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LIVESTOCK AND CROPS THE EXCELLENT MIX

How ASARECA crop-livestock innovations are boosting food security and income
in Burundi, Kenya, Tanzania and Uganda

Mr. Peter Ddaki and his wife Nnalongo Ddaki are a happy couple. Every year they produce enough food for sale and for family consumption; and as such, they are able to satisfy their nutritional needs, pay school fees and meet other financial obligations. They are also able to save a reasonable amount of money for financial security and future investments. This modest, but impressive success is no doubt, a result of hard work.

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Involve farmers in research—minister urges EAAPP scientists

Agricultural scientists implementing the East African Agricultural Productivity Programme (EAAPP) have been urged to keep farmers at the heart of research to ensure that solutions to agricultural concerns are relevant and sustainable.

“It is necessary to consult farmers and all direct beneficiaries to obtain their views for effective implementation,” Uganda’s Minister of Agriculture, Animal Industry and Fisheries, Hope Mwesigye told agriculturalists on March 22.

Speaking at a ceremony to launch the Cassava Regional Centre of Excellence (RCoE) at the National Crops Resources Research Institute (NaCRRI), in Uganda, Mwesigye described EAAPP as “a shining and a lasting quest to end hunger in Africa”. “EAAPP will play a significant role in addressing agricultural productivity challenges in the sub-region by building on existing capacity through the four Regional Centers of Excellence,” she observed.

Addressing common challenges

Conceived in 2009, the governments of Ethiopia, Kenya, Tanzania and Uganda in 2010 signed agreements to implement EAAPP at national and sub-regional levels. All the countries, except Uganda launched the project last year. In all the countries, the agricultural sector is still faced with challenges notably; the absence of adequate improved technologies for farmers and fragmented research efforts across small programmes.

Kenya will be the centre of excellence for dairy, Uganda for cassava, Ethiopia wheat and Tanzania for rice. The countries have pledged to manage investment in these commodities which have been identified by ASARECA as being of sub-regional importance in mitigating food insecurity.

Research benefits to increase

EAAPP is informed by the realization that the spillover of research benefits across national borders can increase rates of



Participants listen attentively during the EAAPP launch at NaLIRRI in Uganda

return. Statistics show that investments yielding regional benefits in African agriculture deliver as much as three to four times the gain over and above the direct benefits in the country of origin.

Free-up scientists

Speaking at the launch, the World Bank’s country manager, Kundhavi Kadiresan, said the confinement of scientists within the individual countries impedes the assembling of a critical mass of researchers needed to address complex problems associated with agricultural research and development, which are in most cases regional in nature.

It is understood that the RCoEs will facilitate better use of scarce expertise and resources that are scattered across the sub-region by sharing resources, knowledge and technologies among EAAPP countries through the existing mechanisms championed by ASARECA.

This is a positive development for ASARECA because RCoEs are an excellent opportunity for transforming the sub-region’s agriculture from subsistence to innovative, productive, commercially oriented and competitive agriculture.

EAAPP, like ASARECA, seeks to enhance collaboration among the National Agricultural Research Systems (NARS).

This collaboration contributes to the AU/NEPAD’s CAADP Pillar IV which focuses on revitalizing, reforming and expanding Africa’s agricultural research, technology dissemination and adoption.

ASARECA has offered to use its expertise in coordinating regional research for development, extension, training and education to facilitate spillovers of technologies and innovations that will be generated through EAAPP.

Why cassava, wheat, dairy, rice?

Cassava: Cassava is important for food security, and commercial applications. It is a staple crop for more than 200 million people and is the second most important food crop in Africa after maize.

The Abuja Declaration (2006) identified cassava as one of the crops with the greatest potential to combat poverty and food and nutrition insecurity in Africa. Four of the 10 ASARECA countries namely DR Congo, Tanzania, Uganda and Madagascar are among the top 10 world cassava producers after Nigeria, Brazil, Thailand and Indonesia.

DR Congo produces approximately 16 million tonnes, Tanzania approximately



Uganda's Agriculture Minister, Hope Mwesigye (c) and Livestock State Minister Bright Rwamirama and officials prepare to cut a cake at EAAPP Uganda launch

5 million tonnes, Uganda approximately 5 million tonnes and Madagascar approximately 3 million tonnes. Overall, more than 30 million tonnes of cassava is produced annually in Eastern and Central Africa (ECA), which is more than any other staple crop. On average, between 1961 and 1999, the value of cassava production (over US\$2 billion annually) was the highest among all crops produced in the ASARECA region.

Apart from obviously being a major staple food crop in most African countries, cassava has a range of domestic and industrial uses. Cassava is used to make glucose, fructose, lactose, and is a substitute for sucrose in making beverages, jams and canned fruits. It is mixed with active pharmaceutical materials to make capsules and tablets. In homes and livestock farms, it is used as an ingredient in animal feeds.

It is also used to produce liquor, industrial and medical alcohol. Cassava starch is widely used in the production of foods such as instant noodle, tapioca pearl and seasoning sauce.

Other uses include sizing yarn during the making of cloth; pressing, flattening and polishing paper; acts as high-quality glue for plywood binding. Cassava starch can also be mixed with bio-degradable polymer to produce packaging material.

Cassava faces major production constraints and these mainly include pests and diseases particularly cassava mosaic disease (CMD), cassava brown streak disease (CBSD), cassava bacterial blight (CBB), cassava mealy bug and cassava green spider mite. It is estimated that losses due to CBSD were above US\$ 100 million in 2003. As such, these pests and diseases need to be checked. Uganda is seen as a leader in the region in developing disease resistant varieties, training and dissemination of technologies.

Wheat: Although wheat production is relatively limited in the region, the demand for wheat in Sub-Saharan Africa is estimated by the International Maize and Wheat Improvement Centre (CIMMYT) to rise from 9.4 million metric tonnes in 1997 to 19.1 million metric tonnes in 2020. Much of the demand is expected to be met by imports. Current production in East Africa is estimated at 2 million metric tonnes. Wheat production has the potential to expand in the region and is relatively profitable.

Dairy: Demand for dairy products is high within the region and is expected to grow, particularly in urban areas. The East African Community (EAC) and COMESA have identified the regional dairy market as an area of high potential for increasing regional trade. In 2006,

the value of actual regional trade was estimated at US\$ 8.2 million compared to a potential market of value of US\$ 139 million.

Dairy is a high priority for ASARECA countries and has emerged as the commodity with the highest potential for regional impact in ASARECA's recent assessment. Kenya has a strong dairy industry and has demonstrated success in breed improvement, disease control and nutrition.

Rice: Rice is an important staple that contributes to domestic food supply and acts as a food and cash crop in Sub-Saharan Africa where it is grown on 8.5 million hectares. Per capita rice consumption is growing in sub-Saharan Africa—where, in 2003, consumption grew by 3.2% per year. As a result, rice imports have grown rapidly.

Sub-Saharan Africa now accounts for a quarter of the global import market and hosts some of the world's largest rice-importing countries. In 2003, 11 sub-Saharan countries imported more than 200,000 tonnes of rice.

However, efforts to increase rice production and productivity in sub-Saharan Africa have been limited. The area planted with rice increased from 3.5 million hectares in 1970 to 8.5 million hectares in 2004, but the average rice yield remains low at 1.5 tonnes per hectare.

Initial successes in the development and dissemination of rice technologies in the sub-region – such as New Rice for Africa (NERICA) varieties – show strong potential for scaling up. Tanzania has established rice production as a strong national priority and has a strong network of research and development institutes for rice research. Other ECA countries will be working with Tanzania in conducting research in rice under EAAPP.

*Article compiled by Information and Communications Unit and Capacity Development and Partnerships Unit.
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►► From cover page

The success is also largely stimulated by a range of facilities, practices and technical support.

The Ddakis are proud owners of an underground rain water tank. They use it to irrigate the various food and fodder crops on their four-acre farm near Masaka town in south western Uganda.

"We harvest enough water to irrigate the banana plantation, indigenous vegetables like *Nakatti* (*solanum aethiopicum*) and *dodo* (*amaranthus sp.*), beans, and fodder crops like *Lablab*, *Gliricidia*, *Calliandra*, Napier grass and others," Says Nnalongo Ddaki. "We also use harvested water to provide drinking water for our three cross-breed dairy cows and other livestock."

The Ddakis are also proud owners of an improved forage cutter which they use to chop chosen mixtures of forage for their livestock. Previously, like other farmers, they used crude tools like the machete to chop forage and this came with the risk of family members chopping off their fingers.

The Ddakis use cow dung and urine collected from the zero grazing unit and other readily available organic materials to make compost manure, which they use as the major farm fertiliser.

Looking at the farm, the numerous banana bunches at various stages of getting ready are teaming with large healthy bananas, thanks to the good soils and additional water. The plantation gives back to the family daily food and income. The banana leaves and trunks provide mulching material. With time, the leaves decompose to form organic manure to the good health of the *nakkati*, cabbages, *dodo* etc. In short, every part of the farm benefits the others.

The Ddakis get about 41 litres of milk daily from their three dairy cows. They keep six litres for home consumption and sell about 35 litres daily. This gives them about Ushs 35,000 (US\$15) in daily income and about Ushs 1 million (\$430) monthly. The Ddakis and many other farmers in Masaka, are part of a group of beneficiaries in Eastern and Central Africa that ASARECA is supporting to produce crops alongside



Mr and Mrs Ddaki link the success at their farm to this underground water tank

livestock in a project; "Crop-livestock integration for sustainable management of natural resources and building livestock resilience in Eastern and Central Africa".

The project is implemented by the National Livestock Resources Research Institute (NaLIRRI) in Uganda, Kenya Agricultural Research Institute (KARI), National Livestock Research Institute (NLRI) in Tanzania and Institut du Sciences des Agronomiques du Burundi (ISABU).

Under the leadership of NaLIRRI, the project is implementing activities to enhance the use of smallholder crop-livestock innovations to improve efficiency and the quality of production to increase profitability. The project is implemented at Wote and Machakos peri-urban areas in Kenya, in Nyamagana and Illemela districts in Tanzania, in Masaka and Kumi districts in Uganda and Songa district in Burundi.

The intervention by ASARECA and partners is informed by the knowledge that mixed crop-livestock production is a major source of livelihood for numerous households in Eastern and Central Africa. However, the increasing effects of climate change coupled with other social, economic and political issues in the region have escalated farmers' risks and losses and increasingly reduced

crop and livestock production.

Against this background, ASARECA and partners see integrated crop and livestock innovations as a way of achieving maximum use of available resources on farms. In addition, ASARECA is promoting land and water management technologies and practices, exploitation of market opportunities and institutional and policy innovations to address farmers needs.

Dairy production, a source of nutrition and income, is crucial to crop-livestock systems in ECA. Therefore, solutions to address problems in these systems should focus on dairy based mixed farms. Similarly, vegetables contribute significantly to household nutrition and income. Testimonies such as that of the Ddakis show that interventions by ASARECA to address these problems on farm are yielding good results.

Rain water harvesting

The project has constructed rain water harvesting tanks of about 15,000 to 35,000 litres in four homesteads in Uganda. In Kenya, roof catchment tanks have been constructed in some homesteads. Micro catchment holes and shallow wells have been dug in fodder fields and other locations and have been integrated with drip irrigation techniques and cattle manure application in vegetables and fodder gardens.



A farmer in Masaka, Uganda who was supported to grow vegetables

The project supplied drip irrigation kits to facilitate year-round vegetable production to eight households in Masaka to produce cabbages. The farmers reported that cabbage production in the irrigated and manured plots was 40% higher than in plots without the interventions. A total of 23 households in Wote and Machakos in Kenya also received kits for tomato production.

Multi-purpose fodder trees

Fodder trees namely *Gliricidia sepium* (*Gliricidia*), *Calliandra calothyrsus* (*Calliandra*), and *Sesbania sesban* (*Sesbania*) were introduced on farms to supplement feeds for dairy cattle and fix nitrogen in the soil.

In Kenya and Burundi, the multipurpose tree *Leucaena* was established. On-farm case studies showed that supplementing 2kg dry matter of *Calliandra* leaf hay with 1kg of maize bran to dairy cattle improved

daily milk production by over 30% during the dry season.

Intercropping practices

Napier grass with *Centrosema pubescens*: The farmers received technical advice on intercropping Napier grass with, *Centrosema pubescens*, a tropical forage legume. As a result, Napier grass fodder dry matter yield increased from 10 to 12 tonnes per hectare per year.

The forage legumes contributed about 26% of total fodder yield, and in addition, improve the crude protein available to the dairy cattle. In Tanzania and Kenya, the tropical legume *Clitoria ternatea* was used instead of *Centrosema pubescens* because it yields larger quantities of fodder in those agro-ecologies. In Kenya, tropical legume was also planted in some farms.

Maize with *Lablab*: Fodder and grain yield increased by 26% and 6% respectively when maize was intercropped with the forage legume, *Lablab purpureus*. *Lablab* notably controls the weeds that often compete with maize for nutrients and moisture. This represents a weeding cost saving of about \$50 per hectare. Farmers have noted that maize-*lablab* intercropping increases fodder production and is, therefore, important in filling the feed gap during the dry season.

Small-scale hay and silage making techniques:

The project promoted forage conservation technologies, especially silage and hay making to address the scarcity of feed in the dry season. Farmers and other stakeholders were trained on forage production, conservation and utilization. Over 100 farmers (80% women) received training on using grain stovers, hay and silage as resources for dry season feeding.

Fixed-knife forage choppers

The project introduced fixed-knife forage choppers to reduce the labour burden for women and

children in chopping fodder for feeding dairy cattle. The manual method of forage chopping using a machete is tedious, time consuming and risky. Farmers often chop off their fingers in the process of chopping the fodder. In addition, the chopped pieces turn out irregular in length, which contributes to reduced feed intake by the cattle. The fixed knife forage choppers cost about \$70 per unit compared to the motorized chopper which costs about \$1,100. The fixed knife forage choppers reduced forage wastage by 20%.

Organising farmers

Through the project, a milk producers' group comprising of 25 men and 15 women was formed in Nyamagana district in Tanzania to address challenges of milk marketing.

In Uganda, four farmers' marketing associations with 30 members per group have been established to address marketing of vegetables in Kumi district. The groups were guided to make Constitutions for their associations and register their associations. In addition, three vegetable marketing collection centres were initiated in Kumi district. In Kenya, farmer groups were supported to identify suitable equipment for processing ghee and yoghurt.

Farmers received training on improved fodder production; vegetable production using a simple irrigation drip kit to ensure year-round vegetable supply; production and utilization of fodder trees; forage conservation and utilization and feed formulation.

Article compiled by researchers Dr. Jolly Kabirizi (Principal Investigator-NaLIRRI), Dr. Donald Njarui (KARI), Mr. Suleiman Kaganda (NLRI) and Mr. Jean Nizigama (ISABU) supported by country teams; and ASARECA Livestock and Fisheries Programme team; Dr. Jean Ndikumana (Programme Manager) and Dr. Sarah Mubiru (Programme Assistant)

The team is grateful to the farmers, the Agricultural Engineering and Appropriate Technology Research Centre, Uganda; Kamenyamiggo District Agricultural Training and Information Centre, Uganda for their active participation and support.

Fruits and vegetables for the whole year

Fruits and vegetables are important crops in Eastern and Central Africa. They are a source of essential vitamins, minerals, antioxidants, fibres and carbohydrates which our bodies crucially need. These nutrients improve the quality the human diet and protect us from chronic diseases.

Fruits and vegetables, however, are perishable, leading to drastic losses. Estimated post harvest losses for fruits and vegetable in developing countries is 40%. This means that during the off-season, households face shortage of fruits and vegetables due to lack of knowledge on how to preserve and process them. The long term implication is that supplies of locally processed products are inadequate and do not meet the required quality standards.

These challenges spurred ASARECA to initiate a project; "Processing for commercial exploitation of selected tree-fruits and vegetables in Tanzania and Rwanda" to validate the existing protocols for processing dried products and fruit juices on small scale commercial basis. The project is focusing on ready-to-drink single or mixed fruit mango and passion fruits, and the vegetable *Amaranthus sp.*

It is implemented by scientists from Sokoine University of Agriculture, Tanzania; Institut des Sciences Agronomiques du Rwanda, Mikocheni Agricultural Research Institute, Tanzania, the Kigali Institute of Science and Technology, Rwanda, and the Community Food Processing and Training Centre, Tanzania.

The project identified a number of key cost-effective technology packages for small scale fruits and vegetables processing to produce quality products that meet safety demands of target markets.

It fostered linkages amongst stakeholders along the fruit/vegetable value chain to promote best handling practices and standards, and sensitised consumers to appreciate the value of locally processed fruits and vegetable products. The project also facilitated the training of farmers, transporters, processors and traders on



Fruit processors participate during a training on value addition

suitable agronomic practices, quality assurance and appropriate technologies.

Solar drying

Drying of agricultural products is the oldest and most widely used preservation method. It involves decreasing as much water as possible from foodstuffs so as to stop enzyme and microbe activities, hence slowing down deterioration and increasing shelf life.

There are different types of drying. However, the use of solar energy is cheaper and more practical for small scale processors. Compared to the other methods, the closed solar drying method is preferred because quality is not affected by external factors. Fruits like mangoes, paw paws, guavas and bananas are easily dried using this method.

Tips for drying

- Select fresh fruits which are harvested at the right maturity stage. Avoid overripe or immature fruits because they tend to be fibrous, get bruised and easily contaminated.
- Wash the fruits thoroughly. Peel the fruits, if necessary, and cut into small uniform pieces to ensure faster drying
- Use stainless steel knives to peel and slice. Treat with sodium metabisulphate (3g/L) or anti-oxidants like citrus (5% lemon juice) to avoid discoloration and excessive vitamin losses

- Fruits like pineapples may require pre-cooking to soften fibrous tissue to hasten drying. Fruits are considered dry when they are soft, pliable and have lost 80% of the original moisture content, while vegetables are considered dry when they are brittle and have lost 90% of original moisture.

- At room temperature (23-25°C) and below, dried and well packaged fruits have a shelf life of 12 months, while the shelf life of dried vegetables is between 6 and 12 months. The same procedure applies to vegetables.

Tips for preparation of mango/passion mixed juice

- Preparation of mango/passion juice starts with pulp extraction. To make good pulp, only fresh, ripe and mould-free fruits should be used
- Mix the mango pulp and passion juice in water
- Add sugar to the mixture to obtain total soluble solids brix of 12°C
- Pasteurise the mixture and pack it before labelling

Write-up compiled by Dr. Mwamburi Mcharo and Ms. Maureen Katafiire, High Value Non Staple Crops programme in collaboration with Prof. Tiisekwa Bendantunguka, Sokoine University. For more information contact: hvns@asareca.org

Harmonised seed policies begin to bear fruit

Local seed production in Uganda, Kenya and Tanzania tripled from 43,000 to about 122,000 tonnes between 2002 and 2008. Seed imports into the region almost doubled from 9,000 to about 15,000 tonnes over the same period. As a result, intra-Eastern and Central Africa (ECA) seed trade grew more than three times. Additionally, private sector involvement in variety breeding and release increased.

Fragmented to vibrant market

These are only a few signs that the seed market in ECA, which was previously small and fragmented, is becoming vibrant. This is a result of an initiative supported by the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) to rationalize and harmonize the frameworks governing the seed sector.

With funding from USAID, the project undertook wide-ranging analyses of the seed systems in Kenya, Tanzania and Uganda. This was followed with national and regional activities leading to an agreement for policy reform and mechanisms for coordination and implementation in 2002.

By 2004 the initiative had expanded to Burundi, DR Congo, Eritrea, Ethiopia, Rwanda, Madagascar and Sudan. The Eastern Africa Seed Committee (EASCOM) was mandated to spearhead a review of policies and regulations, strengthening national seed associations, operationalising agreements and databases, building capacity, representation in the East African Community (EAC) and the Common Market for Eastern and Southern Africa.

Policies, procedures reviewed

The project facilitated technical seed working groups, joint seed certification exercises and a review of seed policies and regulations through EASCOM. This resulted in the revision of certification procedures, development of regional seed standards, quarantine pest lists and publication of variety lists; harmonization of variety release and registration;



Improved seeds in Burundi

harmonization of import/export procedures in Kenya, Rwanda, Tanzania and Uganda.

The process resulted in the Plant Variety Protection (PVP) Act of 2003 in Tanzania and a draft PVP Bill in Uganda. Tanzania and Rwanda enacted Seed Acts in 2003 and 2004, respectively. In Sudan, the seed law was revised in 2006. The reforms have translated into tremendous benefits.

Business plans for associations in Burundi, DRC, Sudan, Rwanda and Tanzania were developed. Burundi reviewed guidelines for the Seeds Act (2003) and the Plant Breeders Act (2002). Implementation of the acts in Tanzania became operational with the establishment of the official seed certification institute.

Private sector comes on board

With the liberalisation of the seed sector in Uganda, entrepreneurs were encouraged to establish seed companies and more agro-input dealers entered the market. Today, there are 23 companies involved in seed growing, processing and marketing as well as selling agro-inputs

like fertilizers, agro-chemicals and farm equipment in Uganda. Out of these, 18 are members of the Uganda Seed Trade Association (USTA).

USTA has introduced a tamper proof system of seed labels to check trade in fake seeds.

Seed production and export companies in Uganda like Nalweyo Seed Company (NASECO (U) Limited, FICA Seeds Ltd and Victoria Seeds Uganda Limited have reported increasing participation of farmers in seed production as out-growers.

Seed firms employ farmers

NASECO and FICA employ an average of 60 people, excluding casual labourers. They also involve farmers in managing specific requirements for seed production as out growers.

NASECO has about 500 individual seed outgrowers who produce seed on their own land. FICA has several block farms. One of the farms in Kisindi in Masindi district has about 300 contracted seed growers on about 1,000 acres of land.

Reaching out to former IDPs

Victoria Seeds is using a social entrepreneurship model, which is being piloted in Northern Uganda, a post conflict area, which is largely still considered unbankable by financial institutions.

In 2008, the company signed up with 214 contract growers.

The number has since grown to 912 farmers who operate in farmer field schools. They are trained and provided credit and tractor hire services.

The farmers manage the credit, while the company works out models to link them to microfinance institutions in the long run.

It is estimated that about 160,000 households have benefitted from the company's operations.

Article compiled by Policy Analysis and Advocacy programme and Information and Communications Unit. For further information, contact paap@asareca.org

Xanthomonas wilt, the banana enemy confirmed in Burundi

The banana sub-sector in Burundi is under threat following an outbreak of Banana *Xanthomonas wilt* (BXW), a devastating bacterial disease. The National Plant Protection Office has confirmed the disease, which is caused by the bacterium *Xanthomonas campestris* pv. *Musacearum* (Xcm).

The most affected areas are in Cankuzo, bordering Tanzania, and Bubanza in the north west of the country. In Cankuzo, the disease incidence is reported to be 95%. In farm fields where it has been identified for the first time, the farmers recorded 100% of crop loss.

In Bubanza, the incidence was relatively low (30%). The threat has sparked off alarm since Bubanza province borders Cibitoke province which is the major banana producing region. Cankuzo as well is crucial because it borders Muyinga, a distribution point for improved FHIA varieties from Tanzania.

According to Dr. Pascal Ndayirigaye of Institut des Sciences Agronomiques du Burundi (ISABU), bananas are an important staple and a cash crop, is a source of animal feeds, wrapping and construction materials, handicrafts, beverages, beer, and is a staking material.

Although the National Plant Protection Office has just made the first ever official confirmation of the disease, BXW did not take them by surprise. BXW has existed in Tanzania and Rwanda in areas bordering Burundi.

Timeline

Nov. 2010—"New disease": Extension staff in the provinces of Cankuzo and Bubanza reported "a new disease" affecting banana to the National Plant Protection Office.

Dec. 2010—Identification starts: The plant protection office sought the support of ISABU to effectively identify the disease.

Jan. 2011—Verification starts: A



Yellow ooze in an infected plant

team comprising officials from the plant protection office, scientists from IZABU and the Consortium for the Improvement of Agriculture-based Livelihoods in Central Africa (CIALCA) visited the affected areas to start identification and scope. They visited Gisagara Commune, Gitanga colline, all about 25km to the Tanzanian border; Musigati Commune, Rushiha colline, Rutega sub-colline, about 60km from the DRCongo border.

They observed symptoms including yellowing, wilting and drying of leaves, premature ripening of the fruit and internal brown discoloration of the pulp. They also noted that the cross-section of pseudostem or rachis exuded yellowish bacterial ooze. The male bud was also seen to be shrivelling. These symptoms, experts concluded, were similar to those of *Xanthomonas wilt*.

Further investigations

ISABU scientists isolated the bacterium that caused it at their plant pathology laboratory. They sub-cultured yellow bacterial colonies typical of *Xanthomonas campestris* pv. *Musacearum*.

A portion of the culture was sent to the International Institute of Tropical Agriculture (IITA) in Uganda for a process known as molecular identification. The isolates will be used for further tests on disease-free tissue culture plantlets.

Tentative measures in place

Awareness campaigns have been initiated in the most affected areas



Yellowing and drying of leaves



Shriveling of the male bud and uneven ripening of bunch

to inform and mobilize the public to destroy infected materials and report new cases.

In Africa, Bacterial wilt was first reported in Ethiopia over 40 years ago, and in Uganda in 2001. In the recent years, it has spread to the Democratic Republic of Congo, Kenya, and Tanzania. Efforts to find a sustainable solution to the BXW problem in Burundi are being supported by ASARECA, IITA, ISABU, Bioversity International, Institut National pour l'Etude et la Recherche Agronomique (INERA).

Lessons on the management of the disease will be drawn from efforts by the National Agricultural Research Organisation (Uganda), Kenya Agricultural Research Institute (KARI), Institut des Sciences Agronomiques du Rwanda (ISAR), National University of Rwanda and ARI.

Article compiled by ASARECA Staple Crops Programme in collaboration with Dr. Niko Ndayihanzamaso (ISABU); Pascale Lepoint, Consortium for Improving Agricultural based Livelihoods in Central Africa (CIALCA); E. Sakayoya, Direction de la Protection des Végétaux, Burundi.

Gender mainstreaming in agriculture is an urgent call



Participants at a gender training workshop in Arusha facilitated by ASARECA

Collaboration among various stakeholders is crucial in turning opportunities from gender mainstreaming in agriculture into tangible benefits, agriculturalists, social workers and policy makers in Eastern and Central Africa have been told.

Gender mainstreaming helps institutions to analyse and establish mechanisms to address gender issues and concerns like limited access to and ownership over land, water resources, credit services, agricultural extension etc.

Speaking at a gender training workshop in Nairobi, Kenya recently, Dr. Charles Owuor Olungah, a gender expert, listed government institutions, universities, NGOs, planners, development partners, law makers and enforcers, project officials, agriculturalists, local leaders, farmer groups, religious and cultural organisations as cornerstone participants in gender mainstreaming in the agricultural value chain.

The workshop is part of a series of training activities that ASARECA is rolling out in the National Agricultural Research Systems (NARS) in the 10 member countries. In addition, ASARECA secretariat and key project staff in Kenya and Uganda have been trained on gender concepts and approaches. According to Forough Olinga, ASARECA's gender specialist,

"Responsiveness can only be achieved through participation and understanding by all categories of stakeholders of the significance of gender mainstreaming in research."

Gender mainstreaming looks at how disparities between women and men across the socioeconomic classes are manifested. Against this background, ASARECA decided to gender mainstream all project processes from planning, design, implementation, and monitoring and evaluation.

Scaling out

In partnership with the NARS in ECA and some from Southern Africa, ASARECA has conducted training on gender analysis and mainstreaming for key project staff in the Sustainable Intensification of Maize-Legume Cropping Systems for Food Security in Eastern and Southern Africa (SIMLESA) project.

Why gender is critical

Agriculture is regarded as the backbone of most African economies. Agriculture provides resources and the needs of the rural and urban populations, the poor and rich.

Informing sound policies

Gender concerns in agriculture focus policy makers and project implementers

to examine conditions in the sector as they relate to men and women; take into account the differing needs, constraints and conditions of women and men so as to find solutions.

African women are the backbone of the rural economy. They comprise on average 70% of the agricultural labour force. Yet they work under very unprivileged conditions with little access to extension services directed to them.

In Uganda, women on average carry out 55% of land preparation, 65% of planting, 85-90% weeding and over 95% of food processing using rudimentary hand tools (hoe, axe and panga). Marketing of farm produce and access to market information continue to be a domain of men, a situation which has given women a disadvantaged position in the sector.

Increased awareness of gender differences in agricultural research, retooling extension workers to understand gender differences, incorporating the different research interests and needs of men and women in selecting plant varieties for testing, as well, could open up opportunities for women to participate in and benefit from agricultural extension and training.

Researchers at crossroads

Researchers and development workers have been grappling with a dilemma of how to address gender issues in their activities. They often confess being unsure of how and where to start. The most that they have done is to report the number of women and men who attended a field day, a workshop etc.

ASARECA's efforts could reduce this gap. In the words of the Executive Director, Dr. Seyfu Ketema, "Gender mainstreaming could make science more relevant and improve livelihoods."

Article compiled by Ms Furougha Olinga and Information and Communications Unit For further information contact: paap@asareca.org

People and their surrounding

ASARECA researchers have made advances in understanding the status of biodiversity conservation in relation to livelihoods in the Mara-Serengeti savannah ecosystem in Kenya and Tanzania.

The scientists collected baseline information on communities of plants, animals and soil organisms, ecosystems and habitats, how the species are distributed in the region, and on the extent of protected areas. Using the baseline, the team is better equipped for the planned measurement of socio-economic development indicators of the livelihoods of the communities.

Declining biodiversity has far reaching consequences to human survival. Aware of this, ASARECA in 2008 initiated a project entitled, "Integrating Agro-diversity and Conservation to Improve livelihoods in the Savannah Ecosystem". The project was tailored to address the needs of the communities while conserving Mara Serengeti ecosystem. This meant engaging in productivity using agro-ecosystems that promote conservation for socio-economic as well as environmental benefits. The project has selected best bet practices for conservation of biodiversity in the agricultural farms and natural systems; alternative sources of income for improved livelihood and reduction in reliance on natural biodiversity; and interventions to reduce human-wildlife conflict

From the onset, the project, led by Dr. Muchane Muchai of the National Museums of Kenya and managed by ASARECA's Agro-biodiversity and Biotechnology programme, inquired into people's needs and expectations. During a stakeholders' preparatory and awareness workshop, the participants cited ability to generate steady personal income, food security, conservation, and improved natural resource management as important to the communities.

A preliminary survey was conducted using the global positioning system to map sample dry and wet zones in and outside the protected areas of the Serengeti-Mara region. The researchers



Man has a direct relationship with all organisms surrounding him

also conducted a survey to determine the socio-economic characteristics of the communities. Preliminary results show that livelihood options are fewer on the dry ecosystem compared to the wet side. These options include organic farming and eco-agriculture; agro-forestry; community conservancies; community museums and eco-lodges; bird watching and licensed game bird hunting; payment of ecosystem services; mushroom cultivation; bee keeping; greenhouse farming; poultry and rabbit farming; improved livestock farming; and game bird rearing.

Biodiversity types and land use

The scientists determined key biodiversity types and land use in selected landscapes in the savannah ecosystem. The teams have collected data which is being analysed to determine the indicator species. Indicator species for underground, invertebrate, vertebrate and flora biodiversity are being determined. The soils, vegetation, were sampled. A review of the economic importance of identified trees/shrubs is being carried out. Macro fauna like earthworms, millipedes, ants and other underground arthropods were also reviewed. They also cored soil for nitrogen fixing bacteria

and arbuscular mycorrhizae fungi, identified leguminous and herbaceous plants, and excavated nodules from their finer roots. Greenhouse experiments have been conducted to trap arbuscular mycorrhizae fungi and rhizobia. They have also conducted an inventory of mushrooms in the area. Birds and large mammals have been identified and recorded. Small mammals including rodents, shrews and other insectivores have also been sampled.

These key indicators of biodiversity and livelihoods will be used to select the best bet practices for improved livelihoods and biodiversity conservation in savannah ecosystems. The data will be used to measure changes in biological diversity and to track improvement in the livelihoods as a result of this project and other development initiatives.

Partner institutions: University of Dar-es-Salaam, Kenyatta University, Kenya Wildlife Service, National Museums of Kenya, National Environment Management Authority, and Serengeti National Park, Mara Conservancy. Research plots and reception partly hosted and managed by Brian Heath, chief executive Mara Conservancy.

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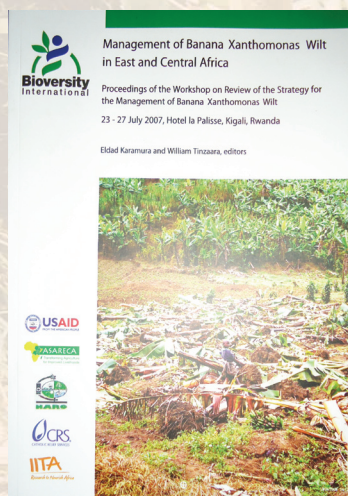
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Title: Management of Banana Xanthomonas Wilt in Eastern and Central Africa

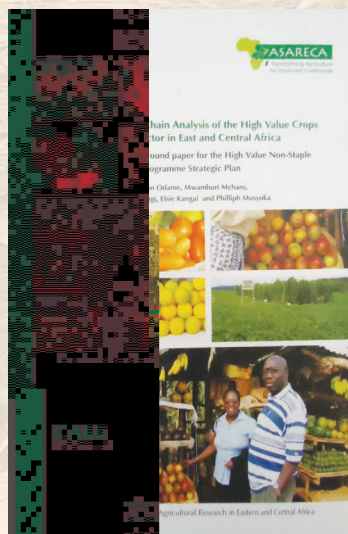
Editors: Eldad Karamura and William Tinzaara

Published by: Bioversity International in collaboration with ASARECA, USAID, NARO, CRS, IITA

Year of Publication: 2009

Synopsis: Since Banana Xanthomonas (BXW) was found in the Great Lakes region in 2001, it has continued wrecking havoc and has now been confirmed in all the countries of the region. The disease is devastating to the production of banana, a major staple crop in the region. In response, the region's banana stakeholders developed a regional strategy to fight the disease. Through training, exposure, field visits and sharing experiences, the stakeholders have empowered each other with knowledge and skills to control BXW in a coherent and coordinated way. This publication captures the processes, proceedings of activities, experiences, success stories and challenges in the management of BXW in the region.

Copy available on www.asareca.org



Title: Value Chain Analysis of the High Value Crops sub-sector in Eastern and Central Africa

Editors: Hannington Odame; Mwamburi Mcharo; Kahi Ngugi, Elsie Kangai and Philliph Musokya

Published by: ASARECA

Year of Publication: 2011

Synopsis: When the ASARECA High Value Staple Crops Programme (HVNCS) started operations in 2009, it developed a strategic plan showing its priorities and research commodities. This process, would have not been better informed without background resources. For this reason, a paper was developed by ASARECA through collective action of all ASARECA member National Agricultural Research Institutes and other major stakeholders. The paper brings out issues of regional interest such as value chain characteristics, geographical considerations and spillovers, providing a sound basis for the strategic plan.

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