Agro-Biodiversity and dietary diversity for optimal nutrition and health

Workshop report

Agro-biodiversity and Dietary diversity for optimal nutrition and health workshop was convened on Tuesday 22nd August, 2017 at the ARC Hotel Egerton University, Kenya. Forty-Five participants from academia, Ministry of Health, Ministry of Agriculture and NGOs working on Agriculture, nutrition and health gathered together with representative from County Government to discuss the important issue of tackling malnutrition and links between agriculture and Nutrition

The workshop was timely as it provided evidence on the potential linkages between Agriculture and nutrition. This is the time when Kenya is striving to reduce levels of malnutrition, despite agriculture being the main source of livelihood to majority of Kenyans. The proportion of children under-five affected by stunting has decreased from 35% in 2009 to 26% in 2014, but one in four children are still malnourished. Moreover, a further 4% of under-fives are wasted. Nationally, 9% of women aged

15-49 years are underweight while the proportion of overweight and obese women has increased from 25% in 2008-2009 to 33% in 2015. Nutrition stakeholders are currently contributing to the development of policies to ensure that malnutrition is tackled through a multi-sectoral approach. This is through realization, that agricultural practice, interventions, and policies can be better designed and adapted to maximize nutrition benefits.

Research is only effective if it is known, understood and applied by the policy and programme actors making decisions on nutrition. The day offered an opportunity for a conversation between researchers and policy makers. Researchers shared findings from the work undertaken in Kenya and Southern Benin, on the link between agro-biodiversity and dietary diversity, the determinants of dietary diversity, factors associated with diet adequacy of children, nutrition impact pathways, participatory approaches to improved dietary diversity and barriers and entry points for improve nutritional status of mothers and children. Representatives from county government and policy makers demonstrated great interest and commitment in improving nutrition parameters at county level from the discussions held from all stakeholders and findings presented.

The discussion across the day demonstrated the value of context specific evidence for developing nutrition sensitive interventions that are specific to region characteristics. In addition to the wealth of knowledge shared, the day was valued by participants as an opportunity to meet and network, to learn from each other and interact with county government representatives and researchers. The audience departed with load of new evidence and inspiration to put in action.

The participants' group photo outside ARC hotel, Egerton University

Workshop Proceedings

Introduction

Dorothy Mituki, Egerton University, welcomed the stakeholders and introduced the agenda and objectives for the workshop.

Dr Stella Muthoka, COD Department of Human nutrition, Egerton University, gave the welcoming remarks and commended the research team for flying the department's flag high. She highlighted the different manifestations of malnutrition including micronutrient deficiencies and overweight/obesity which are coexisting problems of undernutrition in the world. Under nutrition has been shown to be a key determinant in early maternal, infant and young child mortality. Over nutrition has been shown to be positively related to increased prevalence of non-communicable diseases.

The meeting was opened by **Dean Faculty of Health Sciences** and **DVC Research and Extension, Egerton University**

Opening remarks

Dean Faculty of Health Sciences, Dr. Sasmson Obure welcomed the DVC Research and Extension, Egerton University to open the meeting. The Dean emphasized the importance of nutrition in health care; nutrition is crucial in prevention and management of diseases. Optimal nutrition, providing all nutrients in both kind and amount, is the cornerstone of good health and the cutting edge of prevention. It's undeniable that a well-balanced diet goes hand in hand with a healthy lifestyle. The variety of foods we consume, and the different type of nutrients they provide, are the most important continuing environmental factors influencing our growth, development, functional abilities, and health. Food choices make a huge impact on how you feel today, tomorrow and what the future holds in terms of promoting and maintaining good health.

Dean faculty of Health Sciences

DVC Research and Extension, Egerton University opened the workshop by expressing great enthusiasm for the meeting and the opportunity to discuss the issues on the agenda. He particularly commended and appreciated the research team for the published policy brief-a useful document that will guide Nakuru county policy makers in developing agricultural and nutrition sensitive interventions

that are specific to Nakuru County. That this important document can be used by the Rongai community to source funds to support agriculture and nutrition related projects. He emphasized the importance of traditional diets which are often quite healthy but social, cultural and economic change around the global has led to dietary transitions which are now associated with decreasing quality of diets. In most contexts, intervention helps to reverse, mitigate or prevent the negative impact of nutrition transitions and the impact of outside drivers of dietary quality. He encouraged the research team to write a proposal to source funds for agriculture and nutrition interventions. He also reminded the audience the importance of taking a diverse diet and encouraged audience to take advantage of locally available nutrient rich foods to improve quality of their diets and dietary diversity. The department of human nutrition was also tasked to organize a nutrition sensitization day-to sensitize the university of dietary diversity as many people are not aware of the foods groups presented.

Dr Maureen Cheserek, Egerton University highlighted the Rongai Sub-County project main objectives, the study areas, methodologies and findings. She appreciated the support given to the project by International Food Policy Research Institite (IFPRI), Transform Nutrition Consortium, Project Advisor, Namukolo Covic, IFPRI, Cerline Termote, Bioversity International, Kenya, Nakuru County Government and Egerton University.

Agri-nutrition research

The session addressed the link between Agro-biodiversity and dietary diversity

Maureen Gitagia, Egerton University, presented findings on **Determinants of dietary diversity among women of reproductive age in two different agro-ecological zones of Rongai Sub-County, Nakuru**. The study found out that diversity of crops was significantly higher in agricultural high than low potential areas, while diversity of legumes and nuts as well as domesticated animals was higher in low compared to high potential areas. Although agro-biodiversity was different in the two agro-ecological zones, women's dietary diversity was similar. Higher dietary diversity was associated with male headed households, higher education, older age, smaller families and larger cultivated farms, and therefore addressing these determinants during interventions would be useful to improving women dietary diversity to enhance good nutritional status.

Maureen Gitagia, Masters Student presenting findings from Rongai project

Ethnobotany to improve child nutrition – a case study from Southern Benin was presented by **Celine Termonte, Bioversity, Kenya**. She reported diet and nutrition-related behaviours are embedded in cultural and environmental contexts: adoption of new knowledge depends on how easily it can be integrated into existing knowledge systems. As dietary diversity promotion becomes an increasingly common component of nutrition education, understanding local nutrition knowledge systems and local concepts about dietary diversity is essential to formulate efficient messages. The study highlighted a rich existence of agro-biodiversity that is available but is not being fully utilized by participants. Therefore, integrated food-based and educational strategies focusing on increasing the utilization of local agrobiodiversity as a means of improving diet quality and diversity are needed, particularly among resource-limited rural communities. The feeding practices were poor and she recommended culturally sensitive videos/ posters and leaflets to promote good feeding and care practices. In the face of the underperformance of nutrition education programs, anthropological and ethno-medical perspectives on knowledge systems and learning (also called knowledge exchange

or knowledge transmission) may offer novel insight to achieve more efficient exchange and transmission of health and nutrition-related knowledge.

Celine Termonte Presenting findings from the Benin study

Esther Omosa, International Livestock Research Institute, Kenya Presented on **Accelerated Value Chain Development Programme: Lessons and Experiences.** She pointed out the complex linkages between agriculture and nutrition. Agriculture's potential for producing nutritious food is not appropriately tapped for reducing the malnourishment in Kenya. Production of quality food in adequate quantity alone may not improve nutritional outcomes, unless malnutrition is addressed by adopting a multi-sectoral approach. Therefore, the agricultural policies and programmes need to be more nutrition-sensitive to improve nutritional outcomes. There are multiple pathways through which agriculture can influence the nutritional outcomes. Esther highlighted three crucial pathways through which agriculture is linked to nutrition; production pathway, income pathway and women empowerment pathway. Agriculture can influence nutrition via production pathway through increased production of different types of crop and animal species; this can lead directly to improve dietary diversity through consumption of these different species. Income pathway is when the agriculture

production leads to increases in household income; the income can be used to purchase more high quality foods and more diverse diet. Empowerment of women coupled with women friendly agricultural technologies, may result into increased intra household bargaining power and a larger say in household resources allocation. This may eventually lead to provision of nutritious food for themselves and their children.

Sharon Kemboi, Egerton University, shared findings on **Factors Associated with Diet Adequacy of Children Aged 6-23 Months in Rongai Sub-County.** The study found out that complementary feeding was initiated at an early age (17.93 ± 9.16 weeks) with less than half of the children receiving foods at the recommended age. Overall, majority of the women had poor knowledge on young child feeding nutrition during pregnancy and lactation food based dietary guidelines and dietary diversity and water and sanitation. Moreover, all women had poor attitude towards young child feeding and dietary diversity. Overall, more than half of women had poor practices on young child feeding and were significantly higher in high potential areas compared to low potential areas. Minimum meal frequency (MMF) was more likely to be attained by children from high agricultural potential areas and those who consumed animal sourced foods. Children whose mothers had better infant and young child feeding practices were also more likely to attain MMF. The prevalence of wasting was 6.2% overall, with low and high potential areas having a prevalence of 8.6% and 4.5% respectively. Overall, 9.2% were underweight (low, 11.3%; high 7.8 %,) while 23.4% were stunted (low, 26.2%; high, 21.4%).

Poor nutritional status among women and children was attributed to consumption of low quality diets despite the differences in diversity of animal and edible plant species. This implies that, even within the same county, nutrition interventions may have to be made area specific since differences were found in food access, nutritional status of women, eating patterns of children as well as water and sanitation practices. Although areas of low agricultural potential had greater diversity of animal source foods and plant proteins, their children's dietary diversity was not different from high potential areas. This might be due to the important roles of mothers/caregivers knowledge and attitudes towards young child nutrition and dietary diversity which was similar in the two areas. The findings also suggested that increasing on-farm diversity may not improve dietary diversity in the households if they do not have adequate knowledge on the importance of agrobiodiversity and dietary diversity. It is therefore important to educate women from the two areas on diversifying their farms and consuming/feeding their children with these foods for improved nutritional status. Improved

knowledge on agriculture biodiversity could enable household's access nutrient rich foods and increase dietary diversity, a valuable means of achieving optimal diets in Rongai sub-county.

Francis Odhiambo, Bioversity International, Kenya reported on findings **On Improving the Diets of Women and Small Children through Participatory Approaches - Case Study in Vihiga,** A total of 647 households participated in the survey, averaging 65 households per sub-location with mean household size of 6.28 members. One hundred and five (105) on farm plant species (67 edible), 38 wild edible plant species, 12 domesticated animal species and 15 animal species hunted for food were documented. The agrobiodiversity score ranged from 2 to 29 species with a mean of 10 species per household. The study showed that majority of the caregivers knew the recommended age for introduction of complementary foods. However only two-thirds of the caregivers were aware that breastfeeding should continue for two years and beyond. Majority of the caregivers get information on complementary feeding from health care providers. The research identified inadequate knowledge and financial constraints by the caregivers as the main impediments to dietary diversification. The study showed variation in the quality and diversity of the diet between the seasons. An increased number of children and caregivers did not meet the minimum dietary diversity scores in lean season compared with the plenty season. The results point to the need to develop innovative ways of putting the rich available agrobiodiversity into use for improved food and nutrition security through diet diversification. Similarly, there is need to change caregivers‟ knowledge and attitudes for improved health and nutrition of children and caregivers.

Finally, **Rose Ramkat, Moi University** presented on **Barriers and entry points for improving nutritional status of mothers and children in Rongai Sub-County.** The study identified the barriers to agro-biodiversity as climatic change, poor farming method and farming as a business making which made them concentrate on few crops such as maize, beans which had ready market. Also barriers to nutrition and good nutrition practices were identified; poverty, lack of knowledge by young mothers on proper feeding child feeding practices, and inadequate access to a variety of foods lead to children being fed on foods from few food groups mostly the starchy staples. The community also identified the specific interventions that they would prefer to improve their agricultural practices and dietary diversity through development of actions plans and budgets. They proposed '*Kienyeji*' poultry farming, Processing of dairy products, training on preservation of indigenous vegetables and door to door training as some of preferred interventions.

Workshop Participants

Closing remarks

Director Research and Extension, Egerton University, commended the valuable and good work done by the Rongai project team and emphasized the need for more collaboration among stakeholders in the Agriculture, Nutrition and Health sectors to ensure that Agriculture indeed responds sustainably to issues of nutrition and health, hence improved food and nutrition security in the country. The findings of the study will go a long way in guiding the directorate while designing extension services for Rongai community. He asked the Rongai project research team to write an article for Seeds of Gold magazine, a pull out magazine of the Saturday Nation Newspaper.

Agro-biodiversity and dietary diversity for optimal nutrition and health workshop

Agenda

8.45am	Registration – Chadwick
9.00 am	**Introduction/workshop objectives** Dorothy Mituki, Egerton University
9.10 am	**Welcoming Remarks** COD Department of Human Nutrition
9.20 am	**Opening remarks** Dean Faculty of Health Sciences DVC Research and Extension, Egerton University
9.40 am	**Introduction to Rongai Agrobiodiversity and Dietary Diversity Project** Maureen Cheserek, Egerton University
9.50 am	**Agri-nutrition research** Discussion moderated by Joshua Ogweno, Egerton University ▪ Determinants of dietary diversity among women of reproductive age in two different agro-ecological zones of Rongai Sub-County, Nakuru-Maureen Gitagia, Egerton University ▪ Ethnobotany to improve child nutrition – a case study from Southern Benin, Celine, Bioversity, Kenya
10.50 am	*Tea break*
11.20 am	**Agri-nutrition Research** Discussion moderated by Celine Termote, Bioversity International, Kenya ▪ Factors Associated with Diet Adequacy of Children Aged 6-23 Months in Rongai Sub-County, Sharon Kemboi, Egerton University ▪ Accelerated Value Chain Development Programme: Lessons and Experiences, Esther Omosa, ILRI, Kenya
1.00 pm	*Lunch break*
2.00 pm	**Agri-nutrition research** Discussion moderated by Wesley Bor, Kabarak University • Barriers and entry points for improving nutritional status of mothers and children in Rongai sub-county, Rose Ramkat, Moi University • Improving the diets of women and small children through participatory approaches - Case study in Vihiga, Francis Odhiambo, Bioversity International, Kenya
3.45 pm	**Closing Remarks** Director Research and Extension, Egerton University
	Tea break and Guest leave at their own Pleasure

Participants	
Names	**Organisation**
Faith Ngundi Ndungi	Egerton University
Erick Mwangi Maina	Egerton University
Lucy W. Karanja	Egerton University
Prof. J. Kipkemboi	Egerton University
Paul M. Njagi	MOALF- Nakuru
Dr. S.O Obure	Egerton University
Esther Omosa	International Livestock Research Institute (ILRI)
Joshua Ogweno	Egerton University
Naomi Muriuki	Ministry of Agriculture
Jacqualine Wanjala	Ministry of Agriculture
Dr. T. Kinyajui	Egerton University
Kioko Paul Nguti	Egerton University
Evalyne Koech	Provincial General Hospital, Nakuru
Calolyn C. Kenduiwa	Provincial General Hospital, Nakuru
Benson Nyamweno	Egerton University
Dr. Elizabeth Kamau	Egerton University
Dr. Lydia Waswa	Egerton University
Doreen Karimi Kemboi	Egerton University
Jeniffer Too	Farmer, Rongai Sub-County
Lucy Mariera	Egerton University
Prof. Alfred Kibor	Egerton University
Shalo Caroline	Egerton University
Florence Gaturu	Egerton University
Rose Ramkat	Moi University, Eldoret
Grace Kirui	County Government, Nakuru County
Dr. Celine Termonte	Bioversity International
Francis Odour	Bioversity International
Lilian K. Marita	Ministry of Health, Nakuru
Wesley Bor	Kabarak University

Prof Paul Kimurto	Egerton University
Naomi N. Mkonge	Moi University, Eldoret
Maureen Wachira	War Memorial Hospital
Alex Obola	Lanet 3KR
Nelson O Mativa	MOALF- Fisheries Department
Prof B.O Bebe	Egerton University
Prof. J. Tuitoek	Egerton University
Kimani Njoroge	Egerton University
Shadrack K. Ruttoh	Egerton University
Gitagia M. Wanjiru	Egerton University
Sharon Kemboi	Egerton University
Dr. Maureen Cheserek	Egerton University