

InReF News

Newsletter of the KARI-McGill Project, Innovating for Resilient Farming Systems

Issue No. 3

March 2012 to August 2012

Early Results From the Field: the Project at 18 Months



Bee pollinating in large field crop of maize.

The KARI-McGill project on Innovating for Resilient Farming Systems has reached its 18-month mark and has made good progress towards achieving its main development objectives, which are to reduce food insecurity among the most vulnerable smallholder households in the semi-arid midlands of Kenya, and to assess and address the multiple barriers to the widespread adoption of farming systems that are capable of overcoming hunger, malnutrition and ecological degradation. Among the early achievements of field research and activities are the following:

A total of 54 farmer groups in the three counties covered by the project—Makueni, Machakos and Tharaka-Nithi—completed two seasons of primary participatory technology evaluations. Eleven different improved technologies and practices have been evaluated by farmers alongside their local varieties and practices. The second season's activities included

the identification of 216 satellite farmer groups (secondary evaluation groups) in surrounding areas, whose members have participated in demonstrations, learning events and evaluations of the primary trials.

Participatory methodologies have been employed to give a voice to the needs and aspirations of the local farmers which also influences the decisions guiding the implementation of activities. Focus Group Discussions guided the choice of improved technologies and practices to be evaluated. Participatory learning events were organized as farmers worked together with the research teams from planting to harvesting. Field days were organized to share the achievements of the farmer groups in the season's activities. Feedback sessions allowed farmers and research teams to evaluate what worked and what needs improvement in future activities. Participatory market appraisal gave farmers an opportunity to explore available markets for their products.

Farmers who engaged in the market appraisal discovered an unmet demand for their products in the local markets that is likely to change their farming plans in the short rains of October–November 2012. They prioritized indigenous chicken, green grams and cowpeas for market development. The coming season will begin with capacity building exercises facilitated by the project to assist in the development of these enterprises.

Tied ridging as an efficiency-enhancing water use technology was demonstrated in one of the project sites during the first season (beginning October 2011). The results obtained there led to introduction of the tied ridging practice in all the seven districts where the project is being implemented during the March–May 2012 rainy season.

See Early Results, page 3

New Students and Team Members



In this issue, we introduce some of the new students and project team members involved in the KARI-McGill project.



McGill

Margaret Njeri Mwangi is a Master of Science student at Egerton University's Department of Agricultural Economics and Agribusiness Management under co-supervision of Dr. Margaret Ngigi of Egerton University, Department of AGECE/AGBM, and Dr. Wellington Mulinge, KARI. Her research within the KARI-McGill project falls within the economics research stream, which aims to strengthen farmers' links to local and external output markets to allow men and women to diversify their household livelihoods and improve their welfare. In particular, Margaret's study seeks to determine factors that constrain farmers' access to output markets. Understanding these constraints is essential in identifying effective strategies that can link men and women farmers to both local and external output markets. The research will be carried out in Machakos County.

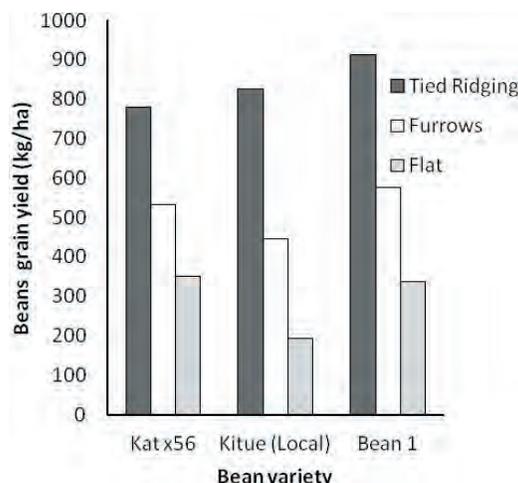
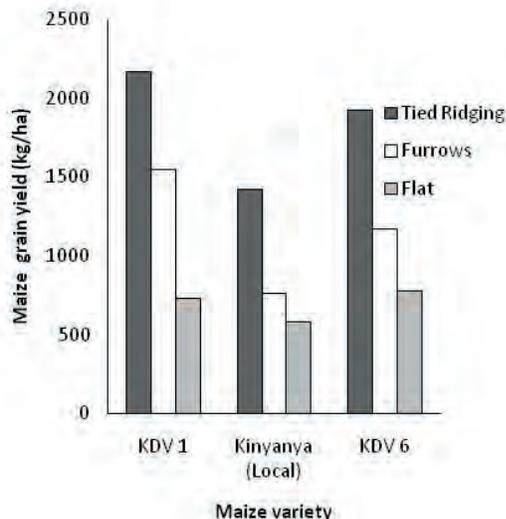
Philip Kinyua Marete is a Master of Science in Food Science and Nutrition student working under the supervision of Prof. M. A. Mwasaru and Prof. C. A. Onyango at Jomo Kenyatta University's Department of Food Science and Technology, and Charity Gathambiri of KARI. In terms of the KARI-McGill project, Philip's research falls within the value addition research stream. In particular it involves nutritional and chemical characterization of sorghum and pigeon pea varieties grown in Kenya's Eastern Province, specifically Tharaka-Nithi and Machakos Counties. In its contribution to household food security, the research will focus on boosting protein quality and digestibility with a composite of sorghum and pigeon peas. Products to be developed and their nutritional value determined include instant weaning food for infants and young children and instant whole pigeon pea. The research will increase consumer knowledge of the nutritional composition of sorghum and pigeon pea varieties and provide a standard operating procedure for development of sorghum and pigeon pea value-added products in Kenya.

Carlyn (Carly) James is a Master of Arts student working under the direction of Dr. John Galaty in McGill's Department of Anthropology. Carly is beginning her studies at McGill in September 2012 with a concentration in Development Studies with research interests that focus on the informal economy, female entrepreneurship, microfinance, credit and savings mobilization, social networking, cooperative institutions, and social justice in Sub-Saharan Africa. With respect to the KARI-McGill project, Carly will focalize her thesis research in knowledge- and resource-sharing among Kenyan females in the context of informal and formal microfinance institutions, "networks of trust" (e.g. solidarity groups, rotating savings/credit groups, women's groups), and the household (as it relates to intra-household decision-making, livelihood strategies). Carly holds a B.A. (with honours) in anthropology, international studies, and French language and culture from The University of Alabama. She looks forward to beginning her field research in June 2013.

June Po is a Ph.D. student working in the Department of Natural Resource Sciences at McGill University under the supervision of Dr. Gordon Hickey. She completed her Master of Science in Global Health and Population at the Harvard School of Public Health and worked at the Harvard Center for Population and Development Studies for the past two years on research within the field of health economics, social epidemiology and reproductive health. For the KARI-McGill project, June will use a mixed method approach to explore the impact of increased social capital (local trust, participation in local organization, and reciprocal knowledge sharing) on farmers' resilience to changes in climatic conditions and market unpredictability. June is interested in understanding the decision-making and negotiation processes regarding gender-based crop allocation. Besides learning from the people at the household level, she is interested in using aggregate data at the regional and national level to explore policy levers that facilitate adoption of sustainable agricultural technology and equitable landholding practices. June started the doctoral program in September 2012. ♦

Early Results, from page 1

The figures below show the maize and bean yields obtained with tied ridging in Ndalani, Yatta District, in Machakos County.



Effect of surface water management on grain yield of maize and beans (kg/ha).
Results obtained from Ndalani, Yatta District, Machakos County.

Key project activities planned for the coming seasons include a new set of participatory evaluations of crops and natural resource management practices; a baseline household survey and gender focus group discussions (September–October 2012); a number of Learning Events focused on post-harvest issues, animal health, and gender and environmental concerns; and a stakeholder evaluation workshop in February 2013. ♦



Women's access to land gets a boost from the new constitution.

Response

If you want to send your views, comment, question, complain or contribute to this newsletter, please write to the editors, Geoffrey Kamau and Leigh Brownhill at: gkamau@kari.org and leigh.brownhill@mail.mcgill.ca.

Policy Corner

Statements from the joint technical planning and review meeting, held 27–29 February 2012 in Machakos, Kenya.

Kevin Tiessen, IDRC Ottawa: “. . . We need to ask ourselves how this project can inform policy since research should not stop at output but should go further to development outcomes.”

Pascal Sanginga, IDRC Nairobi: “. . . Be excited, dream about the project and always ensure that you have a clear vision of success by linking research streams to project outcomes and deliverables. . . . Always ask yourself . . . what do you want to achieve at the end of this project?”

David Miano, KARI Assistant Director: “. . . Partners in this project should be ambassadors of the project in their organizations who should change according to the lessons learned rather than treating it as an event. . . . If attitude towards innovations does not change, then everything learned will end with the end of the project.” ♦

The Tragedy of Bird Scaring in Tharaka

Report from the Economics Research Stream

by Patrick E. Cortbaoui and Nicolas Kosoy, McGill University

On 10 June 2012, our suitcases were packed, the morale was high, the plane was ready to depart from Montreal, headed to Nairobi, and our journey had begun.

Our main objective was to identify the obstacles that keep farmers from adopting High Value Traditional Crops (HVTC) in order to achieve food security at the household level. HVTCs, also known as “orphan crops,” include millet, sorghum, green grams, cowpeas and pigeon peas. They are adapted to the extreme soil and climatic conditions of Africa and are, in particular, compatible to the agro-ecology and socio-economic conditions of semi-arid regions of Kenya.

This study, located within the project’s economics research stream, had several specific objectives including **Objective 1:** To determine the main crops in Tharaka-Nithi County; **Objective 2:** To describe the main activities and time spent per cropping system previously identified; **Objective 3:** To estimate the rent derived from these cropping systems; and **Objective 4:** To identify the major gaps found in the actual policies when promoting and adopting agricultural crops in semi-arid lands of Kenya (LM4 and LM5).

After spending a few days at KARI headquarters in Nairobi for planning and finalizing the basic requirements for the fieldwork with our KARI colleagues, the economics stream research group was ready to start collecting data. The study was conducted in Tharaka-Nithi County, where the two main agro-ecological zones are fully represented (low-midlands 4, low-midlands 5). These zones are characteristic of semi-arid regions of Kenya. Within Tharaka-Nithi County, six villages were selected in the two agro-ecological zones, and a total number of 80 households were sampled, equivalent to about 30% of total population in each village. A survey was randomly administered to each household focusing on cropping systems, labour time, expenditure and costs of inputs of production. A map of each household plot was generated using mobile phone technology and transferring geo-referenced plots to Google Earth and then to Arc View.



Colleagues ready for work at Kanyange village.
Front: John Wambua, Nicolas Kosoy
Rear: Patrick Cortbaoui, Peter Maingi, Mr. Zakari
(Ministry of Agriculture Extension Officer), village elder

The fieldwork experience was memorable. To start with our accommodation, the place was named “The Golden Villa” and it was in reality the best place to stay in Ishiara village. In the rafters above our rooms, between the ceiling and the roof, there were special “guests” (bats) happily making from the place their favorite nests. We respected their space and, luckily, they respected ours. Early each morning, we took our heavy but healthy breakfast and departed for the villages, remembering to carry with us water and the questionnaires. When at the selected village, surveys were administered based on farmers’ consent to participate, securing an ethical engagement with local communities.

See *Bird Scaring*, page 6

What’s next

- Agro-enterprise development strategy meetings with PPATE groups in October & November 2012.
- 13th KARI Biennial Scientific Conference on 22–26 October 2012 at KARI Headquarters Complex, Kaptagat Road, Loresho, Nairobi. ♦

Focus on the County – Machakos

Geography

Location: Located in Eastern province and borders seven counties, which are Muranga, Kiambu, Nairobi, Kajiado, Makueni, Kitui and Embu.

Area (km²): 6,208 km²

Climate/Weather: Temperatures range from a minimum of 9.1°C to a maximum of 26.7°C. Rainfall ranges from 500 mm to 900 mm per annum.

Population

Population: 1,098,584

(Male – 49.4%, Female – 50.6%)

Population Density: 177 people per km²

National Percentage: 2.85%

Annual Growth Rate: 3.76%

Urban Population: 52%

Rural Population: 48%

Number of Households: 186,297



Pigeon peas in field.

Government

County Capital: Machakos Town

Number of Constituencies (2010): 6 (Machakos Town, Masinga, Yatta, Kangundo, Kathiani, Mwala)

Registered Voters: 1,099,000

National Percentage: 3.3%

Number of Districts (2009): 4 (Machakos, Kangundo, Yatta, Mwala)

Economics

Poverty Rate: 59.6%

Resources: Wildlife, hills, building sand, water (rivers), pasture and land

Tourist Attractions: Kyamwilu Hills, Maasai Ostrich Resort, wood carving

Main Economic Activities/Industries: Farming, beekeeping, trade, dairy farming, limited coffee growing; Eco-tourism; Businesses, manufacturing



Beehive suspended from tree.

Agricultural Products: Fruits (mangoes, pawpaws, watermelons), maize, cowpeas, beans, pigeon peas and lentils; livestock

Education

Number of Institutions (2007): Primary (850), Secondary (154)

Primary: Total Enrolment 276,576

Population with Primary Education: 69.7%

Secondary: Total Enrolment 114,996

Population with Secondary Education: 14.6%

Health

Doctor to Population Ratio: 1:27,000

Nurse to Population Ratio: 1:2,054

Morbidity: 36.5%

Morbidity (Male): 36.8%

Morbidity (Female): 36.2%

Infant Mortality Rates: 27/1000 Live births

Under-Five Mortality Rates: 38/1000

Prevalent Diseases: Malaria, TB, HIV/AIDS

Sources:

USAID: <http://kenya.usaid.gov/node/1185>

Kenya Opendata: <https://opendata.go.ke/facet/counties/Machakos?category=++++Environment+And+Natural+Resources&tags=education>

Child Info: http://www.childinfo.org/files/Machakos_Report.pdf ♦

Bird Scaring, from page 4

Our meeting with household members was divided into three main activities:

1. Drawing of the *shamba* (Kiswahili = farm or plot of land) with the farmer, focusing on the placement of the cropping systems. This activity allowed us to have a clearer understanding of the farmers' cropping systems and their distribution.
2. Assessing activities associated with the cropping systems in terms of man-days. This activity allowed us to assess the amount of time dedicated to farming activities associated with the different cropping systems.
3. The third and last activity of the survey was collecting information on cost of inputs for production needed for each cropping system. This activity allowed us to understand costs associated with production and to assess potential avenues for economic subsidies that will facilitate farmers' access to markets.

Each of our interviews with the farmers was an eye-opening experience. Being able to listen to their stories and share a meal or two gave us the opportunity to put faces to the food insecurity dilemma and also to witness success in achievement of household food security amongst a few outstandingly creative farmers.



Sorghum in field.

Regarding our initial questions, we found 24 distinct cropping systems within the study site, with mono-crops of maize, millet, sorghum, cowpeas, green grams and pigeon peas being the most profitable. From a purely monetary perspective, it would appear that maize should be most preferred, as it systematically generates the highest rent in almost all conditions. However, farmers seem to prefer growing millet and sorghum to maize, as they do better under drought conditions.

We then had to ask what factors render millet and sorghum less profitable compared to maize? In other words, what are the main parameters driving opportunity costs in this area? We were amazed when we discovered that bird scaring is the single most time-consuming activity that draws millet



Project training workshop in gender analysis and in crop health held at Matuu, Machakos County, 16–20 July 2012.

and sorghum marginal profits down. Birds, in large flocks, love to feast on sorghum and millet. For at least one month during the growing season, if there are not people in the fields scaring away the birds, up to 70% of the crop can be lost. What practices or technologies do we have at hand to reduce the amount of time spent on chasing birds? With the data and insights gathered during this June field trip, members of the project's economics research stream are drafting a research paper which uses Mumford's conceptualization of the "technological dichotomy" (authoritarian/democratic techniques) to shed light on this issue and to systematically analyze solutions to activities associated with cropping systems that have the largest impact on opportunity costs.

These are some of the questions we were able to address, along with a few new research questions that the farmers' experiences led us to explore.

On 18 July 2012, after 40 days spent between Nairobi and Tharaka, the fieldwork was successfully finished, and it was time to return to Montreal and start preparing our analyses and plans for future research trips. ♦



This project is funded by the Canadian International Food Security Research Fund of the International Development Research Centre and the Government of Canada, through the Canadian International Development Agency. We also acknowledge the support of the Government of the Republic of Kenya.