controlling the pest including the fall armyworms.

Although, pesticides are mostly used to control the pest, the chemical also contaminate the environment and cause major health risks to humans, livestock and biodiversity especially the non-targeted organisms.

Worse, some of the pesticides available in the market are not effective

against the pest because they will kill the larvae and leave the eggs, which later hatch and continue damaging the maize. This is one reason why the pest is very difficult to control.

In Western Kenya, farmers say spraying crops with a mixture of water and sap or paste from a local herb also works to kill the fall armyworm and other pests. The common flowerily plant, a popular feed for goats in many parts of the country, is called *Tithonia diversifolia* (tree marigold or amaua (Kisii), Maruru (Kikuyu), Maua (Luhya), Maua Akech (Luo) and Ilaa (Kamba).

Other methods of control include use of pheromone traps and hand picking of adults and caterpillars, use of parasitoids, predators and natural enemies. Cultural control measures also used include management of broad leaf weeds and rapid disposal of crop residues after harvest.

The fall armyworm is a heavy feeder that quickly destroys the maize crop. It can destroy an entire crop if it is not controlled on time. It can spread fast, and can fly over 30km in one night assisted by the wind. The fall armyworm (*Spodoptera frugiperda*) derives the name from its' feeding habits whereby they eat everything in an area until it is over and the entire "army" then moves to the next available food source.

Meanwhile, Kenya is among five states within the East African regional block that will benefit from a Sh.820.3 billion (7.0 million euros) European Commission funded project to combat the spread of the dreaded fall armyworm.

Nairobi-based The International Centre of Insect Physiology and Ecology (ICIPE) will over see the management of the fall armyworm in Kenya, Ethiopia, Rwanda, Tanzania and Uganda

The European Commission Directorate for International Cooperation and Development (DEVCO) availed is availing the funds to the research body in order to strengthen its financial capacity in the war against the fall armyworm in the five countries.

Originally suspected to have entered the country from Uganda, the fall armyworm was first reported in western Kenya by farmers in March 2017.

Immediately, Kenya Plant Health Inspectorate Service and Kenya Agricultural and Livestock Research Organization confirmed the presence of the pest in Kenya.

The initial counties infested were Busia, TransNzoia, Bungoma, Uasin Gishu and Nandi. By the end of last year fall armyworm had affected more than 143,000 hectares of land in major maize and wheat-producing counties in Kenya

Food Agriculture Organization (FAO) and the ministry of agriculture and the Ministry of Agriculture adopted a planning response figure of 800,000 hectares, which required US\$33.5 million for pesticides and awareness

campaigns in the medium term.

US\$6.6 million was s required for an immediate response. A US US Agency for International Development (USAid) official Regina Eddy cautioned at the out break of the that the country stood to lose up to 50 per cent of an annual maize crop.

The pest also attacks millet, sorghum, cotton, sugar and additional crops, Ms Eddy noted. She pointed, however, to a study commissioned last year by the British government's Department for International Development. It found that in 12 African countries, total potential losses could range from \$2.5 billion to \$6.3 billion.

Says the Head of Section Agriculture, Job Creation and Resilience Delegation of the European Union to Kenya Myra Bernardi:

"This new initiative will enhance livelihoods, resilience and food and nutritional security of small holder maize growers in eastern Africa through better preparedness and eco-friendly management of the fall army worm specifically, and invasive species in general."

She added: "Over the past 10 years, the EU and icipe have formed a solid partnership towards strengthening agriculture as a core and effective component in Africa's development."

The fall army worm in the last three years has been devastating maize and other crops in at least 43 African countries, placing at risk the food and nutrition security, and livelihoods of more than 300 million people.

The larval stage of the fall army worm feeds on more than 80 plant species, including maize, sorghum, rice,



wheat, sugarcane, as well as a variety of horticultural crops thus threatening food and nutritional security, trade, household incomes and overall economies.

Efforts to control the fall army worm through conventional methods, such as use of insecticides is complicated by the fact that the adult stage of the pest is most active at night, and the infestation is only detected after damage has been caused to the crop.

The pest also has a diverse range of alternative host plants that enables its populations to persist and spread. The fall army worm has been shown to develop resistance to some insecticides, while the performance of such chemicals is also hindered by limited knowledge and purchasing power of farmers, resulting into use of low quality, and often harmful products," noted the Director of Research and Partnership ICIPE. Dr Sunday Ekesi,

Since its presence was first reported in Africa in 2016 – the fall armyworm has spread at an alarming rate across the continent, with significant impact.

Estimates from 12 African countries indicate that the pest is causing annual maize losses of between 8 – 21 million tonnes, leading to monetary losses of up to US\$ 6.1 billion, while affecting over 300 million people in Africa, who, directly or indirectly, depend on the crop for food and well-being. (KFI)

Return of 'White Gold' to Nakuru



By Wahinya Henry

Revival of pyrethrum production in Nakuru County is on course after the county and national governments put measures in place to kick start the process.

The pyrethrum revival picked up with speed immediately Governor Lee Kinyanjui assumed office and made a pledge the sector would be one of the key sectors his government will pay attention to as a way of steering industrial growth.

Governor Lee Kinyanjui in his capacity as the chairman of the Pyrethrum producing companies has prioritized revamping of the pyrethrum sector through a multi sectoral approach, a commitment that also attracted private sector participation.

The county government set the

ball rolling by distributing 3.3 million pyrethrum seedlings to farmers in Kinungi, Naivasha Sub County.

The distribution of the seedlings marked another giant step in efforts by the County Government to revive the sub-sector.

"Revival strategies initiated under the leadership of H.E Governor Lee Kinyanjui have started bearing fruits with more farmers embracing the crop," says Dr. Immaculate Maina, who is in charge of agriculture noting:

"Farmers are optimistic the sector will soon be back on its feet following the measures undertaken by the county government."

More than 3,000 farmers are currently farming the crop from less than 300 three years ago.

Dr. Maina said the County Government

had agreed with firms buying the crop that farmers should be paid within 30 days upon delivery.

"We have agreed with the companies that they should pay farmers promptly and if you have any complaint you are free to come to our offices," she said.

She challenged farmers to organize themselves into cooperatives so that they can reap more from their work.

Private sector

County government efforts have since received a boost from the private sector following establishment of a mega 45 acres seed bed in Molo, Nakuru County.

The seed bed established by Kentagra biotechnology limited was intended to be used to raise pyrethrum seedlings to be distributed to farmers for free within Nakuru County.

According to Peter Mwaura, the chief technical officer at Kentagra Bio Technology Ltd, distribution of the seedlings to farmers would translate to 4,500 acres of pyrethrum plantation.

Between 20,000 and 30,000 farmers were targeted annually.

According to Mwaura, it is the company which is among others that joined the pyrethrum industry following liberalization by the government is working with county governments to return the "white gold" to Nakuru County.

As an incentive the company promised to distribute free seedlings and fertilizer after which it will purchase the pyrethrum flowers as per a signed agreement. The quality of seedlings given to farmers is set to be improved every three years.

Francis Githinji, a farmer, regretted that before liberalization farmers encountered problems ranging from delayed payment, lack of incentives

and exploitation by players in the value chain.

He said that with the entry of various private companies in the sector, competition will facilitate prompt payment of farmers, high quality seedlings and more incentives to the farmers.

Scott Sweat, the chief operating officer at Kentagra Bio Technology when the initiative was unveiled thanked the government for liberalizing the pyrethrum industry adding that the future is bright for the sector. He said that with prompt payment, farmers are bound to increasing production.

The Pyrethrum Revival Program was launched at Kenya Agricultural and Livestock Research Organisation site in Molo with the hope of restoring the country to its past position of the best and largest producer of pyrethrum in the world.

Available data varies but records from the ministry indicate production fell

from 18,000 metric tonnes in the late 90s and early 2000 to a meagre 500 tonnes at present

The government had established regulations to ensure that farmers deliveries were paid within 15 to 30 days as a way of encouraging production.

Until the sub-sector went under, Kenya used to be a major producer of pyrethrum in the world, accounting for 70 per cent of the total supply.

Most of the pyrethrum produced is meant for export with the local market consuming less than two per cent.

For Nakuru, statistics from the directorate indicate that the volumes of flowers supplied to the Nakuru-based processor dropped from 390 metric tonnes in 2014 to 290.

In 2014, the extract from pyrethrum exports earned the country Sh200 million. In 2015, Kenya received Sh207 million from the crop and Sh120 million last year. **KFJ**



inset: Nakuru County Governor Lee Kinyanjui planting pyrethrum seedlings

Women and Fish Value Chain

By Wesley Lang'at

Blue economy is present a new lucrative frontier that offers multiple opportunities for women who majorly rely on fishing for their livelihood. Globally, women make up 47% of the 120 million people who earn money directly from fishing and processing. Even though women play a key role in the fisheries and aquaculture value chain, their contribution is often overlooked or undervalued.

Violet Babu, 30 years old mother of three, started working as a fish cleaner at Dunga beach along the shores of Lake Victoria. But Violet always find it inadequate for her to just descale the fish for a vendor and just paid small money at the end of the day while the owner cash in a lot of money.

"It wasn't enough for me to just clean fish and get paid." Said Babu. Adding that she never gave up of her dream of owning a boat some day in future. "I always think of means of owning my boat and fish like men." Said Violet

The 2019 report on Positioning women for success in the Blue Economy published by International Development Research Centre, an organization that fund research in developing countries shows that women provide more than 85% of the landed catch, even when investment is available it reaches men first.

While in this part of Lake Victoria, social cultural arrangements that are discriminatory and limiting women from participating fully in blue economy are fading away and opening up spaces for women to transformative change, investments, and innovations in the fishing industry thus promoting jobs for more women.

Michael Obilo is a long serving fisherman; he has been fishing for

two decades noted the tremendous changes and the increasing number of women in the fishing sector.

"In the early years, women were not allowed to fish or couldn't even come near our boats, they just carry the fish and sell it in the market. But now some are owning several fishing boats and no longer a taboo." Remembers Obilo.

Blue economy presents a gold chance for women in Kisumu to addressing challenges facing women who takes part in fishing by improving the economic, social and ecosystem resilience of fisheries and aquatic based-livelihoods. "As casual labourers, cleaning and descaling fish, I and my friend Eunice started saving money to buy our own boat" Violet explains.

In addition, blue economy sector promotes sustainable development of aquatic resources for the benefit of communities who rely on them for their livelihoods and food security. The efforts spearheaded by various stakeholders in the national and county government under the ministry of agriculture.

By extensively aligning activities within the fisheries and aquaculture

sector with pillars of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), which focus on traditionally marginalized fishing communities.

"We have made progress in modernizing agriculture in Kenya, we have not yet reached our full potential." He paused. "To achieve this potential, we must do agriculture in a different way, from how we create policy at the national level, to how we allocate resources in our farming households."

Mwangi Kiunjuri, Cabinet Secretary, Ministry of Agriculture, Livestock, Fisheries and Irrigation acknowledged in the strategy document for agricultural sector transformation and growth strategy for 2019-2029, a ten-year agricultural blue print towards sustainable agricultural transformation and food security in Kenya.

The two women overcame the financial hurdle through their savings from their own earnings and were determined to venture into fishing in the expansive waters of Lake Victoria like the male counterparts.

"After 6 years, we had saved enough money to buy our own boat at a cost of



Violet and Eunice take a photo in their newly built boat

Ksh.70,000. That enabled us to employ men to go fishing for us." She said.


Nevertheless, in the fisheries and aquaculture sectors, women still experience limited access to investment resources and skills development. The viability of the sector depends on promoting women and establishing policies that facilitate their pursuit of entrepreneurial spirit.

To bridge the financial gaps, the government through affirmative action

















introduces Women Enterprise Fund (WEF) which provide women with affordable loan and financial support. It also provides business related trainings. Judith Odera Wanyonyi regional credit officer at WEF says that their organization isn't like other financial lending institutions which requires collateral.

"We provide women with affordable credit and other financial support and making loans more accessible

to women in a country where only a fraction of them own land or property" Odera explained.

Women investing in agriculture require access to credit in order to purchase equipment and fish and to pay for transport without resorting to borrowing from exploitative money lenders or fish wholesalers. Innovative financing is an integral component of sustainable growth of the blue economy. 

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Celebrating 20 years

of transformation of lives through ICTs

The Communications Authority of Kenya (CA) is this year marking 20 years of existence during which it has overseen fundamental transformation of the ICT industry in Kenya.

As the ICT industry regulator, its mandate spans across the telecommunications, broadcasting, electronic commerce, cyber-security, and postal/courier services. CA is also responsible for managing the country's numbering and frequency spectrum resources as well as safeguarding the interests of users of ICT services.

The Authority's mandate entails issuing licenses for the various information and communications services as well ensuring that licensees adhere to their respective licence conditions. This is achieved through monitoring and enforcement activities undertaken from time to time.

Additionally, the Authority fosters competition within the ICT industry by creating an enabling environment

that enhances innovation, providing consumers a wide variety of services and choices.

The Authority also ensures that ICT equipment used within Kenya meets basic standards in respect to safety and other pre-defined parameters. In this regard, the Authority undertakes type approval of ICT equipment and issues licences to vendors of ICT equipment. Consumers are advised to buy equipment only from licensed providers.

Most importantly, the Authority is vested with the responsibility of protecting the interests of users of ICT services. Towards this end, the Authority monitors the quality of services offered by licensees with a view to ensuring that ICT consumers get value for their money. The Authority also educates ICT consumers through various platforms on their rights and obligations to empower users with information to make informed purchase and use decisions in the market.

On instances where aggrieved

consumers do not get redress from licensed service providers, they are encouraged to escalate their complaints to the Authority for regulatory interventions through chukuahatua@ca.go.ke or telephone number 070042000.

Since its establishment in 1999, the Authority has been at the frontline for opening up the ICT industry to competition. As a result, Kenyans now enjoy choice and quality postal and ICT services at competitive prices. We have achieved this, through licensing of players and creating an enabling environment that fosters innovations and competition within the sector. Currently, the vibrant ICT landscape in Kenya boasts of three mobile network operators (MNOs) and two mobile virtual network operators (MVNOs).

Over the two decades, Authority oversaw the digital migration in Kenya that opened up new opportunities in television broadcasting, establishment of a dynamic licensing regime (Unified

Licensing Framework) which has enabled more entrants into the market and the establishment of the Kenya National Computer Incident Response Team (KE-CIRT) that oversees the country's cyber security issues.

Others include market studies that informed decision-making in the sector and subsequent determinations that had the ripple effect of lowering prices in telecommunications and Broadcast Signal Distribution (BSD) services in broadcasting.

We have also undertaken extensive awareness campaigns through County ICT consumer forums as a measure of empowering consumers and establishment of four regional offices in Kisumu, Nyeri, Mombasa and Eldoret to enhance closer engagement with our stakeholders.

It is also during this period that we operationalize the Universal Service Fund (USF) that we are leveraging on to enhance access to communications services across the country.

As at December 2018, there were 49.51 million mobile subscribers, representing a 106.2 per cent mobile penetration. In the broadcasting sector, there are 173 FM radio stations and 75 television stations on the digital broadcasting platform. There are 45.7 million Internet subscribers, 623 postal offices countrywide, 1,027 private courier outlets and 77,671 dot ke domain names.

The ICT industry therefore continues to expand with the entry of new service providers offering a wide array of services and is now one of the key contributors to Kenya's Gross Domestic Product (GDP) besides creating job opportunities for our youth.

In terms of our regulatory capability, we have continually invested in tools that help us monitor the performance of the industry in a more efficient manner.

The Authority has acquired new Quality of Service Monitoring system (QSMS) that has boosted our capability to measure quality of voice, data and SMS

services provided to consumers by our licensees.

We also have in place a Spectrum Monitoring and Management System (SMMS) that enables us to monitor, plan and allocate spectrum in an efficient manner. Additionally, two years ago, Kenya became the first country in Africa to implement an automated mail quality management system, aimed at improving efficiency in the mail delivery ecosystem making.

We see Information and Communications Technologies (ICTs) as a key enabler in the achievement of the Big 4 Agenda, which focuses on manufacturing, food security, affordable health care and housing.

ICTs especially emerging technologies including artificial intelligence (AI) are now being used to improve people's lives through enabling provision of a wide range of other services.

For instance, ICT innovations supported by the use of broadband and internet are key in the hastening of access to universal healthcare, where such technologies are being deployed to facilitate e-health services, identification and records management of beneficiaries for institutions such as the National Hospital Insurance Fund (NHIF). This is enhancing access to quality health services across the country.

We also see ICTs playing a critical role of narrowing the information divide between health professionals and the communities they serve. ICT is also supporting research in the medical field by providing better ways of accessing, communicating, and storing information. This is being achieved through the development of databases and various applications for the medical sphere.

In manufacturing, there are ongoing efforts by the Government to promote local assembly of phones, TV sets and laptops, which is envisaged to create about 10,000 jobs annually, fuelled

by, among others, business process outsourcing (BPO) services.

The Ministry of Lands recently adopted blockchain in the digitization of lands records was a big leap forward towards driving efficiency and speed in processing of land documents. This will see increased transparency and visibility of ownership through a single source of truth.

We also see integration of ICTs in agriculture as critical in boosting food security in Kenya.

As you will appreciate, ICTs have changed how we access, compute and communicate information to people. ICTs can be leveraged on to provide farmers with useful data to boost food security. These include information on good farming practices, inputs, weather patterns and market access.

ICTs are now increasingly supporting new methods of agriculture like computerized farm machinery that are used to apply fertilizers and pesticides. Farm animals can now be fed and monitored by electronic sensors and identification systems.

The advent of Big data is also presenting additional opportunities for ICT to enhance agricultural productivity. On the farm, this data may include crop yield history, product usage, order status, payment history, and field data such as soil types, moisture levels, available nutrients, pest pressures, and the weather. Presently, farmers or extension officers can send data via the Internet to a database server at a central location where such information can be managed, analyzed and help farmers make better farming and business decisions.

To ensure ICTs support the attainment of the Big 4 Agenda, the Authority is facilitating the roll out of ICT infrastructure to support access to voice and data communication across the country. This initiative is supported through regulatory interventions and use of the Universal Service Fund.

KDF at Gilgil

in Naivasha adding value to crops to reduce food waste

By Fred Omondi

The Kenya Defense Forces at Gilgil in Nakuru County have started value addition in various crops including potatoes, carrots, kales, cabbages, onions and mixed vegetables.

The products were showcased at the Potato Conference that was held in June at the Kenya Agriculture and Livestock Research Organisation headquarters.

Agriculture cabinet secretary Mwangi Kiunjuri said potato is the second most important staple crop after maize in our country.

"The crop is increasingly becoming more so given the level of urbanization and changing consumption patterns. It also has immense opportunities for value addition and commercialization," he said.

The CS said for the last one year, the Ministry has provided the necessary stakeholder leadership to deliver the required regulatory frameworks for the main crops including potato, coffee, horticulture and tea.

Martha Mwamburi said the factory at the army barrack has been doing value addition to not only provide food for the soldiers but the innovation also helps in reducing post harvest losses.

The potatoes, carrots, kales, cabbages, onions and mixed vegetables are washed, piled and cut. After that we blanch (process of boiling the products to kill enzymes), dry and packaged.

"The products have a shelf-life of one year and they still retain the nutritional value. The products are currently available at the Delmere stop-over in Naivasha. But we are planning to start selling the packaged products in Naivas supermarkets from next month," she said.

She said to make the one-kilo packet of irish potatoes, they have used about 20kgs of fresh potatoes of the Shangri

varieties. To cook potatoes and carrots, one needs to soak in cold water for about four hours or two hours in hot water then cook as usual.

One kg packet of potatoes is selling at Sh1, 200, one kilo of carrots Sh1, 100, 250 grams of mixed vegetables (carrots, spinach, kales and cabbages) at Sh230,

250gms of kales at Sh240 while 500gms of cabbages, spinach and onions are selling at Sh500, Sh520 and Sh580 respectively.

New potato regulations Potato farmers will be required to register with the County Government according to a new potato regulation.

Kiunjuri said this will help the government in collecting data on the number of potato farmers in the country.

While launching the Irish Potato Regulations 2019, the CS said the maximum weight unit package shall be 50 kgs bag and not the extended bag that weights 110kgs.

Potato farmers have been complaining of exploitation by middlemen and poor potato prices, and calling on the government to implement the 50kg bag of potato regulation.

"The government is also planning to establish potato collection centres in the potato growing areas hence the need for registration. It is more of a supportive initiative rather than restrictive," Wachira Kaguongo CEO of the National Potato Council of Kenya.


The Potato Regulations were gazetted in early April and they were acceded to by the National Assembly in the first week of May 2019.



Display of value added crops at KDF Gilgil Naivasha

The regulations are focused on curbing malpractices associated with the use of extended bags, quality assurance and marketing and licensing of actors in the potato value chain among other issues. Kiunjuri said the ministry also plans to increase basic and certified seed production.

"This will be done through expanding production capacity of both KALRO and ADC laboratories, increasing the land under irrigation for potato production, and sensitizing farmers to scale-up the use of certified potato seeds. This will be accompanied by other value chain support services and infrastructural development such as cold rooms and aggregation centers," Kiunjuri said. He appealed the support of Governors in the potato growing regions to embrace and support the implementation of these Regulations.

"Our farming communities and other critical stakeholders need to be sensitized on the new regulatory requirements of the Regulations," Kiunjuri said. 



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