

SCIENCE

SAYANSI

All science information

Issue Number Eight

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Shifting to Cleaner Mobility in Africa



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mobility**

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Who we are

The Media for Environment, Science, Health and Agriculture (MESHA) was founded in

November 2005 in Nairobi, Kenya, and is an organisation that provides support to science journalists covering health, development, technology, agriculture and the environment. It does so by offering training workshops, consultancies and encouraging networking through meetings and conferences among journalists, scientists and other stakeholders in Kenya.

The association emphasises on rural journalism and communication.

The idea for the formation of this association sprang up from the fact that there were many organisations and communicators in the fields of agriculture, environment, health and development. However, few organisations in the region bring journalists covering these issues together, for better reporting in the media.

MESHA believes that in a democratic society where science must be answerable to the public, there is need to find new and innovative ways of effective mass communication about the benefits of science, and other areas of concern to the general public.

MESHA aims to ensure continuity, sustainability and consistent coverage of science and development issues as they arise.

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P. O. Box 44199 - 00100, Nairobi
email: coordinator@meshakenya.org
www.meshakenya.org,



Editor

Aghan Daniel

Reviewer

Leopold Obi

HIV: “Test and treat” strategy call for combined interventions

It is almost six months since Kenya launched test and treat guidelines. We must reflect on the journey that we have travelled before getting here.

In the 1980s, if one was diagnosed of HIV, it was equivalent to a death sentence. The coming of Anti-retroviral drugs in the late 1990s and early 2000s brought about hope and now people living with HIV can lead normal lives while on treatment. The country has moved from offering ART to those who had advanced HIV to a more recent approach of offering treatment to those whose CD4 cell count is below 500.

Today, there is compelling scientific evidence that treating the infected irrespective of CD4 count, has significant benefits including preventing early deaths, keeping away opportunistic infections and therefore keeping people healthy and preventing transmission of HIV to sexual partners and babies born of HIV positive mothers. There is no need for anyone to wait anymore but stands to gain immensely by starting treatment today at the nearest health facility of choice. This is what is called “TEST and START”.

It is also good news that Kenya's Ministry of Health through the National AIDS and STI Control Program (NASCO) and partners put in place a strategy to tailor clinic visits to clients' needs. This means that if one is stable they could as well only go to the clinic twice a year for check-up. Even as ART is now being considered as a virtual vaccine against HIV, to defeat HIV, we must invest in combination interventions involving prevention and treatment aspects. Some of the proven prevention strategies include consistent and correct use of condoms, Voluntary Medical Male Circumcision (VMMC), Pre Exposure Prophylaxis (PrEP), HIV Self Testing, Strategies for Preventing Mother to Child Transmission of HIV, harm reduction programs for key populations and prevention of HIV transmission in healthcare settings e.g. through safe blood transfusion services.



Supportive services for vulnerable populations like cash transfers programs are critical in removing vulnerabilities to HIV infection especially among orphans. Girls and boys must be kept in school for as long as it can take. This social protection mechanism is not only important against HIV, but also for other health related dangers like substance abuse and early pregnancies. It is our hope that the ongoing efforts to find a vaccine for HIV will bear fruit so that this scourge can be brought to rest once and for all.

Meanwhile, let us all be responsible in our life choices and sexual lives and say no to stigma and discrimination to those infected and affected. To get to zero, all of us have a role to play and it starts with you. And so we do urge everyone to take an HIV test today and take control of one's life. Start Now.

Dr Martin Sirengo wrote this editorial while he served as the Head of NASCO and Deputy Director of Medical Services, Ministry of Health

The African Seed Trade Association (AFSTA) Congress 2018

27th Feb - 1st March 2018
at Conrad Hotel,
Cairo, Egypt

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REGISTRATION INFORMATION

The registration fees for the congress 2018 are as follows :

	AFSTA Members	Non-AFSTA Members
For delegates:		
• Before 31 st Jan. 2018	US\$600	US\$875
• After 31 st Jan. 2018	US\$650	US\$950
For accompanying persons:		
• Before 31 st Jan. 2018	US\$200	US\$275
• After 31 st Jan. 2018	US\$250	US\$325
3. For Egyptian civil servants:		
• Registration fee	US\$ 325	

Onsite registration will attract an additional fee of 30% of the registration fee for all categories of delegates and accompanying persons as below:

AFSTA Members	US\$ 845
Accompanying person (member)	US\$ 325
Non Members	US\$ 1,235
Accompanying person (non-member)	US\$ 420

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Shifting to Cleaner Mobility in Africa

By Jane Akumu | Jane.Akumu@unep.org

The focus on urban mobility is particularly pertinent in Africa as the urban population is expected to more than double by 2030 (African Development Bank, 2017). Indeed Africa is urbanizing faster than any other region in the world. The continent is undergoing a mobility revolution; witnessing the highest growth rates in motorization, at over 10% in most countries, even where economic growth is lower.

Air pollution is estimated to result in 7 million deaths each year globally. Today, air pollution in African cities is estimated to account for more premature deaths than childhood malnutrition and unsafe sanitation,

costing the continent an estimated USD 215 million annually (OECD, 2016). Air pollution is estimated to contribute to 3.7 million deaths worldwide with transport remaining an important source of air pollution particularly in cities. In Africa, an estimated 176,000 deaths are associated with air pollution (WHO 2014) mainly from transport. In Kenya, over 5,000 deaths each year are directly linked to air pollution, with the air in Nairobi being 70% more polluted than the WHO guideline (<http://breathelife2030.org/city-data-page/?city=1697>). In fact, the UN Environment has coined air pollution as Africa's "invisible, silent killer."

Reducing harmful emissions from Africa's vehicle fleet is a priority that will help to address localized air pollution and to achieve global climate change targets, including the Paris Climate Agreement. Through deliberate policy interventions to promote cleaner mobility, developed countries have been able to reduce their emissions per vehicle kilometre. Some of the strategies they have implemented include the use of cleaner fuels such as ultra-low - 10 parts per million (ppm) - sulphur fuels. High sulphur in fuels, especially diesel, contributes to significant emissions of small particles that we breathe and are associated with diseases such as heart attacks, strokes, lung cancer and even death.

Another strategy is the use of stringent vehicle emission standards. These countries require vehicles to be fitted with the latest emission control technologies that reduce harmful emissions by close to 99%. Recent developments towards zero and low emission vehicles like electric vehicles have further advanced emission reduction goals, encouraging fuel saving as these cars also are energy efficient.

Africa has unfortunately become a 'dumping ground' for poor fuel quality and obsolete vehicles. For example while significant strides have been made to eliminate leaded petrol in the continent, only 1 country has national diesel standards at current Europe level (10 ppm). Regrettably, some of the countries in the continent still allow import of up to 10,000 ppm sulphur diesel, 1,000 times higher than the European specification. The continent predominantly imports used vehicles. In Kenya, for example, imported used vehicles account for 99% of the light duty vehicle fleet (University of Nairobi Enterprises and Services, 2014). Despite there being an opportunity to import some of the latest clean vehicle technologies, 27 out of the 54 African countries place zero restrictions on the importation of used vehicles. Furthermore, most countries still lack vehicle emission standards, and inspection & maintenance programs for in-use vehicles. The combination of the use of high sulphur fuels and obsolete vehicle technology inevitably leads to gross ambient air pollution.

It is in recognition of the opportunities that mobility in Africa presents that the UN Environment is hosting the Africa Clean Mobility Week on 12 -16 March, 2018 at the UN Environment Headquarters in Nairobi, Kenya. With the right policies and fiscal instruments, Africa can leapfrog, within a short time, to a cleaner vehicle stock. With the developed world shifting to electric and hybrid vehicle technology,



Africa could promote the import of these vehicles through policy intervention and consumer awareness. For example, in Mauritius, where a 3 year age limit on imports is enforced, 51% of imported vehicles are new. Africa also needs to shift to soot-free and efficient public transport systems. The majority of the population across the region relies on walking and cycling as the primary mode of mobility.

For example, in Nairobi 47% of all trips are estimated to be made using non-motorized transport (walking or cycling). It is thus paramount that the continent invests in safe and efficient walking and cycling infrastructure.

The Africa Clean Mobility Week is targeted at African government officials, private sector, civil society, media, academia, development partners and experts in the field of transportation. Opportunities for the continent to move towards cleaner technology and more sustainable means of mobility will be explored by focusing on:

- improving the continent's vehicle fleet in terms of emissions reduction strategies and fuel economy improvements,
- exploring opportunities to leapfrog to electric mobility;
- leveraging non-motorized transport for greater gains in clean mobility; and
- ensuring used vehicles contribute to clean mobility.





New Report: Climate Change Affects Every Step of the Food Value Chain

By Special Correspondent

Researchers from the International Food Policy Research Institute (IFPRI) have published an extensive report highlighting the effects of climate change on agriculture and global nutrition. The report, *Climate Change and Variability: What are the Risks for Nutrition, Diets, and Food Systems?*, compiles evidence-based research to provide a detailed look at food security, agriculture, and food systems in relation to climate change. The authors also examine future projections in these areas, seeking to acknowledge the complexity and importance of those relationships as both global population and global temperatures rise.

The report frames the food system as both a victim and a driver of climate change: while climate change negatively affects agriculture and the ability to feed the world, the food system intensifies climate change by significantly contributing to global greenhouse gas emissions (GHGs).

In an introductory post, the reports' authors urge more research and action, calling the task of ensuring adequate global nutrition for all "the challenge of our lifetime." The authors cite research projecting that at current rates of climate change, "it is likely that global food production will decline by two percent every decade until at least 2050, just as the world's population is expected to reach 9.7 billion people."

Persistent drought and other changes in weather patterns are already resulting in famine for millions of vulnerable people.

A 2016 report modeled the effects of this climate change on global health, estimating "excess mortality attributable to agriculturally mediated changes in dietary and weight-related risk factors," and predicted half a million agricultural climate-related deaths in this time period.

The IFPRI authors state that nutritional status, ultimately leading to morbidity and mortality, "can be exacerbated by the effects of climate change at all stages of the food value chain."

Featuring seven focal areas through a food system lens, the report brings together research on each piece of the food value chain and anticipated challenges posed by climate change. The authors suggest both climate change mitigation and adaptation strategies using a nutrition-sensitive approach that is also climate-aware.

The food system lens begins with agricultural input—elements like seeds, agricultural extension services, fertilizer use, soil quality, irrigation—and the importance of understanding how crop productivity and nutritional value can be simultaneously maximized. Next, food production and food storage are considered, stressing that increasing global temperatures and changing precipitation patterns cause changes in what food is grown, where it is grown, how it is stored, and whether it is nutritionally valuable and safe from pathogens.

Citing research by Colin Khoury and colleagues at the U.N. Food and Agriculture Organization (FAO),

the report asserts “food supplies are becoming increasingly homogeneous and dependent on a couple of truly ‘global crops.’” According to Khoury, “reliance worldwide on these crops heightens interdependence among countries in their food supplies, plant genetic resources, and nutritional priorities.”

Experts like Khoury say homogenization of crops grown reduces biological diversity, making crops more susceptible to climate events and pests, and reduces dietary diversity by limiting the variety of foods available to consumers. Dietary diversity is commonly associated with nutritional status, in particular with adequate consumption of micronutrients.

By decreasing crop variety or negatively affecting nutrient content of foods, climate change also has implications for food processing. The report explains increased need for food processing to fortify foods for populations with decreasing access to adequate nutrients, and to help ensure nutrient quality or stability nutritious foods if food storage and transport are challenged by climate change.

Among other distribution challenges, the report cites that rising temperatures will increase need for more refrigerated storage and transport, therefore increasing food system GHGs.

The IFPRI authors also address rising animal-source food consumption, citing World Resources Institute (WRI) research on the importance of animal-source protein in vulnerable populations’ food supplies, while urging that “those eating more [animal-source food] than is nutritionally necessary decrease their consumption.”

The final component of the food system lens is consumption and utilization of food, which involves consumer knowledge and food preparation skills. Utilization also depends on general health and absence of disease that affects nutrient absorption or increases nutritional needs.

Reduced food access will most affect consumption, the report says, because “climate change is expected to increase [food] prices as well as price volatility due

to decreased production and increased loss.” The IFPRI authors cite evidence for the negative effect of food price increases on increased micronutrient deficiencies and other forms of undernutrition.



Reduced food access also increases incidence of obesity and noncommunicable diseases, the report says, referencing findings that “increasing food prices may lower the nutritional quality of dietary intakes, exacerbate obesity, and amplify health inequalities.”

As climate change decreases agricultural productivity and access, the authors argue, it will intensify inequity: the rural poor will be least equipped to adapt. The IFPRI report concludes that a food system that is both climate- and nutrition-sensitive is necessary to be sure nutrition is a key consideration in the development of climate change mitigation and adaptation strategies.

According to the authors, the strategies encompassed in the nutrition-sensitive and climate-aware food value chain must both “maximize nutrition entering the food value chain” and “minimize nutrition exiting the value chain.”

The report includes many recommendations, such as an adoption of agricultural practices that “maintain necessary levels of nutritious food production while minimizing the environmental effects of agriculture.” In addition, the report recommends working to enhance food storage and processing to address food safety concerns and maintain nutritional value of foods, arguing that, in addition to decreasing undernutrition, this could reduce food waste in low- and middle-income countries.

Other recommendations include improved infrastructure and transportation for improving smallholder farmer access to markets, and the creation and dissemination of public health campaigns for promoting the need for sustainability considerations in dietary guidelines. Prior research has recommended public health campaigns for mitigating the negative health effects of climate change.

For safeguarding vulnerable populations from climate change, the report suggests social services “to protect the most vulnerable from long-term stresses and short-term shocks that threaten food security.” It also emphasizes the importance of addressing and decreasing disease in these populations for increased utilization and absorption of nutrients consumed, as well as the importance of dietary diversity.

The authors also emphasize a need for improved early warning systems for detecting both slowly shifting patterns of rainfall or temperature and for extreme weather events.

IFPRI published this report in the days before the Trump administration announced that the United States will back out of the 2016 Paris Climate Agreement. The report’s authors suggest that collaboration and cooperation between the private sector, NGOs, and governments is key to improving nutrition using climate-conscious methods to “[protect] the health of people and the planet.”

Policy framework for indigenous vegetables crucial

By Sifelani Tsiko | sifelani11@gmail.com

The mainstreaming of indigenous vegetables into national programmes is critical for the country's food security and for promoting these vegetables that provide much needed vitamins and contain medicinal properties.

Zimbabwe and most other African countries now need to mainstream indigenous vegetables into the national nutritional programmes and policies, as well as national curricula and training programmes to close the gap between exotic commercial vegetable production and indigenous vegetables by smallholder farmers.

Intensive promotion should be done from both a production and consumption perspective. More research should be done on varieties suited for the several regions in a country with a view to commercialisation.

Seed Houses should be encouraged to produce seeds for indigenous vegetables to ensure their survival.

"Cooperation and working together among all players will yield the desired results," says a renowned Harare-based agrarian expert

Several meetings have been organised in Zimbabwe to discuss ways on how policies could be crafted to increase production, processing, marketing, preparation and consumption of the traditional leafy vegetables found in the country.

At these gatherings stakeholders expressed concern over the erosion of indigenous vegetable germplasm which were important in improving the nutrition of people particularly now when there is a rise in non-communicable diseases such as cancer, diabetes and others.



They noted with the concern the practical disappearance from the local diet of vegetables such as tsunga, nyevhe, mutsine, derere rebupwe, regusha, rename, renyunje and others.

In addition, they say it was worrying that the consumption of indigenous vegetables had declined sharply with the

introduction and aggressive promotion of exotic vegetables (cabbages, spinach, carrots, broccoli).

"This drastic decline in eating indigenous vegetables is a reflection of how seriously our pallets have been colonised. How can this be addressed or reversed?" a senior government official



said calling on all stakeholders to come up with strategies that could help increase production, processing and consumption of traditional vegetables.

Claid Mujaju, head of Seed Service in the Ministry of Agriculture said Zimbabweans needed to change their attitudes that treat indigenous vegetables as inferior.

"Indigenous vegetables are still seen as poverty crops. They are still seen as food for the poor, the lower class. We need to change our mentality and attitudes towards indigenous vegetables if we are serious about promoting traditional vegetables," he said.

"We need to mobilize resources to conduct extensive research on indigenous vegetables to develop new breeds that could meet new demands for taste and other properties."

Concurred Dr Olivia Muchena, a former Zimbabwe agriculture minister: "Young people don't want to eat mfushwa, derere or nyevhe (dried indigenous veges, okra, spider flower leaves). They will say you are giving us poison.

We need to prepare tasty and appealing indigenous vegetable dishes so that our young people can eat them as well."

Stakeholders say there is need to fully integrate indigenous vegetables in national feeding and nutritional programmes as well as national curricula, and training programmes.

They say the ministry of health should further extend this policy, not only from the point of view of HIV and AIDS cases but promoting a holistic approach to health for everyone.

Information on the nutritional and medicinal value should be packaged in a simple and easy-to-read manner and circulated widely to promote the intake of indigenous vegetables across the country, they say.

"Public education on Indigenous vegetables should be intensified. Promotion leaflets should be distributed in supermarkets, schools and aired on radio and TV. This will create a culture of eating indigenous vegetables. At present, IVs are largely viewed as poverty foods and this mentality needs to be corrected," a health ministry official says.

Andrew Mushita, director of CTD, a Harare-based NGO says Zimbabwe must adopt policies that will increase the uptake of indigenous vegetables and promote comprehensive production, marketing and consumption uptake of indigenous vegetables.

"This calls for increased involvement of the private, civil society and public sector institutions in the promotion and marketing of indigenous vegetables designed to economically empower our communities," he said.

"We must strive to see traditional leafy vegetables nyevhe, muboora, mutsine and many others being grown on a commercial basis just like the common brassicas, cabbage, broccoli and rape."

Smallholder farmers face numerous challenges when it comes to the production of indigenous vegetables. These include seed availability, the seasonal nature of traditional vegetables, lack of information, post-harvest handling and processing problems, quality controls, market linkages and limited capacity to satisfy the urban markets.



Farmers will benefit from recently launched automated weather stations

Additional automated weather stations launched

By Leopold Obi | leopoldk40@yahoo.com

Kenya's weather department has received a major boost after it received a new advanced weather station to enhance its efficiency on weather predictions.

The five stations, one of which was handed over to weathermen this month - have been donated and installed by the Chinese government in five counties across the country including Baringo, Elgeyo Marakwet, Nairobi, Nandi and Nyamira. The weather stations add to the 72 automatic stations that have been installed in the country in collaboration with other development partners.

An automatic weather station is equipped with different sensors which measure weather parameters such as wind speed and direction,

air temperature, humidity, radiation, air pressure and rainfall amounts.

These stations provide an opportunity for weather observations to be done in volatile or drought prone areas, or places that are inaccessible due to poor or non-existent road network.

According to the department's Communication Officer, Bahati Musilu, one of the main features of the AWSs is the lightning detectors which have been installed in two of the donated AWSs. All the AWSs are equipped with solar panels as well.

The department is implementing automation through the Vision 2030 flagship project titled Modernization of Meteorological Services.

In the past, the automated stations were set up in places where electricity and telecommunication could easily be accessed but, the inclusion of accessories such as solar panel, wind turbine and mobile phone technology on the modern stations has made it possible for the stations to operate in far flung and off-grid areas.

The system requires less space for installation since the sensors are grouped together as compared to the manual observatory where instruments are installed on individual space. Provision of accurate weather and climate information enables farming communities and policy makers to put in place well thought out plans which in turn enhances their livelihoods.



A farmer preparing his field for planting

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A maize seller in East Africa. More countries in the region are now embracing plant biotechnology

More African countries approve GM crop trials

By Sifelani Tsiko | sifelani11@gmail.com

Africa is quietly changing course of genetically modified crops field testing by giving conditional approval for crop trials as most countries on the continent now see the use of science, technology and innovation as a vehicle to achieve food security for the increasing population.

Recently, Kenya joined the list of African countries that have given a thumbs up to genetically modified crop trials.

The Kenya Biosafety Authority granted a conditional approval for environmental release of insect resistant maize (Bt maize) for national performance trials.

Bt maize has been genetically modified to produce an insecticide – Bt protein – that kills certain insect pests.

Scientists say the gene added to the maize comes from the soil bacterium *Bacillus thuringiensis* (Bt), which has long been known to possess an insecticidal effect and widely used in organic agriculture.

Kenyan researchers say the transformed crop will be able to withstand stem borers, known to reduce maize production by an average of 13 percent or 400 000 tonnes of maize, equivalent to the normal yearly amount of maize that Kenya imports.

This damage is valued at more than US\$80 million.

The Kenyan approval was reached after comprehensive review of the application submitted by Kenya Agricultural Livestock and Research Organization (KALRO) and the African Agricultural Technology Foundation (AATF) in June 2015.

The review process included a public participation exercise, where stakeholders submitted written comments on the application.

Kenyan legislators, after conducting study tours at various research facilities, said the country has the requisite capacity for genetically modified crop research and regulation.

“We have the capacity, technology and science to produce adequate food for our people, through biotechnology,” said Dr Wilbur Ottichilo, Kenyan legislator.

Agricultural experts in Africa and the African Union’s New Partnership for Africa’s Development (NEPAD) have underscored the use of science, technology and innovation as a vehicle to achieve food security for the continent’s growing population.

For decades, Africa was a hostile place for researchers testing genetically modified (GM) crops.

Most governments barred the commercial planting of a transgenic crops after protests from anti-GMO activists.

After heavy lobbying by anti-GMO activists, most African countries crafted moratoriums to bar any GMO field trials, denying local scientists the opportunity to explore the use of biotechnology to enhance crop yields.

Speaking during the launch of the 2014 International Service for the Acquisition of Agri-biotech Applications (ISAAA) global report on commercialised biotech crops in Harare, COMESA senior biotechnology policy advisor Dr Getachew Belay said the utilisation of biotechnology by plant breeders could help the continent to address a myriad of agricultural related challenges including hunger, increasing population and declining food production.

"This is the problem with global biotechnology, it's not addressing indigenous crops," he said. "There is need for a strong political will and concerted efforts by African plant breeders to use biotechnology to enhance the nutritional and productivity levels of indigenous African food crops."

Research into indigenous food crops, Dr Belay said, will enable agricultural extension workers to advise smallholder farmers in their respective countries to continue to grow local crops that address their own needs.

"African researchers should take the lead in promoting biotechnology research on African crops," he said.

"Only African scientists or those working in Africa know the desires of African farmers and consumers and we should not hesitate to use new equipment and techniques to 'genetically sequence, assemble and annotate the genomes' of thousands of indigenous African crops."

Despite stiff resistance to GM crops, most African countries have quietly changed course on GM field testing.

In the past year, Zanu-PF, the ruling party in Zimbabwe, endorsed the use of biotechnology to improve the growing of crops and enhance food security.

Many other African countries have now approved field trials of GM crops, between them allowing tests that include transgenic rice, cotton and maize.

"We need biotechnology to help answer Africa's most problems that include food insecurity and nutrition insecurity," said a University of Zimbabwe biochemist.

"Our governments must allow researchers to do GM crop trials. Look at what's happening to tissue culture research which has led to better sweet potato yields here in Zimbabwe. Its biotechnology at best and there is no better feeling than to know that your technology is performing in the field."

In Africa, only four countries – South Africa, Burkina Faso, Sudan and Egypt — have commercialised genetically modified (GM) crops, while 19 countries have established biosafety regulatory systems, four countries are developing regulatory systems, 21 countries are a work in progress, and 10 have no National Biosafety Frameworks (NBFs).

Nigeria, Uganda and Malawi were among countries that have approved GM crop trials.

Experts say one of the reasons for slow adoption of biotechnology is the lack of functional regulatory systems, including inability to perform timely decision-making.

Other factors, they say, include the absence of national legislation, regulations, risk assessment policies or procedures and inadequate capacity for implementing functional regulatory systems.

In 2014, South Africa grew 2, 7 million hectares of biotech maize of which 28 percent was Bt maize.

A Kenyan government official says: "Scientists have an obligation to assist Kenya to create viable and sustainable agro-food sectors. We need a paradigm shift to fast track swift delivery of new products into solving future challenges of producing more food with fewer resources in a sustainable manner."

He also stressed the importance of science technology and innovation in leveraging Africa's competitive advantage underlining the need to consider agricultural issues more from a multidisciplinary than single-unit approach.

The relaxed attitude to GM crop trials among some African countries is reviving enthusiasm of African researchers who are keen to improve crop yields and enhance the continent's food security

PHOTO CREDIT: AATF



A maize farmer shows off a cob. There is widespread acceptance of GM technology in Africa despite spirited campaigns from haters

position. "Kenya's attitude towards transgenic crops has a symbolic importance beyond its borders," says the UZ researcher.

"It eases tension that surround the use of GM technology in developing nations such as Zimbabwe and others in the region.

"Zimbabwe and most other SADC countries are facing serious food deficits and having to import GM maize from Brazil, Argentina, South Africa and other countries in Latin America. Why not simply adopt the technology and enhance our crop yields."

He says Zimbabwe and most other SADC countries need embrace GM crops to improve agricultural productivity and feed the rapidly growing population.

In addition, he said embracing GM technology could help develop higher-yield crops that are resistant to pests or grow well in droughts or harsh environments.

Zimbabwe still maintains a ban on GM crops but will only allow milled GM maize to avert starvation this year.

Agriculture, Mechanisation and Irrigation Development Minister, Dr Joseph Made told Parliament recently that the government had not changed its policy on GMs, adding any maize imports from other countries would go through extensive security checks.

More than 14 million people face hunger in Southern Africa because of a drought that has been exacerbated by an El Nino weather pattern, according to the United Nations World Food Programme (WFP).

The drought has hit much of the region including the maize belt in South Africa and Zambia which in recent years has been a top supplier of non – GM maize to Zimbabwe and other countries in the SADC region.



This drought has also exposed Southern Africa's vulnerability to food and nutrition security at a time when most countries have made logistical arrangements to import GM maize from Brazil, Argentina and the US to avert starvation.

The worst affected countries in the region in 2016 include Angola, Botswana, Lesotho, Malawi, Mozambique, Madagascar, South Africa, Swaziland and Zimbabwe.

This year, reports indicate that Southern Africa's cereal harvest fell by almost a quarter, down to 34 million tonnes. In 2014, a record 181,5 million hectares of biotech crops were grown globally, an increase of more than six

million hectares from 2013, according to a report released by the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) last year.

Having cultivated 2,7 million hectares in 2014, South Africa ranks as the leading developing country to grow biotech crops in Africa.

Sudan increased Bt cotton hectareage by approximately 50 percent in 2014 and several African countries including Cameroon, Egypt, Ghana, Kenya, Malawi, Nigeria and Uganda conducted field trials on several pro-poor crops including the food crops rice, maize, wheat, sorghum, bananas, cassava and sweet potato. southern times.



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Rice of hope ready for commercialization

By Agatha Ngotho | angotho@gmail.com

Scientists in Kenya have developed a new hybrid rice variety that is rain-fed and resistant to the rice blast disease.

Unlike the conventional rice that is grown under irrigation, the new variety is suited for the upland areas where maize is grown.

According to John Kimani, a rice breeder at the Kenya Agricultural and Livestock Research Organisation (KALRO) and director of the Mwea Centre, the new hybrid variety has preferred traits such as long grains, pleasant aroma and resistance to the devastating rice blast disease.

“Rice blast disease has been a major challenge to rice farmers and can cause up to 80 percent yield loss. In 2008, there was a massive outbreak of the rice blast where some farmers had a total crop failure. In normal cases, it can cause anything between 60 - 100 percent loss and it is a very serious threat to rice production in Kenya. Finally, we have a resistant variety,” says Kimani adding that the variety is also early maturing.

Dr Phoebe Sikuku, a rice researcher at Maseno University says lack of high yielding varieties that are tolerant to drought has also affected rice production. This is because most of the agricultural ecological zones are prone to water deficit.

“We are optimistic that once the research on the variety is concluded, farmers can access seeds and increase productivity on their farms. Our aim is to make Kenya and Africa self-sufficient in rice production,” she adds.



Dr Kimani explains that the upland rice is early maturing and takes 120 days compared to the conventional varieties that mature within 140 - 170 days. It also matures faster than maize, which takes about seven months, particularly the highland maize varieties.

High increase in rice consumption

On his part, Dr Johnson Irungu, Director of Crops in Kenya's Ministry of Agriculture says that rice consumption in the country has been growing at a high rate since 2008 and is currently standing at 12 percent while maize, which is the staple food is at one and wheat at three per cent.

Kenya produces 140,000 metric tonnes per year against a consumption rate of 540,000 - 600,000 metric tonnes per year. The deficit of about 75 percent is imported mostly from Pakistan and neighboring countries.

Thanks to the many hybrid varieties that have been developed, Kimani says, production has almost doubled from 54,000 metric tonnes per year since 2008.

“It means we have been able to double production in 10 years. Kenya's Vision2030 projects that Kenya will feed her 48 million population without importing as has always been the case. The challenge is that the realized yield currently is about three tonnes per hectare for the irrigated lands but there is room to go up to seven tonnes per hectare. Kenya has a potential of producing up to 12 tonnes per hectare. We are now bridging the realisable yield from three tonnes to seven tonnes before working on the potential,” says Kimani.

Economic and strategic crop in Africa

The new rice variety has also scored another first as a home-grown one by local researchers.

According to Dr Sanni Kayode, a rice breeder and project manager for rice project at African Agricultural Technology Foundation (AATF), this is the first hybrid rice that has been developed by Africans in Africa and for Africans.

PHOTO: AATF



A researcher inspecting rice being grown in Kenya

“It will soon be commercialized and this is an important factor towards realizing food security in the continent. This is also important because we have deficiency in rice and the crop is becoming a crop of strategic and economic importance in Africa,” he says.

Kayode explains that Africa has a rice deficiency of about 12 million metric tonnes. Production is at about 14 million metric tonnes against a consumption rate of about 26 million metric tonnes annually. The deficit, he says, is imported at a cost of about \$5 billion every year which is huge investment for Africa.

Globally, the average productivity of rice is 4.3 tonnes per hectare while in Africa, the average is about two tonnes per hectare which is two times lower than the global average.

KALRO in partnership with the Africa Agriculture Technology Foundation and Maseno University is developing new rice varieties to increase rice production to meet the currently high demand for rice.

The first phase of the project had 15 rice hybrids that have been developed and are at the Distinctiveness, Uniformity and Stability (DUS) test stage with the Kenya Plant Health Inspectorate Service awaiting commercialization. The upland rice variety is part of the second set of the hybrids being developed under the rice project.

The second phase has 127 hybrid rice developed in Kenya and bred in Malindi, along the country’s coastal strip with the capacity to grow all across the country. The upland land is being tested in Busia County, near the border of Uganda under upland/rain-fed conditions and not flooded conditions.

Experts say that with the upland rice, one can harvest 140 bags of 50kg to 200 bags per hectare from the current harvest of about 80 (50kg) bags per hectare.

“Our estimates have shown us that on average, a hectare can yield an extra profit of about \$400 to \$100 with good agronomist practices. We will not just give the seeds to the farmers but we will teach them how to produce it using

the best agronomic practices so they can maximize their profits. If the whole rice system, from the seed companies to the farmers can make profit, then the cost of production compared to productivity is going to reduce. This will make the cost of locally produced rice compete with imported rice,” said the scientist.

Africa has a rice deficiency of about 12 million metric tonnes. Production is at about 14 million metric tonnes against a consumption rate of about 26 million metric tonnes annually

Kenya introduces new potato varieties suitable for French fries and crisps

By **Agatha Ngotho** | angotho@gmail.com

The government of Kenya has released 52 new potato varieties that are specifically suited for making French fries and crisps.

According to the Managing Director of the Kenya Plant Health Inspectorate Service (Kephis) Dr Esther Kimani, this is in response to a growing demand for chips or French fries in the country, driven by a growing middle class with disposable incomes.

"This ever-rising demand has attracted many international hotel chains and restaurants to set up shop in the country. This has created an opportunity for farmers, hence the need for suitable potato varieties," Dr Kimani said in a statement released in August.



She said besides the cooking trait, the new potato varieties are resistant to diseases such as the bacterial wilt.

At the moment, over 800,000 Kenyans are directly engaged in potato production, according to statistics from Ministry of Agriculture with a total of over 2.5 million people directly involved in the potato value

chain in the country. The country produces 2.06 metric tonnes of potato worth Sh10 billion (USD100m) at farm gate and Sh28 billion (USD280m) at consumer level annually.

Despite its economic importance, potato production is constrained by late blight and bacterial wilt diseases as well as unavailability of certified seed.

Seed trade congress set for Cairo

By **Aghan Daniel** | daghan@afsta.org

Preparations for the 19th AFSTA Congress to be held in Cairo, Egypt from 27th February to 1st March 2018 are on high gear.

"We have finally identified a befitting venue for the Congress at Conrad Hilton Hotel and we are optimistic that Cairo will be a historical congress in terms of numbers, pomp and content," said Mr Justin Rakotoarisaona, Secretary General of AFSTA. He added that the local organizing committee led by Dr Abradou Ismail, is making very good progress with a target of hosting over 700 delegates at the annual event.

Set on the magnificent River Nile,



the Conrad Cairo hotel is a stunning landmark in the heart of bustling downtown, offering 614 elegant guest rooms overlooking the Nile from their private balconies.

With extensive range of distinctive event spaces, Conrad is one of the most prestigious business hotels in Cairo.

The award-winning hotel is a preferred meeting venue for international corporations and diplomatic organizations.

According to the Communication Department, articles and advertisements have also started trickling in with key pages of the AFSTA magazine 2018 already receiving bookings for spaces for advertisement. "There is need to ensure that our writers and advertisers send their articles and artworks by early November to avoid missing out on our fourth colourful African Seed Magazine," added the Secretary General.

The Congress registration opens on November 30, 2017.

Nairobi marks the World Breastfeeding Day

By Thomas Bwire | thomas.bwire2015@gmail.com

Health experts have urged stakeholders to prioritize the needs of breastfeeding mothers. In a rallying call during this year's breastfeeding day held in Kibera, Nairobi in the first week of August, experts said that this can be done at different levels of the society starting from the family unit to the highest levels of governance.

In keeping with this year's theme which is: 'Sustaining Breastfeeding Together' it was reported that Nairobi County has gradually achieved an increase in exclusive breastfeeding rates in recent years.

According to Esther Kwamboka Mogusu, the County Nutritionist Coordinator, Nairobi now stands at 78 per cent on exclusive breastfeeding rates above the national rates of 61 per cent.



The most recent according to the Kenya Demographic Health Survey (KDHS) 2014 indicates that ninety-nine percent of children have ever been breastfed.

Experts therefore lauded the government of Kenya for the steps it has taken to enhance uptake of breastfeeding among Kenyan mothers. Recently, the government introduced the breastfeeding mother's bill 2017.

The principal object of the bill is to provide a legal framework on mothers who may wish to breastfeed their children at the work place. This piece of legislation further provides for the right of a mother to breastfeed freely or expresses milk for her infant. The Bill also requires employers to provide breastfeeding employees with lactation rooms to either breastfeed or express milk for their children.

Ray of hope for expectant mothers in informal settlements

By Thomas Bwire | thomas.bwire2015@gmail.com

Expectant mothers in Kibera soon will benefit from a new initiative that will provide them with access to free pre-natal screenings.

Under the \$25,000 partnership, the dwellers in Kibera, said to be the largest informal settlement globally, will have access to hand-held ultrasound, training and advisory support to help the implementers mobilize mothers to seek pre-natal screenings early enough.

The initiative follows the premise that informal settlements have continued to lag behind in providing access to quality

health care services for expectant mothers during and immediately after delivery. This has contributed to high mother and child mortality rates.

Currently, maternal and child mortality rates are about 50% higher in informal settlements than the national figure with an under-five mortality rate of 64 in every 1,000 live births. Thus, "through a range of initiatives across the continent, General Electric Healthcare East Africa is looking forward to supporting better outcomes for mothers and babies across Africa," says General Manager Andrew Waititu.

Most of the health facilities in informal settlements lack appropriate equipment to deal with prenatal and maternal health emergencies, in addition to a shortage of skilled personnel needed to provide emergency obstetric care.

According to World Health Organization (WHO) data 2015, Kenya's maternal mortality rates accounted for 510 deaths per 100,000 live births and an infant mortality rate of 36 per 1,000 live births.

The partnership agreement will be between General Electric Healthcare East Africa (GE) and Charity Shining Hope for Communities Organization (SHOFCO).

Science journalists urged to embrace Pan Africanism

By Sifelani Tsiko | sifelani11@gmail.com

The media in Africa has been urged to embrace Pan-African values that advance local innovations and solutions that can help the continent to attain food security and nutrition in the face of climate change.

Experts speaking at a meeting held last September to discuss the crisis in African agriculture, challenged journalists on the continent to embrace critical thinking, especially when it comes to reporting agrarian issues on the continent.

We need to embrace pan African values and put the continent first in terms of interest and engagement," said Uduak Amimo, a veteran Kenyan journalist and former BBC correspondent.

"As African journalists we need to set the agenda for issues that are African. If we don't, we would have abdicated our role for agenda setting. African journalists are supposed to be feeding not Africa about its own agricultural issues but the whole world."

The Media for Environment, Science, Health and Agriculture (MESHA), a Kenyan-based organisation and the Centre for Science and Environment (CSE), a leading research and advocacy think tank based in New Delhi, India organised the meeting held in Addis Ababa, Ethiopia. African Voices for Climate Change, based in Cameroon, was the third partner in this meeting.

At the meeting journalists and experts discussed wide-ranging issues on the crisis in African agriculture and how best the media could play its role of promoting the growth of agriculture on the continent.



African science journalists interviewing an expert. A call has made to reporters to embrace pan-Africanism to improve on reporting science issues

"You must reflect on the crisis in African agriculture while embracing the Pan-Africanist values in a broader sense and setting goals to make Africa a better place," said a participant.

"The media in Africa must take the bull by the horns and recount the African story in agriculture and share a worldview common to all Africans."

Richard Mahapatra, managing editor of Down To Earth, (CSE) publication, urged African science journalists to carry out research, read and understand materials on African agriculture to remain apprised on the continent's plans to achieve food security.

"Africa and India share so many problems," he said. "We are all facing the food import trap and we have to engage each other on how we can move out of this trap. Climate change is already destroying all efforts to lift Africa from the food import trap. We need to interrogate issues around this and engage our policy makers."

Said Aghan Daniel, secretary of MESHA: "Challenges that we face as African journalists, are the things that should spur us to do more. Is the crisis in agriculture in agriculture or it's in reporting agriculture?" he asked.

"We have to tell it well, in a principled manner. We have to tell the story in a way that examines our home grown solutions as well as others coming from outside."

Aaron Yancho Kaah, a veteran Cameroonian journalist said the African media must take a convincing and engaging stand on agricultural issues such as land, food import policies, climate change responses and others that can help the continent attain food security.

"We must adopt a convincing and engaging stand on agricultural issues facing the continent," he said. "We must influence the thought process on all agricultural matters affecting Africa."

Pan African values have been touted for promoting deeper economic integration among African states.

Good tidings as MESHA members put Kenya on the Global map

By Leopold Obi | leopoldk40@yahoo.com

How do you describe someone who has been at the forefront of addressing a country's environmental matters?

An activist, farmer, information specialist, conservationist or a reporter? Zeynab Wandati is all these, and even more.

Using both the power of the pen and the lens, Zeynab – a Kenyan science journalist working for the Nation Media Group's NTV- is slowly and steadily leading a revolution on day-to-day reporting of science matters in a world that pedestalizes politics and entertainment over science and research.

Media houses across the continent thrive more on political reporting while allocating very little or no space for science and development reporting much to the bane of consumers of media contents. Her TV show "Food Friday" which goes on air every Friday has been the difference as far as addressing food security in Kenya is concerned, and many TV stations have been following her foot steps and initiating such programmes in their bulletins.

Zeynab's efforts and other like-minded reporters to highlight environmental and agricultural matters in the East African country without a doubt bring transformations to hundreds of farming communities in the region, and the world has been impressed by their initiatives.

Last month, Zeynab and Keni Lesa, a journalist from Samoa, were named co-winners of the A.H. Boerma Award by the world food governing body, the Food and Agriculture Organization of



Zeynab Wandati displays the trophy she won at the FAO competition

the United Nations, for their unwavering consistency in addressing agricultural issues in their respective countries. That's not all. Zeynab has won another award this year, an Open Forum on Agricultural Biotechnology. The award was given by the OFAB Kenya chapter on the 24th September.

Also flying the agricultural flag high is Phillip Ketainy, the agriculture storyteller at Kenya Television Network (KTN). Through his weekly agri-magazine segment "The Next Frontier" Keitany has been traversing parts of the country to air food security and agribusiness opportunities since January 2016.

Mr. Keitany was among nine agricultural journalists across the globe who were honoured at the 2017

International Federation of Agriculture Journalists Alltech Young Leaders in Agricultural Journalism Award which took place in Johannesburg, South Africa. He was recently awarded a media scholarship by The World Federation of Science Journalists network that saw him represent Kenya in the 10th World Conference of Science Science Journalists held in the United States last October. Also in the list of award winning members of MESH is Dr Joseph Othieno.

Dr. Othieno, a veterinary surgeon cum journalist who regularly contributes to The Standard, won the maiden Animal Welfare Award - sponsored by the World Veterinary Association in collaboration with CEVA Sante Animale. The award was inaugurated to honour and celebrate veterinary doctors who have gone beyond their professional calling to create awareness on animal welfare. Dr. Othieno joined five other winners from the other continents in Incheon, South Korea, in August where they received the award during a global animal welfare workshop.

Last year Dr. Othieno was the winner of the Vet. of the Year Award (VOYA) besides, a presidential commendation – Order of the Grand Warrior of Kenya –OGW in recognition of his service to the nation.

He pens weekly columns on the Smart Harvest Magazine in the Standard Newspaper which creates awareness on various science issues. It is due to his journalism work that he has gotten these accolades. In addition to the newspaper articles he has co-authored many other scholar papers in peer reviewed journals.

Why only 'helicopter journalists' dare write about this place



A science journalist, Ms Seno Setili from Botswana at work: In some places, journalists operate under very insecure environments such as in Turkana, Kenya

By Kiundu Waweru | wkiundu@gmail.com

Pah. Pah Pah... the gunshots roared.
 "Wee badilisha magazine! change the magazine...!"
 Ordered one of the cops.

Pah. Pah. Pah... the police issue G3 riffles and AK47s spit in hair splitting continuity. In between the mayhem, the cop tells someone to not fear, to just keep on the ground, still.

This was Ken Simiyu, a journalist with Akicha radio which broadcasts in Turkana, the second largest but marginalized County nestled 700km north of the capital Nairobi, being addressed. He was sprawled on the ground next to the police inspector, whose right index finger pulled the trigger in short quick movements. Something hot hit Simiyu, and he felt a burning sensation in his hands and face. He cried out thinking he had been hit by a bandit's, who are known to be sharpshooters and masters of camouflage, bullet.

"Don't be afraid, those are just cartridges," Simiyu remembers the inspector's reassuring words; "he asked me to jump over to his other side, as he covered me from the front."

Though this was not the first time to be caught in a shoot-out in the line of duty between police and cattle rustlers and highway robbers who roam the dry and expansive and one of the most porous Counties in Kenya, Simiyu was very afraid. But he managed to record an audio of the shoot-out and a hazy video, a living 'memento' of the day in the life of a journalist in Turkana. On this day, August 16, Simiyu had accompanied police from Lodwar, the Turkana headquarters as they escorted a truck loaded with goods to Kainuk which is four hours' drive away. Kainuk is one of the most dangerous places in Turkana, where that Tuesday evening, the bandits had attacked travellers. Simiyu was on assignment on this story, when they too were attacked.

"In May 2015, I again was caught in such a melee nearly the same spot. That time, I had accompanied Turkana leaders, including members of parliament and the senator. They were on a mission to quell disquiet between the Pokot and Turkana.

The Pokot and the Turkana are neighbouring communities who have for ages been embroiled in conflict over livestock characterised by daring armed raids. Kainuk strides the border of West Pokot and Turkana Counties, and Simiyu says youths from West Pokot blocked the Kapenguria- Lodwar road, the main lifeline of both Counties for close to a week. Trucks which supply the dry region with food and other stuff had stalled, and the food supplies were rotting.

The leaders were hoping to peacefully negotiate, but they were met with unforgiving gunfire.

"In both of the two occasions, miraculously, no one was hurt," remembers Simiyu.

Tall, dark and thin like a rail, Simiyu is a self-driven journalist, one of the few who work from Turkana. We met him during an Internews journalism training on maternal and newborn health in June. Health journalism, or any other kind of development journalism, is none existent here. This is despite Turkana being one of Kenya's destinations with rich story ideas.

For instance, driving a short distance from Lodwar town, suddenly the tarmac road becomes an unpaved road, then a dusty path as you hit what resembles a desert. During the dry seasons, cars get stuck on sand. When it rains, it pours. Rivers suddenly sprout where only dust existed in what they call laga.

The local women, dressed traditional with necks overwhelmed by bright coloured beads sit under tree shades next

to their manyattas, traditional mud and dung walled structures, the men sprawled in another shade, heads resting on wooden stools, ekcholong, while children play, mostly naked, with their faces mostly covered with flies.

Eye disease reigns supreme. Some of the children have distended tummies, rickety feet, red hair. During a media roundtable organised by Internews Maternal and Child Health project on malnutrition, Cynthia Lokidor, the Deputy County Nutrition Coordinator said that in Turkana, nearly one in every four children under the age of five are wasted (too thin for their height) and one in every four being stunted (too short for their age.)" This condition, exacerbated by frequent and prolonged droughts is well above the World Health Organization emergency threshold of Global Acute Malnutrition.

Turkana is one of the worst places to be a mother in Kenya. It has Maternal Mortality Ratio of 1594 deaths out of one hundred thousand births, which is much higher than the national average at 495 per 100,000.

But these stories are rarely told by the local journalists. They give several reasons why, including the cost of venturing outside of Lodwar. You have to hire a four-wheel drive and police escort for \$150 daily (most of the journalists are freelancers and contributors earning less than \$150 monthly). The stories will only see the light of day when a journalist from Nairobi or from global media dares enough to travel here. The local journals call them 'helicopter journalists.'

Says Peter Warutumo a cameraman with NTV and based in Turkana; "they jet in and out, and do stories which win awards; oblivious that most of these stories we

(Turkana journalists) cannot touch..."

This, they say, is due to hostility from local politicians and other interest groups, as a motorbike taxi rider recently told this writer, huku hamna sharia, this is a lawless place, or on the extreme, as Joan Letting recently found out.

Letting is a young and talented



Surrendered arms: Ken Simiyu of Radio Akicha rummages through an assortment of arms surrendered by warring West Pokot and Turkana communities. During the talks last year in Lobei Kataruk, Turkana County where most people are armed, the participants were asked to lay their guns down as a sign of goodwill.

journalist writing for The Standard. She recently did a story on oil and gas, an emotive subject in the area. Kenya struck the black gold in 2011 in Turkana, and the government is now ready to transport the first oil. The move has opened a Pandora's box. Naturally the Turkana people want to benefit from the find, and politicians have moved in to curry mileage with their followers. In her piece, Letting revealed that two opposing leaders differ on the percentage of the spoils which the Turkana County should get from the sale of oil.

"When I did the story on the differing percentages, one of the camp was not happy. I noticed when I went to cover this camp, I got cold stares and subtle hostility. Someone told me I had been discussed

adversely in a high-level meeting. Another told me to ship out, that my life was in danger."

Letting had no respite but to skip town. Now she reports from Eldoret town, 400 kilometres from Turkana. If there is an important event to be covered in Turkana, she travels at night, hastily gathers the story and beats it fast back to Eldoret.

"If we had an alternative we would not be here," says Simiyu, who hails from Bungoma County. But I guess a man is gotta do what a man is gotta do.

"Like Simiyu, a good number of the journalists in Turkana come from other Counties. Pauline Muthoni, a radio host with Ekeyekon comes from Lamu, a coastal County almost 1000km from Turkana. She attended college in Eldoret and came to Turkana as an intern.

"You know in Kenya, getting an internship has become as hard as getting a job. But no one dares come here due to the harsh conditions." Nevertheless, she bussed in with several other adventurous college mates. They did not last.

Asking Simiyu, Muthoni and Warutumo what drives them, they seem lost in thought and nodding, just smile.

Kiundu Waweru is a health media trainer with Internews in Kenya. Internews' current health reporting work in Kenya, Health Voices Amplified, is supported by the UK's Department for International Development (DFID). Ken Simiyu is one of the journalists trained under the project on maternal and newborn health in Turkana and he has been filing in-depth radio programs on the same with support from Internews. The project also has trained and mentors journalists in Bungoma County, besides building the capacity of DFID communication officers and county health officials in Turkana, Nairobi and Bungoma.

Growing sweetpotatoes in the desert

By Special Correspondent

For many of us, deserts represent dry wastelands where almost nothing can take root, let alone grow and flourish. But for the last three years, Dr. Hari Krishna has been growing sweetpotato in the desert in Abu Dhabi, with considerable success.

Dr. Krishna is a development agronomist and postharvest technologist with over 35 years' experience working in the agricultural sector in India, Malaysia, New Zealand, Indonesia and The Philippines. His passion for agricultural research and development goes way back to his childhood in rural Malaysia, which he recalls as a time of plenty. His mother was an enthusiastic farmer, and provided more than enough food for their family of fourteen with one acre of land.

In 2013, Dr. Krishna went to Abu Dhabi on a short-term consultancy assignment for the Abu Dhabi Farmers' Services, and stayed for four years. He has encouraged the implementation of modern approaches to the production of vegetables, fruit and forages. He also facilitated the introduction of new technologies and new crops that added value to farm income, contributed to sustainability and food security.

Making farms more efficient

Abu Dhabi is the capital and second most populous city of the United Arab Emirates, a region that is well known for its oil and gas wealth. One would wonder: why would a country that can bring in enough food for its entire population from the proceeds of oil and gas exports need to grow food?



According to Dr. Krishna, there is a growing interest in agriculture for food security. The belated Emir and founder of the United Arab Emirates, HH Sheikh Zayed al Nahyan had a vision for agricultural development. During his leadership, he encouraged locals to grow agricultural produce on their farms. As a result, there are more than 20,000 farms in Abu Dhabi, about 20% can grow vegetables. But with this came another problem. The existing farms however use 70% of the ground water but contribute less than 1% of the GDP. Dr. Krishna's role therefore, has been to help strengthen the integrated agricultural system and make these farms more productive through the introduction of new technologies, including the growing of high value crops.

As you can imagine, this can be a daunting task in this hot, harsh arid desert climate. The average annual rainfall of 57 mm falls in about 10 days. June to September are the hottest months of the year, with temperatures going higher than 38°C. November to March are cooler months but even then, the air can be dry, mostly in the interior part of the country. Vegetables are often exposed to heat, salinity and water stress during their growth cycle; and the odds of survival and production depend on managing these harsh conditions with adequate irrigation and good farming techniques.



Pushing sweetpotato into marginal lands

In 2014, Dr. Krishna got the idea of trying to grow sweetpotato in the vegetable production areas. Sweetpotato is one of the most resilient crops, growing well in areas with prolonged dry periods. In November 2014, he wrote to the International Potato Center (CIP) to request sweetpotato cultivars that can potentially grow in drier environments. As fate would have it, the breeding programme in Mozambique had spent many years developing drought tolerant orange-fleshed sweetpotato varieties. He received 11 drought tolerant varieties from the International Potato Center (CIP), and set up trials to see how far into marginal lands he

could push this resilient crop. Most of these varieties were developed and released by two of the 2016 World Food Prize Laureates, Drs. Maria Andrade and Robert Mwangi.

"I remember very well when we got this little package of two kilograms of cuttings. Now we have several greenhouses with multiplication plots and we are harvesting over 25 tonnes of roots from extension farms," Dr. Krishna says.

Out of the 11 cultivars, ten did well and after further trials in a controlled research environment, six were found to be good for commercial production. Cuttings were mass propagated and were planted in extension farms in three locations. The entire production process was also monitored carefully.

As a first quality check, there is a central nursery system, which ensures the quality of the cultivars going out. Any rooted cuttings that are found to be defective or diseased are destroyed. Only disease free vigorous cuttings are released for production.

Cuttings are pre-rooted in a polystyrene tray with potting mix and are ready for transplanting after one week. Each tray holds 220 cuttings. "The plug transplant is the critical component in the successful establishment of sweetpotato in desert farming," explains Dr. Krishna. This is because the nutrient rich potting mix holding adequate moisture acts as a buffer and helps rooted cutting to rapidly acclimatize and grow into the sandy soil amended using cow



manure and some basal fertilisers like superphosphates. Irrigation needs to be carefully controlled during establishment of transplants.

In the 2016-17 growing season, the project expanded to 16 farms around the country growing the most promising cultivars Irene, Erica, Melinda, Sumaia, Kabode and Vita. Preliminary results suggest that all these cultivars performed well with yields ranging from 10 to 25 tonnes/Ha. There is however limitation when irrigation water salinity increases. Yield losses of nearly 50% can be expected in higher salinities.

For desert agriculture, irrigation water is tapped from aquifers through bore wells and drip irrigation is mostly used to grow crops. Currently, there are more than 20,000 farms using drip irrigation for cultivation. Fertigation and chemigation are common practices.

Fertigation is the injection of soluble fertilizers into the irrigation system for plant nutrition, while chemigation is the injection of chemicals such as pesticides to control pests and diseases. In addition, row covers are used to protect the young sweetpotato crop from bird and insect attacks, and from intense radiation to reduce heat stress on young plants during the crop establishment phase.

The main sweetpotato growing period is from October to December with harvesting in January. A second crop can be established in December and harvested in April. This allows farmers to double crop in one season. This helps to increase farm income.

Sweetpotato roots grown in the desert are ready for harvest between 120 and 140 days after transplanting. Manual harvesting is carried out by gently prying out the sandy soils around the roots.

“This means digging mostly by hand with a help of a ‘pharaoh’s stick’ as I call it. This is just a stick with a blunt edge to ease the sand away from the root before pulling it out. The technique has been used in Egypt since antiquity. It prevents root damage from improper harvesting techniques,” Dr. Krishna elaborates. Because most sweetpotato crops are only about 1,000 square metres, harvesting can be completed in two working days.

In a desert environment, postharvest handling of the roots are critical for quality and storage potential. Soon after harvest, the roots are trimmed and washed in four consecutive baths full of water to remove sand particles. This gets the roots clean, and also hydrates them. Humidity plays an important role in postharvest handling of sweetpotato. In the interior parts of the desert, humidity can be as low as 30% drying out roots, which quickly

shrivels and lose their appearance. Because humidity never goes above 60%, manual hydration is critical to help the roots hold their moisture and reduce water loss. To market prepare the roots, they need to be trimmed, washed, sorted and graded into small, medium and large roots.

Some findings from the desert trials

Dr. Krishna's desert trials have yielded interesting findings about the resilience of sweetpotato varieties that were developed for drought and disease tolerance in tropical Africa. "Irene is our best performing cultivar. Yield ranges between 15 and 25 tonnes per hectare from about 130 days of growing depending on the location and quality of irrigation water in which it is grown," he says.

The sweetpotato varieties have remained true to their genetic makeup. For example, Kabode, a variety developed in Uganda, is irregular and knobbly, while Irene is smooth shaped. Both of them retained these characteristics in the sandy soils in which they are grown.

Storage is one of the major challenges affecting the sweetpotato value chain. Dr. Krishna's trials found that washed and cured roots stored between 12 and 15 °C, had reduced incidence of rotting and sprouting even after seven months of storage. Although there were some rots, these could be minimised with increased aeration during storage. In a cool, dark, humid and well ventilated environment, roots may be kept for a shorter duration between one and two months.

For farmers in marginal arid and semi-arid regions, these drought resistant varieties could potentially provide a source of food and nutrition. The vines and leaves can also be fed to livestock. According to 2016 World Food Prize Laureate Dr. Mwanga, sweetpotato and other tropical crops will give good yields as long as they



receive water and are grown in soils that are not too poor in fertility. This applies even in desert conditions where fertiliser inputs are minimal. "In areas where water is limited, poor farmers can benefit from such nutritious crops as OFSP if some irrigation water is available," he says.

His co-laureate Dr. Andrade agrees. She recalls growing sweetpotato in a coastal area in Cape Verde, which was sandy and dry using fertigation and drip irrigation. "I harvested a sweetpotato root weighing 13 kg. There is no problem with sweetpotato as long as you have water and some fertiliser. If you have plenty of solar radiation sweetpotato would love it."

For farmers in marginal arid and semi-arid regions, these drought resistant varieties could potentially provide a source of food and nutrition. The vines and leaves can also be fed to livestock.

STORY AND PHOTO: IPS



Nurse treats cholera victims

Cholera in North-Eastern Nigeria: An Endemic Outbreak

A recent cholera outbreak in North-Eastern Nigeria has resulted in at least 186 suspected cases and 14 deaths as of Sep. 1, according to Borno State's Ministry of Health.

The outbreak, which coincided with this year's annual World Water Week, occurred in Muna Garage, a camp sheltering an estimated 44,000 internally displaced persons (IDPs) on the outskirts of Maiduguri, the capital city of Borno state, according to the World Health Organization (WHO).

A rapid response to the outbreak by Borno State's Ministry of Health, along with WHO and other humanitarian partners, is underway.

The response includes, but is not limited to, establishing cholera treatment centers, distributing statewide diarrheal disease kits, increasing risk awareness and community outreach, initiating oral cholera vaccination campaigns in the camp's affected areas and training health workers on cholera infection, prevention and control (IPC).

Cholera outbreaks are endemic in North-Eastern Nigeria. According to an overview in the Pan-African Medical Journal, such endemic outbreaks are prone to occur in conflict-affected areas where civil unrest has disrupted public sanitation services.

Borno State is one of Boko Haram's strongholds.

Boko Haram terrorists have damaged or destroyed 75 percent of the water and sanitation infrastructure in North-Eastern Nigeria, leaving about 3.6 million people without the most basic water services, according to the United Nations Children's Fund (UNICEF).

Most Northern states in Nigeria rely on hand dug wells and contaminated ponds as sources of drinking water. A cholera outbreak occurs when untreated diarrhea from cholera patients gets into the water supplies, according to the Pan-African Medical Journal overview.

"When children have no safe water to drink, and when health systems are left in ruins, malnutrition and potentially fatal diseases like cholera will inevitably follow," said UNICEF's Global Chief of Water, Sanitation and Hygiene, Sanjay Wijesekera, on Aug. 30.

The best preventive measures against cholera include basic hygiene and sanitation practices as well as access to clean water, according to WHO's assessment. This ties in with the sixth United Nations Sustainable Development Goal (SDG) to "ensure water and sanitation for all" by 2030.

Steps towards achieving this goal involve 'not just keeping up with cases' but also implementing programs to 'prevent further spread and early detection of cholera', according to WHO.

Significantly, cholera outbreaks in North-Eastern Nigeria have occurred prior to the dawn of Boko Haram in 2002.

Mobile App lights the life of pregnant women in Nairobi slums

By Kimani Chege | ezekichege@gmail.com

A mobile telephone application (fondly referred to as app) developed to save lives among pregnant women in a Nairobi slum is already giving dividends hardly two years after its launch.

The software program (officially called mPAMANECH) which was produced under a comprehensive initiative for maternal and child health has continued to gain popularity among mothers and community health workers in Kibera slums and beyond.

The initiative, which involves training volunteers as community health workers on how to collect and analyze data using a mobile phone application have since establishment in March 2016, seen Community Health Volunteers (CHVs) follow up to 307 mothers out of whom 88 with danger signs have been referred, treated and are being monitored at home.

Dr. Pauline Bakibinga is a researcher with the Nairobi based Africa Population Health Research Centre (APHRC) that commissioned a private tech company to produce the App, notes that cases of delayed decision making in referring pregnant women to health facilities has greatly contributed to deaths.

According to Dr Bakibinga, with enough capacity and equipment, CHVs can help in saving many lives especially related to maternal and child mortality.

"The role of the mobile App in improving clinical outcomes has been described and shown to reduce medical errors and increase health care quality. The CHV play a vital role yet they lack adequate health education and therefore decision making is hard, this system improves their capacity to take the right decision in time".

Francis Otieno is the lead programmer for the App that has an open source. He has installed a component that enables



one to get exact geographical location of the data collected through GPS. "The gadgets are connected through internet to a server which in turn gets customized reports," notes Otieno. "The only investment you need is to increase the number of data collectors and the gadgets to reach more geographical areas".

The greatest challenge according to Otieno was that some CHV who are not so tech-savvy have had problems in using the App even though it is, according to Otieno, easy to use and there has been extensive training of the CHVs.

Miriam Omar is one of the trained volunteer community health workers. Every morning, she visits different women in Eastleigh, a semi shanty estate east of Nairobi. She has been nominated by the community to take a few hours of her day to help pregnant women and new born cope with health issues. This is a voluntary position where she gets no pay.

"I make sure I am at the doorsteps of pregnant women by 10 am every day. I start by recording basic measures like blood pressure as well as observing how the patient is doing. I input all the data in the mobile application which aptly advices me on the current situation of the patient. In case of danger signs, the application recommends admission in a government facility."

Unlike some of her colleagues with a lower education level, she finds the App easy to use.

"Initially, we used to carry along a book during home visits. This was cumbersome as one could record everything in a book, keep referring to the text to pick out symptoms and it was hard to give accurate diagnosis. Sometimes you would go home with the book and my children could rip pages off. Now with the mobile application, everything I input is stored in the phone as well as the data is sent to be analysed by medical personnel in health facilities," observes Miriam.

Lessons learnt from this will be useful to improve the quality and the access to essential health services. All information in the application is accessible to the Ministry of Health. Data collected from the mobile phone application is then transferred to a server in which it is processed into maps, graphs and other formats to be used for decision making. A challenge to plan for health care in the slums has since long been to find a system that captures the vital data.

Another factor is of course the quality of care available in the facilities where women turn. The poor state of both maternal and child care services in the slums contributes to the high under-five and maternal mortality. In one study by APHRC, 70 percent of mothers reported to have delivered in a health facility but only 40 percent delivered in a proper facility with trained staff and equipment to handle basic emergency obstetric and neonatal complications. In addition, there are still a significant proportion of births attended by traditional birth attendants, relatives and other unskilled persons.

"This has been a case of tackling one problem at a time", says Dr Bakibinga. "Though government and partners are working on different interventions to reduce deaths, more needs to be done, not least to understand why some women, despite the availability of free maternity services, still deliver from home or choose facilities that lack the proper infrastructure to respond to their health needs."

Breeding mosquitoes to fight malaria

By **Lominda Afedraru** | lominda25@gmail.com

A malaria free mosquito has been created by scientists using genetic technology that causes a disease free characteristic to be inherited by nearly all its offspring raising the possibility of eradicating malaria within a single breeding season.

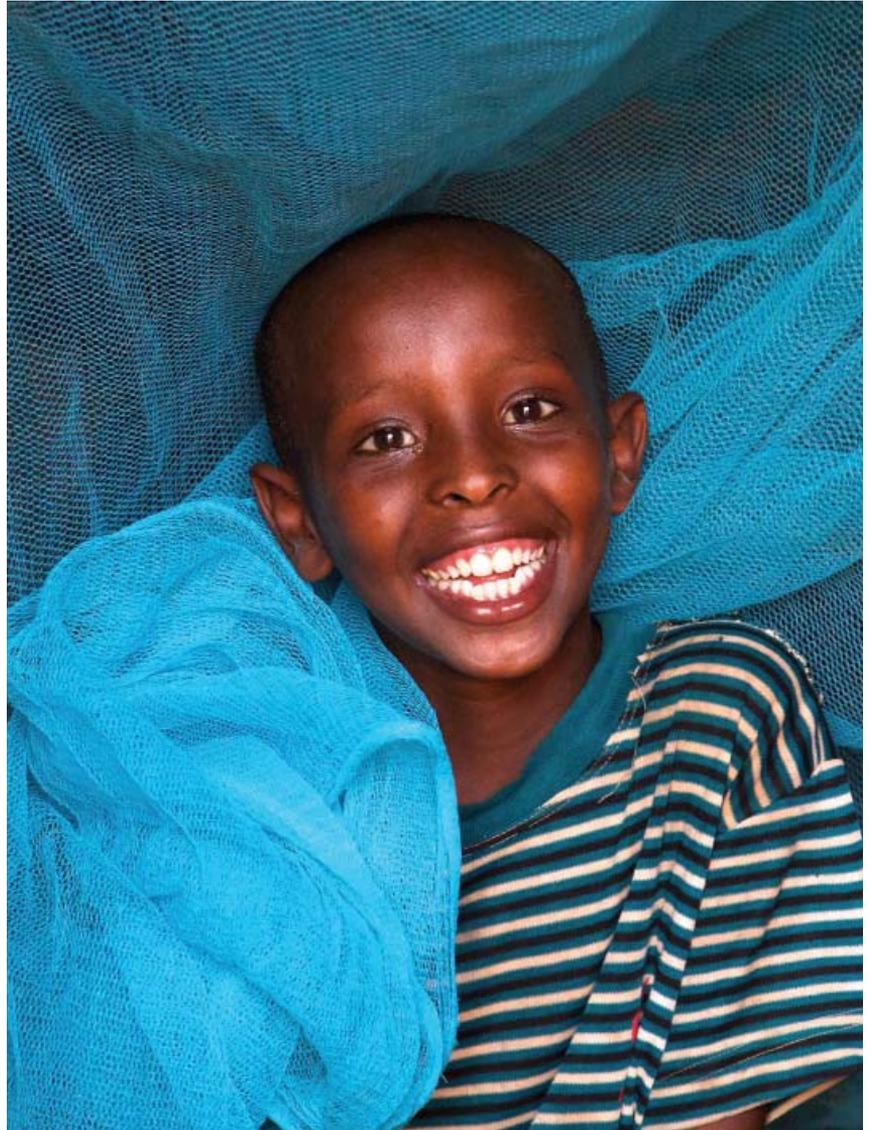
The genetically engineered mosquito is incapable of transmitting malaria to humans and can pass on its disease immunity to 99.5% of its offspring.

The mosquito carries extra genes for antibodies that block the development of the malaria parasite within the insect and so prevent the disease from being transmitted to people when mosquitoes feed on human blood.

Laboratory experiments have demonstrated a method of amplifying the inheritance of the antibody gene that causes the malaria immunity so that all subsequent generations of mosquito are equally incapable of transmitting the disease to human hosts.

This study has been done by scientists in the developed countries like United Kingdom which Scientists at the Uganda Virus Research Institute in Entebbe are currently engaged in.

Dr Jonathan Kayondo the lead research at the institute explains the advances so far reached in their experiment to stakeholders meeting in Kampala during the Biosafety Forum organized by Uganda National Council for Science and Technology that his team is in the process of understanding the mosquito characteristics which helps in spread of malaria and it can be altered not to spread the same.



The study involves application of a target gene which once altered will not necessitate spread of malaria.

Dr Kayondo explains that usually the malaria parasite in the anopheles mosquito takes about one week to develop for it to reach the saliva. If someone has malaria parasites, it infests the mosquito's body to develop the parasite which will be transmitted to human body once the

mosquito bites someone. What scientists are doing is alter the reproductive system of the mosquito not to produce the malaria parasite.

In the process of alteration, once the male mosquitoes mate with female ones, there will be no room for reproduction meaning the population of those spreading malaria will be reduced gradually.



The team is now studying and trying to understand the mosquito population in the country as well as understand the gene flow at the time of mating.

There are two mosquito species that spread malaria namely *Anopheles gambiae* and *Anopheles fenestus* and the study focus is on the former which is more widespread throughout the country.

The scientists are studying the characteristic of inbred mosquitoes for a modification which requires identification of the parasites and how transmission is effected even when modification has been done.

In doing so they have to ensure that the modification allows the mosquito to mate normally and it should not end up transmitting other diseases.

The technology in general is meant to reduce the population of mosquitoes that are transmitting malaria parasites.

The species which are being bred and observed in the laboratory at the institute in Entebbe where collected in the 1950s in Gambia and colonized in the laboratory. The modification created in the laboratory will be in position to infest those that are similar to the species in the wild.

A normal lifespan of mosquitoes in the wild is about two weeks but those that are colonized in the laboratory can take about one month. They are fed on artificial food comprising of blood meal and sugar solutions.

Dr Kayondo explained that the GM mosquitoes bred by scientists in USA is mainly for mosquito species in Asia which may not apply for the species in Africa.

This same study is being done by scientists in Burkina Faso and Mali and once results prove positive, it will help in eradication of malaria parasites in Africa.

Professor Paulo Paes De Andrede from Brazil explained that the GM mosquitoes used in Brazil to contain the Zika virus were developed by a UK science based company Oxitec. The company breeds and releases into the wild male mosquitoes that don't produce viable offspring. When females mate with the GMO males, they lay eggs that hatch but the larvae dies before adulthood.

The company produced genetically engineered line of the *Aedes aegypti* mosquito that carries dengue fever and chikungunya believed to be a tropical disease.

Aedes aegypti also carries Zika, a disease whose symptoms include fever, like dengue.

It has been linked to a birth defect, microcephaly in children born to women infected with Zika.

Trials conducted in Brazil and other countries since 2004 show releasing bioengineered male mosquitoes can reduce the wild *Aedes aegypti* population by 90 percent.

Prof Andede explained that these mosquito species were released in 2015 in Piracicaba, a city about 100 miles northwest of Sao Paulo where the virus infestation occurred. It is controlling the mosquito population in the wild.

PHOTO: NATION MEDIA



One of Nairobi River's distributaries in Congo Kawangware chocking under garbage and sewage

How pollution of Nairobi River endangers lives of city dwellers

By Leopold Obi | leopoldk40@yahoo.com

Away from its swanky glass facades, trendy cafés and ultramodern highways, deep into its neighbourhood, Nairobi's estates convulse in water stress, chaotic settlements and nauseating stench of open sewers.

Hundreds of houses and pit latrines in Kawangware among other informal estates discharge raw sludge into Nairobi River and its tributaries, same water used by peri-urban farmers downstream-in Njiru and Mwiki- to irrigate vegetables consumed by city dwellers.

Last week, the Sayansi team traced the Nairobi waterway upstream, from Kangemi where a seemingly clean water flows unadulterated until it hits areas of Kawangware.

Walking along the river's bank, from Kawangware towards the City, the water grows increasingly darker and murkier

as raw sludge and debris from Gatina and Congo areas of Kawangware, and Sodom in Kangemi run into the river at certain points. But more contamination from garage spillages, surface runoffs and effluence from surrounding buildings get ejected into the riverine around the CBD.

Mr Stephen Mutoro, the Consumers Federation of Kenya (Cofek) Secretary-General, is categorical that it is criminal for anyone to discharge sewage into a water way and blames the lapse on the county government's poor surveillance to put the sanitation mess to order.

Nairobi's sewerage infrastructure laid over 40 years ago; is also old and constrained capacity-wise and thus prone to frequent bursts and spillages which further elevate the risks of contamination of water sources. Mr Mutoro says that due to rampant contamination of water sources, urban farming needs to be licenced to curb

vices such as farming with sewage polluted water. "This however doesn't happen due to lack of surveillance and enforcement which is a county government responsibility," the Cofek boss said.

Mr Gerphas Opondo, the director of the Environmental Compliance Institute, cautions that raw sewage effluence contains industrial wastes, human faeces among other toxic wastes that are harmful to health.

"The waste-water also contain pathogens which settle on the vegetable leaves during irrigation since the farmers carry out open field irrigation," explained Opondo, "most of the sewage treatment plants in Nairobi rely on anaerobic treatment which does not kill the chemical components contained in the sludge thus they end up absorbed by the crops."

He reckons that presence of open sewers in the city raises chances for contamination of the available freshwater resources further dashing any hopes for drilling boreholes.

Contaminated water, according to the World Health Organization, is a breeding ground for cholera, dysentery, typhoid and diarrhoea, one of the main killers of children under five.

While factors driving sanitation havoc in Nairobi can be described as manifold, environmental experts point to the city's shambolic water distribution system as an outstanding let down.

Prof Ratemo Michieka, a veteran environmental scientist at the University of Nairobi, told Sayansi that lack of access to clean water is a key factor pushing peri-urban farmers to use waste-water for irrigation.

Prof Ratemo, a former NEMA director further noted that since many residents were admitted for cholera in the last few month's is a pointer to a deficient sanitation and argues that it was time the government took public health with seriousness.

"Most of the water pipes run side by side with sewage pipes, contamination is likely to happen especially during constructions where excavators hit and break water

PHOTO:TUNZA.ECO-GENERATION.ORG

and sewer pipes, explained Prof Ratemo, "Also surface runoffs during rains mix with clean water in the burst pipes resulting contamination."

And in Nairobi residential sections of Umoja, Mathare, Huruma, Eastleigh, Kibera, Mukuru, Kayole, and Pipeline; piped water mixes with raw sewer as leaking plastic water-pipes run across open sewers. Since the ability of people to actually pay for the full cost of water depends-as it does with anything for sale- on income, the Nairobi's poor community have little option but to contend with a contaminated aqua even if it means they must pay the price by their own lives.

Less than two months ago, the country was greeted to a devastating cholera outbreak that claimed more than six lives in Nairobi alone, while over 400 others hospitalised, two cabinet secretaries alongside other top government officials were among those hospitalised.

A few eateries were later closed down but things returned to normal sooner than later.

However, for those living in the informal areas, life has never been so daunting.

"Sisi tunaishi tu kwa neema ya Mungu," (we are living by God's grace) remarked Caroline Mwendu, a resident of Mukuru slum while pointing at a leaking plastic water pipe running side-by-side an open sewer.

Mwendu, a mother of three who is currently battling typhoid, said that her family either boils drinking water or adds chlorine to purify the water, and hopes that the government will wage war on poor sanitation after the doing away with plastic bags.

In Africa in the Time of Cholera: A History of Pandemics from 1817 to the Present, Myron Echenberg, a retired professor of African History at Canada's McGill University, notes that 5,000 to 7,000 cholera deaths reported every year in Africa represent a failure to provide public sanitation systems and access to clean water.



A section of the polluted Nairobi River as captured in the recent past. The River today, unlike five years or so back cries for urgent attention

And sanitation challenges are set to accelerate with the escalation of slum areas, Prof Echenberg cautions.

Mr David Ong'are, the director of compliance and enforcement at NEMA, notes that sewage management is a pressing problem in many cities in developing countries including Kenya. The main driver in a city like Nairobi, he says, is exponential population growth and urbanization.

"Nairobi's population growth has been accompanied by rapid development of housing units both informal and formal. The sewerage infrastructure in Nairobi is over 40 years old; this poses two immediate problems; natural breaching due to age, and low capacity to accommodate new connections." said Mr Ong'are

The capacity constraints have led to the usage of septic tanks by many households in the city, he says.

He adds that NEMA has taken up both dialogue and enforcement actions with the Nairobi City Water and Sewerage Company and that the company is exploring avenues for upgrading the sewerage infrastructure.

"Unfortunately it is an extremely expensive undertaking and might require a public-private partnership arrangement as one of the options," Mr Ong'are noted.

A Joint Monitoring Programme for Water Supply and Sanitation conducted by WHO and UNICEF in 2015 cautions that access to improved water sources in urban areas of Kenya have plummeted from 92 per cent in 1990 to 82 per cent in 2015. In rural areas, however, access increased from 33 per cent to 57 per cent during the same period.

Despite the city's soaring sanitation, a recent assessment on the NWSC water conducted by the Water Sector Regulatory Board found that 93 per cent of drinking water samples collected from city taps complied with quality standards, which should make the commodity very safe for consumption.

But Eng.Lamarck Oyath, the managing director of Lartech Africa, argues that because most Nairobi residents get water from the NWSC on countable days or don't get at all, it means they get most of their supply of the commodity from vendors.

"But who knows where these vendors get their water and who regulates them?" posed Eng.Oyath.

While Nairobi Water has an option of hiring suppliers to distribute water to areas they cannot access, the firm has failed to do so, and instead remained complacent leaving opportunity for takeover by cartels.

In some instances the cartels in the water sector close water valves in some areas to create artificial water shortage to make business for their water totting venture, claimed Mr.Muturo.

During the deputy governors' debate last month, Mr Polycarp Igate, now the deputy governor for Nairobi County, alleged that NWSC has seven regional managers who are also the same owners of water tankers and sewage trucks.

"The same tankers transporting water also carry sewage which further elevates the risks of water contamination," said Mr Igate during the televised debate.

Attempts to get response from city hall did not succeed despite attempts to contact them.

High cost of TB drug stifles fight against disease



Dr Jackson Kioko Head of the National Tuberculosis Leprosy and Lung Disease Unit NTLD-U addresses participants during the Stakeholders Forum

By Joyce Chimbi | j.chimbi@gmail.com

Jackie Akinyi is one of the estimated 90,000 Kenyans who were treated for tuberculosis (TB) last year with experts saying that the country has made good progress in the fight against the disease.

As is the case for all TB patients, Akinyi's cost of tests and drugs for both drug sensitive and drug resistant TB are catered for by the government where a six months treatment regimen for drug sensitive TB costs about Ksh 8,000 (USD80) per patient and about Ksh 1.5 million (USD10,500) for drug resistant TB.

"I have been very productive since I was put on medication and there is nothing I cannot do now that I used to do before being infected with TB," says the mother of two.

According to Dr Enos O. Masini head of program at the National Tuberculosis, Leprosy and Lung Disease Program, in the past ten years about 1.2 million Kenyans have been diagnosed with TB with 90 percent of them being successfully treated. Over half a million deaths have been averted through early and prompt treatment over this period of time, he adds.

"Though TB is the fourth leading cause of death in the country, drug resistant TB patients treated in Kenya have much better outcomes than in many other parts of the world, with an 80 percent treatment success rate compared to 40 percent globally," says Dr Masini.

Dr. Stephen Wanjala, deputy medical coordinator at the Médecins Sans Frontières (MSF) says that the positive outcome notwithstanding, "it is a high priority issue that we have new, effective drugs available through consistent research and development by pharmaceutical companies." This is especially true in countries such as Kenya where there is also a high prevalence of HIV/AIDS co-infected people that are at even further risk of unsuccessful outcomes of TB treatment, he says.

Against this backdrop, MSF has decried the high cost of the relatively new TB drug, delamanid which is expected to be made available to some developing countries at about Ksh 170,000 (USD1700) per treatment course.

Delamanid needs to be taken with several other drugs to effectively treat drug-resistant TB.

The regimens, without delamanid, already cost between Ksh100, 000 and 450,000 per treatment course at the lowest prices available to developing countries, which is unaffordable for governments.

To help with widespread scale up of Drug Resistance TB treatment, MSF is advocating for a target price of Ksh50, 000 (USD500) per treatment course for drug-resistant TB.

Any TB treatment is free of charge to the patients and is partly financed by the government and by Global Fund to Fight AIDS, Tuberculosis and Malaria and or the United States President's Emergency Plan for AIDS Relief (PEPFAR).

MSF says that Delamanid is one of only two new drugs to treat TB to become available in the last half a century, and is effective against the deadliest strains of tuberculosis that are resistant to many of the other drugs used to treat TB, including Multi-Drug Resistant and Extensively Drug-Resistant TB.

“All countries experiencing relative high burden of Drug Resistant TB should be able to access those drugs in a timely manner as it is likely that among those affected by Drug Resistant TB we will diagnose Extensively Drug Resistant patients with resistance to some of the second line drugs,” Dr Wanjala expounds. Kenya’s first 3 Extensively Drug Resistant cases were diagnosed by MSF and the Ministry of Health in 2014.

Further observing that Kenya, as any other country with Multi-Drug Resistance and Extensively Drug Resistant patients, should be considered as a priority country.

Dr Linda Sato in charge of the Family Care Medical Centre in Eldoret explains that there is a need to embrace advances in science to manage diseases such as TB particularly due to the fact that they are highly contagious in nature.



Ms Rose Kaberia, a survivor of MDR TB strain, addresses health journalists during a training on infectious diseases

Dr Masini explains that delamanid became only the second new TB drug after bedaquiline to be approved in over forty years to treat multi-drug resistant TB in April 2014. Delamanid is given to adults with TB that is affecting the lungs, and which is multi drug resistant (MDR).

“The World Health Organisation recommends adding bedaquiline or delamanid when Multidrug-Resistant TB regimen with four effective drugs cannot be designed and delamanid in patients with high risk of poor outcomes,” he expounds.

However, the availability and uptake of delamanid has been much too limited, he says. Further saying that nearly two years post approval, the drug has reached fewer than 200 patients worldwide.

Otsuka pharmaceuticals, the drug manufacturer has registered the drug only in the European Union, Japan, and South Korea—areas in which relatively few people with MDR-TB live. Registration is pending in China and Hong Kong.

“There are a handful of patients receiving delamanid in South Africa. Nigeria offers Bedaquiline to less than



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10 patients under compassionate use. Kenya, as any other country with multidrug resistance TB patients, should be considered as a priority country," says Dr Wanjala.

Compassionate use refers to the treatment of a seriously ill patient using a new and promising, unapproved drug when no other treatments are available.

Such a drug needs to have shown significant promise in clinical trials but is typically still considered an investigational drug.

According to the World Health Organisation (WHO), the current cure ratio for Multi-Drug Resistant patients in Kenya is about 80 percent.

Dr Masini further says that according to WHO recommendations for the use of new TB medications like delamanid and bedaquiline, "25 to 50 percent of our multi-drug resistance TB patients meet criteria to receive these drugs."

Experts say that this is due to their high-level resistance, intolerance to drugs currently used to treat multi-drug resistance TB. Dr Masini is however quick to emphasize that any country that is eligible for TB financing from the Global Fund and follows WHO guidelines for the proper management of Multi-Drug Resistant TB in quality-assured programs may apply to Stop TB's Global Drug Facility (GDF) to incorporate delamanid into their national treatment programmes.

Further saying that more than 100 countries - Kenya included - may now be eligible to access delamanid through the Global Drug Facility.

"The Ministry of Health has therefore commenced preparations on use of new molecules like delamanid and will in due course train health care workers on its use and make orders for it through the Global Drug Facility," he says.



Patients await a medical check-up at the start of the Kenya tuberculosis prevalence survey in Mshomoroni, Mombasa on September 25, 2015. the results were released today. Kevin Odit | NMG

But the outcry regarding the high price of delamanid notwithstanding, Dr Wanjala says that the country needs to ensure funding becomes sustainable and to rely less and less on Global Fund and PEPFAR.

Kenya also needs to reinforce its diagnostic capacity for both TB and

Drug Resistant TB, train its personnel on managing Multi-Drug Resistant (MDR) and Extensively Drug Resistant (EDR) patients. More efforts are needed to win the battle but we cannot say that Kenya is losing the fight against TB, he concludes.

TEXT BOX

- In a population estimate of 45 million the TB prevalence stands at 266/100.000 and 246/100.000 for incidence (the occurrence, rate, or frequency of a disease).
- TB is a disease caused by a bacterium called *Mycobacterium tuberculosis*.
- The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain.
- Multi-Drug Resistant Tuberculosis is a form of TB infection caused by bacteria that are resistant to treatment with at least two of the most powerful first-line anti-TB drugs, isoniazid (INH) and rifampicin (RMP).
- It thus requires the use of 2nd line drugs with a longer duration of treatment and more side effects.
- Extensively drug-resistant TB is a rare type of multidrug-resistant tuberculosis that is resistant to isoniazid and rifampin, and additionally also resistant to 2nd line drugs from two key groups; the fluoroquinolones and the injectables.

Communities embrace blue economy for food security

By **Diana Wanyonyi I** wanyonyidiana@gmail.com

Kenya's Coastal region has the giant share of the Indian Ocean presenting a huge potential for fish farming hitherto not fully exploited.

The Coastal communities in Kenya, on their part have depended on fishing for centuries to provide employment and food to thousands of households.

It is for this reason that a community in Majaoni area near Mtwapa creek in Kilifi County is embracing blue economy through a practice known as mari-culture which helps in rehabilitating mangrove trees along the tributary of the Indian Ocean.

David Taura is the leader of Community Environmental Sustainable Mari-Culture Self Help Group (COMENSUM) which started in 2012 with 20 members.

"We formed the group to eradicate poverty and to ensure there is adequate food through fish farming, crab farming, bee keeping, eco-tourism and rehabilitation of the mangrove forest destroyed by human activities," he said.

So far they have planted 128,000 mangrove seedlings in 15 hectares of the land near the creek that has been infertile due to sand deposits during raining season and wrong farming practices by the communities living within the area.

Crab culture is another practice here, communities have eight crab cages made of pieces of bamboo sticks attached to empty 20 litre jericans, which act as floaters. Inside one crab cage there are 10 chambers, each holding one crab.

"This is where crab fattening is done, to ensure that they are well fed and meet the required weight and size for our major clients - big hotels in Mombasa and here in Mtwapa," says Josephat Mwanyae, one of the community members. Adjacent to crab culture there are two fish ponds which are 15 meters by 20 meters each, one is capable of holding 1200 milk fish. Milk fish



Mangrove replanted from seedlings through community effort

fingerlings are easily trapped to the pond during the rainy season when the tributary which flows from Mtwapa Creek pours its waters to the Indian Ocean. The fingerlings take between four to six months to mature.

"Milk fish is fed three times a week and are sold when they attain the weight of 250 to 500 grams. We have already harvested thrice and we are also expecting bumper harvest this coming month," adds Mwanyae.

Statistics from the Ministry of Fisheries in Mombasa County indicate that the marine fishery sector has the potential to produce 150,000 – 300,000 metric tonnes of fish annually, but only 9,000 metric tonnes were produced in 2015, compared to countries like Somalia which produced 132,000 metric tonnes the same year.

But thanks to The Kenya Coastal Development Project (KCDP), an initiative financed by the World Bank and the Global Environmental Facility, and hosted by the Kenya Marine and Fisheries Research Institute (KMFRI) with the aim of strengthening the capacity of coastal communities there is hope that Kenya can expand its potential of tapping into the blue economy.

COMENSUM received a KCDP grant of Ksh 4,247,500 (USD41,238). The grant came through the KCDP Component

responsible for community development known as Hazina ya Maendeleo ya Pwani (HMP).

Dr Jacqueline Uku, Project Manager of KCDP, says that coastal and marine resources, if well managed, can contribute substantially to economic growth and reduction of poverty, through the Blue Growth Initiative.

"We have been focusing on vulnerable and marginalized groups and this shows how we fish on regular basis. You will find fishermen out struggling. It's a way of life. It's a culture but then you go to some place and find they have aggregated, they have better gears and they are able to get a better catch," she says.

The main areas of focus of KCDP is to enhance wealth creation and benefits from the blue economy, through support for the commercialization of the marine fishery and aquaculture; support of the infrastructure, and the training of youth and women to tap into the fishery potential.

Bardale Tapata a honorary warden from Kenya Wildlife Service in Mombasa, says that since COMENSUM self-help group started the rehabilitation work, the mangroves are flourishing and now the group has become an eco-tourism and camping site for school children and training site for the public.

Dr. Melckzedek Osore, Manager responsible for community livelihood component of KCDP said that through HMP support, COMENSUM has also received funds to construct and furnish a community run resource centre that will enable the local community to take full charge of protecting the mangrove ecosystem around Mtwapa Creek. Sustainable use of the mangrove trees and related marine resources with involvement of the local communities is the aspiration of the national Blue Economy approach.



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Tel: +254 729 476 072

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