

## HOW ASARECA CROP-LIVESTOCK INNOVATIONS ARE BOOSTING FOOD SECURITY AND INCOME IN BURUNDI, KENYA, TANZANIA AND UGANDA

2011

### OTHER RESOURCES



ASARECA Mail



**Rain water harvesting tank at the Ddakis**

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. 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 in Kitenga village, about four miles from Masaka town in south western Uganda.

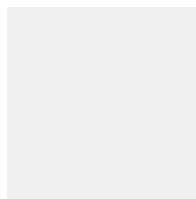
“We harvest enough water to irrigate the banana plantation, indigenous

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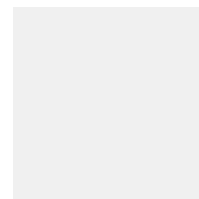
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vegetables like *Nakatti* (*solanum aethiopicum*) and *dodo* (*amaranthus sp*), beans, and fodder crops like *Lablab*, *Gliricidia*, *Calliandra*, Napier grass and others,” Says Nnalongo Ddaki. “We also use harvested water to provide drinking water 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.



Using a fixed forage chopper is safer



Using crude forage chopping tools is risky

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 teeming with large healthy bananas, thanks to the good soils and additional water. The banana plantation gives back to the family in form of daily food and income. The banana leaves and trunks provide mulching material for the soil and plants. With time, the leaves decompose to form organic manure to the good health of crops like *nakkati*, cabbages, *dodo* etc. In short, every part that forms Ddaki’s farm is benefiting the others in one way or the other.

The Ddakis get about 41 litres of milk daily from their three dairy cows. They keep five 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 (US\$ 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 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 Ilemela 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. Crop residues are a source of livestock feed. As such, ASARECA and partners see vegetables as key in crop-livestock systems.

Baseline surveys on smallholder crop-livestock farm households were carried out prior to the project start. The surveys identified inadequate feed supply, insufficient water for livestock, shortage of labour, poor soils, frequent dry spells, and lack of basic information on best practices as the major problems hindering profitability. 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 for vegetable and dairy production**

The project has constructed rain water harvesting tanks of about 15,000 to 35,000 litres in four homesteads in Masaka in Uganda. In Kenya, roof catchment above-ground tanks have been constructed at some of the participating homesteads. Micro catchment holes (*tumbukiza*) and shallow wells have been dug in fodder fields and other locations to demonstrate

simple water harvesting and conservation techniques; and have been integrated with drip irrigation techniques and cattle manure application in vegetables and fodder gardens.

The project supplied drip irrigation kits to facilitate year-round vegetable production to eight households in Masaka to produce cabbages. The farmers have 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) have been introduced on farms. These were specifically meant to supplement feeds for dairy cattle while fixing nitrogen in the soil and controlling soil erosion.

In Kenya and Burundi, the multipurpose tree *Leucaena* has been established. On-farm case studies showed that supplementing 2 kg dry matter of Calliandra leaf hay with 1 kg of maize bran to dairy cattle previously fed on low quality forages and crop residues 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 US\$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 have been 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 *panga* or 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%. Farmers have reported that chopping time has been reduced by about 30%.

### **Addressing components of the value chain**

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 have been guided to make Constitutions for their associations and register their associations. In addition, three vegetable marketing collection centres have been initiated in Kumi district. In Kenya, farmer groups have been supported to identify suitable equipment for processing ghee and yoghurt.

Farmers have 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.

### **Lessons learned**

- Participatory testing of technologies is key to the adoption of

innovations and leads to improved food and feed security and household income.

- Farmer groups facilitate sharing on information, knowledge and skills and subsequently protect and empower marginalized members.

*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)*

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