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EXCLUSIVE

Africa's Oldest Fossils discovered in Ethiopia

The only African site with well preserved fossils of plants and animals that are 22 million years old was recently discovered in Mush Basin in central Ethiopia, 157 kilometres north of Addis Ababa. Mush Basin yielded fossils of amphibians, fish, mammals and numerous plants.

Over the last 30 million years, the eastern part of Ethiopia has been placed over what is known as mantle-plume which generated huge volcanic eruption and structural depressions that allowed for the accumulation of lake sediments. These ancient lake sediments, in geology, are rather called natural archives because it is within these units that we find evidences of

CONTINUED ON PAGE 19

Jatropha-Economic Viability Low

Little or no information and knowledge exist on the economic viability of *Jatropha curcas* for commercial bio-diesel production in Kenya. A study by KARI researchers applied internal rate of return and gross margin to analyze the species economic potential using data collected through field surveys in selected sites in all the provinces of Kenya except North Eastern.

The KARI study concludes that *Jatropha* use in bio-diesel production is not economically viable in Kenya, irrespective of age of trees and level of integration into existing farming systems. However, better results could be derived when produced as an intercrop with good agronomic practices for enhanced yields coupled with post harvest addition. ❑

HEALTHCARE IN AFRICA

Nigeria Resumes Sickle Cell Drug Manufacture

This is a continuation of our exclusive series focusing on various aspects of health services in different African countries

BY HOPE MAFARANGA
ScienceAfrica Correspondent who recently visited Nigeria

Nigeria is to resume manufacturing sickle cell drug known as Nicosan to help over 4 million patients in the country. Sickle cell causes severe pain, ulcers, organ and tissue damage, which eventually leads to stroke and acute chest pain. The immune system attacks and destroys the abnormally shaped cells often leaving the body with an insufficient number of normal oxygen carrying red blood cells which in turn results in anaemic condition.

The repeated crisis can also damage kidney, lungs, bones, eyes and the central nervous system. Around 12 million people across the world suffer from the painful genetic illness of which about 4 million are Nigerian. Nicosan drug that was manufactured at Sheda Science and Technology Complex (SHESTCO) in conjunction with National Institute for Pharmaceutical Research and Development (NIPRD) in Abuja was readily available for Nigerians and other patients in the world, but for some reasons, production was stopped.

The halt of manufacturing the SDC drug followed a fraud complaint brought before Nigeria's

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PRESIDENTIAL ATTENTION

What is it that generated such maximum attention from Kenya's President Mwai Kibaki? Dr Segenet Kelemu, director of the BecA Hub at ILRI in Nairobi, was explaining to President Kibaki the significance of a metal and glass sculpture of DNA helix that was unveiled by the President. Science, technology and innovation (STI) is recognized as the force that drives national, regional and global economies and in the 21st century, it is gene science. Also see page 16

(photo credit: ILRI/Njuguna.)

Agriculture Generates Most Jobs

BY GEORGE ACHIA
ScienceAfrica Reporter

Agricultural research institutions should fast-track efforts to address key challenges facing the sector including improvement of productivity of crops and livestock, better use of land resources, identifying new markets and investment in value addition to make Kenya's agriculture more competitive in the global market.

KARI executive director Dr. E. Mukisira (left), Agriculture secretary Dr. W. Songa and Agriculture Assistant Minister Kareke Mbiuki during the unveiling of the Institute's ISO certified soil analytical labs. *(Pic by Jeff Oloo/ScienceAfrica)*

The call was made by Kenya's minister of agriculture Dr. Sally Kosgei during the 12th KARI biennial scientific conference where scientists and other agricultural stakeholders shared research findings.

In a speech read on her behalf by her deputy Kareke Mbiuki, the minister said:

"The agricultural sector ac-

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The Day Africa Turned Donor for Global Fund - Page 3

ENVIRONMENT

One Man's Mission to Save Uganda's Shrinking Forests

Professor Joseph Obua, one of Africa's most experienced forestry experts told *Science Africa* correspondent *Hope Mafaranga* about the status of forests in Uganda. He is a beneficiary of African Academy of Sciences - AFORNET project.

Q: Trees, forests and woodlands cover about 14 percent of Uganda's land surface, but this percentage is reducing daily due to people who are cutting trees in search of firewood and timber, what measures have you put in place to restore the forests?

A: Over the last 30 to 40 years, growth in human population has increased hence the increase of demand for forest products for domestic and industrial use, expansion of agricultural land, illegal settlements and weak forest management capacity have adversely affected the status of natural forests in Uganda, particularly the biodiversity.

There is a need for regular data collection and monitoring of the status of the forests in terms of a real extent, distribution, plantation species introductions and biodiversity.

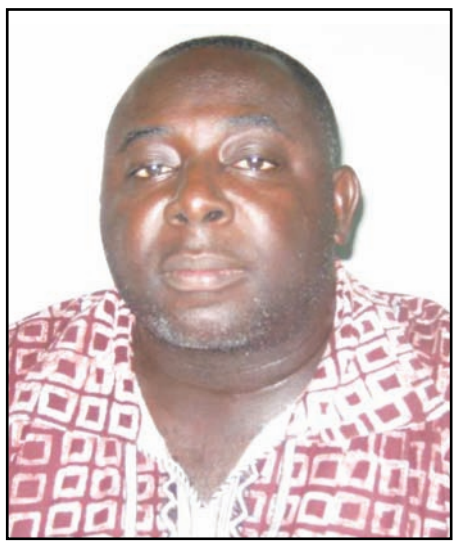
When discussing the status of forests in Uganda, woodlands are also included because many forests have extensive woody species coverage.

About 4.9 million hectares of forests and woodlands in Uganda, (64 percent) are found outside the Permanent Forest Estate (PFE), (land set aside for forestry activities in perpetuity, managed by private landowners and regulated by local governments).

The PFE is 1.9 million ha, of which 61.4 percent is managed by the stated owned National Forestry Authority (NFA), 33.6% is managed by Uganda Wildlife Authority (UWA), and 4.7% of the PFE is jointly managed by NFA and UWA and 0.3% by local governments.

The Central Forest Reserves (CFRs) were reserved to provide forest products, amenity and recreation, conserve biodiversity, ameliorate climate, stabilize soils, and protect water catchments and steep slopes, riverbanks and lakeshores.

Since the establishment of the Forestry and Scientific Department in 1890, forestland was reserved for research, protection of ecological systems and future supply of forest products.



Professor Joseph Obua.
Pic by Hope Mafaranga

Sixty-five CFRs with a total area of 840,100 hectares are part of a network of sites of special scientific interest that are critical for biodiversity conservation in Uganda.

Forests and woodlands are very important because they provide a number of environmental services and direct benefits to agriculture, water and fisheries sectors. These include the value of watershed and ground water protection, erosion control and carbon sequestration.

However it is important to NOTE that the rate at which Uganda is losing her forests is worrying. Our initial species are gone; we are losing the glory of "The Pearl of Africa".

The forest cover and natural resource is declining because of the high pressure and the ever increasing population in Uganda.

Trees are the source of energy and 90 percent of Ugandans use charcoal and fire woods. People must cook every day. People want to clear the trees to create space for grass to grow for their animals. The booming business of timbers in Uganda has also contributed to the reduction of forests.

Q: Uganda is experiencing reduction in rainfall, which environmentalists have attributed to forest degradation and deforestation. Tell us about the status of forests in Uganda.

A: The current status of forests in Uganda is a product of changes in the forest cover because of degradation and deforestation.
According to the forest cover may have been as much as 10.8 million hectares (53%) of Uganda's land area in 1890.

The government run National Environment Management Authority (NEMA) in its 2004/2005 reported that Uganda's tropical high forest cover dwindled from 12.5% of the total land area to 3% in 1987.

The National Biomass Study data collected between 1989 and 1995 indicate that this has now shrunk to 5 million hectares (24%) of the land area.

Uganda's forest and woodland cover has dropped from 4.9 million hectares (20% of Uganda's land area) in 1990 to 3.6 million (14%) in 2005.

This represents a 1.9% deforestation rate, which is slightly higher than in other East African countries whose rate is below 1%.

On private lands, nearly 1.3 million hectares have been lost over the last 15 years while 91,000 ha have been lost in CFRs, confirming that forests on private lands are fast disappearing.
The quality of the tropical high forest, in terms of number of species and trees, has also declined over time with over 30% being classified as degraded.

Although there is no clear definition or measurement of this degradation, oral accounts from experienced foresters indicate that 75% of Uganda's principal forest reserves have been degraded by heavy mechanical and uncontrolled pit-sawing.

In 2000, deforestation rate in Uganda was estimated at 55,000 hectares (0.9%) per annum based on change in areas of bush land and woodland from 1990 to 1995.

Estimates by the Forest Department show that by 2002, Uganda was losing about 200,000 hectares of forest annually. Of a total of 1.17 million hectares of CFRs, 58,000 hectares (5%) had been degraded or depleted. Overall, 14 of 500 forest reserves had been degraded.

Q: What are the causes?

A: Several causes of forest degradation and deforestation in Uganda have been documented key among which is breakdown in law and order.

Conversion to agricultural land and other land uses, increase in demand for forest products for domestic and commercial purposes, higher demand for construction and furniture timber and weak law enforcement and policy implementation.

About 3,436,000 ha of forests found on private land have been degraded because the landowners regard the forest as a major source of income, and potential agricultural and grazing land.

Charcoal, fuel wood, poles and timber are uncontrollably extracted from these forests.

The high human population growth rate of 3.4% per annum and expanding human settlement (urban and rural) have also been responsible for the high rate of deforestation in Uganda as forests are cleared to give way to spatial agricultural expansion and settlement.

In general, annual rate of deforestation is highest in the woodlands (2.1%) and lowest in the relatively well-stocked tropical moist forests (0.3%).

Q: Tell us species of tree facing extinction?

Hamilton (1984) published a book on Deforestation in Uganda and noted that despite some taxonomic uncertainties, there were only 450 known forest trees in Uganda.

The future of forestry in Uganda since the introduction of agriculture nearly 2500 years ago, forests have been cleared to make way for agricultural crops and pasture, a process that still continues, so that even the remaining forest patches are shrinking fast.

There are many places that supported considerable number of trees in the last 40 years which today are almost treeless.

Q: What are challenges faced at local and international level, as the global warming continues to increase.

A: The status of Uganda's forests cannot be discussed without referring to issues of governance, poverty alleviation and human population growth.

Some forest land was lost as a result of post-independent government policy to increase agricultural production between 1960 and 1970.

Although Uganda's forest policy is well articulated, its implementation is weak because of inadequate resource allocation and political interference that are highly detrimental to good forest management and conservation.

Millions of resource poor Ugandans still depend on environmental resources such as trees and forests as the most readily ac-

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BIOTECH

GM Regulations and Farmers' Needs

By George Achia

Functional and stronger regulatory system that responds to the realities of farmers' needs and which reflects the legal tradition of the country is urgently needed to guide exploitation and safe deployment of genetically modified crops in Kenya.

This emerged during a two-day workshop organized by Centre for African Bio-Entrepreneurship (CABE), Future Agricultures Consortium and the STEPS Centre at the University of Sussex to discuss issues of biosafety regulation by exploring how debates about biosafety can be opened up.

The workshop focused on Kenya and the Philippines, two countries that have at different times been seen as regional test cases for biotechnology and development of biosafety regulations. However, Mr. Jose Maria, former member and legal adviser, the National Biosafety Committee of the Philippine urged his Kenyan counterparts to have country focus on issues of GMOs rather than adopting and relying on what has been done in other countries.

Biosafety regulation is just one aspect of innovation governance, which focuses on downstream risks and effects that are, in principle, knowable. It also focuses attention on bio-physical risks rather than broader socio-economic concerns.

What came out strongly during the workshop is the need for Kenya to move ahead with debates on biosafety.

Participants at the CABE workshop at JKUAT. *Pic by Jeff Oloo/ScienceAfrica*

"Time for debate in Kenya is long and we should embrace the spirit of dialogue with the Biosafety Act in place," said Mr. Hanningtone Odame, director CABE.

The object of Biosafety Act 2009 is to regulate activities linked to genetically modified organisms.

The workshop highlighted the need for flexibility in the Kenyan context including capacity governance and response to the local realities. Flexibility at the institutional levels should incorporate key stakeholders and information sharing

Top priority for Kenya biosafety regulation was key on the debate among the participants where varied opinions were raised including the implementation of the Biosafety Act 2009, National Biosafety Authority (NBA) should take up their responsibilities and duties, demystification of GM foods and involvement of all stakeholders in the process.

John Mutunga, CEO, Kenya National Federation of Agricultural Producers applauded the workshop as being held at the right time and called for the need for transparent and cost- effective regulatory systems that inspire public confidence through objective evaluation of risks and benefits on a case by case basis.

"Such regulations must balance different interests while reflecting the legal traditions of the country. This is because countries must be allowed to engage in internal consultation within the framework of public-private sector partnership with a view to assessing the benefits and risks without undue influence from powerful multinational institutions with vested interests," he said.

Nevertheless, many questions about implementation remain unanswered, particularly in relation to Kenya's primary crop – maize - much of which is grown on small scale farms.

It was noted that unlike in Organization for Economic Co-operation and Development (OECD) countries, many Kenyan farmers plant own-saved or exchanged seed rather than buy commercially produced seeds. ❑

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HEALTH FINANCING

Africa Gives Global Fund $2m

Kigali, Rwanda - African researchers keen on having a strong spokesman for home grown funding of science technology and innovation need to compare notes with Rwanda's President Paul Kagame who recently hosted the continent's private sector summit attended by over 200 businessmen who donated $2m to be used by the Global Fund in the war against malaria.

The private sector in Africa is now acknowledging that its social responsibility goes beyond sponsoring dinners, sports, endless music and drum-beats, to include funding various aspects of science, technology and innovation. The summit in Kigali was organised by Friends of the Global Fund Africa and the Rwandan government.

President Kagame said that it was time to expand participation in financing the health sector beyond the traditional donors and the government players. The business leaders at the summit included Bralirwa (Rwanda), Remi Olowude for IGI (Nigeria), Hezi Bezalel (Honorary Consul to Israel), Crane Bank (Uganda), Stanbic Bank (Uganda). Also present was Ray Chambers (United Nations Secretary-General's Special Envoy for Malaria).

Pacesetters: President Kagame and First Lady Jeanette Kagame hosted the continent's private sector summit

Rwanda's First Lady set the tone for the evening by making an appeal to the audience that "Africa's wealth can and should contribute to Africa's health." The private sector in Rwanda heard her appeal. Indeed, out of the US$ 2 million pledged, US$ 1.2 came from Rwanda's companies.

The Executive Director of the Global Fund, Professor Michel Kazatchkine, said that "private companies in Africa have demonstrated that they care about Africa and have a global perspective and are becoming part of a global health movement. Those companies that contribute to Gift from Africa know that healthy companies are made up of healthy people, and that investments in health are investments in the workforce and in communities" (*Source: Global Fund Press Release)*

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South Africa Going for GM Maize With Two Traits

By ScienceAfrica Correspondent

Monsanto South Africa has secured cultivation approvals for MON89034 (Yieldgard II) and MON89034 x NK603 (stacked trait) in South Africa in terms of the GMO Amendment Act, Act No 23 of 2006.

"These approvals are great news for our customers. It confirms our undertaking of bringing the best technology to our customers as well as Monsanto's position as a leader in the field of biotechnology. We are glad that we have been able to register these new traits

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BIODIVERSITY

CABI Highlights Dangers of Invasive Species

By George Achia
ScienceAfrica Reporter

The Centre for Agricultural Bioscience International (CABI) celebrated a century of scientific endeavour by highlighting and creating awareness on the increasing dangers of invasive species which already pose a major threat to ecosystems and food production in Africa.

The centenary celebrations which was marked at the Nairobi National Park was led by the permanent secretary, ministry of environment and mineral resources, Ali Mohamed accompanied by scientists and staff from CABI, Kenya Agricultural Research Institute (KARI), Kenya Wildlife Service (KWS) and others. The activities included rooting out some invasive species from parts of the park.

"Invasive species are a major threat to biodiversity and threaten food security, human health and economic development which is why we have turned celebration into awareness creation," said Arne Witt, head of the invasive species programme at CABI.

He notes that the problem of invasive weeds in Africa is not only a biodiversity issue but also a major contributor to food insecurity.

Arne Witt, head of the invasive species programme at CABI in Nairobi

One of the invasive species of plants on display during the CABI anniversary.
Pics by Jeff Oloo/ScienceAfrica

According to Witt, *Pathenium* weed which is rapidly spreading in most of Kenya's national parks as well as parts of Rift Valley and Western Kenya can cause crop loss of up to 60% while loss of pastures reaches 90% in developing countries.

The latest research on the weed done in Australia shows that people living near it can develop allergies including asthma and those living with HIV and AIDS having their immune system compromised due to the effects of pollen grains from the weed.

However, the big question is: are people aware of hazards posed by these dangerous weeds and is enough being done to control or manage their spread?

Permanent secretary ministry of environment and mineral resources, Mr. Ali Mohamed, called for the reduction of these invasive species if Kenya and other developing countries are to conserve biodiversity and achieve food security within the region.

"It is frightening to learn that a large number of protected areas in Africa are threatened by invasive plants. I understand that these plants are so aggressive that they could reverse the gains made towards conserving biodiversity and achieving food security," he said.

Besides *Pathenium,* invasive species currently threatening protected areas in Africa include *Prosopis, Lantana, Chromolaena* and *Mimosa*. *Lantana* is present in almost all the protected areas in East Africa while *Prosopis* has already invaded Tsavo National Park and some game reserves in Kenya.

Conservation of biodiversity is a major challenge worldwide. The global biodiversity outlook launched last May showed that species worldwide continue to disappear at a rate 1,000 times the natural background rate of extinction. The report further warns that without concerted action, massive loss of biodiversity is projected to occur before the end of the century and that ecosystems are approaching tipping points beyond which they will be irreversibly degraded with dire consequences for human wellbeing and survival. ❑

REPRODUCTIVE HEALTH

Women Pay the Price of High Birth Rate

By Lizzy Awuor
ScienceAfrica Reporter

Over 7,000 women die annually in Kenya during delivery and this figure is expected to rise significantly if no urgent action is taken. Although Total Fertility Rate (TFR) fell from about eight to below five births per woman during the last 20 years, the population could hit 70m by 2030 threatening the availability of resources.

"Many women die due to heavy bleeding, obstruct labour, complications of unsafe abortions and also major infections in their reproductive systems which mostly are preventable," UN representative Dr. Janet Byaruhanga said in Nairobi, during the launch of Campaign on Accelerated Reduction of Maternal Mortality CARMMA in Africa.

It is estimated that a woman in Africa has high chances of developing complication during childbirth as compared to those in developed countries. This is attributed to inadequate maternal facilities to cater for the rising number of expectant women in the continent.

Her sentiments were echoed by Kenya's public heath and sanitation minister Beth Mugo who said that other problems include inadequate food security, tuberculosis, malaria and other communicable diseases. Evidence reveals that cases of high child mortality are also linked to population growth, high fertility and reduced access to safe drinking water.

CARMMA is a campaign initiative of African Union Commission and UN Population Fund aiming at promoting renewed implementation of the Maputo Plan of Action for reducing maternal mortality in Africa. The National Coordinating Agency for Population and Development (NCPD) is embarking on a nationwide campaign from mid-November 2010 aiming at controlling birth rate in the country.

Dr Boniface K'Oyugi, chief executive officer of NCAPD, said that "Unless, as a country we allocate resources to family planning, we are unlikely to witness population decline and sexually active youth and married couples should be targeted with appropriate information to ensure that the available reproductive products and services reach the intended audiences.

The population is expected to hit 70 million by 2030 if the current growth rate is not tamed. Only 40 percent of Kenyans use contraceptives as a result of poor access and misconceptions. "We need to address these misconceptions by individuals about family planning methods," Dr Jonah Maina, Division of Reproductive Health Family Planning Program manager, said during the launch of the campaign targeting Nairobi, Mombasa Kisumu, Machakos and Kakamega.

A comprehensive family planning documentary '*Reclaiming a Lost Decade-Repositioning Family Planning in Kenya*' launched recently by NCAPD, outlines the trends in fertility among women. The documentary emphasizes the importance and urgency of adequate provision of family planning services and availability of relevant information. ❑

BIOTECH

Maize With Two Traits

FROM PAGE 3

and that we now have cultivation approvals," Kobus Lindeque, area director Monsanto Africa.

Monsanto applied via the Directorate Biosafety of the Department of Agriculture, Fisheries and Forestry for general release of improved insect resistant GM maize and a genetically modified maize product that contains two traits in the same hybrid. The inserted traits concerned are insect resistance and herbicide tolerance (MON 89034 and MON89034 x NK603). The general release is intended for the entire region in South Africa where maize is grown.

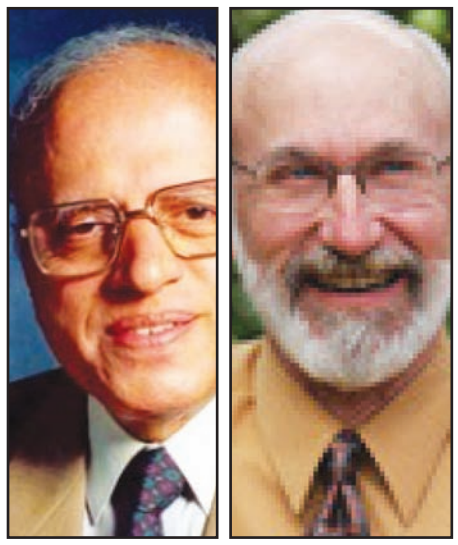
The combination of these traits into a single plant is expected to provide maize growers with excellent stalk borer control, reduced chances of insect resistance development and tolerance to applications of the Roundup herbicide formulations for weed control. It is used in no-till planting that reduce erosion and soil compacting while conserving fuel, which can lead to a significant reduction of emissions of carbon dioxide. ❑

BIODIVERSITY

Call to Make Africa's Agriculture "Evergreen"
- Project in 18 Countries

Two leading scientists say that Africa's agricultural sectors should be "reinvented" and transformed to cope with climate change, food security and transition towards sustainability.

Dr Dennis Garrity, director general of the Nairobi based World Agroforestry Centre and Prof M.S. Swaminathan, the 1987 World Food Prize Laureate and founder of India's MS Swaminathan Research Foundation, have teamed up to promote what they call a 'fresh out of the box solution.' It involves improving crop yields and increased carbon storage.



Prof M.S. Swaminathan and Dr Dennis Garrity, ICRAF director

"Doubling food production by mid-century when so many of the world's soils are depleted and we are faced with a changing climate cannot be achieved with business-as-usual conventional agriculture," Dr Garrity said. "We need to reinvent agriculture in a sustainable and affordable way so that it can adapt to climate change and reduce its emissions of greenhouse gases."

Evergreen agriculture allows us to glimpse a future of more environmentally sound farming where much of our annual food crop production occurs under a full canopy of trees," says Garrity.

"We are already working with 18 countries across the African continent to develop national plans for implementation of evergreen agriculture," Garrity explained.

Swaminathan added that "novel solutions and technological advances must be married

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KWS Celebrates Annual Thanksgiving Day

-Kshs. 800million is to be invested in Marsabit National Park

The Kenya Wildlife Service held its annual Thanksgiving Ceremony at the Afraha Stadium in Nakuru, Kenya. The event was officiated by the Minister for Forestry and Wildlife, who was represented by M. A. M WaMwachai, the Permanent Secretary in the ministry.

Completion and commissioning of the Aberdare Fence, gazzettement of Lakes Elementaita and Kanyaboli as national reserves, and the discovery of the elephant shrew at Boni-Dodori are among significant milestones apart from the proposed Wildlife Bill that is being studied to ensure that is aligned to Kenyas new Constitution.

The KWS chairman, David Mwiraria, said that 2010 signifies the importance of tourism as a resilient industry and economic pillar. The director of KWS, Mr Julius Kipng'etich said that that Kshs. 800million is to be invested in Marsabit National Park for staff houses, visitor facilities and community projects,

KWS Director Dr. Julius Kipng'etich

in partnership with the French Development Agency (AFD).

He further said that KWS will invest heavily in staff training to make them more efficient and Manyani Field Training School is set to receive new trainees to strengthen field conservation operations.

The Institute will be upgraded and renamed KWS Paramilitary Academy from next year and Kshs 40million will be used to improve staff houses and visitor facilities in Tsavo, he added ❑

Food Security at the Top of Africa's Development Agenda, says Kofi Annan

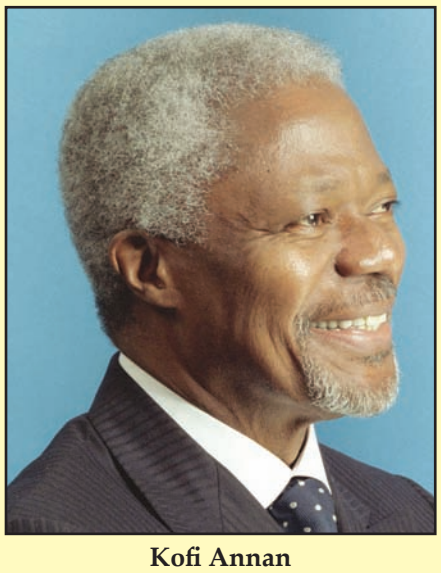
"Africa is the only continent which does not grow enough food to feed itself and has failed, in recent decades, to see agricultural productivity keep pace with its growing population.

Mr Kofi Annan, the former UN Secretary General and chairman of Alliance for Green Revolution in Africa said this during the recent World Food Prize annual international symposium, held in Des Moines, Iowa, US.

Africa alone was bypassed by the science-based agricultural development, which dramatically transformed food production in Asia, Mr Annan added.

However, Mr. Annan also argued that "never before has there been such a collective drive for change encompassing civil society organizations, philanthropic foundations and multinational corporations.

"Thus food and nutrition security now sit at the top of the development agenda and recently I saw some of this prog-



Kofi Annan

ress when visiting farmers in Mali who said that access to high-yielding seeds and fertilizer is helping improve their livelihoods," he said.

He explained that "the Alliance for a Green Revolution in Africa (AGRA) is helping to build the systems needed and strengthen the links in the entire value chain to make smallholder farming productive, profitable and sustainable".

"We are doing this by identifying, supporting and extending proven, local solutions for the benefits of farmers, particularly in those areas with the greatest potential to become Africa's breadbaskets."

"We cannot forget that, the women who produce most of Africa's food are particularly disadvantaged economically and socially. We need practical measures from field to market to remove these obstacles so they have a voice and a stake right through the value chain", Mr. Annan said.

"We need to build on our successes, listen to the farmers, innovate as we go and scale-up what we know works. The goal must always be permanent reform. If we stand together – governments, civil society, the private sector, the scientific community and farmers – and sustain our efforts, a unique African Green Revolution is within our grasp," he concluded. ❑

Africa and Space Science

By MEKONNEN TESHOME in Addis Ababa, Ethiopia

The 8th Conference of the African Association of Remote Sensing of the Environment (AARSE-2010), held in Addis Ababa, Ethiopia, urged African countries to collaborate and aim to benefit from space science.

Through effective coordination Africa can maximize participation in the global effort to exploit space science, build capacity, design space policies and programmes, and establish an African Space Agency.

The participants agreed that Africa needs to give special attention to Geo-information and Earth Observations would support the development of a dedicated African Earth Observation Satellite and African Resource Management Constellation to contribute towards sustainable development.

The conference focused on the need for national geo-information systems for monitoring its ecosystems on a sustainable basis; enhancing the awareness of African decision makers, scientists, institutions, private sector and the society at large, on the benefits of geo-information and space technology. It contributes in the management of natural resources and environment, apart from potential applications for poverty alleviation. ❑

Call to Make Africa's Agriculture "Evergreen"

FROM PAGE 5

with ecological thinking to drive a truly sustainable agricultural revolution". Swaminathan emphasized that Africa needs an evergreen revolution that increases productivity without causing ecological damage.

"Successful examples of evergreen agriculture from Africa urgently need further research and scaling up to create a real evergreen revolution," Swaminathan said.

The two experts were speaking at the recent World Food Prize Borlaug Dialogue Des Moines, Iowa USA.

In Malawi maize yields increased nearly threefold when grown under the canopy of *Faidherbia albida* which sheds leaves during the early rainy season and remains dormant through the crop-growing period, making it highly compatible with food crops.

In Niger, over 4.8m hectares of millet and sorghum being are in agroforests with up to 160 *Faidherbia* trees per hectare. The concept of Evergreen Agriculture, where fertilizer trees are integrated into annual food crop and livestock systems, sustains a green cover on the land throughout the year. It bolsters nutrient supply through nitrogen fixation and nutrient cycling, increases direct production of food, fodder, fuel, and fibre, and provides additional income to farmers from tree products. (Source WAC) ❑

Faidherbia albida - Africa's leading fertilizer tree increases maize yield. *Source WAC*

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Severe Drought Expected

Some countries within Africa's Equatorial region especially those in the Horn of Africa should prepare for prolonged drought that will include March-May 2011 which represents the long rains seasons, IGAD Climate Prediction and Adaptation Centre has warned.

"The moderate to strong La Niña, which appeared in July, is now well established over the equatorial Pacific and is expected to have severe global climate impacts performance, including up to March-May 2011. The need for preparedness for the impending long period of drought over parts of the equatorial region should therefore be the most critical massage of this newsletter," says a press release from ICPAC headquarters in Nairobi, Kenya.

ICPAC currently provides regular 10 day, monthly and seasonal climate updates as well as timely information on major regional climate stress and impacts associated with extreme climate events such as drought and floods. Some of these climate extremes have been associated with changes on ocean surface temperatures - El Niño / La Niña events. January is the driest month in the IGAD region which includes Ethiopia, Sudan, Kenya, Uganda, Tanzania, Rwanda, Burundi, Eritrea, Somalia and Djibouti. ❑

Herbs Control Vegetable Pests

Brassica vegetable- like cabbages and kale- production is an important income generating activity for small scale farmers. However, pests and inappropriate agronomic packages limit production. KARI researchers say that previous work in vegetable projects led farmers to depend on pesticides including organophosphates, carbamates and pyrethroids with reduced effectiveness against diamondback moth and aphids for example.

The experts say that research and promotion of cultural practices to manage diseases and arthropod pests gets minimal attention. However, extracts from the neem tree, *Azadirachta indica A.*, the syringe tree, *Melia azaderach L.*, Bt-based products and others have been found effective.

A field experiment conducted at KARI-NARC-Muguga during long rains of 2009 showed that the mixture of herbal pest controller, Kokari, registered the highest yields.

The Kokari Herbal pest controller was effective in the control of the diamond back moth, *Plutella xylostella.* Kokari Herbal pest controller, at 2.0 ml per litre of water is recommended for the control of diamond back moth.

The use of Kokari herbal pest controller could have an added advantage in that it is safe to the users and environmentally friendly because of being biodegradable. The researchers included V. Ochieng, F. J. Musembi., S. Njihia, L. Wasilwa, and W. B. Kipkorir. ❑

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African Plants Treat Candidiasis

African medicinal plants including *Uvaria chamae, Annona senegalensis* and *Schwenckia Americana* have anticandidal activity and can be used as an alternative source of treatment of oral candidiasis. This is according to a study done by researchers at the University of Nigeria and International Centre for Ethnomedicine and Drug Development. ❑

EDITORIAL

Lessons from 12th KARI Biennial Scientific Conference

Kenya Agricultural Research Institute's 12th Biennial Scientific Conference held in the second week of November, 2010, was a major eye opener for those keen on seeing Africa overcome widespread famine, hunger, malnutrition and devastating poverty apart from direct and indirect socio-economic growth linked to increased income from agriculture. Appropriately the theme of the conference "Transforming Agriculture for Improvement Livelihoods Though Agricultural Product Value Chains", was indeed quite timely and a clear indication that KARI has its eyes wide open when it comes to practical promotion of science and technology as the major driving force for competition at national, regional and global market place.

In the past, scientific research, especially in Africa, was least linked to socio-economic improvement or well being of the people. Researchers were just keen to "talk" to themselves and it was upon others to help implement their work. However it is notable that two out of three presentations were linked to "people-impact" or the much needed socio-economic perspectives. However, it was not just an occasion for KARI to focus purely on its own activities. The level of collaboration has definitely increased. There were a variety of exhibitions and the participation or presence of experts from other institutions dealing with various aspects of agriculture among them CABI, ILRI, CIMMYT, ICRAF and Kenya Sugar Research Institute was notable.

There was much to learn and "carry home" from the conference. Those keen on breeding indigenous poultry- for example - had an opportunity to practically learn all that it takes including orders for day old or four weeks old chicks. The biennial conference is definitely going to be a major event in Kenya's efforts to overcome poverty and ill-health. The conference also included completion of the journey to accreditation of the KARI NARL soil analytical labs that are now ISO certified as ISO/IEC 17025:2005. The ultra-modern labs are located in eight KARI centres. The institute's nearly 200 researchers with PhDs and unlimited hands-on experience and skills is well placed to continue excelling in its role of delivering appropriate agricultural innovations and knowledge needed for sustainable socio-economic growth.

Cassava: Africa Last in Value Addition

One of the most important aspects of the November,2010 KARI conference was that the presentations had practical implication for Africa and other developing nations where agriculture is the backbone of national economies. There were presentations that should alert Africa on the importance or need to focus on value addition. Despite African nations like Nigeria and Congo DRC being top producers of cassava, it is Thailand in Asia that apparently dominates global cassava trade since the mid 1960s according to the abstract by Julia Tijaja from Open University, UK.

In 2008 Thailand controlled 90 percent of cassava starch exports, and 70 percent of dried cassava exports. African researchers tend to be hooked on what goes on in the West instead of learning from Asian nations considered their contemporaries. Although Nigerian cassava and wheat flour are appropriately mixed to make bread there is room for improvement.

The story of cassava is closely linked to Africa's devastating failure to appropriately develop and exploit palm trees. For example, Kenya spends nearly $100m importing palm oil from Malaysia. ❑

LETTERS

Thank you very much for this informative scientific journal. I highly appreciate it.
Almami Dampha (African Union); Addis Ababa, Ethopia

Thanks a bunch for the educative and informative scientific magazine. I have circulated to our Agronomists. We hope to participate in your subsequent publications. What are the requirements?
Joseph Muli
Marketing Manager
Farmchem Limited
www.farmchemafrica.com

Thanks very much and congratulation.
Prof Tom Ogada, Nairobi

Hi ScienceAfrica team,
Excellent work. We are ready to share information with you including interviews.
Anne Wangalachi (CIMMYT), Nairobi

Thanks you for coming up with an electronic version of your informative paper. I am not a scientist but I have enjoyed reading its very accessible and informative content.
Tom Onditi-USIU, Nairobi

Many thanks for sending me this publication. I found it very useful in keeping me informed on science based developments relevant to Kenya and Africa in general. Congratulation on an excellent job and keep it up.
Prof Shellemiah Keya, Nairobi

What's your view? Share it with us. Contact the Editor; info@scienceafrica.com, cell: +254 722 843101

QUOTABLES

"We need to reinvent agriculture in a sustainable and affordable way so that it can adapt to climate change and reduce its emissions of greenhouse gases."
ICRAF director, Dr Dennis Garrity.

"I saw some progress when visiting farmers in Mali who said that access to high-yielding seeds and fertilizer is helping improve their livelihoods."
AGRA chairman and former UN Secretary General Kofi Annan.

Understanding Kidney Failure

By LIZZY AWUOR and BENJAMIN WAYUMBA

When Mary visited hospital for a normal check-up after a long time, she had no idea that she would be diagnosed with a kidney disease. She was shell-shocked when the doctor informed her she was suffering from the disease and that it was at an advanced stage.

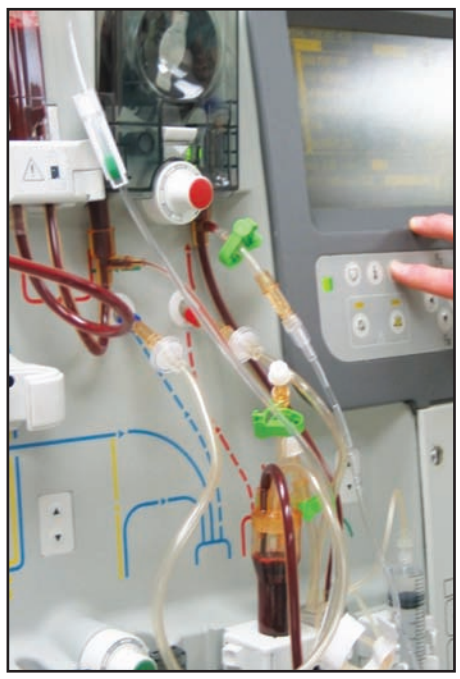
So when we visited Dr Patrick Mbugua's office at Kenyatta National Hospital, we found Mary waiting patiently to undergo hemodialysis, a blood purification process. She has been doing this for four hours, three times a week.

For years now, Mary has religiously undergone through this process that is done using a special filter, called dialyzer, which functions like an artificial kidney.

During treatment, the blood is passed through tubes into the dialyzer, which filters out toxic wastes, extra salt and excessive water. Then the purified blood flows through another set of tubes back into the body.

The other process is called peritoneal dialysis, whereby a solution is put into the abdomen (Peritoneal cavity). The fluid captures the waste products from a person's blood. After a few hours when the fluid is nearly saturated with wastes, it is drained through a catheter. Then, a fresh bag of fluid is dripped into the abdomen to continue the cleansing process. Patients can perform peritoneal dialysis themselves.

According to Dr. Mbugua, a nephrologist at Kenyatta National Hospital, "one out of every ten people has a kidney disease, unfortunately a majority do not know, as the disease does not present any symptoms, unless the patient is screened during a check-up which is recommended every four to six months."



Dialysis machine

Kidneys are vital organs responsible for processing about two hundred liters of blood to sift out about two liters of waste products and extra water (urine) which flows to the bladder through the urethra.

Dr Mbugua explains that wastes in the blood come from the normal breakdown of active tissues, such as muscles, and from food. The body uses food for energy and self-repairs. After the body has taken what it needs from food, the wastes are sent to the kidney for excretion.

If the kidneys did not remove these wastes, they would build up in the blood and damage the body resulting into chronic kidney disease or CKD, also known as chronic renal disease, which is a progressive loss of renal function over a period of months or in some instances several years.

Most kidney diseases attack the nephrons, causing them to lose their filtering capacity. Damage to the nephrons can happen quickly, often as a result of injury or poisoning (nephrotoxicity), but most kidney diseases destroy the nephrons slowly but surely. Only after years or even decades will the damage become apparent

Dr. Mbugua advises patients suffering from high blood pressure to have a check-up for kidney disease as it may be a sign that the kidney is already impaired.

Healthy kidneys take wastes out of the blood but leave protein. Impaired kidneys may fail to separate a blood protein called albumin from the wastes. At first, only small amounts of albumin may leak into the urine, a condition known as microalbuminuria, a sign of deteriorating kidney function. As the kidney function worsens, the amount of albumin and other proteins in the urine increases (proteinuria).

A doctor may first detect the condition through routine blood and urine tests. The National Kidney Foundation recommends three simple tests to screen for kidney disease: a blood pressure measurement, a spot check for protein or albumin in the urine, and a calculation of Glomerular Filtration Rate (GFR) based on a serum creatinine measurement.

A person's blood is screened to see how many milligrams of creatinine are in one deciliter of blood. A person whose creatinine level is only slightly above 0.6 to 1.2 mg/Dl level (normal range) will probably not feel sick, but the elevation is a sign that the kidneys are not working at full strength.

Permanent kidney failure occurs when the kidneys stop working completely. The body gets filled with extra water and waste products. This condition is called uremia. Hands or feet may swell. A person will feel fatigued and weak because the body needs clean blood to function properly.

Untreated uremia may lead to seizures or coma and will ultimately result in death if the person is not put on dialysis or rather undergo kidney transplant.

Unfortunately, CKD often cannot be cured. But people in the early stages of CKD may be able to make their kidneys last longer by seeking early medical attention. Doctors advise that people should watch their blood glucose levels closely to keep them under control.

Kidney patients are advised to check on their protein intake, because impaired kidneys may fail to separate the protein from the wastes. They should limit the amount of protein they eat so that the kidneys have less work to do.

People with a family history of kidney problem and diabetes are particularly at risk of kidney disease. Poisons and trauma, such as a direct and forceful blow to the kidneys, can lead to kidney disease. Over-the-counter medicines can be poisonous to the kidneys if taken regularly over a long period of time. Taking painkillers regularly is also proven to be a leading cause of CKD.

Smoking, too, is a major cause of kidney diseases, Dr Mbugua said.

Improve Coverage of Agriculture and Rural Development

By GEORGE ACHIA and KIPROTICH KOROS

There is room for the mass media in Africa to improve the coverage of agriculture and rural development and this involves closing the communication gap between scientists and journalists who have expertise in packaging and disseminating timely information.

This was one of the major conclusions by scientists and journalists who attended a conference in Nairobi organized by the World Agroforestry Centre and Technical Centre for Agricultural and Rural Cooperation (CTA).

"Knowledge generated by research organizations needs to reach those on the ground, especially poor farmers and this could be achieved through better management of communication activities," said Prof. August Temu of ICRAF. The workshop reiterated the important role of the media in disseminating timely information, the use of simple and understandable language, weather updates and value addition practices to farmers. It was agreed that the media should ensure that farmers are provided with accessible information about emerging technologies which when adopted will lead to increase productivity.

"Communication for agriculture is not seen as a priority at either national or international level and the role of the media as an effective player in agricultural and rural development, including dissemination of information on emerging technologies, is undervalued," said Michael Hailu, CTA director.

Dirane Onifade, Chair of African Federation of Science Journalists, concurred. "For media houses, agriculture is not seen as newsworthy and it is difficult to interpret scientific jargon for their audience," he noted. However, there is need to re-brand development journalism so that it does not seem like government propaganda while ensuring that skilled agriculture journalists are not confined to cities or urban areas like Nairobi giving rural areas little attention, Onifade added.

Other factors identified by participants from the continent as working against effective coverage of agriculture and rural development included language barrier, poor translation of scientific information mainly originally written in English and French.

Potential for Local Flower Market

KARI researchers say there is potential in the domestic market for small-scale flower production and marketing. There is room for increased production and marketing through capacity building on appropriate production and marketing skills. It can also be concluded that small-scale farmers in Mount Kenya Region with biophysical and socio-economic environments similar to Kiambu, Nyandarua and Limuru, have the potential to produce and supply flowers in the local market profitably, if provided with the appropriate skills and information. ❑

DISEASES

Elephantiasis on the Increase in Western Uganda

By HOPE MAFARANGA
Science Africa Correspondent in Kampala

Elephantiasis is on the increase in western Uganda. A survey carried out in the month of October in Kitagwenda County, Kamwenge district in western Uganda reveals that out of every 10 homesteads, seven people have swollen legs, scrotums and painful limbs due to the disease. The disease usually claims new victims with the onset of the rainy season.

One of the victims, 15-year-old John Ariganyira from Kihoro village, says he has been living with the disease for three years. He describes the pain as unbearable and the disease has become resistant to Ivermectin, a painkiller used to reduce the pain. In Kakasti village, the disease has not spared children as young as five years.

Sevurini Kashaija of Kiryangabi village says eight members of his family have elephantiasis, but he cannot afford treatment because Ivermectin is expensive.

Joseph Wamani, the district focal person, said that elephantiasis is a neglected disease, adding that the government has concentrated on eliminating river blindness and neglected elephantiasis.

"The district has concentrated in the elimination of only Onchocerciasis (River blindness) without addressing elephantiasis which is almost a sister diseases," Wamani said.

The district health officer, Dr Vincent Mubangizi says: "The disease has been associated with witchcraft due to lack of knowledge and information."

Scientifically known as lymphatic filariasis, the disease is one of the neglected tropical diseases.

Elephantiasis is caused by a thread-like worm called wuchereria bancrfti which is transmitted by the mosquito.

Dr Mubangizi says elephantiasis is a syndrome most often caused by an obstruction of the lymphatic vessels, which results in extreme swelling of the skin and tissues, typically in the lower trunk and body.

He says in its primary stages, it affects the legs and genitals, resulting in shapeless, thickened and ulcerated skin, along with fever and chills.

He explained that elephantiasis can be very painful and uncomfortable and reduces the sufferer's ability to lead a normal life. A serious complication of elephantiasis can obstruct blood vessels, which limit blood supply and cause the skin to become infected, Dr Mubangizi explained.

Mubangizi says in women besides affecting the private part, symptoms include abnormal swelling of the breasts. Elephantiasis also affects the ears and mucus membrane.

Devastating impact of elephantiasis.
Pic by Hope Mafaranga

According to the Rapid Assessment Report that was released by the Vector Control Division and health ministry in 2004, the disease was first reported in Lango (now Apac and Lira districts) in northern Uganda. But it was also common in eastern and western Uganda.

Elephantiasis has two main forms and several related disorders, Dr Mubangizi names them as Lymphatic filariasis, which is the most common form of elephantiasis and is caused by a parasitic disease resulting from a bite from an infected mosquito.

Elephantiasis is caused by most commonly known as *Wuchereria bancrofti* parasite, but also can be caused by *Brugia malayi* and *Brugia timori.* These parasites are all nematodes, or roundworms, that are transmitted by mosquitoes.

The parasite inhabits the lymphatic vessels, resulting in their inability to drain the affected extremities.

It is not definitely known if the parasite itself is the sole reason of the swelling, or if the fact that the immune system is working to fight the parasitic infection contributes to it.

Lymphatic filariasis affects people primarily in the tropics and is concentrated in Africa. It is estimated that 120 million people spread over 80 countries are affected by elephantiasis. Approximately one-third of these suffer serious cases of the disorder.

The director of neglected diseases in Uganda ministry of health, Dr Ambrose Onapa, noted that nonfilarial elephantiasis, the second type of elephantiasis, is non-parasitic. This type is more common to Africa's central mountains. It is caused by repeated contact with volcanic ash in the area. The primarily barefooted population contact chemicals from the soil into their feet, and the chemicals travel to the lymphatic vessels and irritate and block them.

He says that treatment of elephantiasis depends on the type of the disorder.

Lymphatic filariasis is treated with medication designed to kill the parasite.

These medications include Suramin, Diethylcarbamazine, Ivermectin, Metrifonate, Mebendazole and Levamisole.

"Medicines must be taken early after the primary infection, but they can have toxic side effects," Dr Onapa says.

He acknowledges that the problem with effective treatment of elephantiasis is that it is difficult to diagnose it early enough.

Doctors have found that careful, daily cleaning of the affected areas helps prevent secondary skin infections that may be associated with elephantiasis.

Surgical treatments are usually only effective on scrotal elephantiasis, but not on limbs. Unfortunately, there is no vaccine available at this time.

Standard Therapies

Treatment of elephantiasis usually involves surgery to remove excess skin. In extreme cases, the amputation of an entire limb may be necessary. In cases where the male genitals have been affected, reconstructive surgery on the penis and scrotum has been successful. Antistreptococcal antibiotics are used to relieve infection.

Lymphatic tissue is removed by surgery or radiation therapy.

"In a male, there may be enlargement of the scrotum, and the penis may be retracted under skin which has become thickened, nonelastic, hot and painful and in female, the external parts of the female genital organs (vulva) may also be affected by elephantiasis," Dr Onapa explains.

He said that underlying damage to the lymphatic system may leave individuals susceptible to secondary bacterial and fungal infections that can greatly worsen the condition.

"Although the legs, arms and external genitalia are most often affected, elephantiasis can affect any area of the body," he adds.

In underdeveloped regions of South America, Central Africa, Asia, the Pacific Islands and the Caribbean, obstruction can be caused by a parasitic disease known as lymphatic filariasis.

Lymphatic filariasis is caused by three different species of worms known as Brugia malayi, Brugia timori and Wuchereria bancrofti. These worms cause damage and inflammation to the lymphatic system.

The larval form of the worms is introduced into the human body through the bite of infected mosquitoes.

Genital elephantiasis can also be caused by bacterial sexually transmitted diseases, specifically lymphogranuloma venereum (LGV) and donovanosis.

The bacterium that results in LGV, Chlamydia trachomatis serovar L1-L3, damages the lympathic system resulting in lymphatic obstruction in the genitals.

Chronic obstruction eventually results in genital elephantiasis. Donovanosis is caused by the bacterium Calymmatobacterium (Klebsiella) granulomatosis.

Donovanosis causes genital elephantiasis because the body's immune system response to the bacterium causes inflammation and narrowing (constriction) of the lymphatic vessels.

Elephantiasis is also associated with a disorder known as podoconiosis. Podoconiosis, sometimes referred to as nonfilarial elephantiasis, is a disorder caused by the absorption of minute mineral particles from the soil through the feet of barefoot individuals.

It is believed that the mineral particles cause an immune system response eventually resulting in the formation of inflammatory masses of nodules (granulomas) in the lymph vessels of the feet and legs. Additional causes of elephantiasis include a protozoan disease called leishmaniasis, tuberculosis, leprosy, and a repeated streptococcal infection.

Diagnosis

A diagnosis of elephantiasis is made based upon a thorough clinical evaluation, a detailed patient history and identification of characteristic symptoms. A variety of tests may be used to determine the underlying cause of lymphatic damage and subsequent elephantiasis.

Treatment

Treatment of elephantiasis usually involves treating the underlying condition. Lymphatic filariasis is treated with diethylcarbamazine. LGV is treated with doxycycline. Donovanosis may be treated with azithromycin.

However, in many cases, medical therapy alone is not enough and surgery may be necessary. In cases where the male genitals have been affected, reconstructive surgery on the penis and scrotum has been successful. Anti-streptococcal antibiotics are used to relieve secondary infection. Lymphatic tissue may be removed by surgery or radiation therapy. ❑

HEALTHCARE IN AFRICA

Impact of Ghana's 'Helipad' Hospital

KINGSLEY E.HOPE,
KUMASI,GHANA

Undoubtedly, the Komfo Anokye Teaching Hospital (KATH),still remains the only public hospital with a helipad for helicopters for emergency situations not only in Ghana but also in the sub-shara Africa.The ultra-modern hospital is located in Kumasi,the capital of Ashanti Region in Ghana.The capital has a total population of over three million.

The geographical position of the 1,000 bed hospital,the road network of the country and commercial nature of Kumasi make the hospital accessible to all the areas that share boundaries with Ashanti Region and others that are further away.

As a major tertiary institution, referrals are received from all the ten regions of the country as well as from the neighboring countries such as Ivory Coast,Togo Burkina Faso.

It has seven technical or clinical directorates,such as,Internal medicine,Child Health,Obstetrics and Gynecology,orthopedic and Trauma, General Surgery, Oncology.

KATH has a staff strength of about 3,000 made up of 500 medical doctors including house officers,that is,interns with two specialists and consultants at each of the clinical departments,while nurses number up to 1,000 the fact being that nurses are trained at the hospital.

The hospital,which existed in the 1940s,became a teaching hospital in 1975 for the training of medical students in collaboration with the School of Medical Science of the Kwame Nkrumah University of Science and Technology and,

It has a vision of becoming a centre of excellence offering clinical and non-clinical services of the highest quality standards comparable to international standards. There are cancer treatment facilities to meet the needs and expectations of its numerous clients. The mortuary can accommodate 200 bodies.

In terms of patient care,KATH cannot tell for sure how many patients it treats because of the referrals it receives from surrounding areas and the neighboring countries,which can is laudable.

With the advent of the National Health Insurance Scheme, medical care has become more affordable to the populace and that has resulted in congestion at the hospital especially at the maternity ward and the hospital is poised

(Photo from internet)

to improve on infrastructural facilities.A maternity ward which was commenced in the 1940 is now about 85 percent complete

About 16 kilometers away from this hospital is a major private one,ANINWAH MEDICAL CENTER, at Emmena,off the main Kumasi -Accra highway. Established some 18 years ago,the medical center has five doctors and two specialists,an Indian and a Ghanaian,with 37 nurses. It has X-ray, physiotherapy, mortuary among other facilities, and treats all kind kinds of diseases.

The patient friendly medical center has a 100 bed capacity and can boast of 350 patients that are taken care of a day.

There are other private hospitals in the Region which have good facilities and are doing quite well in terms of patient care,but it is interesting to note that some rich men or famous people relegate these public and private institutions to the background and travel abroad for medical treatment.

Recently two former Ministers of the past administration,(New Patriotic Party), Courage Quarshigah, Health and Kwadwo Baah Wiredu,Finance and Economic Planning,went outside the country for treatment but never survived.

There have been diverse opinions by medical doctors on why rich or famous people leave for treatment overseas.

DR. Lewis Roberts, works at the Mayo Hospital in Rochester, Minnesota in the United States of America(USA).

He has a laboratory that researches into how liver cancer develops in the hope of developing better means of preventing them,or detecting them at an early stage to effectively treat it.

To update health care workers, physicians,nurses,superintendents on the latest updates in the care of patients for the most common diseases prevalent in West Africa,DR Roberts have grouped some doctors in the USA:African Partners Medical,and collaborated with the KATH,for continuing medical education.

The aim, therefore,of African Partners Medical,is to help build capacity to improve the skill level of physicians who are already well trained.

The yearly program brings together specialists,physicians,nurses,surgeons from the neighboring countries to meet in Ghana. Born and educated in Ghana,DR Roberts,has been in the USA for the past 24 years.

Was met during a recent program under the theme,''Advances in Medicine''.

In his view,rich or famous people travel rush to oversea for medical care because of the level of confidence they have in the institutions abroad with respect to skillful personnel who have acquired great experience in their specialized fields,not to talk about the technological advancement in terms of equipments.

There is the need for governments to raise the level of care to the extent that average persons can feel comfortable,because it is less expensive and they trust the quality of the care they should get.

According to DR.Roberts,this is taking place in India,though not in all the health institutions,but in specialized areas and it is not a surprise that many people from the USA are moving there for treatment these days.

DR.Baffour Awuah,the Medical Director of the KATH,and a radiation oncology consultant,shares that it is ignorance as many Africans,sometimes,do not believe and trust what they have.lamented about some person who sold a complete house and went abroad for breast cancer treatment at a cost of about 20,000 dollars.

It is not the lack of skillful personnel but sometimes these rich or famous people would not want the society to know that they have certain diseases and would travel abroad under the guise of holidaying,but in reality for treatment.

However,DR.Awuah did not rule out modern equipments as a contributing factor:''It is possible that one day these rich people would turn their eyes unto us if we join hands to bring our facilities to a state of art level.''

DR. Dipen Prajapati,an Indian, specialist in obstetric and gynecology at the Aninwah Medical Center,says having specialists is not the only criteria and underscores the need for technological advancement in equipment.

The 30-year experienced specialist observes that everyday so many new things are coming up and not investing in modern equipment could continue to push rich men to seek treatment abroad.Someone with kidney stone would need a special machine to break the stone,such device is not in most Africa nations,he quips.

For the Medical Director of the Aninwah Medical Center,DR. David Owusu-Ansah,the issue has been bothering him since his medical life 13 years ago.
Trained in the then Soviet Union,DR. Owusu-Ansah,thinks with the African and for that matter a Ghanaian,whatever is out there is the best.

In his view it is high time these rich men look unto doctors in the country they have what it takes to be efficient, skillful

Not mincing words that modern equipments is a major factor, the Medical Director notes that these infrastructures and equipments are now being put in place in most African countries such as Ghana.The notion that what is good always comes from the western world should be a thing of the past,he says.

FOCUS ON AIC KIJABE HOSPITAL

Kenya: President Visits AIC Kijabe Hospital

AIC Kijabe Hospital has come a long way since it was established in 1915. Located 5 Kms from the Nairobi-Nakuru highway, Kijabe hospital is now a Referral hospital, fully equipped with new 9 unit operating theatre rooms, modern ICU, Dental, Laboratory and Pathology units. Many projects such as Bethany Kids at Kijabe Hospital (BKKH), AIDS Relief Project,the development of Naivasha Medical Centre and Marira Clinic have also been realized as the hospital continues to witness tremendous growth. Last year alone the hospital received more than 120,000 outpatient visits, operated more than 9100 surgical cases in its theatres. This year the hospital started Plastic surgery and children neurosurgery.

The President opened our new nine-unit theatre facility on 8th October 2010. Accompanying the president were Hon. Beth Mugo Minister Health and Public Sanitation, Hon. Samson Kazungu Assistant Minister for Medical Services, Ms. Mary Ngari PS Medical Services, Mr. Francis Kimemia PS Provincial Administration and Internal Security, Dr. Alfred Mutua Government Spokesman among other dignitaries.

The president acknowledged the support church-based institutions are contributing to Kenya's economy and commended AIC Kijabe hospital for the pivotal role it played during post election crisis in treating the victims.

He noted that for the new constitution to take effect, different institutions should corroborate with the Government in provision of services.

President Kibaki appreciated different donors who have assisted in development of Kenyan economy by investing in different sectors. He also thanked the donors who contributed funds towards the construction and refurbishing of the new theatres namely:-

- Cavadas Foundations
- BRRI
- Smile Train
- Australian High Commissioner.

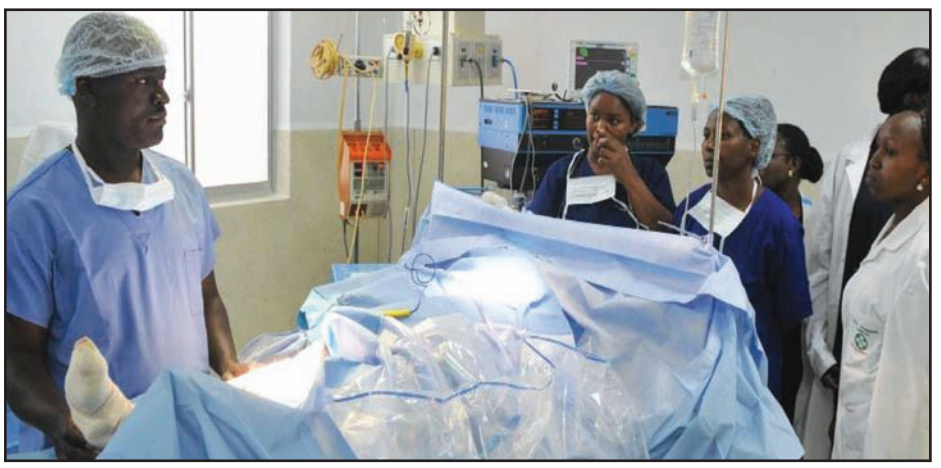
The president challenged the hospital to source for donors within the country even from the government itself.

He pledged that the government will support the hospital in the following way:-

1. *Consideration of waiver on taxation for equipment imported for use of hospital work.*
2. *Secondment of doctors by the Ministry of Medical Services .i.e. obstetrician & Gynecology and pediatrician.*
3. *Promise of helping the hospital with two donated 4-wheel ambulances.*
4. *Settlement of outstanding bills for care given to displaced persons in the period December 2007 and January 2008 amounting to Ksh.2,131,380.*
5. *Considering paying debts incurred by patients for over the last 5 years amounting to more than 30 million in order for the hospital to release title deeds and securities kept as pledge documents.*
6. *Improvement of the near by Gichiengo-Mai-mahiu roads.* ❑

Hon Beth Mugo, Minister for Health and Public Sanitation, is led by Nelson Kimilu, Marketing & Public Relation Manager to the new theatre.

Kenya's President Mwai Kibaki is shown around the hospital by Justus Marete (Executive Director). BELOW: Dr.Tobias preparing one of the theatre rooms to show the President



(Article contributed by Marketing and Public Relations Manager, Mr. Nelson Kimilu).

Pics courtesy of Kijabe Hospital

Kijabe's Extra-ordinary 'Daktari' Bransford

One of our doctors was recognised in America for provision of healthcare.

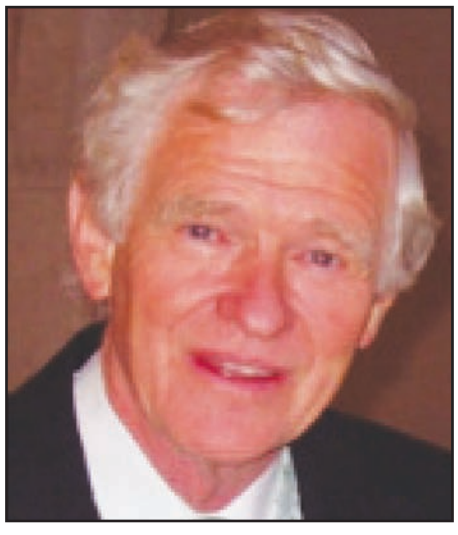
Dr. Richard Bransford

On behalf of the Board of Governors' Committee on Socioeconomics Issues, the Board of Governors' Executive Committee, and Operation Giving Back, congratulations on being named the recipient of the ***2010 American College of Surgeons/Pfizer, Inc. Surgical Humanitarian Award.*** Your contributions to the profession and humanity are truly exemplary.

The writeup below was read on October 4, 2010 as Dr. Bransford humbly received the award. This document was written by Mark Newton and is in tribute to Dr. Richard Bransford and his generous contribution to medicine and humanity. It is headlined:

"He noticed me!"

When I think of Dick Bransford, I



see…

A doctor who left his home country 34 years ago to live in Africa and serve as a general surgeon. A surgeon who mops the surgical floor, carries the baby to the operating room, helps place the intravenous line, cleans the surgical site himself and is gowned and gloved before the table is positioned for surgery.

A surgeon, who removed dead bowel from a typhoid patient, performed a C/S in less than ten minutes, repaired club feet (hundreds or thousands), straightened a burn-scarred arm, repaired a frontal encephalocele, and closed more myelomeningoceles than probably anyone in the world.

A doctor sitting on the bedside of a 2 month old girl with hydrocephalus comforting a Maasai mother who prior to seeing Daktari Branford would cry in the back of her mud hut since she was told that as a mother she was worthless.

A surgeon, who is willing to ask for advice, read a surgical text in the OR, constantly seeks new surgical skills, pray for each patient, and inspire all those around him with his dedication and passion.

A doctor who is constantly searching for opportunities to treat those without surgical care while never be satisfied with past accomplishments.

A surgeon who has operated under Acacia trees in Southern Sudan surrounded by people dying of starvation with civil war raging less than 40 miles from the camp while helping prepare for a massive food drop to feed the hungry mothers.

A primary care doctor who knows river blindness, leprosy, tuberculosis, schistosomiasis and even, "Nodding Disease" and would never sit and examine children next to a hole in the ground. I soon discovered why.

A surgeon who trains medical students in countries recovering from war while also working 12-16 hours per day performing surgeries attempting

CONTINUED ON PAGE 12

Cameroon: Elites Seek Treatment Overseas

By LEOCADIA BONGBEN, ScienceAfrica Correspondent in Cameroon

While there are certain pathologies that may warrant evacuation, Cameroonians seem to prefer what is foreign although national or local hospitals often have the capacity to treat its people, says Prof. Bob Oyono, chief medical doctor of Djoungulo, a leading church hospital.

The medical services at Djoungulo hospital are designed to be more caring and humane beginning with patient reception which tends to be a scary experience in some countries. "The logic is that reception is the best and care more humane" Prof. Oyono says.

However, maintaining the standards set by the founders who were Americans is a major challenge and the hospital was once at a point of closing down, Prof. Oyono regretted.

The hospital has a staff of 140 including nurses and doctors. The hospital can boost of basic facilities but needs more input when it comes to specialized medicine.

Prof. Bob Oyono

However, Prof. Oyono warns that hospitals in Cameroon should not be compared with those abroad because there are a lot of parameters that characterize a given society including the level of personnel training, basic facilities, equipment and materials. Therefore people need to appropriately adapt to their environment and not do things as if they are in Europe.

Cameroon hospitals are classified into various categories including being public or private. According to Prof. Arthur Essomba, the director of Health Care Organization and Sanitary Technology, first class hospitals in Cameroon are General or Referral Hospitals in Yaoundé and Douala. There is also the Gynaeco-Obstetric and Pediatric Hospital, YGOPH, in Yaoundé.

The General Hospitals have autonomous administration run by a board of directors and act as referral hospitals for difficult cases. Second class hospitals include the Central Hospital in Yaoundé, The Laquintinie Hospital in Douala and the Jamot Psychiatric Hospital.

The Regional Hospitals are the third category followed by District Hospitals and health centers. The Director of Yaoundé Gynaeco-Obstetric and Pediatric Hospital, YGOPH, Prof. Doh Anderson Sama, says the hospital has a staff of 600 including Chinese volunteers.

The hospital created in 2001, has top expertise in the areas of gynaecology, breast cancer, pediatric ophthalmology, medical imagery, anesthesia, physiotherapy, dermatology, venerology, pediatric surgery, acupuncture, orthopedics, cardiology and 24 hour-emergency service and an intensive care unit.

The director told *ScienceAfrica* that the focus is on mother and child health, but male patients are equally received and coping with the increasing number of patients and the demand for modern hospital equipment remains a hurdle.

However, there are other views like that of Prof. Jeremia Ewota, retired lecturer, who says that he does not admire the public hospitals due to the frustration patients go through.

"Poor reception and the longer periods of waiting are unbearable and worse, accident victims may die due to take-it-easy attitude."

HEALTHCARE IN KENYA

Kijabe Doctor Wins US Humanitarian Award

FROM PAGE 11

to give hope to the next, then the next, then the next… and wakes the next day ready to do it again with a smile and thankfulness that he has been given this opportunity.

A surgeon who has been the surgical pillar for a once small mission hospital called Kijabe Hospital which is now undoubtedly, one of the largest surgical hospitals in all of rural Africa, training surgeons from many countries in Africa and performing over 12,000 cases per year.

A father who has raised 7 wonderful children (5 biological and 2 adopted Kenyan sons) and who has prompted many around him to follow his lead in this special gift of family. Many Kenyan orphans are now in loving homes because of his example.

A husband, who is perhaps married to one of the very best women in the world and after 45 years, is still seen walking down the paths of Kijabe holding the hand of his sweetheart. And, any women who can put up with an "African-Missionary" surgeon for 45 years deserve two of these awards!

When I see Dick, I see a man who was called to serve the poor by a God who loves the poor, the children and the widows. He was given the skills of a great surgeon, the attitude of a servant, and a passion which is fueled by a belief that all people, especially disabled African children, deserve surgical care blended with hope in a loving God.

I know that this room is filled with many wonderful surgeons but in the eyes of thousands of mothers, fathers and children who live under the Acacia trees, in mud-walled huts on the vast plains of East Africa, Daktari Bransford and his ongoing impact in surgical care will never be forgotten. In my 11 years working with Dick Bransford, he is the model of a great surgeon!

"He would hold my baby with the large head when others would not even look at me since I was told that I was cursed. I love Dr. Bransford with all of my heart". "He noticed me in the crowd!"

A Maasai mother's words when she came looking for her doctor last month at Kijabe Hospital.

WATER CATCHMENT

Worries Over West African Dams, Transboundary Rivers

With case studies spanning Ghana, Benin and Nigeria, Michael Simire in Lagos explores water challenges posed by the construction and operation of dams, as well as the sharing of water bodies in the West African sub-region.

Nana Oteaku Amani is not a happy man this morning. An elder and traditional ruler in Apaaso Resettlement Community, he agonises over the plight of the neighbourhood of some 800 people created via a resettlement programme involving former settlers of land where the famous Akosombo dam now sits. "Before we were brought here, we lived behind where the dam now is. We had our farmlands then and some families had about four or five houses. But most families were relocated to single rooms. Initially, each family got a parcel of land to farm so as to be able to earn a living, but the land was either taken away or those lucky to still farm were forced to share proceeds from the farm with the host/original settlers," he laments. According to Amani, who is the Asare III in the community, water and sanitation issues are increasingly threatening the lives of inhabitants. "We lack drinking water and the houses have no toilet. There are no health facilities, save for an eye clinic established by an individual. Life here is terrible, and the dam has done nothing good for us," he says.

Another elder in the community, Okyeame Gyensti, discloses that residents face land problems for farming and lack of major amenities for their wellbeing. He says that, as part of plans resettle them in 1966 upon the dam's completion, the authorities promised to compensate them with lands for farming, as well as provide schools, clinics and electricity, which he adds have not been forthcoming. As a result, he points out, the youth and some community members have migrated to other parts of the country, leaving the elderly to fend for themselves. "We have lost everything. How I wish the dam was never built," Gyensti cries out. A casual observation is quite revealing: the community appears to lack adequate toilet facilities, the homes are without electricity despite existing overhead powerlines, access roads are barely motorable and basic amenities seem non-existence. Indeed, residents of Apaaso and several other resettled communities along the Akosombo and Kpong dams insist the projects have unfavourably impacted on their livelihoods after 45 years of resettlement. Some 80,000 persons from 52 ommunities were resettled at new sites along the Volta Lake upon the construction and completion of the Akosombo Dam in Ghana between 1962 and 1972. The dam was built to provide electricity to aid the country's development.

But Akosombo Dam spokesperson, Mrs. Rhoda Arthur, says that the Volta River Authority (VRA) works with the people to have issues resolved amicably, adding that the construction of amenities and compensations to affected persons are being paid as required. She submits that a Trust Fund had been established to cater for such needs.

VRA estate manager, Mr. Emmanuel Martey, counters complaints and allegations made by resettlement community dwellers, stressing that the authority has the people at heart and has never failed them. His words: "We will not spoon-feed these communities forever. Residents should learn to provide for themselves. These towns are no different from other towns in Ghana. To make life meaningful for these communities, medical facilities are regularly made available via boats equipped as a clinic. Schools, toilets and other amenities are also being provided.

Hundreds of kilometers away close to the Togo-Benin border, the Nangbeto Dam is widely believed to be the root cause of a series of despair being experienced by families along the course of the Mono River. One of such is Anani Acakpo, a fisherman and father of six children who hails from Nicoue-Condji in the province of Mono, Benin Republic. For decades, he depended on fishing for the family's sustenance and had started tutoring his first son Amavi how to fish. Wife Afiavi and daughter Ayele would sell the fish in the local market.

Then there was a sudden drop in fishing. The fish which used to be abundant in the river now flourishes upstream the dam on the Togolese territory. Similarly, flooding, which was hitherto experienced once in five years, became a yearly affair. "I am now forced into farming, which is also threatened by the flooding. Some others have turned into motorcycle-taxi drivers and other less profitable activities. The release of water at the dams results in these devastating floods. The salty ocean water from the lagoon now flows into what used to be a fresh water territory," complains Acakpo, saying that workforce of affected communities is diminishing as the youths leave in droves for the cities. The second longest river in Benin after the Oueme, Mono River runs over more than 500 kilometres and forms the natural border between several municipalities of Benin, including Grand Popo, Athieme and Djakotome. For some 100 kilometres, the water body constitutes the natural border between Benin and Togo. Mayor of Athieme, Mr. Anani Amavi Joseph, laments that the natural flooding that occurs around the months of August, September and October are worsened by water releases by the Communaute Electrique du Benin (CBE) from the Nangbeto Dam, leading to human, economic and material disruptions. "The floods of the Mono River cause many damages almost every year.

They carry away crops, destroy houses, make many homeless and cause drowning of people," he laments. "People throw all kinds of rubbish in the river; some even defecate inside the river, which some others use for drinking water." According to him, there have been rare cases of conflict over the river involving communities in Togo and Benin. "These are conflicts caused by sand extraction, deforestation for canoe making and bushfires," Joseph says, pointing out however that the authorities of both countries are implementing some development projects on the Mono valley including the construction of a bridge linking both sides to service the Mono River Basin.

But just across the border in northern Nigeria, a proposed dam project on the Jama'are River is raising eyebrows. The river forms part of the Hadejia-Nguru wetlands and scientists believe that the rhythm of flooding and draining in the wetlands determines the agricultural output of over 500,000 impoverished people spread across the states of Bauchi, Jigawa and Yobe in Nigeria.

The water body is also a tributary of the vast Lake Chad Basin, whose rivers, swamps and lakes support a delicate and diverse ecosystem as well as over two million villagers reliant on fishing and farming in Nigeria, Niger, Chad and Cameroon. Yet, it is on this river that the proposed Kafin Zaki Dam will be built. State (Bauchi) and local council (Ningi) officials as well as a business concern (Dangote Group) obviously have some interests and have given the scheme the go-ahead. State officials say the Dangote Group won the bid to invest N60 billion (about $400 million) in building the dam, which will irrigate between 120,000 to 700,000 hectares of land to produce an estimated one million tones of sugar annually.

NEXT ISSUE:
Why Nigerian Conservation Foundation opposes the construction of a new dam

Innovation: **New Microbicide and Contraceptive**

BY CLEMENTINE OSODO
ScienceAfrica Correspondent

Many African countries lack a safe and convenient method for women to have the upper hand on prevention of unwanted pregnancies and infection of HIV and STIs. The high incidences of these infections are as a result of heterosexual intercourse and the infections spread more readily from men to women than vice versa.

Women often have little or no power to negotiate the use of condoms with their partners and are unable to protect themselves from nonconsensual coercive sex. There is a desperate need for provision and availability of new, easy to use, safe and affordable methods of protection which allow women to take the necessary precautions without having to negotiate with their partners.

It is in this regard that a local reproductive health scientist Dr. Peter Gichuhi Mwethera, head of the reproductive health and biology department in the Primate Research Institute (PRI), was motivated to come up with a vaginal lubricating gel which is being developed as a microbicidal contraceptive preventing pregnancy, infection of HIV and sexually transmitted diseases.

The gel under the trademark name UniPron was granted Patent No. KE 218 from KIPI and is still under experimentation having succeeded on baboons. It is a clear fluffy, acidic, non-detergent and also heavily buffered and has a PH of 3.4. The gel is very stable at room temperature, of approximately 22°C, and body temperature. It has a shelf life of over 24 months.

UniPron's mechanism of action is to lower the vaginal PH from 5.0 to 3.4 immediately after administration and maintaining the acidity for about three hours after which the PH returns to the normal range without causing any detectable irritation on the vaginal epithelium. It has the ability to preserve an acidic vaginal microenvironment due to its highly buffered PH of 3.4 hence a vaginal defense enhancer. It was scheduled to undergo the human clinical test before the end of 2010 or early 2011 at a city hospital.

This initiative was funded by the Government of Kenya through the Ministry of State for National Heritage and Culture. It was awarded a two year grant totaling to US$ 214,000 to develop a microbicide and spermicide from 2006 to 2009, another two year Grant of US$ 266,000 to continue the development of a microbicidal contraceptive from 2009 to 2011 and last a grant of US$ 1,066,600 to develop, promote and market two medical products under trademark names SMUGEL and SMUSCAN.

Smugel and Smuscan are two other research products under Dr. Mwethera's initiative which have been commercialized and are now in the market.

Smugel is a human lubricating gel specially made for women to address vaginal dryness at personal level caused by menopause, use of some contraceptives, use of anti cancer drugs, use of some antibiotics and emotional reasons. It is also used at medical level for vaginal examinations, delivery in hospitals, and lubrication of theatre equipment.

Smugel is water based, inert and sterile hence safe for use with condoms since it does not react with rubber. Unlike oil based lubricants, it also does not react with the epithelial region of the vagina interfering with the good bacteria of the organ known as lactobacilli which maintain the acidity of the vaginal region. Consequently Smugel is safe compared to the oil based lubricants which may lead to lesions and also interfere with baby's skin during delivery.

Smuscan on the other hand is a scanning gel used for ultrasound procedures in hospitals. It helps improve maternal healthcare because it aids in discoveries of medical defaults hence prevention of complications at childbirth.

Both gels are locally made, very affordable and have a positive impact on the economy. They are available on chemist shelves and some hospitals. Donations of five hundred tubes of Smugel and five hundred tubes of Smuscan have been sent to some provincial hospitals.

Dr. Mwethera strongly believes that Africa and Kenya to be precise can not develop let alone industrialize without investing in science and technology as drivers of any serious economy.

Dr. Mwethera also pointed out that the biggest challenge faced is the failure of researchers to partner with the private industry since such partnerships can result in the production of quality medical products that are cheap therefore increasing accessibility and improving the economy in a great way.

CONTINUED ON PAGE 15

East Africa: **Anti-counterfeit Law Threatens Lives**

- *Generics Classified as Counterfeit*
- *Puts millions of lives in danger*

By GEORGE ACHIA

Health Action International (HAI) Africa and Medecins Sans Frontieres (MSF) have called for the repeal the Kenyan Anti – Counterfeit law which in its current form is a threat to millions of East African citizens who depend on essential generic medicines.

The law which also contravenes calls for universal access to treatment by UNAIDS is likely to overturns gains already made in the treatment of People Living with HIV in Kenya and East African Community (EAC).

The controversial Section 2 of the Anti-Counterfeit Act, 2008 classify generic drugs as counterfeit.

"The overall concern about the Bill is that it does not distinguish medicines from other goods. Medicines are essential and lifesaving and should be distinguished from other goods. Use of counterfeit medicines can result in treatment failure or even death," said Mr. Gichinga Ndirangu, the regional coordinator HAI Africa, during editors' briefing on Anti-Counterfeit Initiatives at a Nairobi hotel.

"Generics are not counterfeits! They are legitimate exact copies of their brand-name original. The manufacturing of generic medicines is not a criminal offense under Kenyan Law," Gichinga emphasized.

"This is a challenge to most Kenyans who depend on generic drugs which are affordable and hence is a sure way to stop PLHIV from accessing cheap ARVs and other essential medicines," Rose Kaberia, the Regional Coordinator of Eastern Africa Treatment Access Movement (EATAM) said at the same function.

The blurring and lack of clear definition of what counterfeit medicines are have led to a lot of confusion of what is understood as counterfeit. Medicines that are deliberately and fraudulently mislabelled regarding their identity or source are said to be counterfeits. Both branded and generic products can and are counterfeited.

Gichinga also called for the need to change the current approach based on an Intellectual Property Protection because it will not solve the public health problems associated with counterfeit medicines but instead wants the Pharmacy and Poisons Board (PPB) to deal with issues concerning counterfeit medicine and not the Kenya Revenue Authority (KRA).

"The powers given to the KRA are too broad. The PPB should be in charge of combating counterfeit medicines," he noted.

The growing push to enact anti-counterfeit laws must be carefully interrogated to ensure legitimate concerns over safeguarding access to more affordable medicines are not overlooked.

The push within the East African Community to develop a draft law and policy on anti-counterfeiting which would supersede national legislation and form the basis of a homogenous law and policy in the region raises significant questions on national autonomy in policy making and regulation.

He called for strengthening quality surveillance while safeguarding access to more affordable medicines. Currently, several health facilities in Kenya are reporting drug shortages of essential medicines including ARVs. ❑

Hepatitis B:

Turkana Hardest Hit

BY AYOKI ONYANGO
ScienceAfrica Correspondent

An increase of hepatitis infection rates poses a threat to the East African region's blood banks, top medical experts have warned. In Kenya Turkana with rates reaching up to 30 percent is hardest hit while Central Kenya has the lowest rates of about three percent says Dr Fredrick Okoth of the Kenya Medical Research Institute.

"We are concerned by an upward trend in hepatitis A, B and C," says Dr Margaret Oduor, the Kenya National Blood Transfusion Services director at the Ministry of Medical Services. Hepatitis is an inflammation of the liver, most commonly caused by a viral infection and can be fatal. There are five main hepatitis viruses – type A, B, C, D and E but the most prevalent in Kenya are A, B and C.

Symptoms of the disease include jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. Hepatitis A and E are typically caused by ingesting contaminated food or water while B, C and D usually occur due to contact with infected body fluids. Hepatitis B is also transmitted through sexual contact.

Dr Oduor said her organization was worried about the new threat of hepatitis infection rates in Kenya.

Mr. Joseph Wang'endo, the Executive Director of the Bloodlink Foundation, says an effective hepatitis vaccines is available in the country.

The Hepatitis B vaccine was incorporated in the National Childhood Immunization Programme in 2001- meaning those born before then are not protected. Experts say that it is important to vaccinate food handlers, commercial sex workers, healthcare workers and school children, who are above nine years against Hepatitis B. The medics therefore recommend the vaccination of adolescents before they become sexually active and all other risk groups against Hepatitis B. Hepatitis

Dr. Mercy Njuguna of Sanofi-Aventis Group told a workshop that her organization has developed two vaccines for hepatitis A and B. Hepatitis B vaccine Euvax B requires two doses and a booster after six months. Avaxim vaccine from for Hepatitis A also requires the process. She says the best weapon against hepatitis, especially A and B is prevention through vaccination, which is cheap and effective. The medics were speaking at a Nairobi hotel during World Hepatitis Day. ❑

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Microbicides:

Promising HIV Prevention Tool

By GEORGE ACHIA

Safety studies of microbicides that could significantly reduce a woman's risks of infection with HIV virus is going on in several Africa countries including Kenya, Uganda, Malawi, Zimbabwe, Zambia, Tanzania and Rwanda.

In a series of clinical trials that spreads across Sub-Saharan Africa and other developing countries under the auspices of International Partnership for Microbicides (IPM), the microbicide research is exploring ways in which women can independently protect themselves from contracting HIV infection through sex.

"Researchers have been working for years toward the goal of developing safe and effective microbicides, and the knowledge they have accumulated has resulted in proof-of-concept that an ARV-based vaginal gel can offer women protection against HIV," Dr. Zeda Rosenberg, the Chief Executive Officer of IPM recently told *ScienceAfrica* during an exclusive interview in Nairobi.

In Kenya, the studies are being carried out in Suba and Kisumu. Microbicides are topical vaginal products being developed to prevent heterosexual transmission of HIV. These products could take many forms including those that could be used monthly, daily or at around the time of intercourse.

ARV-based microbicide would work in a variety of ways by either preventing HIV from attaching to or entering a healthy human cell or by preventing the virus from duplicating itself once it is inside a cell.

Researchers are developing a variety of products that include daily vaginal gels, films and tablets, as well as vaginal rings that would release an ARV drug gradually and provide protection against HIV for as much as a month at a time.

A microbicide would be a significant complement to other HIV prevention measures, such as safer sex education, condom use, voluntary testing and counseling, treatment of sexually transmitted infections, anti stigma campaigns and safe blood supplies.

"The IPM is developing microbicide based on the same types of potent ARV drugs used successfully in HIV and AIDS treatment and in the prevention of mother-to-child transmission of HIV. Now, IPM is testing a vaginal ring which is popular among women in the developed countries for contraception and other medical uses to deliver ARVs to help protect women from HIV," Dr. Rosenberg said.

The vaginal ring being tested in IPM clinical trials contain the antiretroviral drug *dapivirine* which is being developed by IPM under royalty – free license from drug companies including Johnson & Johnson, Merck and Pfizer. These companies also allow for drug combinations to enable for combined microbicides.

Developing tools such as microbicides that empower women to protect their health and save lives is of key importance to stem the tide of HIV infection. However, according to Dr. Rosenberg, more studies in this field are needed. ❑

New Microbicide and Contraceptive

FROM PAGE 14

Together with other stakeholders, they have converted research knowledge into medical products to improve reproductive health and maternal health.

The stakeholders include the Primate Research Institute (PRI), a biomedical research institution whose mandate is to improve human health by ethically utilizing non-human primates (monkeys) and a private pharmaceutical company known as Universal Corporation Limited (UCL). UCL is a local company that manufactures over two hundred medical products in sixteen African countries and whose headquarters are in Kenya.

The views expressed by Dr. Mwethera in this article are personal and not from the Institute of Primate Research. The writer can be contacted through email: clementinejunior@yahoo.com
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PICTORIAL SPECIAL

Kenya's President Mwai Kibaki, listens to Lydia Wamalwa, a plant molecular biologist, during the opening of the Biosciences Eastern and Central Africa Hub on 5 November 2010. The BecA Hub is open for use by researchers working to improve African agriculture. The BecA Hub puts Africa's research capacity on par with some of the world's most advanced research institutes. (Photo credit ILRI/Masi).

Assistant Minister for Agriculture Mr. Kareke Mbiuki (centre), Agriculture secretary Dr. Songa and Prof. O. Ole MoiYoi, chairman KARI board of management during the opening of KARI's 12th Biennal conference held at KARI headquarters in Nairobi. (Photo by Jeff Oloo/ScienceAfrica).

Dr. James Onsando, executive director KEPHIS, speaks during the official launching of Centre of Phytosanitary Excellence (COPE) at Kenyatta International Conference Centre, Nairobi, Kenya. Other top officials and experts were from ministry of Agriculture, university, CABI, KARI and other related institutions.

(Photo by Jeff Oloo/ ScienceAfrica).

Confirmed: **Sickle Cell Gene in Areas with High Levels of Malaria**

The potentially deadly sickle cell gene, which also protects against malaria, is most commonly found in areas with historically high levels of the mosquito borne disease.

The malaria hypothesis has since been supported by both population and laboratory studies, but the original observations of a geographical overlap between frequency of the gene and malaria prevalence have never been tested beyond simple visual comparisons at the global scale.

To address this, Dr Fred Piel and colleagues collated all the information currently accessible on the occurrence of the sickle cell gene in native populations worldwide and, using modern mapping techniques, created a map of the global frequency of this gene. The map was then compared with the distribution and intensity of malaria before widespread malaria control.

The study showed that the sickle cell gene is most common in sub-Saharan Africa, the Middle East and India, and that the areas of high frequency of this gene are coincident with historically high levels of malaria, thus confirming that the malaria hypothesis is correct at the global scale.

"This study highlights the first steps in our efforts to create an open-access, online database of the frequency of various inherited blood disorders," says lead author Dr Piel, from the University of Oxford. "Such databases will help improving estimates of their public health burden and guide where resources would be best applied."

Co-author Dr Simon Hay adds: "The malaria hypothesis is the text-book example of a natural selection 'balancing act', where selection against an unfavourable mutation is weighed against selection in favour of a protective gene.

The sickle frequency map was created as part of the activities of the Malaria Atlas Project, a multinational research collaboration funded primarily by the Wellcome Trust. The study was funded by the Wellcome Trust, geographers, biologists and statisticians at the University of Oxford, together with colleagues from the KEMRI-Wellcome Trust Programme in Kenya, have produced the first detailed global map showing the distribution of the sickle cell gene. The results were published in the journal *Nature Communications*.

The Kenya Medical Research Institute is one of the most well developed national research institutes in Africa with a network of centres across Kenya such as the Centre of Geographic Medicine Research Coast (CGMR-C), which is home to the KEMRI-Wellcome Trust Research Programme. The programme formally established in 1989, is a partnership between KEMRI, Oxford University and the Wellcome Trust. It conducts basic, epidemiological and clinical research in parallel, with results feeding directly into local and international health policy, and aims to expand the country's capacity to conduct multidisciplinary research that is strong, sustainable and internationally competitive.

Source; KEMRI/ Wellcome Trust.

Mission to Save Uganda's Forests

FROM PAGE 2

cessible and valuable resources for personal acquisition and exploitation for income and to sustain their livelihoods.

Q: what will it take for Uganda to restore her forests?

A: Uganda's forests can also be saved if sufficient resources are allocated to the NFA to manage, conserve and ensure their sustainable utilization. The forest sector has been inadequately financed over the last four decades, along with other environmental services.

Despite the recent establishment of the National Environment Management Authority (NEMA) and the NFA as governmental agencies responsible for implementation of environmental systems of control, low expenditure on the environment and forestry has contributed to their deterioration.

Q: You were appointed last year to head Lake Victoria Research Initiative, what have you achieved in terms of development, environment and protecting natural resources?.

A: Lake Victoria Research Initiative Basin has had a linkage on development, environment and protection of natural resources. Since 2003, we have had 96 projects funded with a total fund grant from Swedish, Canadian International Development Agency (CIDA) of 20 million USD.

Our research focus had been in six areas, research on plants, fisheries and agriculture, indigenous and local knowledge, land use, natural resources management and pollution on the lake and the pollution of the water bodies within lake Victoria Basin.

Our studies have been designed in a way that they address all the above issues in line with poverty eradication. The lake and the lake environment, we are looking at environment very boldly ranging from the pollution of the lake, protecting the water bodies, use of natural resources, use of environment, forest, energy studies that are related to environment, we are looking at agriculture and how it impacts on environment. Some studies are focusing on small scale mining and how they are impacting on environment.

Q: The government of Uganda signed over 7,000 hectares of forest to BIDCO, the largest manufacturer of vegetable oil in Uganda, on Bugala islands in exchange for a 10 percent share in the plantation.

A further 3,500 was set aside for plantations to be cultivated by out- grower. This implies that 40 percent of the natural forest of Bugala, the main island has been destroyed. What is your view?

A: I was in charge of looking at and forests issues in that team of specialists and in my recommendation as the forestry expert at that time having looked at the background information from BIDCO, they were proposing 10,000 hectares of forest land to convert it into oil palm.

Bagala island has pristine forest, relatively un-tampered with, with that rich biodiversity still intact, with all the initial species that God allowed to grow there still growing, not even converted with what we call secondary forest because secondary forest is when you clear the initial ones, there is a re-growth and it may not have all the species that had grown there before and it may not have all the biodiversity associated with it.

We found that it was pristine and primary forest, in my recommendation, the idea of growing oil palm trees on Bugala was not bad per say, but let BIDCO grow palm in grass land areas not necessarily in forest areas.

Secondly, I recommended that the hectares they want can not be obtained from Bugala island alone, they should seek else where.

I said they should get 3000 hectares from Bugala then they can seek it else where and get 7000 to other grass land areas for the palm, but that was not the case.

The project went on and cleared the forests; they are determined to clear the entire forest. Our concern in the environment terms, we advised that by clearing 6000 to 10,000 hectares of forest Land on Bugala Island which is in the middle of Lake Victoria will create problem.

Like, hydrology was certainly going to change, you see 10,000 hectares is not small area of land, it big, that can significant affect the rain falls partners, and we are talking about rainfall partner within the lake and in the neighborhood of the lake.

This will not affect Uganda but also our friends in Kenya, Tanzania and perhaps Rwanda and Burundi, we are talking about a regional problem. By removing the trees and we are actually replacing it with a mono-crop, and palm will be the only crop growing there, now you can not compare 10,000 hectares of palm with single specie, you can not compare 10,000 hectares of palm trees to forest with a mixture of species.

We are, converting 10,000 hectare of natural forest, removing ecosystem service.

Q: After you carried out the research and advised the government about the implication of clearing the forest, government went ahead and gave it away. BIDCO still took the land, its still growing the palm trees and government is aware of the environmental consequences.

A: The desire for fast economic growth triggered government decisions to degazette forest reserves and the land given to investors under the guise of increasing agricultural production in spite of public disapproval and resentment.

The degazetting of Butamira and Bugala Island forests recently are clear testimonies to this.
On Bugala Island in Lake Victoria, over 6000 hectares of relatively undisturbed natural forest have been cleared to give way to oil palm growing.

Mabira forest reserve on the Kampala–Jinja highway is still at risk of being given away for sugar cane growing. The drive for a modern economy has also been coupled with a significant increase in construction of residential, commercial and institutional buildings that use millions of bricks burnt with thousands of tonnes of firewood.

Timber for construction is also on high demand and much of it comes from the natural forests.

Furthermore, the majority of industries are agro-based and some like tea processing, sugar production, tobacco curing, bakeries and fish processing require huge quantities of firewood.

Although all these indicate the economic importance of forests to Uganda, they at the same time show the detrimental effects of social and economic activities on Uganda's forest and tree cover.

Q: Tell us the projects you have worked on and the one you are doing currently.

A: We've completed 96 projects and we are having 39 on going research projects involving 200 researchers and 49 participating institutions in the five East African states. We are going to get more six projects funded by the end of this end year. At the end of 2009 we closed 59 projects. ❑

Agriculture and Jobs Creation

FROM PAGE 1

counts for about 65 per cent of Kenya's total exports and provides more than 70 per cent of informal employment in the rural areas."

The conference held at KARI headquarters in Nairobi, also came at a time when the country's premier agricultural research institute is celebrating the accreditation of its Kabete analytical laboratories. The labs have state-of-the-art equipment for soil and plant tissue analysis and other basic laboratory equipment. Accreditation is a means of assessing the technical competence and integrity of a laboratory offering testing services for customers' interest.

"The growing emphasis on knowledge creation reinforces the importance of integrating research systems; sharing knowledge and information to create opportunities for transferring technologies; and methods of enhancing the dissemination of research results," said Dr. Ephraim Mukisira, the director KARI.

KARI board of management chairman Prof. Onesmo Ole-MoiYoi reiterated the institution's contributions to the country's successes in agriculture.

"The rapid growth in the cereals, legumes, horticulture and industrial crops in recent years is mainly attributed to the new and improved crop varieties, animal breeds and production technologies released by KARI," he said. KARI operates through a network of 23 centres spread all over the country. These research centres address priority constraints in accordance with the research continuum, from strategic to adaptive research as they discharge their respective mandate. ❑

ENVIRONMENT

World Curbs Ozone Layer Depletion

International efforts to protect the ozone layer, the shield that protects life on earth from harmful levels of the sun's ultraviolet rays, have stopped additional ozone losses and contributed to mitigating the greenhouse effect, according to the report published by the World Meteorological Organization and the United Nations Environment Programme.

The Scientific Assessment of Ozone Depletion 2010 was written and reviewed by 300 scientists and launched on September 16th - the International Day for the Preservation of the Ozone Layer. It says that Montreal Protocol is working and has protected the ozone layer from higher levels of depletion by phasing out production and consumption of ozone depleting substances."

The new report says that Montreal Protocol has provided substantial co-benefits by reducing climate change and in 2010, the reduction of ozone depleting substances expressed in CO_2-equivalent emissions (about 10 Gigatonnes per year), were five times larger than those targeted by the first commitment period (2008-2012) of the Kyoto Protocol, the greenhouse emissions reduction treaty.

Key findings on the ozone layer:

- Over the past decade, global ozone and ozone in the Arctic and Antarctic regions is no longer decreasing but is not yet increasing.
- As a result of the phase-out of ozone depleting substances under the Montreal Protocol, the ozone layer outside the Polar regions is projected to recover to its pre-1980 levels some time before the middle of this century. The recovery might be speeded up by greenhouse gas-induced cooling of the upper stratosphere.
- In contrast, the springtime ozone hole over the Antarctic is expected to recover much later.
- The impact of the Antarctic ozone hole on surface climate is becoming evident, leading to important changes in surface temperature and wind patterns.
- It is reaffirmed that at mid-latitudes, surface UV radiation has been about constant over the last decade.
- In Antarctica large UV levels continue to be seen when the springtime ozone hole is large.

Ozone depleting chemicals, such as CFCs (chlorofluorocarbons), once present in refrigerators and spray cans, have been phased out. Demand for replacement substances called HCFCs (hydrochlorofluorocarbons) and HFCs (hydrofluorocarbons) has increased. Many of these are powerful greenhouse gases.

- Total emissions of HCFCs are projected to begin to decline in the coming decade due to measures agreed under the Montreal Protocol in 2007. But they are currently increasing faster than four years ago. The most abundant one, HCFC-22, increased more than 50% faster in 2007-2008 than in 2003-2004.
- Abundances and emissions of HFCs are increasing at about 8% per year. HFC-23 is a byproduct of HCFC-22 production. Although it has no impact on the ozone layer it is more than 14,000 times more powerful as a greenhouse gas than CO_2.

Achim Steiner, UN Under-Secretary General and UNEP Executive Director says that it is a potential area for action within the overall climate change challenge and delivers multiple benefits to economies including efforts to meet the Millennium Development Goals including benefits to public health.

Without the Montreal Protocol and its associated Vienna Convention, atmospheric levels of ozone-depleting substances could have increased tenfold by 2050. This in turn could have led to up to 20 million more cases of skin cancer and 130 million more cases of eye cataracts, not to speak of damage to human immune systems, wildlife and agriculture, the report says.

"The ozone depletion isues demonstrates the importance of long-term atmospheric conitoring and research, without which ozone destruction would have continued unabated and might not have been detected until more serious damage was evident," said WMO Secretary-General Michel Jarraud. "The Montreal Protocol is an outstanding example of collaboration among scientists and decision-makers that has resulted in the successful mitigation of a serious environmental and societal threat.''

Briefs From African Network for Drugs and Diagnostics Innovation (ANDI)

Settlements, Water Quality

A study aimed at evaluating the impact of human settlement on the water quality in two springs in **Muea,** Cameroon, shows that the closer the settlement is to the spring, the higher the probability of contamination and the higher the prevalence of diarrhea.

According to this study by researchers at the University of **Buea** and Research Foundation in Tropical Diseases and Environment, Cameroon, human settlement has a negative impact on the water quality of springs.

Neem Controls RVF

Larvicidal mechanism of pounded Neem plant leaves has illustrated a way of controlling Rift Valley Fever (RVF) and malaria vector. In a research conducted by International Centre for Cancer Research in Kisumu, Kenya, the study was carried out to investigate the effects of the pounded leaves of the Neem and Moringa on mosquito larvae. However, Moringa had no significant effect.

Malaria: Misdiagnosis, over-prescription

A joint research between the Centre for Global Health Research and Kenya Medical Research Institute (KEMRI) shows massive over-prescription of antimalarials. The study investigated the diagnostic accuracy of clinical malaria cases in different health facilities in Western Kenya highlands. This implies that over treatment and misdiagnosis will lead to misuse of very expensive combination drugs which are currently in use and could also trigger drug resistance to these antimalarials.

Nigeria Resumes Sickle Cell Drug Manufacture

FROM PAGE 1

Economic and Financial Crime Commission against Xechem Nigeria in 2009. The complainant alleged that US$3.5 million of public funding from the Nigerian government, which was supposed to have been spent on drug manufacture, had been misused. Xechem had also borrowed nearly US$4 million from a Nigerian bank and US$4 million from a US bank. The destination of these loans was questioned.

This led to the closure and of company charged with producing the drug and had its licence revoked which left many Nigerian sickle cell sufferers without a medicine with which to alleviate their symptoms. At the time of its halt, the company was producing 50,000 capsules a year.

Professor K. S Gemaniel of NIPRD said they are planning to resume the manufacturing of the drug. He explained that Nicosan is obtained from the mixture of four Nigerian plant materials like *Piper guineese* (seeds), *Pterocarpus Osun* (stems), Eugenia caryophyllum (fruits), Sorghum bicolor (leaves), in a standard ratio which produce a hygroscopic, reddish-brown powder with a pungent odour. Prof Gamaniel said that the plan to resume Nicosan production is because there was no other cheaper alternative treatment shown to be a safe and efficacious medicine for the management of patients with sickle cell disease.

"There is no any other cheaper medicine for SCD patients, it is for this reason we have to resume the production of Nicosan," he told international science journalists who visited his office. He said Nicosan was tested and proved by High Performance Liquid Chromatography (HPLC). The drug does not cause any side effect. Nicosan can be safely combined, with other drugs, even the cytotoxic drugs like Indinavir, Zidovudine, Lamivudine and Vevirapine used in the management of HIV/AIDS. He said that this will give children with SCD the chance to live long.

"Many children with sickle cell do not survive infancy or early childhood. They die before their second birthday," he said. At the same meeting, Dr Yemisi Kuule said that Nigeria is working with traditional healers to identify plants which can help people living with HIV/AIDS in Nigeria. Dr Oby Obudazie, the NIPRID the director of chemistry and quality services, said that the institute will soon start a research on HIV prevention of mother-to-child infection.

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AFRICAN ADAPTATION PROGRAMME

Innovation: Why Workshop on Threshold 21?

Threshold 21, also known as T21, is a jargon that is yet to find its way into normal conversation, media coverage and even experts involved in various aspects of national and regional planning and development activities are just beginning to explore its benefits. It is a dynamic simulation tool that supports comprehensive, integrated long-term national development planning.

Once a country identifies its vision, and key goals, T21 generates scenarios describing the future consequences of the proposed strategies. The T21 model takes into account over 800 variables and their interdependencies in its simulation

Thus a recent workshop in Nairobi on *Threshold 21 Integrated Planning Model* organized under the auspices of *Kenya, Africa Adaptation Programme* and facilitated by the *Millenium Institute,* was an eye-opener on the application of T21 to various aspects of Kenya's national planning process. The theme focused on "*Strengthening Institutional Capacity for Integrated Climate Change Adaptation and Comprehensive National Development Planning in Kenya*"

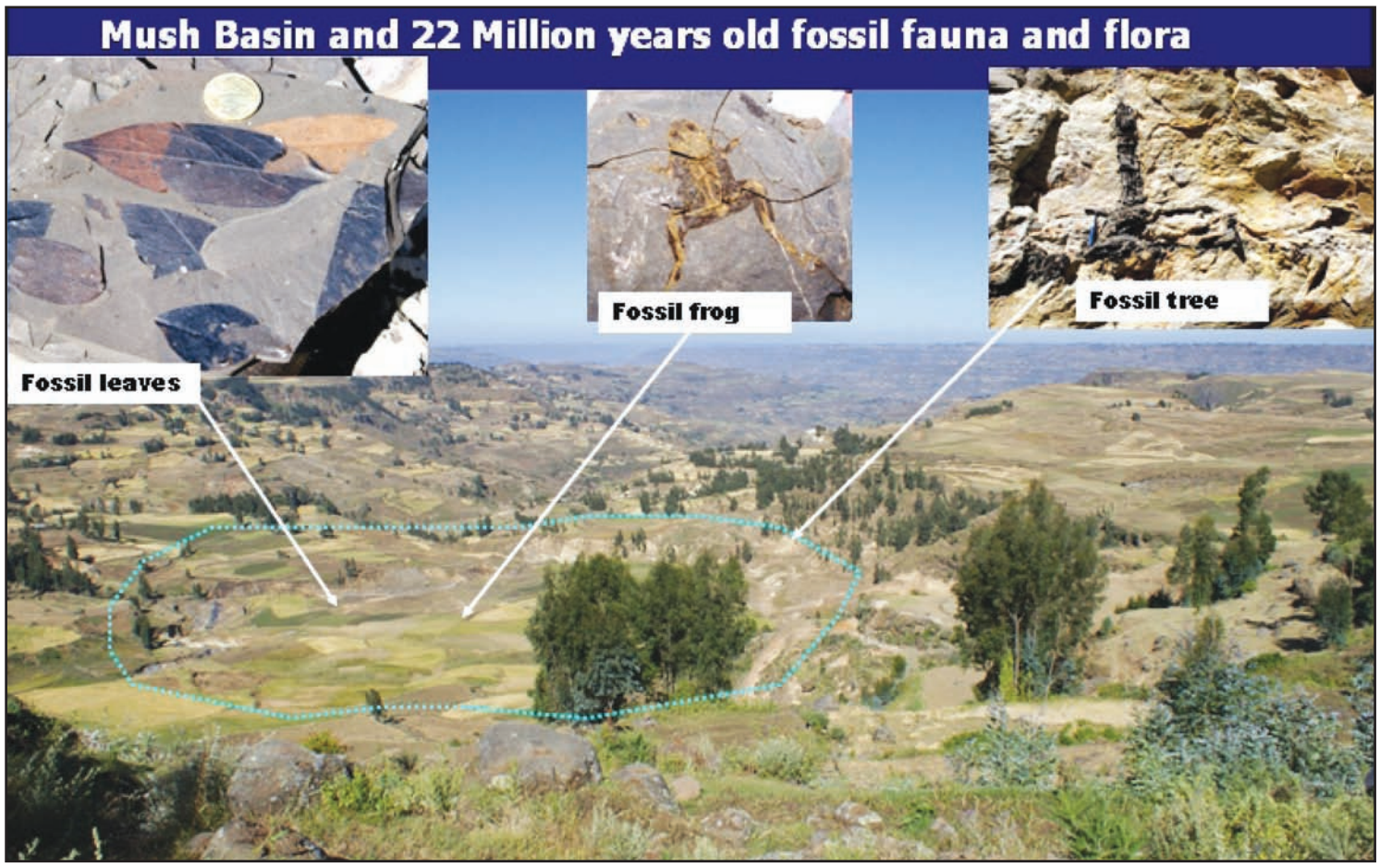
Dr Andrea Bassi (right) from the Millenium Institute and Hiroshi Matsuura, second secretary embassy of Japan. BELOW: Participants at the T21 workshop at Norfolk hotel in Nairobi

Key players included the ministry of environment and mineral resources, ministry of planning, national development and Vision 2030, UNDP Kenya and embassy of Japan. Presentations included: use of simulation models for policy analysis; application on climate change and national development issues; mapping key sectors for T21-Kenya, introduction to system dyanamics and others. Dr Andrea Bassi from the Millenium Institute was the key facilitator during the training workshop.

Those present during the opening ceremony included permanent secretary ministry of environment and mineral resources, Dr Edward Sambili, the permanent secretary in the ministry of planning ,national development and Vision 2030, Hiroshi Matsuura, second secretary embassy of Japan and Christopher Gakahu, UNDP Kenya.

22 Million Years Old Fossils Discovered in Ethiopia

FROM PAGE 1



ancient climate, fauna, flora and geologic processes.

These geologic records in turn provide evidences of ancient plant and animal lives; frequency, range, and duration of significant global climate changes; and faunal and floral changes which took part in the recorded Earth's history. Lake sediments formed in eastern, west-central and central part of Ethiopia following the plume generated volcanism have unique potential in that they can provide multiple localities rich in fossils of plants, animals and climatic record. Research in the Chilga basin lake sediments, northwest Ethiopia, provides comprehensive understanding of 27-28 million years old fauna, flora and climatic conditions.

Similarly research on new locality in the Mush basin (157 kilometers north of Addis Ababa) central Ethiopia has yielded in the discovery of 22 million years old fossil amphibians, fish, mammals and numerous plants (the only African site of its age). The Mush basin research undertakes paleoenvironmental reconstruction of the Mush basin with the following specific objectives:

1. understand the origin of the sedimentary basin;
2. understand the ancient climate and vegetation;
3. reconstruct the holistic ancient environment of the Mush basin and
4. use the reconstructed Mush basin vegetation and climate as reference for historical and future global warming events.

The outputs of this research will play critical role in the overarching paleoenvironmental reconstruction research that will produce models that explain the 30 Million to present records of fauna, flora and climate in East Africa.

Researchers; Mulugeta Feseha, PhD; Dereje Ayalew, Phd; Kassaye Begashew PhD; Solomon Yirga D.Sc.)

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BIOSAFETY

GM: Uganda's Confined Field Trials for Major Food Crops

By PETER WAMBOGA-MUGIRYA

Ugandan researchers will carry out a series of field trials on some of the major food crops that have been genetically modified (GM), following several recent approvals by the Uganda National Biosafety Committee.

They will seek to develop both transgenic and conventional maize varieties tolerant to climate change-induced drought; GM cassava resistant to virulent cassava brown streak virus ravaging the starchy root crop across eastern and central Africa; GM bananas with engineered resistance to *Xanthomonas* bacterial infections; and cotton plants containing both Bt and 'roundup-ready' genes.

According to Yona Baguma, vice-chairman of the committee, the approvals — given in July and followed by planting that started in September and were to go on until November — are "historic". They are clear signals that Uganda's scientific community has built capacity in molecular biology and convinced the committee it can adhere to national and international guidelines on GM organisms, he said.

"It is also significant that the committee has matured with functional and competent systems to assess and evaluate applications, with rejections and approvals," said Baguma.

Godfrey Asea, principal investigator for the maize trials and national project coordinator for Water Efficient Maize for Africa, said: "Our confined field trial site is ready to plant the first transgenic maize in November 2010.

"This shall be a trial on efficacy for drought-tolerance by GM and conventionally-bred maize. When it succeeds, we expect to carry out more trials on starch content, taste, production outputs and to commercialise by 2017," Asea told *SciDev.Net*.

Uganda has previously approved and carried out a field trial on banana to test black sigatoka disease resistance (2007 - 2009), two trials to evaluate Bt and roundup ready cotton (2009 - 2010), one trial to test cassava mosaic virus resistance (2009 - 2010), and one ongoing trial to test banana bio-fortified for vitamin A and iron.

But the country still lacks a national biotechnology legal framework for releasing such crops on the market. The 2008 National Biotechnology and Biosafety Bill has still not been approved by Parliament and, with elections expected in February next year, the date of its passage remains uncertain.

But Godber Tumushabe, chief executive officer of the Advocates Coalition for Development and Environment — a policy think-tank — said Uganda is unnecessarily rushing to develop GM crops before it builds the critical scientific and infrastructural capacity to ensure the products are safe.

Only three African countries are currently growing GM crops commercially: Burkina Faso, Egypt and South Africa. Several others are conducting research and field trials, including Ghana, Kenya, Malawi, Nigeria, Tanzania and Zimbabwe, mainly focusing on staple local crops such as cowpea. ❑

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KNOW YOUR SCIENTISTS

Professor Moses K.H. Limo is one Kenya's top experts in the fields of biochemistry and molecular biology and was the founding chairman Department of Biochemistry and Molecular Biology, Egerton University. He also became the director of the Graduate School. He became an associate prof of biochemistry and is now a professor of biochemistry promoting quality undergraduate and postgraduate teaching on molecular biology and biotechnology ; biochemistry of parasites; biochemistry of nucleic acids, biosafety, bioethics and conducts research in the application of molecular markers in disease control.

Prof Limo has strong interests in the application of science, technology and innovation to control parasites and disease vectors that exact a heavy toll in the production of food and against the health of animals and people. He is a specialist on application of biosafety and bioethics in modern biotechnology to health, environment and agriculture. He is a board member of the National Biosafety Authority, where he chairs the technical subcommittee.

He remains on a journey of academic excellence that started from Seretumin Primary School to Kabarak and Alliance High School before he became a top chemistry and bio-chemistry student at the University of Nairobi, where he earned his B.Sc. (1st Class Honours) in Chemistry and Biochemistry. He eaned MSc in Environmental Chemistry; Environmental Technology Section, SINTEF, Norwegian Institute of Technology, University of Trondheim, Norway and University of Nairobi. He earned his PhD in Biochemistry; Biochemistry and Molecular Biology Laboratory, International Laboratory for Research on Animal Diseases (ILRAD, now

ILRI) and University of Nairobi, Nairobi, Kenya. Prof Limo also has a postgraduate Certificate in Public Health (Bioethics) from School of Public Health and Health Systems, University of Pretoria.

Prof Limo has been a visiting scientist: Centre for Biotechnology and Bioinformatics (CEBIB). Created public knowledge and awareness on biosafety and biotechnology in Kenyaand also conducted research on kappa casein gene polymormism. He was also a visiting scientist: Insect Molecular Genetics Group, Institute of Molecular Biology and Biotechnology (IMBB), Heraklion, Crete, Greece

Characterized potential insect antennae (odorant) receptor genes. Research scientist: Molecular Biology and Biochemistry Department, Vector and Disease Management Programme, International Centre of Insect Physiology and Ecology (ICIPE), where Characterized tick (Rhipicephalus appendiculatus) potential anti-tick vaccines using biochemical, molecular biology, immunological and genomic techniques Developed molecular genetic markers for population analysis and linkage mapping of Glossina species: RAPD - PCR and microsatellite markers. Trained postgraduate students in African Regional Postgraduate Program in Insect Science (ARPPIS).

He developed analytical tests (PCR) on nucleic acids of genetically engineered animal vaccines. Post Doctoral (Sep 1987 - Jul 1990): International Laboratory of Molecular Biology of Tropical Disease Agents, School of Veterinary Medicine, University of California, Davis, U.S.A. Cloned, sequenced, analyzed and expressed in eukaryotic vectors genes of the virulent (Kabete-O) strain of Rinderpest virus. Expressed recombinant genes in vaccinia virus and baculovirus vectors. Constructed an infectious vaccinia virus recombinant which expresses glycoproteins of vesicular stomatitis virus of the New Jersey and Indiana serotypes for use as a polyvalent vaccine. Did advanced post graduate courses in molecular biology and biotechnology.

He has received several research grants awards, supervised and trained postgraduate students. Has published and presented many papers. ❑

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