

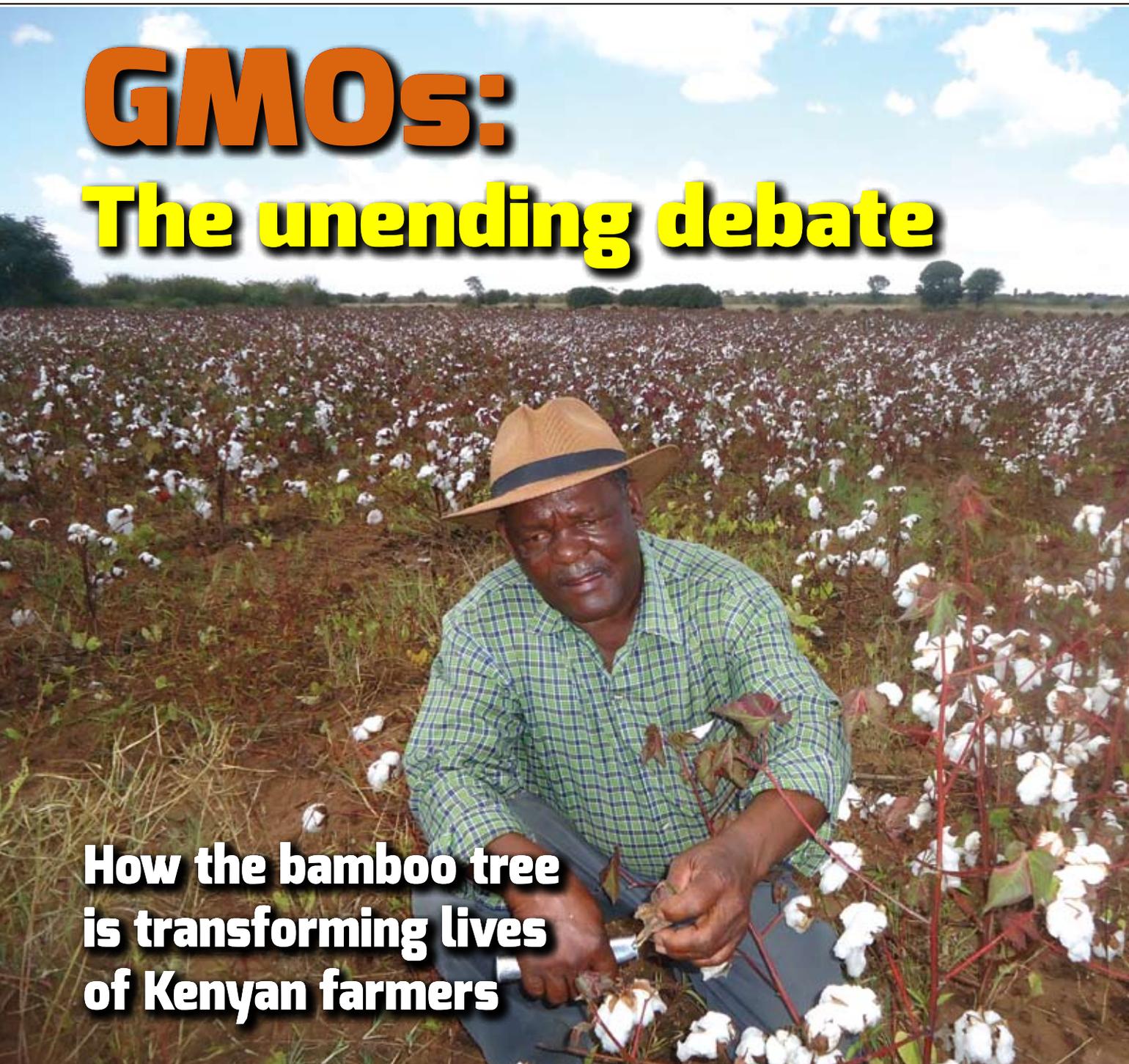
SAYANSI

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Issue No. 3

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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 organization 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 and scientists among other stakeholders in Kenya.

The association emphasizes on rural journalism and communication.

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

MESHA believes that in a democratic society where science must be answerable to the public, there is real need to find new and innovative ways of more effective mass communication about the benefits of science, but also about 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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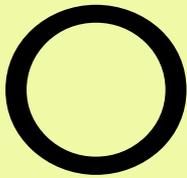
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Let the world attention turn to mitigate the impact of air pollution



ne of the most neglected areas in science journalism in

Africa today is on air pollution.

This notwithstanding the fact that cities across the global South are witnessing an unprecedented surge in air pollution and congestion – largely owing to the increasing numbers of private vehicles in urban areas.

According to the Delhi based Centre for Environmental Science (CSE), Africa needs to worry more about the impact of air pollution in her cities. CSE notes that more than ever before, used cars are being “dumped” in Africa to quench the appetite of a growing middle class. Most of these cars, are more than five years old and are known for emitting dangerous fumes to the environment much to the ignorance of the owners.

Fine particle pollution presents is the biggest health threat in cities causing or aggravating serious respiratory diseases and cancers on various organs. Because of little manufacturing base, the main source of Africa’s air pollution comes from vehicles. Experts are now calling for better urban planning to allow for rapid public transport lanes, bicycles and pedestrian walks, the lack of this mechanisms in place has seen

citizens acquire private cars at an alarming rate.

The World Health Organization (WHO) is on record as having linked air-borne particulate pollution resulting from diesel vehicles to lung cancer. This issue has acquired a critical dimension.

Kudos then must go to the delegates of the just ended (May 26, 2015) World Health Assembly who adopted a resolution to address the health impacts of air pollution – the world’s largest single environmental health risk. Every year 4.3 million deaths occur from exposure to indoor air pollution and 3.7 million deaths are attributable to outdoor air pollution according to WHO. This was the first time the World Health Assembly prioritised such discussions.

The resolution highlights the key role national health authorities need to play in raising awareness about the potential to save lives and reduce health costs, if air pollution is addressed effectively. It also stresses the need for strong cooperation between different sectors and integration of health concerns into all national, regional and local air pollution-related policies. It urges Member States to develop air quality monitoring systems and health registries to improve surveillance for all

illnesses related to air pollution; promote clean cooking, heating and lighting technologies and fuels; and strengthen international transfer of expertise, technologies and scientific data in the field of air pollution.

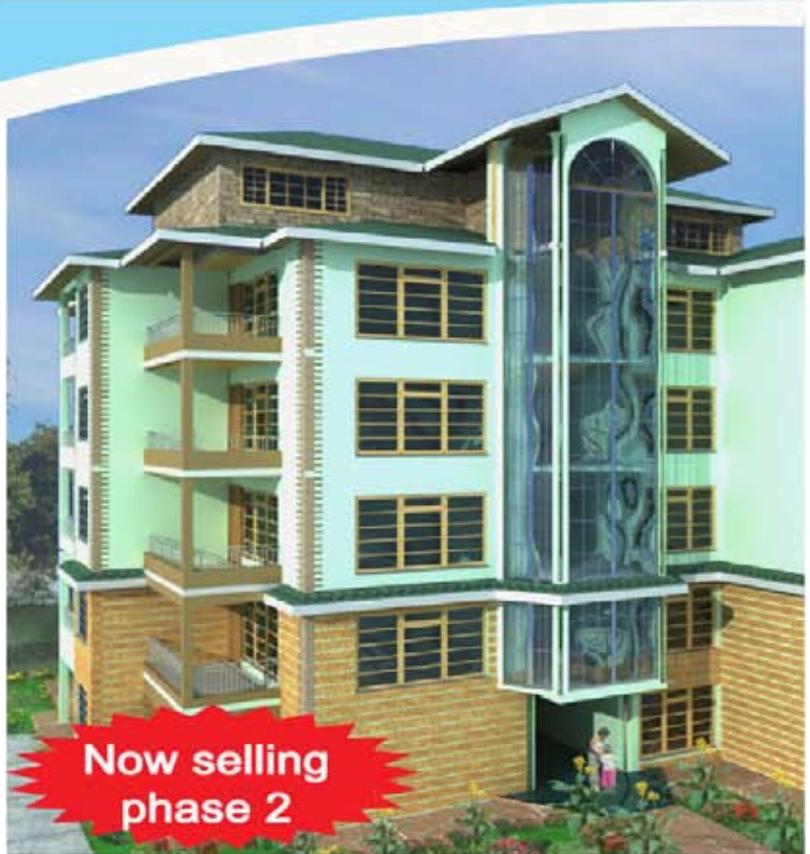
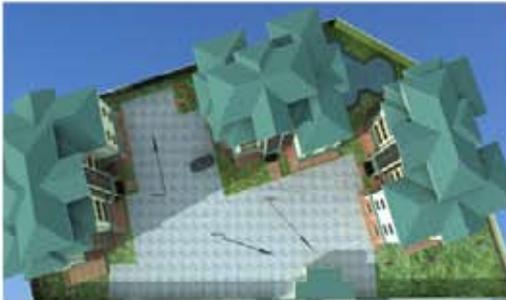
Besides, the resolution asks the WHO secretariat to strengthen its technical capacities to support member states in taking action on air pollution. This includes further building capacity to: implement the “WHO air quality guidelines” conduct cost-benefit assessment of mitigation measures; and advance research into air pollution’s health effects and effectiveness.

That WHO will propose at the next assembly in the coming year, a road map for an enhanced global response by the health sector that reduces the adverse health effects of air pollution can only be lauded by men and women of good will.

We urge journalists to let the world know what WHO and other bodies are doing towards ensuring that the negative impacts of pollution are mitigated.

Aghan Daniel

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GMOs: The unending debate

By Zeynab Wandati

In 1996, the first genetically modified seed was planted in the US. Today, 3.7 billion acres of land around the world are under genetically modified crops, with the US being the largest producer of GM foods. In Africa, South Africa is the biggest adopter of GM technology, followed by Egypt and Sudan.

Genetic Engineering is the most controversial technology to ever hit the agriculture and food industry. While everyone agrees that with climate change and a growing global population, the world needs to produce a lot more food faster, how to achieve that goal is the bone of contention.

Today, 19 years after genetically modified seeds were introduced, 28 countries around the world are growing the seeds and feeding them to their populations. Among those countries is South Africa.

"We need a multifaceted approach to food security challenges and biotechnology is just one of the tools available to the farmer," says Dr. Nompumelelo Obokoh, the Chief Executive Officer of AfricaBio, a biotechnology research organisation based in South Africa. "Biotechnology has proven that it has the capacity to improve yields and we have seen it here in South Africa. Let the farmer make the choice for himself."

By last year, at least 2.9 million hectares of land in South Africa was under genetically modified crop, making her the 9th biggest producer of GM food globally. 86% of the maize grown in the country is GM, as well as 92% of soybean and 100% of cotton.

Bubi Aphane is a farmer in Boekenhoutskloof Oog, in Pretoria. She has a 50 hectare piece of land, most of which is idle. Last year she put two hectares under maize farming, growing genetically modified maize.



Maize is a staple food in most African countries

"We grew up in the rural areas where farming was an everyday occupation but the crops were always plagued by diseases. When I heard about biotechnology and the resistance genes, I thought, why not! It saves you on labour and weeding," she says.

Frans Mallela's story is a little different from Bubi's. He's been a farmer for 30 years in the Limpopo Province of South Africa and was among the first farmers to adopt bt technology when it was introduced in South Africa. He started off on just four hectares but today, he has 150 hectares.



Maize is an important crop worldwide as food and feed

“When I planted conventional maize, the harvest was about one tonne per hectare. Now with bt, we are going up to 7 tonnes per hectare if the rain is good,” he says. “I have done conventional before and now I am doing bt. I have seen both sides and bt is better.”

Maize is the staple food in South Africa, used to make *pap*, the South African version of ugali.

Although the GM technology is considered a huge success having improved yields, the concern about the safety on humans is getting louder. These concerns the GM seed makers say have no basis, because genes introduced into the crops pose no threat to man.

“What we do is we take a protein from bacteria, and that protein is very specific to pests we are trying to control,” Fanie Friis, the Team Leader for Technology and Development for Monsanto Central, East and Southern Africa, said.

“Take maize for example. The target pest is *Buseola Fusca* which causes stalk borer disease. The protein we add to the seed is specific for *buseola fusca* and other lipidopteran pests such that only that pest will die. Not any other pest.

Not man. For humans and animals it is completely harmless because their digestive system can digest that protein,” says Friis.

GM technology involves altering the genetic make-up of an organism in this case seeds using the DNA of other organisms such as bacteria and other seeds, with the purpose of making the altered seed better. This is done in three main ways; the seed is either made herbicide tolerant only or it is made insect and pest resistant or both.

Herbicide tolerance basically means that when a herbicide is sprayed on the crop, the weeds will die but the crop will remain standing. These herbicide tolerant crops are referred to as roundup ready crops. The most common herbicide used on bt crops is called Glyphosate.

Despite the success of the technology in South Africa, there’ve been stories about insects and weeds building resistance to the bt technology, but South Africa says the resistance is in isolated areas that are under control.

“This is not a problem. We are advancing the technology, introducing more genes into the market and stacking them, so it is even more difficult for insects to build resistance,” he says.

Monsanto says that the challenges of resistance came about when some farmers didn’t follow planting instructions properly for instance refuger.

Although the GM technology is considered a huge success having improved yields, concern about its safety on humans is getting louder

A refuger is an area between 200 and 800 metres from the genetically modified crops, on which conventional seed of the same crop is planted. If you are planting bt soybean for instance, there should be another section of the land on which non GM soybean is planted. This section must make up 5% of the total bt crop acreage. The purpose of conventional seed area is to ensure that all pests



coming out of that area to the GM area remain susceptible to the bt technology, and that and that they get no chance to build resistance. If there is no refuger, the pests become resistant to the technology.

Back in Kenya, there is still uncertainty. To adopt or not to adopt ... that is still the big question in relation to genetic modification. So big is the issue that the government put in place a task force to review matters relating to genetically modified foods and advise the country on which way to go.

The GMO debate hit a climax in November 2012, when the then minister for Public Health Beth Mugo imposed a ban on all GM food imports. This ban was based on the now infamous Seralini Paper, which linked GM food to cancer. This earned the government a lot of criticism from the science fraternity, who say that the ban is not in line with the Biosafety Act.

Proponents of GM technology have maintained that it is one of the technologies that the world needs if it is to feed its growing population. By the end of last year, 175 million hectares of land around the world was under biotech crop. Africa accounted for 2 per cent of that land area.

Ethiopia, South Africa, Malawi and Burkina Faso are among African countries that have embraced the technology.

Monsanto and Syngenta are among the world's biggest producers of bt seed, and a lot of anti-GM campaigns have been held around the world, terming these seeds 'seeds of death'

"Farmers in Burkina Faso have benefited greatly from bt technology, says Betty Kiplagat, the Corporate Affairs Manager for Monsanto East Africa. "They don't have to spray pesticide as much as they used to." Since the peer reviewed journal that published Seralini's paper retracted it in 2013 on grounds

that the rats used in the research were prone to cancer anyway, local scientists have been demanding lifting of the ban. Seralini however had the same paper re-published in a different journal last year. But those opposing GMO argue the ban should stay because Kenya hasn't thought through the implications.

"When independent scientists raise concerns of health risks, people look into their character and bash them, yet we need to pay attention to what they are saying," says Wanjiru Kamau, the Policy Manager of the Kenya Organic Agriculture Network (KOAN).

Monsanto and Syngenta are among the world's biggest producers of bt seed, and a lot of anti-GM campaigns have been held around the world, terming these seeds 'seeds of death'.

What bothers the anti-GMO groups is the fact that the producer of the seed owns it exclusively, thereby denying the farmer the right to save and share seeds - to them, whoever controls the seed, controls the food.

"Who owns this technology? How will it affect our food system? If all seed is patented and owned by multi-nationals, how will that affect our control of food? These are questions that we need to ask," says Wanjiru.

Concerns have been raised about the relatively high cost of GM seeds. However, Betty Kiplagat of Monsanto differs "When the people get a seed that is drought tolerant and can be planted in a place like Turkana where there's no water, I assure you, they'll be happy with the technology."

When a taskforce was set up to look into the safety of GMOs in Kenya, local scientists demanded its disbandment, accusing the Task Force chair, Prof. Thairu Kihumbu of bias.

"Every sovereign state looks at its own interest first," Prof. Kihumbu said in an interview last year. "So this idea that GMO is something internationally accepted and therefore we have to adopt, doesn't apply."

Since the GM debate started there have been fears that the seeds and food were already in circulation. The National Biosafety Authority repeatedly said the fears have no basis.

"NBA has not approved any GM product for release in the market," said Prof. Dorington Ogoyi, the Technical Services Director of the NBA. "All approvals we've done so far are for contained use only and that is experimental. So there's no GMO in the market."

The proponents say that those opposed to GMO lack knowledge of science, and with Kenya being food insecure, GM technology holds the key because not only does it produce much higher yields, but also pest resistant crops.

"The truth is that while GM is no silver bullet and can't solve the world's problems overnight, without it, it will be an uphill battle to feed humanity and still be environmentally sensitive," Mark Lynas said when he visited Kenya in 2013.

He is a British environmentalist who was once actively involved in anti GM campaigns, but has now crossed over to the yes side.

The government has not made a clear stand yet, but Deputy President William Ruto has made his stand known.

"You will find very knowledgeable people telling you that they don't want biotechnology because they'll grow extra heads and fingers. This is all a myth," Ruto said.



Proponents say GM crop produce higher yields and are pest resistant PHOTO: © FAO/Y.WACHIRA

With agricultural productivity in the country declining sharply due to shrinking land sizes, Ruto expressed frustration with the farmers' reluctance to let go of the old farming practices in favour of modern technology - such as genetic engineering.

"How do we get Africa to see the benefits of biotechnology to deal with the constant problem of hunger and get farmers out of poverty?" he said.

"For how long will we let our farmers suffer under poor yields yet we have the power to change that in our hands?" asks the Principal Secretary in the Ministry of Industrialisation, Dr. Wilson Songa. The reason you hear all these negative things about GM technology is because the anti GM team speaks the loudest and has the most money. But the truth is, we are dealing with this matter with ignorance. Are you aware that insulin is genetically modified? Stop misleading farmers." Dr. Songa said.

The taskforce completed its report last year and handed it over to the Ministry of Health, but that report has not been released to the public yet. However, a summary of it was presented before the parliamentary committee on health a few weeks ago. The taskforce felt that the safety of genetically modified products had not been fully assessed, and that the country lacks the capacity to do so.

They recommended that the lifting of the ban but on a case by case basis, provided that the government enacts legislation that will ensure proper safety assessment.

Writing in the recently introduced magazine called The African Seed published by the African Seed Trade Association (AFSTA), farmer Gilbert arap Bor says;

"In Kenya, we suffer from a ban on the importation of GM foods since November 2012 - an irrational prohibition grounded in scientific illiteracy. We continue to host field trials of GM cotton, cassava, sweet potatoes, sorghum and maize (corn), but our government has given no indication of when it will permit the commercial dissemination of GM seeds. For years, we've waited, and there's no telling when our wait will end.

Farmers like me would love to use this technology, if only it were permitted. Many of us have met farmers from other countries who have used it. Even those who don't share these personal connections have heard the stories. They are all interested in this technology. Once they see it with their own eyes-weed-free fields and crops that resist the infestation of pests-they'll want it for themselves;

Several research works into genetically modified crops are ongoing with confined field trials for bt maize and cotton having been completed.

Bt potatoes and bananas are currently in the field trials stage.

Bamboo transforming Kenyan farmers' lives

The giant bamboo grows very fast within a short period, its fibrous roots that spread very fast holds the flowing water rehabilitating degraded areas

By Sophie Mbugua

Every time Ms. Jane Kabugi looks at a Muiri tree she has planted in honour of Wangari Maathai, the late environmentalist, she gets inspired.

This is one of the many trees she has planted on several trenches she has dug-out in her compound to guard against run-off, which used to destroy her compound and small farm.

Kabugi, is a mother of two and the chairlady of the Resi women group in Ndakaini, a hilly village in Thika constituency. Her farm is shining example to how the resident of the area can manage soil erosion and benefit from soil conservation. The 59 year old has constructed gabions, terraces, planted bamboo and wood trees around her homestead to prevent soil erosion and retain soil nutrients within her farm.

"The rain water from the upper region used to run all over carrying everything down," she explains "at one point the rain water tore apart a perimeter wall at night and swept all the stones to the river downstream."

In her effort to prevent further destruction, Kabugi dug holes around the water way, planted bananas, fruit trees. Still, this was not enough to hold the soil.

"I noticed my house was cracking due to the erosion, so I dug 4-6 feet holes to harvest the water and manure. I also built terraces and gabions using four truckloads of stones and planted these bamboo trees. I have now found peace," adds a smiling Ms. Kabugi.

Using bamboo trees in soil conservation

Three years ago, in its effort to rehabilitate the Thika- Chania sub water shed that provides water to Ndakaini dam



Ms Jane Kabugi collects the bamboo leaves that she also uses as firewood. The leaves fall on the ground to form biomass PHOTO: SOPHIE MBUGUA

in Thika, the nature conservancy established a 10-year Nairobi-upper Tana water fund. The fund is working with farmers like Kabugi to conserve the area and ensure they reduce the amount of soil that flows into the rivers,

and to retain the soil nutrients beneficial to their crops.

"I started with five seedlings. Today I have over 200 mature bamboos which I sell at Ksh1200 (USD 21) each.



Ms. Kabugi has built terraces in her farm to prevent soil erosion PHOTO: SOPHIE MBUGUA

The soil in my farm has stabilized and water speed has reduced tremendously," she says. "The trenches below the bamboo trees are able to collect water now. Previously, I would make trenches that the rain water would wash away."

Bamboo is a versatile, strong, renewable and environment-friendly giant grass. It adapts to most climatic conditions and soil types, acting as a soil stabilizer and an effective carbon sink.

According to George Njogi, a field conservation coordinator for the Water Fund, Ndakaini village has very loose loam soils that are easily swept away by wind and water. More than 90% per cent of the land is sloppy with rain water running at a very high rate, carrying top soil particles and manure rendering the soils unproductive every time it rains.

"The giant bamboo grows very fast within a short period, its fibrous roots that spread very fast holds the flowing water rehabilitating degraded areas fast," he says. "As the bamboo tree grows, the dry leaves fall down forming a mooching on the top of the soil. Each time it rains, the

rain water meets the leaves reducing its speed. This biomass prevents the top soil from being carried away, holds the water as a sponge and releases the water slowly for a long time. This area will not dry as fast as an exposed area. Over time, this water is released slowly to form the streams," he expounds.

According to Job Kihaba the water engineer at the Ndakaini dam in Thika, there is too much soil flowing into the rivers increasing the cost of cleaning water as more chemicals are needed to remove the turbidity (brown color) in the water.

"Soil erosion affects the quality of water going down the river and reaching the dam," explains Fred Kihara, the Water Fund Director at the Nature Conservancy.

"The upper Tana provides 95 per cent of water to Nairobi city therefore, we want to always provide a water shed that is of good quality that can yield ample amount of water that the city needs," explains Kihara. "We are also making sure there is ample water flowing in the rivers throughout the year to ensure the residents have enough

water for themselves and have enough to supply the Nairobi City."

The USD 10 million Water Fund launched on March 20 is working with government together with the Water Resources Management Authority (WAMA), Tana and Athi Rivers Development Authority (TARDA), the Nature Conservancy (TNC), the International Centre for Tropical Agriculture (CIAT), Nairobi City Water and Sewerage Company, the Kenya Electricity Generating Company (Kengen), East Africa Breweries Limited (EABL), Coca-Cola, Pentair Inc, Frigoken Ltd, United Nations Development Program (UNDP), International Fund for Agricultural Development (IFAD), the United Nations Environmental Program (UNEP), the Swedish Embassy in Kenya together with local implementing partners in both upper and lower Tana.

About 1200 acres of land in the Thika-Chania watershed has already been conserved, 5500 tree seedlings have been given to farmers with plans underway to plant one million trees in the entire upper Tana water shed every year.

Government dominance stifling growth of seed business

Kenya Seed Company controls 70% of the seed market in the country



President Uhuru Kenyatta tours the Kenya Seed Company Ltd stand at the Nakuru ASK Show on July 5, 2013. PHOTO: THE NAKURU DISPATCH

By Zeynab Wandati

There are only 68 crop breeders in Kenya, 25 of who specialise in developing maize seed varieties, 22 in beans and 10 on sorghum. The rest of the crops grown in the country share the remaining breeders. While this number is small and might affect speed of seed production, Kenya is better off than neighbouring

Uganda that only has 11 breeders. This is according to an Africa Seed Access Index released in March, 2015.

It indicates that South Africa, which has 15 breeders less than Kenya has released 310 seed varieties in the last three years, while Kenya has only managed to release 60 varieties. This affects the availability of certified seeds in the market, pushing up the cost.

Dr. Edward Mabeya, the lead researcher for the index says for Kenya's case, the biggest challenge is the strong dominance of the government in the seed business. "This is in the form of Kenya Seed Company, controlling about 70% of the market. This could be stifling competition and limiting potential investment in the seed sector and also makes it much harder for smaller companies to operate."

Dr. Mabeya is also an associate director at the Cornell International Institute for Food, Agriculture and Development.

Hellen Kirarei, a farmer in Cheplaskey in Eldoret, echoes Dr. Mabeya's sentiments. "The seed is too expensive now," she says. "They are selling a 25kg to us at Sh4,500. For a small scale farmer like me, I can't afford that so I can't buy certified seed."

The 60 varieties that have been released into the Kenyan market in the last three years were maize, sorghum, beans and cowpeas seeds.

It takes an average of 37 months to develop one variety in Kenya.

This compared to South Africa's 22 months average is not good for Kenya's seed business, because it means that a seed stays in circulation longer than it should. But seed breeders have often accused the farmers for being resistant to change, case in point the H614 maize variety that has been in circulation since the 1960s. Ideally, a seed variety should be in circulation for a maximum of three years.

"There are many reasons for resistance. One of them maybe the price you get after you sell your commodity and you don't even make enough money to invest in seeds in the next season, Mainza Mugoya, the Programme Officer for the Eastern Africa Farmers Federation says.

He says there is also the issue of falling prey to counterfeit seed, making farmers lose confidence in improved seed varieties."



Mr. Azariah Soi, the General Manager, Simlaw Seed Company, a constituent company of the Kenya Seed Company receives 800 kilogrammes of white label breeders seed of two bean varieties, Kenya Red Kidney and Miezi Mbili from Prof. Agnes Mwang’ombe, Principal, College of Agriculture and Veterinary Sciences (CAVS). The seed varieties were developed by the Faculty of Agriculture PHOTO: UNIVERSITY OF NAIROBI

This Seed Access index is the first in Africa, and has focused on an initial four countries as a pilot. Kenya is compared to South Africa, Uganda and Zimbabwe, using data collected from interviews with seed breeders, policy makers, seed companies and farmers.

The countries are then judged based on 16 indicators, such as policies and laws that govern the seed sector and the availability of seed in small packages for ease of access by small-scale farmers.

The index found that Kenya is the only country that packages seed as little as 100 grams. Kenya, however, scored the lowest points of 38.5 because of fake seed, with 36 cases of fake seed reported in the last three years.

South Africa reported 17 such cases. The seed industry in Kenya is estimated to be worth USD46 million. This is partly why counterfeiters target it. But the biggest challenge the industry faces is lenient punishment for counterfeiters. The highest penalty is only USD 20. It is even more discouraging that the fine is based on an old law formulated in 1952. Although the law has been amended a few times, the fine has never changed.

“In 1952, a fine of Sh2,000 (USD 21) was a big deal because it was a lot of money then. Today, it is nothing. It is a slap on the wrist.” says Kenneth Ayuko, the Deputy Director of Agriculture Policy in the State Department of Agriculture.

South Africa has emerged as a country with the most mature seed industry,

while Zimbabwe’s is taking a nosedive. Kenya and Uganda have been rated for showing good signs of growth, but it needs to improve the policy environment to protect the future of the sector.

Kenya is working on three new policies that are still in the draft stage.

The new laws will increase penalties for violating seed rules to a minimum fine of USD 5.1m.

Some players in the seed business however feel the TASAI is not good enough to be representative of the continent because only four countries were sampled.

TASAI researchers have admitted the shortcomings, but say the index will be done regularly and in more countries in order to give a more accurate picture.



Manderla North in Kenya's North Eastern region has been the scene of recent conflicts over water. PHOTO: PROTUS ONYANGO/IPS

Pastoralists use customary methods to fight climate change

Loss of the rangelands to other uses and the increasing fragmentation of common land are slowly but surely reducing the area left for pasture

By Jane Kiiru

Modernity has resulted in the erosion of historical natural resource management practices without providing a viable alternative for managing competing demands from different groups. This has contributed to loss of animals and people from conflict over pasture and water especially in the Arid and Semi Arid Lands of Kenya.

Loss of the rangelands to other uses and the increasing fragmentation of common land is slowly but surely reducing the area left for pasture. This is undermining pastoralists' time-tested strategies to produce high value foods – milk and meat – under conditions of rainfall variability and to respond to extreme events such as drought. Today we are seeing changes to the climate. The seasons seem to be shifting with greater uncertainty of when the rains will come, or end and increasing events of more erratic and violent rainfall followed by severe drought. The current formal natural resource management system and formal administrative and justice system are not in tune with these changes and in many respects are undermining the ability of local people to respond to climate change.

Discussions on mass irrigation to turn arid counties into agriculturally productive areas have also emerged in the recent past. Consequently, some counties such as Isiolo have bought tractors in readiness

for agricultural production and in the process shift the economic livelihood of the communities from pastoralism to agriculture. But is this what the community wants? Or is it even appropriate for a dryland county like Isiolo, which is a major livestock, producing area? Large-scale irrigation of the drylands is very costly and highly unsustainable often causing major environmental damage as shown by past schemes in Turkana and Tana River as well as in other dryland countries like Sudan and even South-Eastern Australia.

Muhamud Sheikh Mohamed, a Dedha elder from Isiolo endorses the Dedha system, a community driven institution among the Boran pastoralists that ensures the rationale management of the rangelands to ensure livestock find pasture and water in both the rainy and the dry seasons, and even during drought. He believes that this system if supported by the county government will allow the community to better manage climate change.



Armed teenage cattle herder in West Pokot, Kenya

The biggest impediment for communities to withstand the recurring drought is poor natural resource governance

He states that in the past the system was highly recognized by the community and through it they were able to mitigate conflict and save their animals from drought. Access to pasture by other counties was also negotiated prior to their migration. Through the Dedha system, resources were demarcated and land preserved for the drought, dry and wet seasons. He notes that this system was successful, as the communities were able to take and enforce decisions in response to what was happening locally with respect to water and pasture conditions.

“During the Dedha reign, herds were divided into two, with lactating animals grazing near the homestead whereas the rest of the animals were taken further a field in search of pasture and water,” he said.

“When herding the animals, two people were assigned to collect animal dung from the water point to ensure that the water remained clean. If and when the water was finished, the Dedha elders would consult amongst themselves and recommend a different watering point. This process would go on until the drought was over,” he added.

Through the Isiolo County Adaptation Fund (ICAF), supported by the Department of International Development (DfID), the Adaptation Committees have

revived the Dedha customary natural resource management system, which was informed by the resilience assessment undertaken by the Adaptation committees and county government staff. They identified that the biggest impediment for communities to withstand the recurring drought is poor natural resource governance. As part of the process of reviving the Dedha system, the community has also conducted cross border resource sharing meetings with the Counties of Wajir and Garissa to agree with pastoral communities from these areas consensual rules for reciprocal access. This is essential for effective resource sharing and mitigation of conflict.

The Isiolo County government has recognized the importance of the system and is currently in the process of passing a Bill that will give the Dedha’s authority to manage the resources. “We have traditional grazing patterns that include places for the wet season, drought season and dry season grazing the areas that are well demarcated. We have collected all the data and what is remaining is to formalize it and create the structure to govern”, said Suleiman Guyo, County Executive – Agriculture, livestock, Fisheries and physical planning - Isiolo County. “Once we have the areas and institutions to govern, the community will greatly benefit.

Pasture will flourish, animals will be healthy, and there will be control of influx and diseases”, he added.

A recent study undertaken by the Adaptation Consortium has identified the following benefits as result of the revival of the Dedha System: Reduced livestock mortality by 60% as compared to previous years of droughts; Community empowerment, and well managed resources through clearly defined and adhered to rules of the customary institution of Dedha; reduced disease eruptions due to controlled livestock influx from other wards and counties. This has reduced household expenses on drugs by 40%, and resulted in a constant supply of milk during the dry season leading to improved nutrition for the elderly and children, and reduced need for pastoral households to sell animals when prices are low to buy expensive cereals.

The author is the Communication Officer, Adaptation Consortium, Nairobi

World's deadliest natural disasters revealed: Report

Horn of Africa is the most vulnerable region in Africa, with drought related losses and damage worth 4.9 billion dollars in the last 10 years



By Zeynab Wandati

Droughts, floods, earthquakes, storms and tsunamis are the world's deadliest natural disasters.

When they strike, the agriculture sector takes the worst beating. And even though Asia is the most vulnerable region because it experiences at least four of these natural disasters, Africa is the most at risk because it is the least prepared. These were some of the revelations contained in a 16 - page report tabled at the United Nation's World Conference for Disaster Risk Reduction in Japan.

The report focused specifically on the agriculture sector, which accounts for 22% of all economic impacts as a result of natural disasters. Food production suffered the greatest loss and damage in the last decade, with 58 million hectares of crops worth one trillion shillings destroyed.

Sixty per cent of these losses were as a result of floods. Eleven million heads of

livestock were also lost. In sub-Saharan Africa, drought is the most devastating natural disaster followed by floods. The Horn of Africa is the most vulnerable region in Africa, with drought related losses and damage worth 4.9 billion dollars in the last 10 years.

In Kenya, for instance, the drought between 2008 and 2011 cost the country 10.7 billion dollars - Sh980 billion.

What this means, according to the report, is that Kenya loses 3.7 percent of its per capita Dietary Energy Supply after each drought followed by Ethiopia with 3.3 per cent, Somalia with 1.9 per cent, and Djibouti with 0.2 per cent.

By the time the UN meeting was concluding, Japan had pledged support for mitigation and recovery measures for these vulnerable countries.

"Japan has some very good mitigation measures in place. It has suffered from natural disasters and they have excellent mechanisms in place. As we are setting up our own mechanisms, we

are learning from Japan," said President Uhuru Kenyatta of Kenya.

Loss and damage as result of natural disasters is always a sensitive subject, especially for climate related disasters. Vulnerable countries have always insisted that developed countries be compelled to compensate them for weather related disasters because they hold the greatest responsibility for climate change, but rich nations are of the opinion that everyone foots their own bills. Still, the rich countries pledged a USD100 billion annual fund for adaptation and mitigation, but that target has never been reached even once.

But exactly how much global economies lose is not really known, and the numbers vary from source to source. The United Nation's Office for Disaster Risk Reduction reports that the economic impact in the last 13 years is about 2.5 trillion dollars, 50 per cent more than any other estimates ever given.

The Sahel reaps from climate change

Rainfall in some of the affected regions is likely to continue decreasing in the next ten years before peaking again: Study

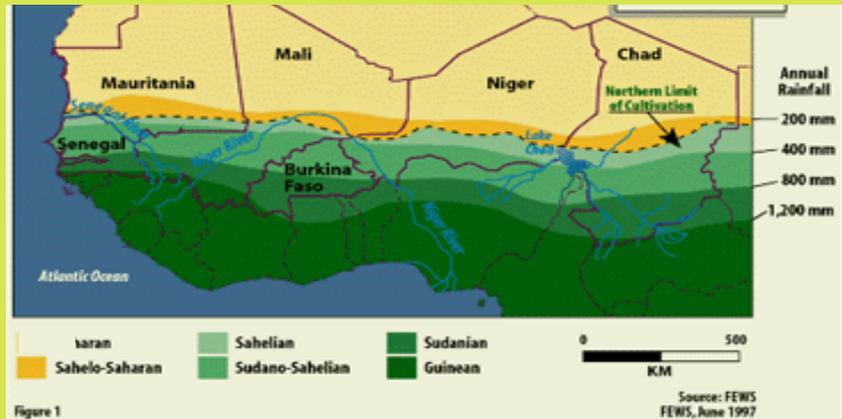
By Maina Waruru

Rainfall patterns and vegetation cover in Sub-Saharan Africa have been changing over the past ten years with central and western African regions experiencing reduced precipitation, with parts in traditionally drier Sahel region receiving increased rainfall.

A study of the region by use of satellite technology has revealed that areas including Congo, Nigeria and Madagascar, have witnessed reduced greenness in vegetation as opposed to those in Sahel countries of Mali, Mauritania and which have seen their vegetation getting greener over the period, thanks to “drastic changes in rainfall amounts”.

The study published for the first time in December 2014 in the International Journal of Climatology also found that East and South Africa suffered similar fate as that of Western and Central Africa, where Kenya and parts of South Africa also showed climate-induced degradation of the vegetation, implying that agriculture-based livelihoods could be becoming difficult in these parts while possibly improving in the Sahel.

Rainfall in some of the affected regions is likely to continue decreasing in the next ten years before peaking again, while in others the decline may persist owing to effects of climate change, the study co-author Professor Heiko Balzter, Director of the Centre for Landscape and Climate Research at the University of Leicester told **SAYANSI**.



“We expect that in some regions of Africa, rainfall is going to decline again over the next 10 years, and then increase again, in an oscillating pattern. In other parts there may be a long-term decline or increase as a result of climate change-the climate models suggest that this will happen but are not all conclusive what happens where,” he said of the mapping done in partnership with Joint Research Centre of the European Commission, the Institute of Electromagnetic Sensing of Environment of the National Research Council of Italy, and the Polish Institute of Geodesy and Cartography.

Parts of East and Southern Africa however recorded some reduced greenness attributable to land degradation as opposed to reduction in rainfall amounts.

“My opinion is at the moment that in areas that we have identified as suffering from non-climatic degradation, people

have to look at ways to improve the sustainability of the land management”.

“In areas of climatic degradation where rainfall has decreased, it is important to examine more resilience to changes in rainfall, perhaps by adapting new cropping patterns”, added Balzter.

The study titled “A conceptual model for assessing rainfall and vegetation trends in sub-Saharan Africa from satellite data” used a concept developed by the research team interpreting satellite observations of rainfall and vegetation greenness at the same time.

While commending the findings, Johnson Muturi a meteorologist specialising in hydrology at the Kenya Meteorological Services (KMS) says that more localised and field studies need to be carried out to complement the team’s findings.

“Satellite technology has a good level of accuracy but more localised field studies need to be carried out to corroborate the satellite observations”, added Muturi.

Balzter agrees that more field studies would be welcome “though the area covered is wide and very vast.”

“Complementing the findings with field data is good, more field studies would be most welcome, It is impossible to sample all of Africa in the field, but if any researchers come forward with local observations over the same time we would very much welcome the rainfall data which are in my view reliable when we look at trends over time, but not as accurate in absolute value,” concludes the professor.



Parts of sub-Saharan Africa to receive less rainfall



High temperatures affect agricultural output

By Zeynab Wandati

In the last few months, Kenya has recorded the highest levels of temperatures, putting the agriculture sector under serious strain.

Turkana county is one of the hottest parts of the country, recording temperatures of above 40 degrees.

The high temperatures spell doom for a country whose economy is agriculture-based. Scientists say the only way to climate-proof the sector, is by investing heavily in resilient crops. Currently there is research focusing on dry land cereals at the Kenya Agricultural and Livestock Research Organisation Centre in Kiboko.

"The crops we are working on include barley, finger millet, palm millet and sorghum," says Dr. Shoba

Sivasankar, the Programme director for the drylands cereals research programme.

The research involves developing hybrid sorghum and millet seeds that can survive in hot temperatures with the least amount of water. And the results indicate that these two crops can thrive in over 40 degrees heat.

"So these are the most climate smart crops. They can tolerate degraded soil," said Dr. Sivasankar.

"When we talk of water stress, this is what we mean; take maize, sorghum, palm millet and finger millet and push through very low water conditions, maize will drop out first," Dr. Eric Manyasa, a cereals breeder, says. He says sorghum may drop out next but after a long stretch.

Palm millet is the most resilient crop because it can survive with even 150mm of rain per year.

The dry land cereals research program is based on a similar project in India, which was overseen by Dr. Sivasankar, and has produced impressive results.

It is run by the International Crop Research Institute for the Semi Arid Tropics, and the local scientists on the program say sorghum and millet provide an excellent alternative for the staple maize, especially now with the Maize Lethal Necrosis Disease threatening to send the maize crop into extinction.

However, research has shown that the MLND causing pathogen is also present in both sorghum and millet, but they say there's no reason to worry about that.

According to Dr. Manyasa, the fact that the pathogen is present does not necessarily mean infection because so far, no MLND symptoms have developed in sorghum or millet.

The drylands cereals research at the moment is centered around developing hybrid seeds, that will suit the different climatic conditions around the country.

India, the US and Kenya are undertaking field trials at the Kiboko Centre, and the hybrids produced are doing well.

"Hybrids have the potential to improve yields by between 30 and 40%," says Dr. Manyasa. He says if we can tap into that yield advantage, we can get more grain to feed into the value chain.

"Some of these crops are not just contributing carbohydrates to the diet, they have micro - nutrient accumulation," says Dr. Sivasankar. He adds, "Iron keeps anemia at bay, zinc is good for the immune system and calcium is important for bone strength."

Sorghum production in the country has been growing steadily over the last few years, hitting the 7 billion mark in revenues by the end of 2013. Currently, there is at least 230,000 hectares of land that is under sorghum production, but no hybrid seeds exist in the market. With this hybrid, the breeders are optimistic that sorghum's popularity will grow.

The Missing Millions

Data is not just for measuring changes, they also facilitate and catalyse that change

By Kiprotich Koros

Findings of a new report indicate that as many as 350 million people living in extreme poverty could be completely missing out in government statistics worldwide. The report *The Data Revolution; Finding the Missing Millions* points out the limitations of traditional data gathering tools such as censuses and calls for the incorporation of new technologies such as phones, drones and satellites to gather crucial data for national planning.

By design, governments usually do not gather data from hard to reach communities such as pastoralists and those in conflicts, says Ms Elizabeth Stuart, a co-author of the report. Substantial errors also occur while extrapolating data.

"Data are not just for measuring changes, they also facilitate and catalyse that change," the report says.

"Of course, good quality numbers will not change people's lives in themselves. But to target the poorest systematically, to lift and keep them out of poverty, even the most willing governments cannot efficiently deliver services if they do not know who those people are, where they live and what they need. Nor do they know where their resources will have the greatest impact," the report reads in part.

Kenya, Ethiopia and India have revised their national HIV prevalence rates down by 20% after it was realized that data was extrapolated from groups for which such testing was mandatory such as pregnant women.

In 2013, Kenya revised its GDP for the previous year to 53.4 billion; 25% higher than previously estimated thereby becoming a middle income economy. This allowed Kenya to renegotiate a loan with the International Monetary Fund (IMF). Ms Stuart says that "good data pays for itself."



Planning for people: Millions of people still miss in national statistics globally
PHOTO: UNIVERSITY OF NAIROBI

The IMF notes that investing in better quality data can result in reduction of borrowing costs by as much as 20%. Kenya, for example renegotiated for a new loan with the IMF after it rebased its economy.

Netherlands conducted its 2011 census entirely using data from registers such as housing and land registers and records from the central bank with only 15 staff. The census cost only 1.4 million euros.

Ms Stuart says underinvestment in National Statistical Offices (NSOs) especially in developing countries is to blame for the situation with some countries having less than 20% skilled statisticians in NSOs.

In 2011, Kenya launched the open data initiatives meant to open up government procurement data and expose price differences. It is estimated that this could be saving the government as much as USD 1 billion every year.

The ability of people to generate, access and understand information can also help tilt the power dynamics between citizens, the private sector and government.

Young Kenyans are known to be active on social media platforms such as Facebook and Twitter.

These platforms as Ma3route are being used creatively to report traffic flows in various parts of the city. Such data can be used as part of feedback to help bring about reforms, the report says.

Another application called MFarm regularly gives farmers critical information such as when to plant their crops. MFarm and Ma3route were developed by ihub, an innovation hub for the technology community based in Nairobi and is part of a greater revolution placing Kenya as one the most vibrant IT hubs in Africa.

While traditional data capture may be more accurate in some aspects, sometimes it takes too long before they are made available. Modern ways of capturing data using tools such as using smartphones can be faster, inexpensive and useful in making decisions.

The report calls for the opening of a secret World Bank database containing over 600 representative household surveys that is only accessible to its staff and consultants.

Over half of 25 developing country NSOs surveyed recently did not follow international standards while a fifth did not have quality control in place.

Car Explosion Fuelling disease in Cities

Pesticides have been detected in mother's milk due to environmental and food contamination



Non-motorized infrastructure at the UN Avenue, Nairobi: Most road designs give advantage to vehicles over pedestrians and public service users. PHOTO: UNEP

By Kiprotich Koros

African nations have been told to take lessons from its Asian counterparts and stem air pollution in cities before they get out of hand.

More than ever, used cars are being “dumped” in Africa to quench the appetite of a growing middle class. Most of them are more than five years old emitting dangerous fumes to the environment.

Fine particle pollution presents is the biggest health threat in cities causing or aggravating serious respiratory diseases and cancers on various organs. Because of little manufacturing base, the main source of Africa’s air pollution comes from vehicles. Experts also called for better urban planning to allow for rapid public transport lanes, bicycles and pedestrian walks, the lack of which is seen as an incentive driving the acquisition of private cars.

Prof Shem Wandiga, a leading researcher at the University of Nairobi warns that air pollution can interfere with the reproductive health of residents in highly polluted areas such as Nairobi and its environs.

“Research carried by the University of Nairobi shows that these types of chemicals though taken in small quantities are a big concern to us as some of them will interfere with the reproductive systems of the residents,” said Prof Wandigah.

There is also concern over high levels of DDT pesticides in the air released from incineration of stockpiles from obsolete dumpsites, added Prof Wandiga. Pesticides have also been detected in mother’s milk due to environmental and food contamination, he said.

He was speaking during the First Africa Dialogue on Air Pollution that was organized by the Centre for Science and Environment based in New Delhi jointly with the Media for Environment, Science, Health and Agriculture (MESHA). More than 50 science journalists drawn from across the continent and experts on air pollution attended.

“Air quality monitoring is still limited and evolving in our regions,” says Ms Anumita Roychowdhury (inset), Director, Centre for Science and Environment (CSE) based in New Delhi. African cities particularly lack consistent data on the level of air



pollution, with most studies conducted disparately by various international organizations, the meeting heard.

Prof Wandigah says that experts are worried that children born in the heavily polluted areas may not live to see their 50th birthday. “The chemical emitted from the vehicles are acidic in nature and are corrosive and they will react with body tissues and hence increases cases of asthma and deadly lung diseases,” he said.

Air pollution in countries such as India and China are at critically high levels with close to half of the urban population breathing air with killer particles exceeding the recommended PM 10 levels. At least six African countries are now considered among the fastest 10 growing countries in the world and it is

feared that pollution may get out of hand if no proper planning is put in place.

“Reported pollution levels in African cities are lower than some of the worst hit cities in India. But they are still much higher than the stringent WHO guidelines. PM10 levels are 7.5 times the WHO standards in Dakar, 5 times higher in Accra, 6 times higher in Lagos, and more than 3 times higher in Johannesburg and Tunis. In New Delhi levels are 10 times higher,” said Ms. Roychowdhury.

It is estimated that 176,000 premature deaths in Africa is due to air pollution. In Nairobi, economic losses associated with air pollution are estimated at USD 1.2 million annually from illnesses and deaths, according to a study by the University of Nairobi.

Traffic jams in cities costs a lot in lost man hours and fuel estimated at USD 15 million per day in addition to increasing air pollution. City planners advocate for use of larger capacity vehicles as they can carry more passengers. One way of encouraging people to use public transport is designating bus rapid transit. This is still however lacking in many African and Asian cities.

A bus rapid transit is currently under construction in Dar es Salaam at a cost of USD 146.5 million. The project which began in 2012 will cover a total of 21 kilometres in its first phase and will have a total of 29 stations and three trunk routes. Residential areas will be connected through 10 feeder routes. A total of 148 buses will be deployed each with a capacity to carry 40 passengers.

The county government of Nairobi has previously hinted that it plans to introduce bus rapid transit and train system within the city.

The county government is said to be in talks with JICA to fund the construction. The recently constructed Thika Superhighway although having cycle tracks lacks designated bus lanes does not have bus rapid transit. Pedestrian walks have also been encroached by hawkers in some sections. Road designs also give advantage to vehicles over pedestrians and public service users. Countries like Senegal are leading the way in air quality monitoring with about five stations and a mobile air monitoring van. Results are communicated to the public through a simple index.



A bus terminal in Kampala, Uganda: Lack of reliable public transport has seen more people buy private cars, congesting cities.



A bus on Waiyaki Way, Nairobi emitting thick exhaust fumes: Exhausts gases discharged from engines running on diesel contain several constituents that are harmful to human health and the environment. PHOTOS: UNEP

Efforts to develop low cost air quality monitoring systems are underway. “Our cities however need to bridge the gap in data availability to citizens and also assess personal exposure,” says Ms. Roychowdhury. But “there are enough evidences out there for us to act and protect public health,” she notes.

Designating bus lanes for rapid transport can encourage people to use public transport

According to American Cancer Society data “a mere increase of 10 microgramme per cum of PM2.5 can increase the risk of lung cancer by 8 per cent, cardiopulmonary deaths by 6 per cent, and on all deaths by 4 percent.

Particulate matter, or PM, is the term for particles found in the air, including soot, smoke, dirt, dust, and liquid droplets. Studies have also linked conditions such as diabetes and high blood pressure to increase in air pollution. Injuries and deaths is another reality associated with road transport.

In Nairobi 50-70 per cent of road fatalities are pedestrians, far much higher than global estimates. In Africa the average is 38 per cent. 85.5 per cent of registered vehicles in Kenya are personal with about 200,000 vehicles being imported into the country annually. The number of registered motor vehicles stood at 2.25 million in 2013. 39 per cent of air pollution in Kenya is caused by traffic.

Diesel cars emit more nitrogen oxide, classified as Class I carcinogen for lung cancer. Countries like China have banned diesel vehicles in an effort to reduce pollution.

In Sri Lanka, higher duties are imposed on diesel cars. In several European countries, tax on diesel vehicles is higher than that of petrol vehicles.

Will Ebola crisis change public leadership?

A strong public opinion has been mobilized and with Ebola now a household term, there is simply no turning back



By Bernard Pécoul

While the epidemic peak of the Ebola crisis slightly begins to wane and with it potential avenues for treatment beginning to emerge, the global health community simply cannot go back to business as usual.

A strong public opinion has been mobilized and with Ebola now a household term, there is simply no turning back.

A hard stance is being taken on many fronts, including policy makers, scientists, pharmaceutical companies, philanthropists, civil society members, global health experts, and journalists to ensure that beyond this one crisis, the lessons learned from several hitherto seemingly unrelated public health issues be brought together and examined with the same scrutiny.

But we cannot stop there; a comprehensive and lasting solution could be at our doorsteps but requires a serious look at what is not working currently, and what is!

Today's unparalleled convergence of innovation and access crises, notably antimicrobial resistance, Ebola, hepatitis C, and all neglected diseases – requires a substantive response that is in tune with the reality of the currently broken innovation system, as well as the shifting of wealth and poverty to middle income countries, and all that this entails.

Admittedly, it is challenging to 'connect the dots' and paradigm shifts are generally seen in hindsight. We cannot afford to wait for that hindsight.

Greater mobilization by governments and global health stakeholders is vital to securing the political and financial commitments required for the solutions proposed today to address public health priorities in a sustainable way with public leadership at the helm.

Recent member state discussions at the World Health Organization's Executive Board show that there is a political momentum.

The Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, which proposed the elements for public-driven sustainable research and development for poverty-related diseases, has been extended to 2022, essentially maintaining its importance and scope on the political agenda.

The follow-up to the Consultative Expert Working Group (CEWG) on Research and Development: Financing and Coordination (CEWG) process received strong moves of support with funding commitments and consensus over the establishment of a pooled fund for R&D programmes. Ebola was brought into the discussions, elucidating the urgent need for a sustainable mechanism to ensure innovation is timely and access secured.

A draft global action plan on antimicrobial resistance was tabled, and sets out far-reaching objectives, which call for a rapid, high-level global political response to stimulate R&D.

The recent WHO Neglected Tropical Diseases (NTD) report has also placed great emphasis for the need to invest both politically and financially, calling for innovative financing mechanisms and endemic country investment, notably from middle-income countries, where the majority of the poor, and thus the majority of NTD patients, reside.

Draft global action plan on antimicrobial resistance calls for a rapid, high-level global political response to stimulate R&D

As the frontiers of poverty, disease, and policy and market failures are blurring, we see that the commonality between 'traditional' poverty related diseases and emerging global health crises (for example Ebola, or hepatitis C) all point to patients for whom there is no, or insufficient innovation, and who lack access to adapted treatments.

They point to patients who deserve to benefit from anticipation, from innovation in R&D in the way it is prioritized, coordinated, financed, and conducted, and certainly from the way it is made accessible to them.

The conditions are present now, and we could be at the brink of 'connecting the dots' with a framework for a global, adapted response to the innovation and access crises with: Patient-needs driven priority setting; De-linkage of the cost of R&D from the price of products delivered; Integration of global health R&D monitoring, coordination, and financing; Creation of a more enabling regulatory environment to expedite approval of essential medicines; Setting up of sustainable financing mechanisms, including through a global health pooled funding for long-term innovation.

The author is the Executive Director, DNDI

APHRC wins UN Population Award



Dr. Alex Ezeh, Executive Director, APHRC

The African Population and Health Research Center (APHRC) has won the 2015 United Nations Population Award. The award, established in 1981, is given annually to individuals and institutions for exceptional work and achievement in the fields of population and health. Thoraya Ahmed Obaid, a former Executive Director of UNFPA, also won the award.

"This is an international recognition of 15 years of APHRC's contribution to a better Africa through quality research, and results-based strategic communication and policy engagement. It underscores the relevance of the organization's mission, which is to be a global center of excellence, consistently generating and delivering scientific evidence for policy and action on population, health, and education in Africa," said Dr Alex Ezeh, Executive Director, APHRC.

Previous laureates of the prize include outstanding demographers, family planning associations, researchers, policymakers, grass-roots organizations, development agencies and national leaders from all over the world.

APHRC is a leading pan-African research institution headquartered in Nairobi, Kenya, that conducts high quality policy-relevant research on population, health, education, urbanization and related development issues across Africa. APHRC actively engages policymakers and other key stakeholders to achieve measurable policy impacts and ensure decision making across the continent is informed by rigorous evidence.

Over the last decade, APHRC has contributed to a better Africa through quality research, and results-based strategic communications and policy engagement.



Kenya Science Journalists Congress 2015

23-25 November 2015, Eastland Hotel, Nairobi-Kenya

Experts call for global research fund for neglected diseases



The current R&D system, which relies on monopolies and high prices does not work for people who fall outside of the market-based paradigm

By MESH A Writer

A group of renowned global health experts are calling for the creation of a global health research and development (R&D) fund and mechanism to address deadly gaps in innovation for emerging infectious diseases such as Ebola, anti-microbial resistance, and a host of other diseases that have been neglected by the pharmaceutical market. The call comes at a time when these and other public health challenges are high on political agendas.

In an article published in *PLOS Medicine*, the experts argue that recent proposals to tackle R&D gaps are too fragmented, while failing to adequately address issues of affordability, access and efficiency in the R&D process. The authors include experts from MSF and DNDi, as well as public and private research institutions, government officials, non-governmental organizations, and academic groups from Europe, China, India, and South Africa.

“Over a year into the crisis in West Africa, therapeutics and vaccines for Ebola

remain experimental, the pipeline for new antibiotics is dry, and many diagnostics, treatments, and vaccines for a range of other neglected diseases are archaic, unaffordable, or non-existent,” said Dr. Bernard Pécoul, Executive Director of DNDi. “Various initiatives to tackle these gaps are being discussed but there is a risk that this will further fragment efforts to accelerate R&D for desperately needed new health technologies. A coordinated approach is crucial.”

The authors propose a fund and mechanism that can act as an “umbrella framework” to cover all disease areas that suffer from chronic under-investment in R&D. This “pooled fund” should complement existing funding mechanisms and secure long-term and sustainable financing primarily from governments but also other donors. It should be owned and overseen by governments with a strong link to an inter-governmental agency like the WHO, but private and philanthropic actors and civil society should be involved as stakeholders. Existing multilateral funds can serve as models,

such as those created to scale up delivery of treatment and prevention programmes in developing countries like the Global Fund to Fight AIDS, Tuberculosis and Malaria; Gavi, the Vaccine Alliance; and UNITAID.

“We need strong public leadership to fix our broken R&D system, which relies on monopolies and high prices and does not work for people who fall outside of the market-based paradigm,” said Dr. Manica Balasegaram, Executive Director of MSF’s Access Campaign. “Instead of a chaotic patchwork of new R&D mechanisms and funds linked to specific diseases, we need to effectively channel these efforts towards cohesive, needs-driven innovation that ensures equitable access for patients.”

The authors argue that the proposed fund and mechanism must take an independent approach to priority-setting, monitoring, and coordination of R&D, and be based on the principles of open knowledge innovation, fair licensing, and the de-linkage of the final price of a product from R&D costs.

Keep the faith, AIDS vaccine researchers say

A vaccine is the best hope for zero new HIV infections but safety is the biggest challenge in the development of the vaccine



Dr. Kundai Chinyenze, Medical Director, International AIDS Vaccine Initiative

By Sophie Mbugua and Aghan Daniel

The story of vaccines did not begin with the first vaccine, but with the long history of infectious disease in humans, and in particular, with early uses of smallpox material to provide immunity to that disease.

Developing a vaccine is a long and a complex process often lasting 10-15 years or even more depending on the vaccine. Researchers such as Edward Jenner's innovations method underwent medical and technological changes for over 200 years, and eventually resulted in the eradication of smallpox.

Prof Salim Abdool Karim and Prof Quarraisha Abdul Karim of South Africa, in their fight against HIV/Aids took 17 years to develop a Microbicide gel that empowered women against their physically stronger male partners who would often push them into unsafe sex.

Given the efforts put towards developing a HIV/Aids vaccine in Kenya, researchers have called on the public to keep the faith that an AIDS vaccine will be found.

"A lot of focus has been on management in the belief that it alone could achieve zero new infections," explains Professor Omu Anzala, Director of the Kenya AIDS Vaccine Initiative (KAVI) Institute of Clinical Research and lecturer at the University of Nairobi.

"You have to remember that this is a marathon. Malaria for example has been around since the 1800s and still we don't have a licensed vaccine," says Prof Anzala. "For us we want a vaccine that will prevent infection not a vaccine that will prevent the disease."

A tall order it might seem to be, he argues, given the success of treatment is predicated on human behaviour. "The patient needs to faithfully take their Anti-Retroviral drugs as prescribed in order to keep their viral load low and reduce their chances of transmitting the virus. If their sexual partner is on Pre-exposure prophylaxis, they need to take their drugs as prescribed, for the period advised, in order to remain HIV-negative."

In 2013, there were 2.1 million new infections in Kenya accounting for five percent of the cases world wide, according to the United Nations Programme on HIV/AIDS (UNAIDS).

Professor Anzala notes that a vaccine is the best hope for zero new HIV infections but admits safety is the biggest challenge in the development of the vaccine.

Unlike malaria, HIV/AIDS is manageable but not yet incurable. Unlike the measles or polio vaccines which use attenuated version of diseases to prevent the diseases from developing, to do so with the HIV virus, Dr. Kundai Chinyenze of the International AIDS Vaccine Initiative says, would be reckless.

"It's a smart disease. It's able to mutate; which could result in you acquiring an additional strain."

Unlike other vaccines therefore, an AIDS vaccine should not only prevent the disease, but prevent infection on exposure to the virus.

The ability of the virus to mutate is another challenge that has faced researchers as a vaccine would need to be apply universally. "I often get asked why the same ARVs can be used by South Africans who primarily contract the C strain and Kenyans,

majority of whom have the A strain and why if that's the case, we haven't been able to do the same with vaccines but you have to realise that with ARVs we're dealing with the enzymes which are defined," Chinyenze explains.

That being said, enormous strides, both Chinyenze and Anzala say, have been made in the search for a vaccine.

"There was a vaccine tested in Thailand that resulted in 31 percent efficacy, which is of course not good enough given vaccines usually have an efficacy of 80 percent and above, but it's the closest we've ever come," Anzala says.

The discovery of an 'elite', very minimal, Anzala says, population of persons infected with the HIV virus, "out of thousands we tested here, we only got two from this group," who manage to keep their viral loads low without ARVs, has also led to significant advancement.

The development of an Ebola vaccine for instance, Chinyenze says, is a process that has been greatly aided by research into the development of an AIDS vaccine.

"They might not go round announcing it but 80 percent of the progress they've made is off the back of AIDS research," she says.

KAVI is therefore equipped to expand their research into the development of an Ebola and Marburg vaccine and soon, maybe even cancer.

"So what we're saying is that we haven't wasted the last three decades or so. We've made tremendous progress and we'd like you to celebrate the milestones with you as we head toward the finish line," Anzala encourages.

Campaign to eradicate devastating livestock disease launched

Annual global losses from the disease range between \$1.45 billion and \$2.1 billion



Peste des petits ruminants (PPR) is a highly contagious and infectious viral disease of domestic and wild ruminants

By MESHA Writer

The Food and Agriculture Organization (FAO) and the World Organization for Animal Health (OIE) are working on a 15-year strategy to eradicate the Peste des petits ruminants (PPR) by 2030, experts told an international conference in Abidjan, Ivory Coast held from 31 March to 2 April 2015.

The deadly disease afflicts sheep and goats driving poor rural families into abject poverty. The goat plague was first diagnosed in the 1940s. PPR has expanded rapidly in the past 15 years and is now present in 70 countries across South and East Asia, Africa and the Middle East.

If left uncontrolled, it will spread to Europe and other parts of the world.

If flocks are not vaccinated, it can kill as many as 90 per cent of the animals it infects. Until now, rinderpest is the only animal disease to have been eradicated.

FAO and OIE led the campaign and declared that catastrophic cattle plague, the cause of famines and the collapse of empires, effectively extinct in 2011.

"If the major achievement of eradicating rinderpest can be replicated for another major trans-boundary animal disease

such as PPR, the positive impact on the livelihoods of farmers and food and nutrition security for all communities, Sustainable Development Goals and the United Nations' Zero Hunger Challenge will be substantial," FAO Assistant Director-General for Africa Bukar Tijani told the conference.

"It is important that PPR campaign succeeds. It counts on robust and well-resourced veterinary services and vaccines that comply with the international standards of the OIE," said OIE Director General, Bernard Vallat. The technical tools to achieve eradication are available, according to FAO and OIE livestock health experts.

PPR is a virus closely related to rinderpest, sharing traits that make it an apt target for an outright eradication campaign: An inexpensive, safe and reliable vaccine exists, as do simple diagnostic tests, while the virus has a relatively short infectious phase and does not survive for long outside a host. There are ample economic incentives to target complete eradication of PPR. Some 2.1 billion small ruminants worldwide – 80 per cent of them in affected regions - represent an important asset

for a third of poor rural households in developing countries. Goats and sheep readily adapt to harsh environments, require little fixed-capital investment such as barns, provide year-round protein and dairy products as well as income from wool and leather, improve fertility of the soil, and serve as a "mobile bank".

As women often own and tend sheep and goats, the animals have an important role in the pursuit of greater gender equity. The disease, which provokes high fever, rapid emaciation and respiratory collapse, causes annual global losses of between \$1.45 billion and \$2.1 billion each year. This figure does not include indirect losses linked to restrictions on trade and livestock mobility triggered by outbreaks.

FAO and OIE say the campaign will bolster veterinary systems in local settings to national level as their role is essential in the success of the campaign.

Without a concerted effort aimed at eradication, the global price tag for poorly-targeted PPR vaccinations are likely to run between \$4 billion and \$5.5 billion over the next 15 years.

Within this range, FAO and OIE believe that if properly targeted and coordinated, these efforts can be focused on eliminating once and for all the scourge of PPR. This effort will not have the current costs associated with battling out PPR outbreaks or new incursions.

The campaign's success requires political commitment in providing financial and human resources, including effective outreach schemes to deliver vaccines and secure the collaboration of both vulnerable people in rural areas as well as of researchers and pharmaceutical companies.

Representatives from around 70 countries are attending the Abidjan conference, along with representatives from donor agencies, the scientific community, the private sector and civil society.

Scientists fear steep yield losses as 'new' maize pest hits Western Kenya

Natural habitats rich in napier grass form an important refuge for natural enemies during crop free period



An infested maize plant

By George Ong'amo

Scientists have cited increase in land use changes as the possible cause in rise to more stem borer species losing their hosts to join the pest community hence causing more maize yield losses.

Maize, first introduced in East Africa from South America in the 16th Century, has since become an important cereal crop among communities in sub-Saharan Africa. Like any other plant away from aborigin home, maize recruited and developed an association with sub-Saharan Africa's indigenous arthropods. Important among the recruited indigenous arthropods are the lepidopteran stem borers {an insect larva that attacks the maize stem at the larval stage} some of which became important pests.

Before the introduction and extensive cultivation of maize and sorghum respectively, these stem borers remained in the wild habitats infesting non-cereal graminaceous plants {a group of plant species with the same characteristics as maize}.

But after the introduction of maize and increased cultivation of sorghum, some lepidopteran stem borers expanded their respective host ranges to include maize and sorghum, which were more nutritious and readily available. Some of the species that shifted and are currently found on maize and sorghum include *Busseola fusca*, *Chilo partellus*, *Sesamia calamistis* and *Chilo orichalcociliellus*.

In East Africa, infestation by these species cause between 30 and 80% cereal losses depending on the season and community composition. In Kenya, the total lost cereals is enough to feed about 3 million people for a year. In addition to maize and sorghum, stem borer pests infest wild graminaceous grasses such as napier grass growing in the crop vicinity. These wild grasses thus form important reservoir of the pest species during non-cropping season.

Studies show that though some lepidopteran stem borer species shifted to cultivated cereals where they became important pests, the non-pest species remained in their respective indigenous graminaceous non-cereal hosts growing in un-cultivated habitats.

The non-pest species that remained in the indigenous graminaceous host such as napier grass form the majority of both known and unknown lepidopteran stem borer species. Some of the non-pest stem borer species are important alternative hosts of natural enemies that suppress pest populations in crop fields.

Natural habitats rich in napier grass therefore form an important refuge for natural enemies during crop free period.

Important among the graminaceous hosts are *Panicum maximum*, *Panicum deustum*, *Pennisetum purpureum*, *Sorghum arundinaceum* and *Setaria megaphylla*.

Scientists have confirmed that in sub-Saharan Africa, nappier grass in the natural habitats stabilize populations of non-pest stem borer species. However, this role is threatened by the global change – loosely described to include land use and climate changes.

Changes in land use patterns may result in habitat loss, directly affecting the existing interactions between stem borers and their indigenous hosts. Non-pest lepidopteran stem borers will respond differently to the habitat loss. Species may respond by increasing their respective host ranges or go to extinction. Scientists are afraid that increase in host range may result in emergence of "new" pests as some species may include important graminaceous crops. They are considered as "new" pests as they have never been included in the list of economically important species in the affected areas.

Scientists working with French Institute for Research and Development (IRD) and the Nairobi based International Centre for Insect Physiology and Ecology (icipe), have reported a "new" lepidopteran pest species, *Busseola segeta*, on maize and sorghum plants in western Kenya. During the seven years of study in Kakamega and Kisii area, populations of *B. segeta* have continuously increased sometimes-exceeding populations of indigenous dominant pest species, *B. fusca*, in the two regions.

Similar trends were observed in experimental fields in Kisii. *Busseola segeta* has been known to infest non-cereal plants, mainly *P. purpureum*. Expansion of its host range to include maize and sorghum is worrying and it may be attributed to reduction in acreage of its important host, *P. purpureum*.

With increasing land use changes, there are fears that more stem borer species may lose their hosts and join the pest community. This may eventually increase the yield losses in the affected areas. There is thus an urgent need to undertake studies on impacts of "new" pest species on maize yield as their establishment in the pest community may complicate the already difficult situation among small and medium-scale farmers in sub-Saharan Africa.

The author is an entomologist and a lecturer, School of Biological Sciences, University of Nairobi.

Anti-HIV tool to empower women on the way

About 60% out of 33.4 million people living with HIV/AIDS in Africa are women.

Young women are three times more likely to be infected than young men

By Kiprotich Koros

Winning the battle against HIV/AIDS will have to involve tools that will empower women to prevent HIV infection. Women are disadvantaged when it comes to negotiating for safe sex according to Dr. Serah Gitome, a researcher with the Kenya Medical Research Institute (KEMRI).

60% out of 33.4 million people living with HIV/AIDS in Africa are women with young women three times more likely to be infected than young men. Current options for HIV prevention such as abstinence, faithfulness and male circumcision are unrealistic due to gender, economic and socio-cultural disparities that render women powerless in their negotiation for safe sex.

"There is need for a female initiated HIV prevention method that women can use to protect themselves," Dr Pamela Njuguna of the Kenya Medical Women's Association (KMWA) said during a media training workshop on microbicides organized by KMWA and the Media for Environment, Science, Health and Agriculture (MESHA). KMWA is a professional association of female doctors and dentists seeking to uplift the health status of women, adolescents and children in Kenya.

Microbicides are some of the tools that scientists hope can add to the already existing tools in HIV prevention. Female microbicides are products applied in the vagina to help women protect themselves against HIV. It works by killing or inactivating HIV, stopping the virus by entering the cells, enhancing the body's immune system and inhibiting HIV replication. They come in many forms including gels, rings and films.



Students participate in an HIV prevention campaign

"HIV is a leading global health challenge with women disproportionately affected. Microbicides aim at protecting either or both the cervical and vagina lining where HIV infects. Microbicides may provide protection through an active ingredient such as ARV or provide a physical barrier at the site of exposure. An ideal microbicide would be safe, effective, easy to store and use, odourless, colourless and acceptable," said Dr Gitome. Seven products have so far been tested for efficacy to date.

The Kenya Medical Research Institute (KEMRI) and the University of California are currently conducting 3 microbicide studies. ARV based trials have shown promising results with Tenofovir shown to lower HIV infection by 39%. Truvada on the other hand can reduce the risk of HIV-1 infection by 44% among men who have sex with men. ARV based microbicides however face challenges such as possible ARV resistance among trial participants, adherence and female disempowerment.

A cost-benefit analysis by the London School of Hygiene and Tropical Medicine indicates that the introduction of microbicides in 73 low income countries which can reduce the risk of infection by 40% at 30% coverage would avert approximately 6 million infections in 3

years as well as reducing healthcare costs by 3.2 billion US dollars.

"A vaccine will be needed to sustain and eventually end the battle against AIDS in combination with other prevention approaches. It is estimated that a vaccine can reduce the number of people on antiretrovirals by as much as 50% in the long run," says Dr Kundai Chinyenze, Medical Director, International Aids Vaccines Initiative (IAVI).

Funding to maximize existing tools however "falls short of the target of between USD 4 to 16 billion per year," says Dr Chinyenze.

Kenya is currently registering 100,000 new HIV infections every year. Although the number of AIDS related deaths have been brought down to 60,000, there is still a lot to be done to prevent new infections. The reduction in deaths is attributable to availability of treatment and care and therefore an ability to prolong life.

HIV research relies heavily on foreign funding and is therefore very risky. Funding is going down globally because of other needs in the developing world. "Africa should look into more ways of funding HIV treatment and research," says Steve Oyugi of the National Aids Control Council (NACC).

Reversing the global obesity pandemic

WHO estimates 1.9 billion overweight people of whom a third are obese.



**By José Graziano da Silva,
FAO Director-General**

The worldwide surge in obesity rivals war and smoking in terms of the global economic burden it imposes.

Obesity is no longer a concern solely of higher income, developed countries. The prevalence of obesity and overweight has risen in all regions, including in low-income countries. Today, nearly half of all countries are struggling with both undernutrition, overweight and obesity. Indeed, undernutrition and obesity often co-exist in the same communities -- even in the same household.

Economic and social transformations, including higher incomes, in many poor and middle-income nations and the availability, at relatively attractive prices,

of over processed foods have led to changes in lifestyles, including dietary habits and reduced physical activity across the globe.

Not a single country -- not one -- saw declining obesity between 2000 and 2013. WHO estimates 1.9 billion overweight people, of whom a third are obese.

This involves social and economic costs that, piled on top of those resulting from malnutrition, society can ill afford to bear.

The 2013 edition of FAO's State of Food and Agriculture noted that the social burden due to overweight and obesity has doubled over the past two decades. According to the report, the cumulative cost of all non-communicable diseases, for which overweight and obesity are leading risk factors, were estimated to be about US\$1.4 trillion in 2010.

More recently, the McKinsey Global Institute estimated the global price tag of obesity -- including the increasing the risk of heart disease, hypertension, strokes, diabetes, and some cancers affecting the overall quality of life -- could run as high as \$2 trillion a year, third only to smoking (\$2.1 trillion) and armed conflicts (\$2.1 trillion)!

While the numbers are not comparable and the global estimates of the economic costs of obesity and overweight vary, they coincide in their scale.

Now, think of what could be done to tackle malnutrition -- hunger, undernutrition, micronutrient deficiencies and obesity -- if we threw that amount of money behind the effort. Increasing funding is necessary to scale up efforts, but it should be a part of a bigger effort to re-strategize our approach to tackling malnutrition in all of its forms, deepening our focus beyond the immediate causes to include the broader socio-cultural, economic and political dimensions of nutrition.

This was a challenge that was taken up at the Second International Conference on Nutrition (ICN2) in Rome in November 2014. At ICN2, governments endorsed the Rome Declaration on Nutrition and the accompanying Framework for Action, committing themselves to address the broad spectrum of malnutrition -- including undernourishment, stunting, wasting, micronutrient deficiencies, obesity and related non-communicable diseases.

Making progress on these pledges will require major shifts in the manner in which we address malnutrition. It entails shifting from treating the adverse effects of malnutrition to prevention by ensuring healthy balanced diets, to better address the root causes of malnutrition, and we'll need to develop new policies, strategies and programs to help us do that.

Here are some guiding ideas

First, let's reform our food systems to ensure better nutrition for all. FAO's State of Food and Agriculture 2013 showed how food systems influence the quantity, quality, diversity and nutritional content of foods, and determine the availability, affordability and acceptability of foods needed for good nutrition. Reforming our food systems to improve nutrition will require growing nutrient-rich foods and ensuring healthy processing to minimize the loss of nutrients.

Second, we must make it easier for consumers to make food choices that promote healthy diets. This requires political commitment besides effective and coherent policies and strategies.

It will require increased investment in nutrition promotion and education programs. It will require creating schools, work places and communities that make healthy diets easily accessible and encourage people to exercise more. It will require empowering consumers with information through formal and informal popular nutrition education and giving more information on the food being sold to them, including through appropriate labelling.

Third, by creating a common vision and multisectoral approach involving governments, farming, health, retail and other relevant public and private sectors, as well as civil society. The multiple causes of malnutrition, including obesity, call for effective collaboration: no sector or entity can effectively address the problem on its own.



Fourth, trade and investment agreements must be designed to influence food systems positively. By improving the availability of, and access to, food, efficient and effective trade can play a key role in achieving nutrition objectives. But such agreements should not "crowd out" the possibility of developing local agriculture. Thriving national and local agriculture systems not only reduce countries' dependency on food imports but promote greater diversity

in diets, can act as a buffer against price spikes in international markets, and generate jobs to help reduce rural poverty.

ICN2 has set the stage for all actors to come on board to reverse the fast rising global obesity. Malnutrition, from undernutrition to obesity, is preventable at a relatively low cost if we work well. Let us move quickly to reverse obesity trends and to make hunger and all forms of malnutrition history.



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MESHA trail blazes Science Journalism in Africa



MESHA Chairperson, Ms Violet Otindo, displays a copy of SAYANSI magazine which was officially launched by the Kenyan Cabinet Secretary for Education, Science and Technology, Prof Jacob Kaimenyi last October

**By Otula Owuor,
Science Africa**

Judged by its achievements over the last five years Nairobi based Media for Environment, Science, Health and Agriculture (MESHA) has practically succeeded in initiating and sustaining important science journalism activities that include national and Africa-wide conferences and training workshop bringing together journalists, communication officers, scientists and policy makers.

MESHA's recent collaboration with India's influential Centre for Science and Environment (CSE) on the first Africa Dialogue on Air pollution highlights its unique networking skills with world renowned institutions. The Centre in collaboration with MESHA trained science journalists from Africa on urban on air pollution and transport. Journalists from 17 African countries attended the Conference.

MESHA has acquired the ability to alternate or hold biennial national and Africa-wide science journalism conferences. The 2014 Second African Conference of Science Journalists proved that Africa's home grown media associations are practically able to initiate, coordinate and seek funding to invite journalists and scientists across the continent and beyond for major conferences dealing with various aspects of science and development.

The Pan-African conference held on 12th to 15th October 2014 in Nairobi, brought together over 200 delegates from 15 African countries and 5 European and American based media practitioners. The 2nd African Conference of Science Journalists which departed from the tradition of hosting only conferences by initiating more than 10 field trips for a total of 120 Journalists, providing them with an opportunity for generating rich science stories from real experiences, followed closely on the First African Conference of Science Journalists hosted by MESHA in 2012 in Nakuru.

The Second African Conference of Science Journalists recorded another first; the delegates were treated to a daily conference bulletin. This bulletin gave a summary of the daily conference highlights including but not limited to field trips, plenary, break-out sessions and interviews.

Kenya's Cabinet Secretary for Education, Science and Technology; Prof. Jacob Kaimenyi, launched the "SAYANSI", a quarterly magazine dedicated to issues of science produced by the network of Science Journalists. Jean Pierre Tutin, Cooperation and Cultural Counselor at the French Embassy in Nairobi, told journalists that public agricultural policies in most countries often focus on land tenure, access to production factors and market regulation.

The Conference presented an array of exhibitions exposing journalists to a variety of information and products from various institutions focusing on research and development activities, regulation, communication and others.

Friends of Progress, a documentary on science journalism was produced as a result of this conference with financial support from IDRC which was also a key partner. The holding of the ACSJ2014 is the continuation of a long journey to bring together an array of stakeholders who tell the story of science in Africa in a tactful, timely, factual and professional manner.

MESHA secretary, Aghan Daniel was at the centre of coordination that has led to the success of its activities. Others who offered resources and technical input included; National Commission of Science, Technology and Innovation (NACOSTI); African Agricultural Technology Foundation (AATF), the Adaptation Consortium, Kenya Plant Health Inspectorate Service (KEPHIS), Panos South Africa (PSAf), Drugs for Neglected Diseases initiative (DNDi), Monsanto; Glaxo SmithKline (GSK), The French Embassy, African Population Health Research Centre (APHRC), National Commission for Science, Technology and Innovation (NACOSTI), International Institute for Tropical Agriculture (IITA), Africa On Air; International Service for Acquisition of Agri-Biotech Applications (ISAAA), Mazingira Limited, Open Forum for Agricultural Biotechnology, Kenya Wildlife Service, Kenya Coast Development Program (KCDP); Global Health Strategies (GHS); UNICEF; African Women in Agricultural Research and Development (AWARD); International Federation of Agriculture Journalists (IFAJ); International Institute for Tropical Medicine, Belgium (IITM), KMET Kisumu and the African Seed Trade Association (AFSTA).

The successful field trips were supported by East African Seed Company, The French Embassy, CIMMYT, Kenya Agricultural and Livestock Research Organisation (KALRO); Sanergy; Gertrude Children's Foundation; the Aga Khan University Hospital; PITCH Africa, Kenya Wildlife Service and Mpala Ranch.



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