

EGERTON



UNIVERSITY

**TEGEMEO INSTITUTE OF AGRICULTURAL
POLICY AND DEVELOPMENT**

2017 Tegemeo Conference: Proceedings

Transforming Agriculture for Inclusive Growth and Sustainable Livelihoods

Held at the Kenya Institute of Curriculum Development (KICD), Nairobi

5th and 6th December, 2017

January, 2018

Table of contents

INTRODUCTION	iv
ACKNOWLEDGMENT.....	v
LIST OF ACRONYMS AND ABBREVIATIONS	vi
DAY ONE.....	1
SESSION I: OPENING AND INTRODUCTION	1
Welcoming Remarks: Prof. Rose Mwonya, <i>Vice Chancellor, Egerton University</i>	1
Opening Address: Dr. Irungu, on behalf of the <i>Cabinet Secretary (CS), Ministry of Agriculture, Livestock and Fisheries (MoALF)</i>	2
Overview of the Conference: Dr. Milton Ayieko, <i>Director, Tegemeo Institute</i>	4
SESSION II: KEYNOTE ADDRESS	5
Transforming Agriculture under the Devolved System of Governance, His Excellency Mr. James Nyoro, <i>Deputy Governor, Kiambu County</i>	5
SESSION III: TRANSFORMATION AND SUSTAINABLE PRODUCTION SYSTEMS	9
Lessons and Opportunities on Agricultural Transformation in a Devolved System, Dr. Timothy Njagi, <i>Tegemeo Institute</i>	9
Can Smallholders Farm Themselves Out of Poverty? Evidence from Kenya: Dr. Milu Muyanga, <i>Michigan State University</i>	11
Land Tenure and Sustainability of Pastoral Productive Systems, Dr. Lilian Kirimi, <i>Tegemeo Institute</i>	13
SESSION IV: PRODUCTIVITY AND INPUT USE	16
Does Soil Quality Information Influence Fertilizer Choice among Smallholder Farmers in Kenya?, Dr. Priscilla Wainaina, <i>Tegemeo Institute</i>	16
Does Establishment of Demonstration Plots Have an Impact on Farmers' Awareness, Perceptions and Use of Improved Maize and Bean Seed? Dr. Mercy Kamau, <i>Tegemeo Institute</i>	18
Adoption of Maize Technology Bundles: Implications on Productivity and Food Security, Mr. Eric Njue, <i>Tegemeo Institute</i>	20
Farmers Willingness to Pay and the Sustainability of Irrigated Maize Production in Rural Kenya, Dr. Dennis Otieno, <i>Tegemeo Institute</i>	22
DAY TWO.....	25
SESSION VI: SUSTAINABLE LIVELIHOODS AND INCLUSIVITY IN AGRICULTURE..	25

Pulled or Pushed Out? Causes and Consequences of Youth Migration from Densely Populated Areas of Rural Kenya, Dr. Milu Muyanga, <i>Michigan State University</i>	27
Women Empowerment in Agriculture: Status, Levels and Determinants among Rural Households in Kenya, Dr. Tim Njagi, <i>Tegemeo Institute</i>	30
SESSION VII: CONSUMPTION AND WELFARE	33
Drivers and Dynamics of Poverty in Rural Kenya, Dr. Timothy Njagi, <i>Tegemeo Institute</i>	33
Changing Consumption Patterns among Rural Households in Kenya, Mr. Kevin Onyango, <i>Tegemeo Institute</i>	34
SESSION VIII: PANEL DISCUSSION.....	37
Public sector represented by Dr. Moses Mwanje Osia, <i>Chair CECM Caucus in Agriculture and CECM for Agriculture, Livestock and Fisheries, Busia County</i>	38
Private Sector and Civil Societies represented by Edward Mudibo, <i>Chair, Agricultural Industry Network</i>	39
Research organizations represented by Charles Nkonge, <i>Researcher, Kenya Agricultural and Livestock Research Organization (KALRO)</i>	40
CONCLUDING REMARKS.....	42
List of Participants	44

INTRODUCTION

The core mandate of Tegemeo Institute is to conduct policy research and disseminate findings in an objective manner. In so doing, the Institute responds to contemporary agriculture-related policy issues and provides information to policy makers that can help in the formulation of appropriate policy strategies in agriculture and rural development sectors in Kenya. Through its work, the Institute has emerged into one of the leading centres of agricultural policy research and analysis and has become a reservoir of knowledge and information on rural livelihoods. The Institute undertakes empirical research and analysis on topical agricultural policy issues and promotes policy dialogue and advocacy via the dissemination of various research findings to a large number of stakeholders including the government, the private sector, development agencies and civil society, among others.

The Institute organized a two-day conference to disseminate its research findings on the theme, “Transforming Agriculture for Inclusive Growth and Sustainable Livelihoods in Kenya”. In collaboration with Michigan State University (MSU) and with the support of the USAID Mission in Kenya, research was carried out on various challenges affecting the agriculture sector and findings were shared at the two-day conference held in Nairobi on 5th and 6th December, 2017. Presentations were organized in sub-themes focusing on sustainable production systems, productivity and input use, sustainable livelihoods and inclusivity in agriculture and lastly consumption and welfare.

The conference was aimed at providing policy options to deal with the challenges facing smallholder farmers based on evidence gathered from research. It also provided a platform for the exchange of ideas among experts on the issues discussed. The conference drew participants from the public sector, such as the Ministry of Agriculture, Livestock and Fisheries and government agencies in the agricultural sector; County governments; the private sector; civil society organizations; development agencies; universities and research institutes; and, farmer representatives, among others.

ACKNOWLEDGMENT

We are grateful to the United States Agency for International Development (USAID) for the financial support in undertaking the research work presented during the conference. We particularly want to thank the USAID/Kenya Mission staff for their support and participation. Special thanks to the Cabinet Secretary, Ministry of Agriculture, Livestock and Fisheries, Mr. Willy Bett and other ministry officials for their participation and support. We highly appreciate the management of Egerton University, the Vice Chancellor, Prof. Rose Mwonya and the Deputy Vice-Chancellor, Research and Extension, Prof. Alfred Kibor, for their continued support and participation during the conference.

We thank all participants from other government ministries, County governments, the private sector and civil society institutions for their participation and contribution during the conference. We extend our sincere gratitude to farmers, public officials and other stakeholders for providing us with information that was analysed and presented in this conference. Efforts by all those who made the conference a success are also acknowledged. In particular, we acknowledge the work of the conference organising committee, the researchers from Tegemeo/MSU for their high quality and informative presentations, and all colleagues at Tegemeo for their continued support.

LIST OF ACRONYMS AND ABBREVIATIONS

ACIAR	Australian Centre for International Agricultural Research
AFA	Agriculture and Food Authority
AGRA	Alliance for a Green Revolution in Africa
ASDSP	Agricultural Sector Development Support Programme
ATA	Agricultural Transformation Agency
CECM	County Executive Committee Member
CS	Cabinet Secretary
FAM	Financial and Administration Manager
GDP	Gross Domestic Product
ILRI	International Livestock Research Institute
KALRO	Kenya Agricultural and Livestock Research Organization
KEPHIS	Kenya Plant Health Inspectorate Services
KEPSA	Kenya Private Sector Alliance
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KMD	Kenya Meteorological Department
KMT	Kenya Markets Trust
MoALF	Ministry of Agriculture, Livestock and Fisheries
MSU	Michigan State University
NCPB	National Cereals and Produce Board
NIB	National Irrigation Board
NLC	National Land Commission
PSCK	Public Service Commission of Kenya
RA	Research Assistant
RESAKSS	Regional Strategic Analysis and Knowledge Support System
SDA	State Department of Agriculture
SRA	Senior Research Assistant
TAPRA	Tegemeo Agricultural Policy Research and Analysis
USAID	United States Agency for International Development
WTP	Willingness to Pay

DAY ONE

SESSION I: OPENING AND INTRODUCTION

The conference started with the moderator, Dr. Samuel Mburu calling the meeting to order and thanking the participants for finding time to attend the Tegemeo Conference 2017. This was followed by a word of prayer from Ms. Catherine Ambenje.

Welcoming Remarks: Prof. Rose Mwonya, *Vice Chancellor, Egerton University*

Speech by Prof. Rose Mwonya

The Africa continent is poor yet endowed with a lot of natural resources. The way we produce and distribute food determines the gains realised from agriculture. The major problem is that we produce but do not add value to the produce. We would gain more if we see to it that value addition on products like milk is done. In addition, our marketing and poor produce distribution strategies contribute significantly to elevating poverty levels. Tegemeo Institute has conducted research on some of these gaps, and is here to disseminate part of the findings in order to give options and strategies that can help drive our nation out of poverty.

The conference comes at a time when ministries are working to align their operations with the 2010 constitution with an aim of attaining the food nutrition and poverty alleviation goals. Agricultural transformation is recognized as the main driver of economic growth in African countries. Lack of empirical evidence has been an obstacle to transformation and hampers decision making in policy formulation and implementation. Identification of locally bred policies is important for empowering homegrown solutions to agricultural productivity, food nutrition and sustainable livelihoods.

The agricultural landscape is changing, most youths are idle and majority of farm workers are women. Inclusion of youth and women is paramount in this agenda and there must be innovative and attractive ways to enhance their participation. Women for instance do a lot of work, but hardly is their participation appreciated. The nature of our land tenure systems also excludes women and youth, and hence policies both short term and long term, must address this issue.

Agriculture being a devolved function of the government, addressing the question of budgetary allocation and services support under the devolved system of governance is important. There is need to conduct studies to inform these broader questions. The country is looking up to Tegemeo

Institute to conduct studies that can inform these processes. The involvement of different stakeholders from various parts of the country in the conference is commendable. It is my hope that the conference is going to be engaging as key research findings are disseminated.

Key studies mostly under TAPRA II project include: food security, poverty, agricultural productivity trends, irrigation, technology use, commercialization and climate change. The Institute has partnered with the Ministry of Agriculture, Livestock and Fisheries and other stakeholders in the development of relevant policy documents and participated in various ministerial thematic working groups. Egerton University is delighted to support agricultural sector development through academic programmes, research and extension. We are also proud to be associated with Tegemeo Institute as one of the University's think tanks. The University has been at the forefront in shaping agricultural policy for almost two decades and this will continue. Egerton has undertaken various measures to strengthen Tegemeo to be the institute of future in agricultural policy research. We acknowledge the support of all the bilateral partners the paramount ones being USAID-Kenya, Bill and Melinda Gates Foundation and the Government of Kenya (Ministry of Agriculture, Livestock and Fisheries).

Opening Address: Dr. Irungu, on behalf of the *Cabinet Secretary (CS), Ministry of Agriculture, Livestock and Fisheries (MoALF)*

Cabinet Secretary's Speech

The agriculture sector continues to play a vital role in the rural economy and is the best engine for inclusive growth and poverty reduction. The sector contributes approximately 33 percent of the Gross Domestic Product (GDP) and is a key component of the economic pillar of the Kenya Vision 2030. Therefore, the sector needs to be transformed in order to be more productive, less risky and more sustainable, especially for the smallholder farmers. The conference theme, "Transforming Agriculture for Inclusive Growth and Sustainable Livelihoods" is both appropriate and relevant, coming at a time when the MoALF is revising its agricultural sector strategy and aligning agricultural operations with the new constitution. This theme captures the key issues relevant for agricultural transformation with an aim of spurring growth in the agricultural sector. Hence, the need for locally bred policies, where Tegemeo Institute takes a lead in provision of credible evidence in the agricultural arena.

Given the importance of agriculture and the changing agriculture landscape in terms of population, household characteristics and the emergence of the medium and large scale farmers in Kenya, strengthening and improving the performance of the agricultural sector and enabling the engagement of women, youth and the marginalized communities in agriculture is a prerequisite and a necessary condition for achieving the desired agricultural transformation. This can be achieved through a shift of agriculture from subsistence to commercial scale; enhanced productivity; increased use of improved inputs; improved soil fertility management; export orientation; and, reduced cost of production, which in turn will encourage surplus production, reduce prices and improve nutrition. Though agricultural transformation is critical, the country has to understand the impediments to transformation, the existing solutions, lessons from the past and what to upscale.

Transforming agriculture is necessary in creation of jobs and economic opportunities along value chains and a stronger agricultural growth that can act as a multiplier for economic growth. However, there exists a large gap between potential and current yields, which provides an opportunity for increasing production. This cannot be achieved when the agriculture sector in Kenya is lagging behind and lacks inclusivity. In addition, the sector faces key challenges which include: low productivity; declining soil quality; crop pests and diseases; weak linkages between research, extension and farmers; low technology uptake; high production costs; limited access to affordable credit; low market participation; declining land sizes; limited access to water for irrigation; and, climate change. These challenges have rendered Kenya a food deficit country. Stagnated productivity coupled with population increase make yesteryears solutions insufficient to solve the current challenges. Hence, there is need for inclusivity in the agricultural sector.

Following the promulgation of the Constitution in 2010, majority of the agriculture functions were devolved to the county governments. The transition to county governments was characterized by teething problems and in order to achieve meaningful transformation, the county governments must be effective in planning, budgeting, coordination with national government, and have sufficient-skilled staff. In addition, most county governments lack credible evidence-based data and information and researchers have to position themselves as think tanks to bridge the gap.

I wish you all fruitful days of deliberations and I declare this conference officially opened.

Overview of the Conference: Dr. Milton Ayieko, *Director, Tegemeo Institute*

Dr. Ayieko thanked the participants for finding time to come and engage in the conference discussions that would spur the agricultural sector in Kenya and move it to where it should be. He alluded that the conference aimed at bringing together different stakeholders, present findings from different studies done by Tegemeo and pick out what can be implemented to help the sector move forward, since agriculture plays a very important role in the country. A number of challenges arose with the devolution of the agricultural sector, among other challenges, hence requiring stakeholders to put their minds together to come up with sound solutions given the diverse representation in the conference. Introducing the conference theme, “*Transforming Agriculture for Inclusive Growth and Sustainable Livelihoods*”, Dr. Ayieko said words had been carefully selected as the conference came at a time when the MoALF was going through a review of the Agricultural Sector Development Strategy (ASDS). Challenges concerning inclusive growth and the role of youth and women in agriculture cannot be over emphasized. The population has been changing and now more youth are engaging in agriculture, research and carrying out several activities across the value chains, hence, we must discuss ways of dealing with the emerging trends. He indicated that Tegemeo Institute prides itself as a provider of credible evidence and knowledge for accountability and learning, to catalyze agricultural and rural sector transformation and address some of the challenges facing the agriculture sector. In line with the conference theme, the following questions would help in unpacking some of the solutions to catalyze agricultural transformation and inclusive growth:

- How can the agricultural sector achieve this transformation?
- What type of support is required to achieve transformation?
- How is devolution of functions to county governments shaping the transformation agenda and how can we sustainably achieve transformation?

The objectives of the conference included:

- Presenting research findings to stakeholders and experts to elicit debate and feedback from the participants
- Laying some background for a wider discussion on policy options/interventions on how to transform smallholder agriculture and effectively address poverty and wealth creation, and food and nutrition security challenges.

Acknowledging the participation of key personnel from the MoALF, civil societies, county governments, academia, farmers and donors, Dr. Ayieko expressed hope that the conference deliberations would be insightful and fruitful, even as he welcomed participants to the event.

SESSION II: KEYNOTE ADDRESS

Transforming Agriculture under the Devolved System of Governance, His Excellency Mr. James Nyoro, *Deputy Governor, Kiambu County*

The Kenyan economy has registered a growth rate of above 5% per annum over the last 10 years but this growth does not necessarily translate into benefits related to poverty reduction or an increase in wealth across the country. Nigeria serves well as an example of an Africa country, which has recorded impressive economic growth rates, but with increasing poverty among its citizens. The drivers of such economic growth do not lead to reduced unemployment and hence increased incomes that improve food and nutrition security.

Over time, different sectors of the economy such as finance, ICT, insurance among others may have grown but when agriculture and manufacturing sectors which accommodate over 70% of the population are neglected, the result is an economic growth that does not grow its people; hence inclusivity is very important for sustainable growth and development of the agricultural sector.

Agricultural transformation must, therefore, involve shifting from subsistence farming to commercial production of agricultural products, enhancing agricultural productivity to reduce cost of production, as well as increasing profit margins and encouraging production of marketable surplus of diverse commodities. This will ultimately result into reduced food prices, improved nutrition among the population as well as increased incomes to spend on health and other items. This also entails pulling people into urban centers rather than pushing them into those centers.

Even though the agricultural sector in Kenya has been devolved, the delineation of devolved functions from the national government has not been very clear. The sector is hypothetically devolved but practically there are some issues that need to be addressed. Such problems are attributed to the fact that the sector's devolution took place at a time when there was a merger of

certain parastatals into KALRO, AFA, etc. Some of these institutions have not yet stabilized and this makes it hard to quantify the impact of devolution. Due to the confusion of roles and responsibilities between the county and the national governments, in November 2016, a joint agricultural secretariat was formed to oversee the sector's coordination.

The national and county governments must pull together for agriculture to thrive and succeed in Kenya. This is possible if there is:

- Proper coordination and clear delineation of the roles and functions within departments at counties and national government
- Formulation of a National Master Plan to chart direction for the agricultural sector, which is a document that explains the national strategy and defines particular targets for specific enterprises or commodities within a given timeline. It also defines the roles of national and county governments, and the private sector as well as an investment plan for the whole sector. This will allow for proper identification of counties' comparative advantages to produce specific commodities, while working towards a national production target to attain self-sufficiency
- Proper funding for agriculture as spelt out in the Maputo declaration
- Planning that is based on evidence, which calls for reliable and credible data that can be used to monitor progress made from investment
- Data and data systems at the county level that can help track changes in trends as investment increases

Using Ethiopia as a case study, Mr. Nyoro gave four necessary conditions for agricultural transformation:

- Political goodwill is required from the top levels of leadership. In Kenya, the President is thinking about four drivers for the economy in the next five years. These drivers include: food security and nutrition, universal health care, manufacturing and affordable housing to be driven by other subsectors such as transport, roads, energy etc. Ethiopia's agricultural transformation was spearhead from the Prime Minister's office through successful formation of the Agricultural Transformation Agency (ATA)

- Allocating and attracting adequate resources to the agricultural sector since countries which have done that have registered a remarkable difference. He emphasized the need to view agriculture as a productive sector rather than a social sector
- Proper coordination and consultation with different players since the Ministry of Agriculture cannot succeed without input from other ministries such as Finance and National Treasury; Transport and Infrastructure; Land, Housing and Urban Development; Ministry of Energy and Petroleum etc.
- Accountability for the resources received and the expected results, which requires a strong monitoring, learning and evaluation system to provide evidence on use and impact of the resources allocated in the sector.

In light of what Ethiopia did, the County government of Kiambu has drawn some lessons towards achieving agricultural transformation. The County has a population of 60% and 40% in rural and urban areas, respectively and so the county's CIDP is driven by agricultural activities practiced by the 60% rural population with diverse enterprises that include dairy farming, pig rearing, coffee, tea and many others. The county focused on a private sector driven agricultural transformation strategy to wean farmers out of subsidies without harming them.

The County also has plans to continue with well-targeted input subsidies to support extremely poor farmers. Well-structured subsidy programs encourage the growth of the commercial inputs market. The county has plans to establish a bacon factory whose starting point will be to identify a key investor to collaborate with local investors and the county government to accomplish this undertaking. The sustainability of such investments requires other backward linkages such as encouraging more farmers to begin rearing pigs, ensuring high quality animal feeds, providing affordable veterinary services, maintaining well equipped slaughterhouses and improving road networks to facilitate transportation.

The county is looking forward to having a new model of extension that uses the village-based advisors. This will create employment in the rural areas and improve extension service delivery since one advisor will be mentoring 300 farmers. He concluded by saying that the county intends to set up an economic zone where agro-processing can be done to prevent the post-harvest losses that occur at farm gate especially for perishable products.

Issues arising from the presentation

Implementation of agricultural policies: Tegemeo Institute being a renowned policy research organization in the region with enormous capability and credibility in agricultural policy matters should be in close contact with the leadership at the Ministry of Agriculture to provide necessary guidance in monitoring and implementation of agricultural policies.

Developing CIDPs: Tegemeo has the expertise which could support the County governments in formulating their CIDPs. During the second term of devolution, CIDPs should not just be focused on fulfilling the requirements by the controller of budgets to enable release of funds to the devolved units, as was the case in 2014; instead, they should be informed by evidence.

Investing in large-scale production: In 2014, the government realized that increasing productivity among small-scale producers would be important but not sufficient to alleviate food insecurity in the country. About 53% of households in Kenya are net food buyers, according to the data provided by Tegemeo Institute in 2014. Based on this fact, the idea of enhancing large-scale production through irrigation in Galana-Kulalu was born. This food security project was aimed at increasing production of staples such as maize and other crops, while taking into consideration constraints on availability of water and arable land. The feasibility study by the implementing agency, the National Irrigation Board (NIB) showed that the cost of irrigated maize production per unit would be half the cost incurred by most farmers.

In order to irrigate the vast land, more water than what was available from River Galana was required and hence building a dam upstream was necessary. It was also not possible to meet the targeted area under maize production and, therefore, the government resorted to increasing maize acreage in the various irrigation schemes such as Perkerra, West Pokot and others. In addition, there was enhanced provision of subsidized fertilizer as well as establishment of a fertilizer-blending factory in Eldoret to produce fertilizer suited to the soil requirements. It was during this time that the soil master plan was launched.

Private sector: Kenya has a strong association of private sector players, the Kenya Private Sector Alliance, but their conversation always revolves around other issues but not agriculture. The President has previously provided various forums for discussion with the private sector but ideas that relate to agriculture were never raised. The private sector is more concerned with improving

the ease of doing business but can do better by collaborating with the counties that are already facing challenges in implementing agriculture-related programs.

Inter-county coordination and cooperation: Coordination and cooperation need to be greatly emphasized. How can inter-county coordination and cooperation in agricultural development be effected, when most county governments are more focused on implementing own priorities in their own style? Forming a strong coordination unit within the council of governors and strengthening the joint agricultural secretariat will improve coordination of agriculture activities. It is important to establish the national food security master plan with national priorities and identify the roles of the counties in achieving food security in the country.

SESSION III: TRANSFORMATION AND SUSTAINABLE PRODUCTION SYSTEMS

Chair: Mr. Bernard Ondanje, Senior Assistant Director of Policy and External Relations, State Department of Agriculture

Three presentations were made in this session: (i) Lessons and Opportunities on Agricultural Transformation in a Devolved System; (ii) Can Smallholders Farm Themselves out of Poverty? Evidence from Kenya; and, (iii) Land Tenure and Sustainability of Pastoral Productive Systems

Lessons and Opportunities on Agricultural Transformation in a Devolved System, Dr. Timothy Njagi, Tegemeo Institute

Introduction

Majority of the functions in the agricultural sector are under county governments. However, the national government still plays a key role in the sector particularly on policy and capacity building. The first term (2013-2017) under devolution was characterized by teething problems in transitioning to the county government systems. The key issues were institutional set-up and coordination, apportionment of responsibilities between National government (NG) and County governments (CGs), finance and resourcing, communication and staffing. To achieve agricultural transformation, CGs must be effective in their role.

The objective of the study was to understand lessons and opportunities from the first-term CGs and their implications for the agriculture sector. The key research questions were:

- How did first-term CGs perform in terms of planning, coordination, implementation of projects and programs, finance and resourcing?

- What challenges are being experienced?
- What do we learn?
- What can be done to keep us on track with the agricultural transformation agenda?

Key findings

- Coordination within the sector has improved with time. The key mechanisms for enhancing coordination included intergovernmental relations through the establishment of a secretariat at the ministry; inter-governmental forums on agriculture and devolution conferences held; and the establishment of the CEC caucus
- There were weak partnerships between NG and CGs in response to challenges/emergencies in the agricultural sector. For instance, in the recent past, NG and CGs were acting independent of each other in dealing with the fall army worm (FAW) infestation
- In planning, the study found that the first CIDPs had little technical input from bureaucrats and most of them were not aligned to the national government plans – MTP II and Vision 2030
- There was little use of data and evidence in prioritization of projects
- In implementation of programs, most counties performed well in provision of subsidized seed, fertilizer and mechanization (ploughing services). However, provision of extension services, actions to promote market linkages and the M&E systems were weak
- Regarding funding, most counties relied heavily on national government funding
- Budgeting process in many counties was characterized by political manipulation and the process did not follow CIDPs
- Majority of the counties introduced the Ward Development Fund and allocation for this was not equal across the wards
- In most counties, money allocated to agriculture was diverted to other sectors like roads and health
- In most counties, health sector received the highest allocation of funds, while youth, gender and social services received the least funding

Policy implications/Recommendations

- To improve coordination, the study recommended unbundling of roles by both levels of governments, coupled with effective apportionment of responsibilities. This will enhance coordination as roles for each level of government will become clear
- There is need to strengthen the budget making process and improve on resources allocation. This could involve enhancing participation of citizens in the budgetary process, effective oversight and accountability by county assembly and innovative ways for resource sharing. In this way political interference will be minimized and the budgets will be realistic and tied to CIDPs
- There is need to improve planning at the county level through inclusion of technical officers in drafting of CIDPs; this will necessitate use of data to inform prioritization of projects and programs. There is also need to strengthen M&E systems to enable learning and provide feedback to communities (can help in managing expectations).
- There is need to build capacity of county governments (both legislative and executive) to perform functions as expected. This will for instance enhance MCAs capacity in oversight and not just implementation.
- Finally, agricultural transformation is only possible if CGs play an effective role in the sector by allocating more resources to the agricultural sector

[See the presentation here ...](#)

Can Smallholders Farm Themselves Out of Poverty? Evidence from Kenya: Dr. Milu Muyanga, Michigan State University

Introduction

Smallholder farmers constitute over 70% of farms in Africa, majority of whom are poor and food insecure. Based on evidence from Asia, it has been generally accepted that a smallholder-led strategy holds the best prospects for achieving structural transformation and mass poverty reduction in Africa. However, smallholder agriculture is characterized by low returns to labor which leads most rural households to seek ways to improve their livelihoods away from farming. Majority of these households attempt to diversify into higher-return non-farm employment or get out of farming entirely. Smallholder agriculture is also characterized by decreasing farm sizes

due to increasing population growth. The production system is also prone to frequent droughts, and most areas have only one growing season per year.

The unsustainable forms of intensification due to population growth and declining land sizes have led to degraded soils, reduced fallow periods (hence decline in soil organic matter), micro-nutrient deficiencies and soil acidification arising from continued use of inorganic fertilizers. Overall, these have led to soil-induced poverty traps.

Given the above challenges, examining the viability of smallholder farming takes on even greater policy significance. This is also important in light of recent studies that have questioned the viability of, and objectives of promoting small-scale agriculture in Africa.

Key findings

- There is a changing farm structure from small to medium scale farms. The emergence of such larger farms is due to:
 - Rise in world food prices that heightened investor interest in farmland
 - Urban elite capture of land as a productive resource since they have access to capital, management expertise, and ability to navigate complex traditional and/or statutory land institutions. These elites also control government input and output policies.
- Only a few smallholders can farm themselves out of poverty since most smallholder farms have become “too small” to generate meaningful output surpluses for the market.
- Continued concentration of arable land may have profound effect for both the pace and nature of growth in rural economies.

Positive consequences of a rise in medium scale farms include:

- Greater use of capital and labor-saving technologies such as mechanization
- Higher productivity; medium farms are more productive since they make greater capital investments
- Higher marketable surplus; medium-scale farms contribute a large share of marketed surplus than small-scale farms.

Negative consequences include:

- Growing land scarcity
- Rising inequality of farmland distribution leading to some displacement of smallholders

- Mechanization could displace some agricultural employment

Policy implications/Recommendations

- There is need to increase agricultural productivity, particularly among smallholders since productivity will remain the cornerstone of any inclusive development and improved livelihoods.
- Growth in productivity will have multiplier effects, for instance, in the growth of non-farm jobs and will affect pace of labor force exit out of farming and labor productivity in the broader economy.
- However, the multiplier effects may be much weaker when the source of agricultural growth is concentrated. Hence need for investments to boost broader economic growth in rural economies where the “too small” smallholders can benefit from the non-farm economy.

In a broad sense and related to the theme on transformation, we need to take cognizant of three sets of activities that promote structural transformation:

- Actions that the private sector will undertake on its own e.g. distribution of inputs to areas where demand is strong
- Actions that the private sector will undertake if governments create a favourable ‘enabling environment’ e.g. distribution of inputs to areas where demand would be strong with improved road, port, communications infrastructure etc.
- Actions that the private sector will not do under most circumstances and that government must do e.g. investment in infrastructure, education, R&D and extension services.

[See the presentation here ...](#)

Land Tenure and Sustainability of Pastoral Productive Systems, Dr. Lilian Kirimi, Tegemeo Institute

Introduction

Pastoral communities have been facing immense pressure on their land due to population growth, urbanization, climate change and misconceptions about pastoralism. It is against this backdrop that Tegemeo Institute in collaboration with GRADE institute, Peru, worked on a comparative study on sustainability of pastoral systems in Kenya and Peru. The aim of the study was to understand the evolution of the two productive systems and their sustainability.

The study compared pastoral systems in Peru and Kenya to explore similarities and differences and draw lessons on how to improve pastoralism and positively impact the livelihoods of pastoralists in Kenya.

Since the colonial period in Kenya, there have been misconceptions about pastoralism where these areas were viewed as unoccupied and unproductive lands and in some cases associated with environmental degradation. This led to increased individualization of land in pastoral areas, which was promoted by land policies that were aimed at enhancing investments, improving productivity and improving environmental conservation.

Key findings

- There existed observable differences between the two systems:
 - The pastoral production system in Peru is more market oriented than in Kenya
 - In Peru, pastoralism is practised in highland mountainous areas with very low temperatures where pastoralists mainly keep llamas and alpacas, while in Kenya it is practised in lowlands with high temperatures where cattle, sheep and goats are mainly kept.
- Population growth, mismanagement of community land, weak community systems and proximity to urban areas were key drivers of individualization of land in Kenya
- Individualization of land has greatly affected wild life migration and the sustainability of pastoral systems of production
- In both production systems there are efforts to promote sustainability of pastoralism whereby collective land tenure is the key driver as it supports strategies that improve pastoral productive systems like mobility and mosaic grazing, split herding, genetic improvement, herd size management, value chain development and wildlife conservation.

Policy implications/Recommendations

- There is need to reorient public policy to support pastoralism and encourage use of multiple sustainable practices with emphasis on herd size management since it is a critical strategy for sustainability
- Promote and strengthen market oriented pastoral economy in Kenya
- Strengthen community management of communal land by establishing and enforcing traditional/community rules on common property e.g. grazing plans

- Integrate wildlife conservancies with pastoralism to reduce increased individualization that is leading to many challenges such as human-wildlife conflict and lack of enough pasture
- Promote insurance to cushion pastoralists from fragile ecosystems and effects of climate change as well as build resilience and enable restocking.

[See the Presentation here ...](#)

Session III plenary: Issues arising from the presentations

Smallholder farming and input subsidy: Over time smallholder farmers have experienced low productivity mainly because in most cases policies and input access programs like fertilizer subsidy and producer prices by the government (NCPB) do not target smallholder farmers. There is need to promote good agricultural practices, encourage value addition and cost reducing technologies so as to increase productivity among smallholder farmers.

Smallholder farmers can ‘farm’ themselves out of poverty if they are supported to exploit their potential for transformation to take place but, as long as their farm sizes are getting smaller they may not get out of poverty. Land amalgamation is important such that smallholder farms are consolidated and production be done on a large-scale basis, which will in the long run create off-farm job opportunities.

About 53% of Kenyans are net food buyers and so providing subsidy to producers only is not sufficient and also not sustainable. Therefore, the support programs should be well targeted such that there is a balanced approach.

Intercounty agriculture coordination: The MoALF in collaboration with the Government of Sweden, Germany (GIZ), FAO and USAID have come up with Inter-Governmental Secretariat (IGS) and agreed on a Joint Agriculture Sector Consultation and Cooperation Mechanism (JASCCOM) led by the CS Agriculture as the chair, to promote collaboration and coordination of agricultural activities within and between counties.

M&E framework and data availability: There is need to collect data and build agricultural extension capacity. Tegemeo Institute has a Monitoring Learning and Evaluation (MLE) unit which is working closely with the private sector and counties. There was a suggestion that the unit could work in partnership with Meru County to come up with information for development and implementation of the County Integrated Development Plan (CIDP), in addition to the role

the Institute has played in providing data to inform policy. It was also recommended that undertaking an agricultural census is necessary in order to provide detailed agricultural information.

Rivers and agriculture: Kenya is well endowed with rivers as compared to other countries like Israel. Under pastoralism, rivers have been part of grazing plans, usually earmarked as grazing areas during droughts conditions. They have also provided water for agro-pastoralism and for large scale irrigation projects like Galana-Kulalu. They are a vital resource for food security but they are underutilized due lack of appropriate technologies to efficiently utilize water for irrigation and increase productivity, which can be achieved through increasing funding for agriculture.

SESSION IV: PRODUCTIVITY AND INPUT USE

Session Chair: Prof. Rose Nyikal, Department of Agricultural Economics, University of Nairobi.

This session had four presentations: (i) Does Soil Quality Information Influence Fertilizer Choice among Smallholder Farmers in Kenya?; (ii) Does Establishment of Demonstration Plots Have an Impact on Farmers' Awareness, Perceptions and Use of Improved Maize and Bean Seed?; (iii) Adoption of Maize Technology Bundles: Implications on Productivity and Food Security; and, (iv) Farmers Willingness to Pay and the Sustainability of Irrigated Maize Production in Rural Kenya.

Does Soil Quality Information Influence Fertilizer Choice among Smallholder Farmers in Kenya?, Dr. Priscilla Wainaina, Tegemeo Institute

Introduction

Soil degradation is a leading cause of low productivity in Africa. The problem is worsened by imbalanced use of fertilizers by the farmers without knowing soil fertility status and nutrient requirement of crops. Most of the fertilizers only contain nitrogen (N), phosphorous (P) and potassium (K). In reality, soils are also deficient in other nutrients including micro-nutrients. In addition, low soil carbon content, soil acidity, and micro-nutrient deficiencies may render crops unresponsive to the application of conventional NPK fertilizer mixes. Diagnostic techniques such

as soil tests make it possible for farmers to obtain precise information about nutrient needs specific to their fields.

In an effort to avail soil information, the government of Kenya recently launched a farm management handbook of soil profiles across different counties. Some County governments have also invested heavily in soil testing equipment to bring the service closer to the farmers. The purpose of this study was to understand the effect of soil quality information on fertilizer use and sought to answer the following questions:

- Do farmers use the soil test information? If not, why?
- Are there differences in fertilizer use before and after acquiring knowledge on soil quality?
- What factors are associated with adopting recommended mineral levels?
- What are the effects of using the recommended fertilizer nutrient rates?

This study used data on adoption of mid-altitude hybrid maize seed varieties in Central and Western Kenya. In total, 1,800 households were randomly selected across two regions in 10 Counties. Out of the total number of households sampled, 600 were from central region specifically Kiambu, Kirinyaga, Meru, Embu and Murang'a, while 1,200 were from western region counties namely, Homabay, Kakamega, Siaya, Migori and Nakuru. In 2013, prior to the survey, soil tests were conducted for all farmers and results issued early 2014. This was followed by distribution of custom-mix fertilizers to half of sample in western region counties and follow-up surveys were also conducted in 2015 and 2016.

Key findings

- Only about 60 % of farmers used results from soil tests with the main reasons being lack of money to purchase recommended fertilizer; inability to understand the results (results were too complicated) and lack of recommended nutrients /fertilizer.
- Farmers' perceptions of quality of their soil influenced fertilizer application; for poor soils, farmers were likely not to use fertilizer or use lower amounts.
- Fertilizer nutrient application rates were way below recommended application rates mainly due to low education levels of heads and farming experience as well as poor affordability and accessibility of fertilizer.
- There were no significant changes in use of fertilizer and also in type of fertilizers used after farmers acquired knowledge on soil quality.

- Factors associated with adopting recommended mineral levels include number of crops planted, use of improved seed, amount of cultivated land and education.
- Use of recommended custom-mix fertilizers at the right quantity led to an increase in yield; farmers were also likely to use improved seeds.

Policy implications/Recommendations

- There is a need to revamp extension services to enlighten farmers on the importance of undertaking soil tests.
- To increase productivity, it is important to avail blended fertilizers to farmers as well as fertilizers fortified with micronutrients.

[See the Presentation here ...](#)

Does Establishment of Demonstration Plots Have an Impact on Farmers' Awareness, Perceptions and Use of Improved Maize and Bean Seed? Dr. Mercy Kamau, Tegemeo Institute

Introduction

In many sub-Saharan Africa (SSA) countries, seed delivery systems are poorly developed or lacking, but even in countries where systems are relatively better developed, the uptake of new varieties is very low or it takes many years before smallholder farmers finally take up the improved varieties. Agencies seeking to increase agricultural productivity through crop improvement often face challenges not only on how to increase farmers' use of improved varieties, but also how to speed up the adoption process amongst smallholder farmers. Though multiple methods are used by seed companies, government/non-governmental agencies to promote new seed varieties, adoption studies show that many farmers in SSA have not been reached by the promotion campaigns, and/or are not using improved seed. Demonstration plots and field days are among the promotion methods used by seed companies and other players in the seed industry to promote improved seed varieties. There is, however, limited information on the effectiveness or cost-effectiveness of the promotion methods. The theory of change is that the promotion methods used by seed companies raises farmers' awareness, perception, knowledge and use of the improved seed for promoted seeds (i.e. PH5052 and NABE15 varieties, for maize and beans, respectively, for this study).

This study sought to establish whether demonstration plots are effective in influencing the adoption behaviour of smallholder farmers, including women farmers. The following hypotheses were tested:

- Establishing demonstration plots and holding field days induce a greater change in the farmers' adoption behavior (awareness, perception and knowledge)
- Establishment of demonstration plots and field days will lead to greater adoption of the new improved varieties being promoted
- Farmers who adopt the improved varieties would achieve higher yields

The study comprised of promotion strategy like radio spot adverts and radio talk shows aired through regional radio stations in the study areas by a local seed company. In addition, demonstration plots were established and field days held in randomly selected areas assigned to treatment group. The demonstration plots/field days were expected to provide information about the attributes and performance of the varieties being promoted. Field days were conducted at the demo sites upon maturity of the crop. This promotion strategy was conducted in the same areas over four cropping seasons during the cropping years 2014/15 and 2015/16. Data was collected at both household and individual level. Quasi-experimental methods were used to estimate the changes attributed to the demonstration plots and field days. Doubly robust regression (Augmented Inverse Probability Weighted (AIPW)) estimators were used for estimation. The AIPW yields consistent estimators when the outcome model is correctly specified, thus providing chances to make a valid inference.

Key findings

This study found that establishment of demonstration plots and holding field days:

- Increased awareness and uptake of older improved varieties rather than promoted varieties; the increase was higher for women than men and for maize compared to beans
- Improved farmer perception of promoted maize variety for both men and women but no change in perception of promoted bean variety
- Improved farmer knowledge on promoted maize variety for both men and women
- Had no effect on adoption of promoted maize and bean varieties (PH5052 and NABE15) (in terms of proportion of farmers using varieties or acreage under the varieties) after four seasons of promotion, partly due to non-availability of the seed in agro-dealer shops

- Increased use of unrecycled and purchased seed

The study also found that promotion campaigns:

- Reached both men and women though they had differential effects
- Were more effective for maize seed compared to bean seed

Policy implications/Recommendations

- There is need to identify and invest in more effective promotion approaches for creating awareness regarding new varieties
- Seed companies need to be provided with more evidence on the efficacy of the commonly used promotion methods to inform:
 - Frequency or how many demos are adequate
 - Best timing and location for their demos in promotion campaigns
- Address non-availability of new improved seed in agro-dealer shops and nearest shopping centres to boost adoption
- Public investment (government and NGOs) in early-stage promotion of newly released varieties is necessary in order to create a critical mass of farmers with awareness and knowledge/experience of the new variety
- Governments should promote newly released varieties and channel more resources to enhance seed quality.

[*See the Presentation here ...*](#)

Adoption of Maize Technology Bundles: Implications on Productivity and Food Security, Mr. Eric Njue, Tegemeo Institute

Introduction

Agriculture sector has been acknowledged to offer solutions for rural development and as means to eradicate hunger and extreme poverty. While agriculture remains the mainstay of sub-Saharan Africa, food systems in these countries face a multiple of challenges that threaten agricultural production. Extreme weather events coupled with rapid population growth have exacerbated food insecurity status, thereby increasing the burden of malnutrition. While it is agreed that agricultural innovations are needed to stimulate crop productivity, our study sought to provide a link between food security and adoption of technology bundle(s) that have high probability of

increasing household's food availability and access, whilst enhancing their resilience to food supply shocks.

The data used in this study come from a randomized evaluation of mid-altitude hybrid maize seed variety in Central and Western Kenya. Study sites were mapped around 18 matched demonstration plots such that the corresponding control zones were drawn at a distant location to avoid contamination of the treatment group. Three villages within a five kilometer radius of each of the 18 zones (in each of the treatment and control zones) were randomly selected into the study and in total, 1,800 households were randomly selected across 10 counties (Embu, Meru, Kirinyaga, Murang'a, Kiambu, Nakuru, Siaya, Homa-Bay, Migori and Kakamega) for the study. The technologies considered were: non-improved seeds only; non-improved seed with fertilizer; improved seeds only; and improved seeds with fertilizer.

Key findings

Results from this study indicate that:

- There exists untapped potential to boost agricultural productivity to increase food security in Kenya. This is demonstrated by varying yield levels achieved through use of different technology inputs.
- While proportion of farmers using improved seed and fertilizer is relatively high, intensity of fertilizer use is still below the recommended levels.
- Major constraints that curtail farmers' endeavors to increase agricultural productivity beside technology adoption are inadequate access to financial services (credit and insurance) and gender inequalities that adversely affect access to agricultural resources among women and youth who are the major source of farm workforce.
- Strong joint correlation exists between improved seed, fertilizer and productivity such that high agricultural productivity is strongly associated with use of improved seed and fertilizer
- Similarly, fertilizer and improved seed exhibit a complementary relationship when they are interacted in a production function – implying that they reinforce each other to boost yields and the subsequent food availability in the household.
- Even when fertilizer is bundled with local (non-improved) seed, there are some marginal incremental gains in productivity, albeit small, meaning that fertilizer is an essential component for satisfactory crop growth and production.

- While bundling seeds and inorganic fertilizer improves productivity, highest gains in both food production and availability per capita are realized when fertilizer is used together with improved seed variety.

Policy implications/Recommendations

- Increasing available food per capita will necessitate a paradigm shift to overcome yield stagnation
- Policy options need to be evaluated well when promoting interventions that aim at raising productivity and these include promoting technologies that complement each other to boost crop yields
- Policy framework must be sensitive to specific needs of the farm population especially female farmers since they are a major source of farm workforce
- Providing information to farmers and access to finance especially for female households can improve use of complementary technologies
- Strong partnerships are required to effectively transfer the right technology and knowledge to farmers.

[See the Presentation here ...](#)

Farmers Willingness to Pay and the Sustainability of Irrigated Maize Production in Rural Kenya, Dr. Dennis Otieno, Tegemeo Institute

Introduction

Maize is a key staple food in Kenya that is consumed by 90 percent of Kenyans. Its production is largely under rain-fed agriculture in the high and medium potential areas. Over the years, the supply of maize has been way below the demand and growth in production has been stagnating despite the growing population. As a result, Kenya is a maize deficit country. To bridge the gap, the country has been importing maize and promoting adoption of modern food production technology and expanding crop production into the marginal lands.

According to FAO, about 2/3 of the world's increase in food production would come from irrigation since it's a mitigation strategy towards climate change, declining arable land and decreasing productivity. Kenya like many other Sub-Saharan African (SSA) countries is a water deficit country and has an irrigation potential of about 1.3 million hectares of land. Of this, 125,000 hectares are currently under irrigation, with smallholders farmers accounting for 43 %,

while public irrigation schemes and private large scale farms account for 18 % and 39 %, respectively.

In order to provide insights toward the contribution of farmers to irrigation development in Kenya, this study carried out a survey on farmers' willingness to pay (WTP) for irrigated maize production among smallholder irrigation farmers.

The main research questions that were addressed were:

- What are the farmers perceptions about services offered for irrigated maize production?
- Is irrigated maize production profitable in Kenya?
- Are farmers willing to pay for irrigation services?
- How can the available water be used sustainably in irrigated maize production in Kenya?

This study adopted a mixed method cross section correlational research design in which quantitative and qualitative data was collected using key informant interviews, focus group discussions and household interviews using a structured questionnaire. The study area covered both small and large irrigation schemes in the country. They were selected purposively with the aim of capturing schemes with varying availability of irrigation water in order to estimate the relationship between increased water availability and WTP values. Since water availability was different along the distribution canals within the schemes, we selected households at different points along the main and feeder canals in order to provide different water availability regimes. The agency implementing irrigation in Kenya, the National Irrigation Board (NIB), provided a list of farming households in their areas of jurisdiction from which 10 were randomly selected. The list had farmers who were receiving irrigation services from the government agency. The selection process was repeated in all the schemes that were visited in Bunyala, Nandi, Mwea, Pekerra, Hola, Galana/Kulalu, Lower Kuja and Bura.

Key findings

- Irrigated maize production is profitable with positive viability indices i.e. operations and management index, financial performance index and replicability index.
- Economic value of water was found to be higher than the subsidized irrigation rates.
- Famers were inefficient in the use of water and fertilizer.

Policy implications/Recommendations

To enhance WTP for sustainable irrigated maize production, there is need to:

- Strengthen water users associations, enhance farmer participation and management of irrigation services and enforce irrigation rules and regulations
- Privatize irrigation water rights to improve allocative efficiency in water use, especially if market forces determine rates of irrigation services and water
- Promote participatory investment prioritization of crops to grown under irrigated.

[See the Presentation here ...](#)

Session IV plenary: Issues arising from the presentations

Soil test results: Results from the study showed that about 17 percent of the farmers could not understand the recommendations. There is, therefore, need for simplified results that are easy to interpret. We need to find out the best way to present the results to the end users.

Education and adoption: The level of education or knowledge in relation to adoption of technology resonates well with the findings by NALEP SIDA program and is a parameter used to assess poverty levels among farming households. The presentations were, however, silent on the informal education, which is also an important means of knowledge acquisition.

Type of analysis: We need to communicate research findings by using economic models of analysis that address our desires of attaining the MDGs and the Vision 2030 of moving farmers out of poverty. Also, the conference had more presentations on crops than livestock issues and it is important to find a balance between the two.

DAY TWO

SESSION VI: SUSTAINABLE LIVELIHOODS AND INCLUSIVITY IN AGRICULTURE

Session Chair: Dr. Augustus Muluvi, Head of Productive Sector, KIPPRA

This session had three presentations: (i) Trends in Crop Productivity, Income Growth and Mobility; (ii) Pulled or Pushed Out? Causes and Consequences of Youth Migration from Densely Populated Areas of Rural Kenya; and, (iii) Women Empowerment in Agriculture: Status, Levels and Determinants among Rural Households in Kenya.

Trends in Crop Productivity, Income Growth and Mobility, Dr. Samuel Mburu, Tegemeo Institute

Introduction

Kenya remains predominantly rural and a large proportion of the population (estimated at 70 per cent) still relies on small-scale agriculture for their livelihood. Although some subsectors (such as horticulture, flowers and dairy) have expanded in the last ten years, most of the agricultural subsectors have performed poorly. A report by the World Bank in 2016 showed that between 2006 and 2014, the sector's share in GDP declined from 26.5 to 22.0 percent.

The study sought to understand how the share of agricultural income versus non-agricultural income has evolved over time so as to provide important lessons on how to improve the welfare of rural households.

The key objectives of the study were to:

- Analyse crop productivity for selected food and cash crops among the sampled households
- Analyse livelihood patterns and relevance of agricultural and non-agricultural incomes
- Establish factors that affect crop productivity and incomes

The study used household survey data collected in four rounds by Tegemeo Institute (2000, 2004, 2007 and 2010) from 22 districts across rural Kenya. A fixed-effect panel regression analysis was used to identify the major factors influencing yields of major crops and incomes, income growth and mobility analysis.

Key findings

- Maize and beans yields have stagnated, while coffee yields have been decreasing and tea yields have been increasing over the decade
- Smaller plots of maize and beans had higher yields compared to larger plots implying that farm households with small farm sizes work excessively in their plots to secure food due to the imperfect labour and insurance markets in the rural areas
- Bundling of technology (fertilizer and improved maize seed) increases the productivity per unit area of land
- Crop income accounted for the largest share of income, but it declined over the period
- Shares of livestock income remained stable over the ten-year period, while income shares from salaries/wages and business increased marginally
- Annualized income per capita growth incidence shows real household incomes did not increase between 2000 and 2010
- Between 2004 and 2007, poor households in the lower two percentiles of income registered better income growth, which was attributed to pro-poor programs such as the Economic Recovery Strategy for Employment and Wealth Creation (ERS) and Strategy for Revitalizing Agriculture as well as good weather conditions during the period. However, this group performed poorly between 2007 and 2010 due to post election violence, high fertilizer prices globally and drought. This implies that poor households are more vulnerable to shocks.
- Share of livestock income increased in the High Potential Maize Zone and Marginal rain Shadow, while share of off-farm incomes was higher in the lowlands (Coastal, Eastern and Marginal zones).
- Gender and education of household head, household size, land ownership and group membership are important drivers of agricultural and non-agricultural incomes.
- Income mobility was evident with 6 percent of households moving from lowest to highest income quartile, while 11 percent moved from highest to lowest income quartile between 2000 and 2010.
- Upward income mobility was mainly associated with rising crop and off-farm incomes over the years.

Policy implications/Recommendations

- To increase agricultural productivity, there is need to strengthen inputs delivery system (seeds, fertilizers) to make them more affordable and accessible to farmers
- Implementation of land reforms to provide rural households with ownership of productive assets (land) is important
- Promote integrated rural development; increasing agricultural productivity and supporting non-farm activities in the rural areas

[See the Presentation here ...](#)

Pulled or Pushed Out? Causes and Consequences of Youth Migration from Densely Populated Areas of Rural Kenya, Dr. Milu Muyanga, *Michigan State University*

Introduction

Sub-Sahara Africa is the only region of world where rural population continues to rise and is projected to do so beyond 2050 (UN, 2013). The continent is facing looming employment challenges especially among the youth with 62 percent of the population being less than 25 years old. A Study by MSU has shown that 40 percent of the youth below 25 years pursue non-farm livelihood options but only 10 percent succeed in the non-farm sector.

Those who succeed are considered to be pulled out of agriculture to jobs with high entry barriers, yet they possess post-secondary education and have invested in skilled training. The 30 percent that struggle in the non-farm sector are viewed as being pushed out of agriculture. This category of youth is relatively unskilled (limited education), has limited access to land/finance and mainly work in the informal sector.

Out of the other 60 percent of the youth that remains in farming, 50% of them are struggling in farming and they are mainly characterized by few productive assets, poor access to land, finance, and knowledge. This category is pushed into agriculture. Only 10 percent of the youths who pursue farming are successful and they have good access to land, finance, favorable markets and infrastructure and have diversified income sources.

The general objective of this study was to investigate youth access to agricultural land, and how land access influences youth migration (seasonal and permanent) in the densely populated areas

of rural Kenya. Specifically, the study examines factors explaining youth access to land and the extent to which youth access to land in turn influences permanent and seasonal youth migration. The study uses a six-wave panel data spanning a 17-year period (from 1997 to 2014), which makes it possible to detect long-term trends that are likely to influence youth access to land and migration.

Key findings

- Most individuals migrated in search for economic opportunities like starting a business, new job posting and land availability, while a few moved to stay with relatives in those areas
- Of those that migrated to start business, only a third of them actually started business, about 42% were engaged in formal employment, 17% in informal employment and 8.3% were still seeking jobs
- Majority of those who migrated due to new jobs or posting, were in formal employment
- For those who migrated because land was available in the area, 49% were in informal employment, 30% started business, while 17% landed formal job opportunities
- For individuals that migrated to stay with relatives, 45% were employed in the formal sector, 27% in the informal sector, about 16% started businesses, while the remaining 12% were still looking for jobs.
- Those who moved to live with friends, 50% were engaged in formal employment, 40% in informal employment, while 10% were still job seeking.
- The regression results showed that gender of the household head, education, number of sisters to household head, initial land holding by the head, initial land inherited by the household head from the father and non-farm employment were important in increasing the likelihood of youths accessing land.

Policy implications/Recommendations

To stem youth migration from the rural areas, this study recommends:

- The formulation of a comprehensive youth employment strategy which includes interventions to raise agricultural productivity growth. This will create new opportunities in farming. The multiplier effects arising from productivity growth will influence the pace of growth in non-farm jobs.

- That agricultural sector policies must anticipate and respond to the resources needed for youth to succeed in farming (e.g. access to land, finance, etc.) and distinguish between “trying to keep youth in agriculture” vs. “giving youth viable choices”.
- The use of green (within agriculture) and blue policy (off-farm) approaches as outlined below:

Green policy approaches include:

- Investment in research and development and institutional capacity building to generate new knowledge
- Development of robust and effective extension systems to facilitate access to productivity enhancing technologies
- Improve coverage and quality of physical infrastructure (energy, road, communication, etc.)
- Development of youth-centered programs to make farming attractive and profitable for young people
- Facilitate access to productivity enhancing inputs (e.g. fertilizer), market, and resources (e.g. land, finance, labor-saving technologies)
- Promote mentoring of youths by successful farmers

Blue policy approaches include:

- Investing in education and skill development to upgrade skills of the labor force
 - Prepare youth to “spot” and take advantage of new job opportunities
 - Regularly update educational curriculum and approaches
 - Invest in actionable research to address the data gaps on labor market issues and impact evaluation, what works well and how?
- Strengthen youth voice on decisions concerning them.

[See the Presentation here ...](#)

Women Empowerment in Agriculture: Status, Levels and Determinants among Rural Households in Kenya, Dr. Tim Njagi, Tegemeo Institute

Introduction

Women play a key role in agriculture but men are known to have greater control over productive resources such as land and income. Studies have shown that women dismally participate in development meetings at county levels due to involvement in other activities. The poor performance is also attributed to constrained access to resources like credit facilities.

The study sought to establish the current status of women empowerment, characterize dimensions of empowerment and determine the drivers of disempowerment using Abbreviated Women Empowerment in Agriculture Index (A-WEAI).

This index was developed to capture the level of women empowerment in Agriculture in different regions and countries and provide an updated data which was lacking. The index focuses on five key dimensions of empowerment: decisions about agricultural production, access to and decision making power over productive resources, control over use of income, leadership in the community and time usage. Data from the Population Based Survey (PBS) in 2015 was used to give insights into this study.

Key findings

- About 44% of women were not empowered in all domains and the mean inadequacy of empowerment was one third of all dimensions
- A third of women were not achieving gender parity with primary male decision makers in their households and gender parity gap was at 17%
- An increase in workload, lack of access to credit and non-participation in groups contributed up to 50% of women disempowerment
- Older members of the household were less likely to be disempowered; however, this was only up to 56 years, beyond which the likelihood of disempowerment increased
- Higher income levels reduced chances of disempowerment

Policy implications/Recommendations:

- There is need to promote programs that empower women's access to credit

- Explore innovative ways to help women manage their workload especially through mechanization
- Group participation was a great contributor of disempowerment in Western and Rift Valley regions, therefore, group participation among women should be promoted
- Social security programs are needed to support older people especially those above 56 years.

[See the Presentation here ...](#)

Session VI plenary: Issues arising from the presentations

Contribution of manure to productivity: It was confirmed from the findings that in most cases manure and inorganic fertilizer complement each other. Crops respond better to inorganic fertilizer in soils with high carbon content, which is obtained from manure, hence in most cases farmers use them together.

Contribution of dam construction to food security: Results showed that there is low agricultural production especially in Arid and Semi-Arid areas (ASALS). This was mainly because of lack of enough rainfall or water for irrigation. Construction of dams will mean more water for irrigation, which will lead to increased food production to enhance food security.

Women empowerment: Empowering women in agriculture has a great contribution to food security. This will lead to improvement in nutrition levels in households since women are traditionally known to concentrate more on food crops than cash crops.

Women have been known to be quite empowered at some levels in the production value chain for example in banana marketing. Moreover, results indicated that women are empowered in some areas in terms of decision making and access to some productive assets in the household. On the other hand, results show that access to credit is a major contributor to women disempowerment. Recommendation is, therefore, to promote access to formal credit by women and increase women access to and control over other productive assets.

The Rural Outreach Program is promoting labor saving tools to reduce workload on women by introducing tools/machines such as planters. It has been observed that men seem to want to operate them, while women tend to shy away from them and yet they are meant for them. This is because culturally, machines are associated with men. Even though mechanization in agriculture is the way to go in Kenya, the underlying challenge is the appropriateness of the different

technologies with regard to gender, hence, there is need to conduct sensitization to address the challenge of cultural influence on women empowerment.

Education and migration: Results have indicated that education reduces chances of rural urban migration which is not the norm. In response, it was noted that form four leavers are more likely to hang around in the village with hope to get jobs like teaching in local schools, while those with no education or lower levels of education are more likely to go to urban areas to either look for jobs or start small businesses like selling eggs. A further interrogation of the data was also suggested to understand this phenomenon.

Maize productivity in comparison with other countries: In Kenya, maize productivity has stagnated over time. Unfortunately, it is not feasible to increase land under farming because farm sizes are shrinking due to population pressure on the available land. However, countries like Rwanda do not have large tracks of land but have been able to improve production per unit area, which Kenya has not done. Kenya should implement innovations and strategies to raise productivity per unit area among smallholders since land is scarce.

Malawi government's input subsidy program effectively led to increased production particularly of maize. However, its sustainability has been questioned because commercial fertilizer and seed prices continued to increase and at the same time the program was used for political leverage by the ruling class. Ethiopia and Rwanda also used subsidy programs to increase productivity among poor farmers. Kenya can, therefore, use such models that target poor farmers in their subsidy programs.

Crops and income drivers in Kenya: The current trend is that there are a lot of production changes taking place in Kenya and, therefore, crop income drivers are also changing. Findings from the study show that majority of farmers are stuck in the traditional food crops especially maize, a fact that informed the choice of these crops for the study. There is thus a need to use a more current data to understand the changing patterns since off-farm income is increasingly becoming a more important income driver. A comparative analysis with other countries was also suggested.

Lessons from urbanization in Asia: The concern was whether there were any lessons to learn from Asia in terms of urbanization, population growth and purchasing power in Africa. Urbanization in Asia was influenced by industrialization that created more jobs. People were

able to move to towns to work (pulled into rather than pushed into towns) and earn incomes to enhance their purchasing power as opposed to the case in Africa where population pressure in rural areas is pushing people to towns. Purchasing power in Africa still remains low due to high levels of unemployment.

SESSION VII: CONSUMPTION AND WELFARE

Chair: Dr. Paul Guthiga, Senior Policy Analyst, ReSAKSS

This session had two presentations: (i) Drivers and Dynamics of Poverty in Rural Kenya; and, (ii) Changing Consumption Patterns among Rural Households in Kenya.

Drivers and Dynamics of Poverty in Rural Kenya, Dr. Timothy Njagi, Tegemeo Institute

Introduction

Rural poverty in Sub-Saharan Africa (SSA) continues to be a key developmental challenge. In Kenya, rural poverty is estimated to be about 49%. Rural population faces challenges that include: limited access to basic social infrastructure (education, health), which informed the push for devolution in order to be responsive to people in the marginalised areas; low number of economic opportunities, especially off-farm employment--most economic activities in rural settings revolve around agriculture such as trading and value addition; and, low agricultural incomes due to high costs of production, low utilization of modern technology and inputs for agricultural production and poor market integration.

Understanding the dynamics and the drivers of poverty is important for programming to help lift rural households out of poverty. The main objective of the study was to contribute to evidence and knowledge on rural poverty, with these specific objectives:

- Understanding the nature and key drivers of rural poverty in Kenya
- Characterizing households that are likely to fall into poverty
- Identifying areas where poverty is likely to be persistent

Two cross-sectional datasets from population-based surveys for the FTF-Kenya program collected in 2013 and 2015 were used. Drivers of poverty were identified using econometric estimation, while dynamics of poverty were characterized using the multidimensional poverty approach.

Key findings

- The chances of households falling into poverty were lower in semi arid areas compared to the high rainfall areas, which is attributed to unsustainable agricultural trends in high rainfall areas, climatic shocks and increased incidences of disease and pest outbreaks
- Poverty was likely to be higher where household heads were older (over 77 years) and had less than secondary level education; households had a high dependency burden; households had either male or female adults only compared to households with both male and female adults; and, households lacked assets such as motorcycles (for income generation) and cell phones and radio (sources of information).
- Living standards was the most significant contributor to multidimensional poverty, which consisted of measures of access to electricity, improved sanitation, improved drinking water, cooking fuel, better housing and asset ownership.

Policy Implication/Recommendation

- Programs geared towards poverty reduction should target improving household incomes and building resilience to income shocks as an effective mechanism for reducing poverty.

[*See the Presentation here ...*](#)

Changing Consumption Patterns among Rural Households in Kenya, Mr. Kevin Onyango, Tegemeo Institute

Introduction

Majority of the Kenyan population lives in rural areas and largely depends on agriculture for food and income. An estimated 7.5 million Kenyans live in extreme poverty and over 10 million suffer from chronic food insecurity and poor nutrition (NFSNP, 2011). Lack of adequate and diversified diets leads to various forms of nutritional problems. The national per capita energy supply per day is less than the recommended rate of 2,250 kcal/day per active adult male equivalent. The rising population, high poverty levels and persistent food insecurity challenges are the major concerns to policy makers and development agents. Increasing food availability and access is, therefore, a key priority for the Government. The main challenges to food availability and access include inadequate local supply, importation bottlenecks, relatively high

market prices and eroded purchasing power. In the face of limited resources, consumption habits and patterns are expected to change as people adapt, change that could be rapid.

Data used in this study was from two cross-sectional consumption and expenditure surveys conducted in 2013 and 2015. Both surveys were done in the month of March. A combination of stratified and multi-stage sampling methods was adopted using NASSEP IV frame by KNBS. The survey covered 22 counties, 16 counties from high potential areas (Bomet, Kakamega, Trans Nzoia, and Nakuru) and 6 from semi-arid areas (Kitui, Machakos, Makueni). Absolute figures and percentages were used to describe changes. Consumption quantities were converted to adult equivalents.

Objectives:

The main objective was to assess the consumption patterns among rural households in high potential and semi-arid regions in Kenya. Specific objectives were to:

- Examine trends and changes in household food consumption
- Determine the relative importance of different food sources
- Evaluate the implication of observed consumption patterns on household nutrition

Key findings

- General decline in consumption of cereals and grains, vegetables, meats and animal products, milk and milk products between 2013 and 2015. Rice and sifted maize flour, however, exhibited an increasing consumption trend.
 - A general decline in straight run maize meal and wheat flour consumption with both quantity consumed and percentage of households consuming exhibiting a declining trend especially among high income households
 - Wheat consumption declined only among high income households
 - Consumption of rice and sifted maize flour generally rose across all income categories especially among households in the high potential zone
- There was an increase in consumption of nuts and pulses
 - Consumption of beans rose between 2013 and 2015, though the percentage of households consuming did not change substantially
- Most food items were largely sourced through purchases though production was also an important food source especially for cereals, root tubers and fruits

- Intake of key macro and micro nutrients was below the Estimated Average Requirement (EAR) especially among low income households.
- The observed decline in consumption of foods such as cereals, meats and animal products, vegetable, and milk and milk products which are the major sources of calories, proteins, iron and zinc imply that household nutrition levels could be declining among rural households.

Policy implications/Recommendations

- Increasing consumption of rice and sifted maize meal is a signal of their rising importance in the household consumption basket among rural households and an indicator of potential demand to value chain actors
 - Transformational policies to improve production and access to the products in response to the observed signal are desirable. Collaboration between National and county governments necessary for this to be achieved
- Need for incorporation of nutrition in all food security interventions and programs given notable nutrient intake imbalances (low protein and zinc intake) among rural households with declining consumption of key foods and products
- Declining vegetable consumption a concern given state of zinc and iron intake among rural households. This trend can be halted and reversed through promotion and health awareness campaigns aimed at sensitizing households on the importance of various foods and food groups. Strategies to improve rural household incomes and improve their purchasing power would also improve household nutrition
- Given increasing importance of markets as a source of foods consumed in rural areas, strategies and actions to ensure better markets and market systems as well as market oriented production systems are desirable.

[*See the Presentation here ...*](#)

Session VII plenary: Issues arising from the presentations

Changing consumption patterns: People are aware of the nutrition importance of food they consume. There was a suggestion that the study on consumption patterns should factor in the issue of rural-urban migration because this affects the consumption patterns. However, other studies by Tegemeo Institute have shown similar consumption patterns among the urban

households and, therefore, urban-rural migration may not have affected the consumption patterns. Inclusion of consumption patterns of white meat and red meat as separate food items in the study should be considered because of their importance on health and nutrition.

Food safety: While consumers are aware of the nutritional value of food, the issue of chemicals used during food production and processing poses a health risk to consumers and should be addressed. A good example is the hastened ripening of fruits and vegetables especially by traders in Nairobi and the neighboring counties. It would be a wise idea to probe further whether such unethical practices encourage consumers to switch preferences away from these food items. Other studies have also indicated contamination of agricultural produce by chemicals used to control pests. Hence, there is need to evaluate effectiveness of our regulatory systems.

Awareness on nutrition: County governments should play a major role in creating awareness of crops that are nutritious to improve nutrition status within their counties. Since the National Food and Nutrition Security Policy Implementation Framework is out, it is important for the county governments to consider anchoring it in the formulation of their CIDPs to guide production as well as nutrition improvement strategies and plans.

SESSION VIII: PANEL DISCUSSION

Chair: Prof. George Owuor, Director, African Centre of Excellence in Sustainable Agriculture and Agribusiness Management, Egerton University

Topic of discussion: How Can We Achieve Inclusive Growth and Sustainable Agricultural Transformation?

The session Chair indicated that the topic would be covered from the perspectives of the public sector, private sector, civil society and the development agencies. He added that there are three basic economic questions in production; what, how and for whom? He noted the questions of what and for whom had been handled in the previous presentations, and so the panel discussion would focus on ‘how’ question i.e. how the public sector, private sector, civil society, research organizations and development agencies can help achieve inclusive and sustainable agricultural transformation.

The following were remarks made by the panelists:

Public sector represented by Dr. Moses Mwanje Osia, Chair CECM Caucus in Agriculture and CECM for Agriculture, Livestock and Fisheries, Busia County

Dr. Mwanje noted that county governments make policies and also have the responsibility of implementing interventions. Hence, building and strengthening institutions is important in transforming agriculture at the national and county levels. In the last four years, county governments have been able to come up with legislations that are now being implemented. Agricultural transformation and inclusive growth in counties can only be made possible through sound policies, strong institutions and engagement of women and youth (marginalized groups) in development matters. Hence, inclusivity is inevitable.

To promote inclusivity in the counties, county governments should:

- Target women and youth through groups such as the initiative by Baringo County through the ‘Vijana Acre Moja’ program that provides the youth with inputs to cultivate a least an acre of land
- Promote credit access programs to make it easier for these groups to get into agricultural production and value addition
- Promote and sustain input subsidy programs targeting these groups
- Collect data for planning by working with universities to help them with evidence

He added that public participation by women and youth in the counties is still poor. When these groups are invited for meetings, women and youth fail to attend and if they do, they do not contribute to the issues being discussed. In addition, they value more what they will receive in return either in kind or monetary terms. Therefore, most meetings are attended by the elite who do not always communicate the challenges facing poor farmers. He pointed out that almost all counties were reviewing their County Integrated Development Plans (CIDPs) and contributions by youth and women are important to make the process successful.

The county governments must contain youth’s rural-urban migration in search for better jobs and higher incomes since they form a pivotal part in transforming agriculture. Contrary to their expectations, most youth have ended up doing less paying jobs rather than exploiting opportunities in the villages that can pay more. Youth sometimes sell their land to buy motorbikes or to move to towns and start businesses, which do not always thrive. Therefore,

county governments must come up with strategies to discourage rural-urban migration and gainfully engage the youth.

The role of the private sector is also very important in ensuring that youth and women are included in activities such as production, processing and value addition in agricultural value chains. There is data that is in the hands of academia and research organizations. The underlying question is how the county governments are going to benefit from the data that is available and also academicians' inputs.

Private Sector and Civil Societies represented by Edward Mudibo, *Chair, Agricultural Industry Network*

Agricultural industry network is constituted by about 50 business member organizations representing about 5 million farmers and other value chain players countywide including producers, processors, traders, cooperatives and consumers. It champions key agricultural policies and legal reforms. Its role is to advocate for strong public-private partnerships. The board is comprised of members who include; East African Tea Traders Association, Cereal Growers Association (CGA), Livestock Producers Association, among others who came together with an aim to consolidate issues affecting them and handle them harmoniously. Since 2013, there has been a push for sound agricultural policy. Key initiatives by this network are:

- Changes in Agriculture Livestock and Food Authority (ALFA) by separating livestock and fisheries to have Agriculture and Food Authority (AFA) because ALFA did not have effective public participation
- Push for the government to come up with the agricultural policy rather than having series of draft policies
- Advocating for changes in computation of levies charged on agricultural products e.g. tea levies to be charged on quantity and not value
- Promotion of automation of auction especially in the tea sector. This will a go a long way in reducing trading cycles and ensure timely, accurate and reliable information. Auction will no longer be controlled by brokers; instead it will be controlled by buyers and it will enable auto-bidding.

Research organizations represented by Charles Nkonge, *Researcher, Kenya Agricultural and Livestock Research Organization (KALRO)*

Charles Nkonge works with the Sustainable Intensification of Maize-Legume cropping systems for food security in Eastern and Southern Africa (SIMLESA) project that is based in Kenya, Ethiopia, Tanzania, Malawi and Mozambique. He noted that agricultural transformation is how to get farmers from subsistence farming to growing produce that is of economic value. It is also ensuring sustainable resource base for future generations, while inclusivity is ensuring that all are included at some point in the product's value chain. He shared some lessons on transformation and inclusivity in agriculture from the SIMLESA project, namely:

- **Inclusivity:** At project inception, inputs from majority of the stakeholders, which included individual farmers, opinion leaders and extension agents in the target areas were obtained and considered. They were facilitated for discussions to ensure that farmers included in the project were from a representative sample. The project then signed an MOU with the selected farmers to allow their farms be used for demonstration, trainings and by donors for monitoring project implementation purposes.
- **Provision of technologies:** Inputs, extension services and soil management technologies were provided to the farmers. To sustain the initiative, sustainable agricultural practices such minimum tillage, fallowing, crop rotation and intercropping were adopted. These interventions have led to increased maize and beans yields. If this growth is replicated to other farmers then it can be a good step towards increasing food production in Kenya. When conservation agriculture is adopted there is also saving in terms of labor use from about US\$ 600 to US\$ 1,200 per hectare. If farmers are to use the same technologies for high value commercial crops, the gains will be even much higher.
- **Attracting youth to agriculture:** youth may not adopt an enterprise that is not profitable. However, providing credit and platforms for mechanized farming is likely to attract young farmers. For instance, mechanization in the SIMLESA project is pulling the youth to agriculture.

Session VIII plenary: Issues arising from the panel discussion

Assessing the impact and sustainability of subsidies in agriculture: Subsidy programs in counties are provided mainly in form of seed, fertilizer, mechanization, artificial insemination

(AI), processing equipment and capacity building. County governments realize the importance of subsidies as a component to promote transformation and inclusivity in the agriculture sector. The pertinent question has been whether the targeted groups get these subsidies. Proper targeting of the beneficiaries of any agricultural promotion program is key to its success. Around 2000, countries like China, Brazil and India were against the introduction of agricultural subsidy programs by the USA (United States of America) government in their countries, but after experiencing their impact in agricultural transformation they are now supporting these programs, a key lesson for Kenya at county and national levels.

Budgetary allocation to the agricultural sector: The agricultural sector is supposed to be allocated 10 percent of the total budget according to Maputo declaration both at the county and national level, which is currently not the case. This has led to poor extension services characterized by a high extension worker to farmer ratio, which is above the recommended ratio of 1:500.

Coordination of value chains: There is need to learn some success stories in production and marketing from sub-sectors like the horticulture and replicate the lessons in strengthening maize and beans value chains.

Intellectual property rights: There is need to explore indigenous knowledge in agriculture, protect and promote it through intellectual property rights. KALRO has done well in this regard by ensuring that technologies are fully protected and use of such technologies requires signing of MOUs with the relevant institutions.

Youth in agriculture: The poor participation by youth in agriculture could be an issue of the education system and the socialization process, where education is more oriented to white collar jobs rather than providing skills for self-employment, especially in agriculture, coupled with limited access to productive capital like land. Mechanizing and making agriculture profitable will attract youth.

Lessons from organized marketing: Organized marketing seems profitable in the tea sub-sector. Success in this sub-sector has been promoted by existence of sound systems and policies and strong sub-associations within the value chain who work closely with clear laid rules. This can be replicated in other sub-sectors.

Selling agricultural products through auctions: There is need to explore, promote and strengthen the sale of all agricultural, livestock and fish products through auctions. This method has proven to work well in the tea sub-sector.

Conservation agriculture: This approach is important to mitigate the challenges of low moisture due to climate change and global warming. The main principle behind this technology is water conservation and maintenance of soil structure. There has been considerable reduction in cost of production through use of conservation agriculture, which can translate to higher profit margins for farmers who have embraced this approach.

Packaging of data and information: There is need for quality and reliable data that is collected by the Institute to be repackaged for purposes of sharing with the county governments. This will be crucial in providing insights at a time when counties have started reviewing their CIDPs. As a premier research institution, Tegemeo has a huge role in provision of evidence-based policy recommendations and needs work closely with county governments in areas of data management as well as monitoring, learning and evaluation (MLE).

CONCLUDING REMARKS

Prof. Symon M. Mahungu, for DVC (R&E), Egerton University

Speech by Prof. Mahungu

Ladies and gentlemen, it gives me great pleasure to have participated in the 2017 Tegemeo conference on “Transforming Agriculture for Inclusive Growth and Sustainable Livelihoods”. Our great country Kenya has become a net food importer. This scenario is not sustainable because hungry people are angry people.

Between 24th November 2017 and 3rd December 2017, Egerton University hosted the 64th world ploughing contest organized by the Agricultural Society of Kenya (ASK). A total of 26 countries were represented, Kenya being the only country from Africa. The function was officially launched by the president of Kenya, H.E. Uhuru Kenyatta on Friday 1st December 2017. In his remarks, the head of state noted the need for mechanization of agriculture for food and nutrition security in Kenya.

The Director, Tegemeo Institute and your team: in the deliberations during this occasion (2017 Tegemeo conference), it has been empirically shown that there is need for good agriculture practices (GAP), improved plant husbandry, improved pastoral lands management, proper use of certified seeds and fertilizers, a paradigm shift for smallholder farmers, proper coordination by the national and county governments, and the need to synergize the various actors in food production.

From these observations, it is clear that Tegemeo Institute will and should be in the forefront in revolutionizing agriculture in Kenya. Please, do not shy from that role. The Egerton University Management Board will support you.

The journey to food and nutrition security will require each one of us to participate in our own small or big way. As our arable land continues be converted to a concrete jungle, what is the role of urban farming, advocacy in agriculture and agriculture policy in Kenya (I learnt yesterday that we now have the 5th draft of the agriculture policy). The question is what role will you as an individual or institution play in transforming agriculture.

Ladies and gentlemen, allow me to conclude by welcoming you to the 37th graduation ceremony to be held on Friday 8th December 2017. Finally, it gives me much pleasure to declare this conference formally closed. I take this opportunity to wish you all a merry Christmas and a great year 2018. Travel well and safely; God bless us all; God bless Kenya; Thank you.

List of Participants

	NAME	TITLE	ORGANIZATION
1	Albert Waudu		USAID
2	Amy Azania	Policy Officer	One Acre Fund
3	Anthony Kariri	IT Technician	Tegemeo
4	Benard Kimeto	CDA Narok	Narok County
5	Bernard Ondanje	SADA	MOALF
6	C Wilson	Chairman	KEPSA
7	Charles Nkonge	Researcher	KALRO
8	Chelangat Tonui	Senior Inspector	KELPHIS
9	Chris Wibor		KEPSA
10	Christine Ambenje	Meteorologist	KMD
11	David Muntet	Secretary	Soralo Naroosura G.R
12	Dionisia M'Eruaki	CDA	Meru County
13	Dr. Kiprono Philemon	ME Officer	PSCK
14	Dr. Mercy Kamau	RF	Tegemeo Institute
15	Dr. Milton Ayieko	Director	Tegemeo Institute
16	Dr. Tim Njagi	Researcher	Tegemeo Institute
17	Dr. Augustus Muluvi	Policy Analyst	KIPPRA
18	Dr. Caleb Wangia	Chairman	AGMARK
19	Dr. Chebii Kilel	Head-Food Crops	AFA
20	Dr. Dennis Otieno	RF	Tegemeo Institute
21	Dr. Eucabeth Majiwa	Lecturer	JKUAT
22	Dr. Lilian Kirimi	SRF	Tegemeo Institute
23	Dr. Milu Muyanga	Assistant Professor	MSU
24	Dr. Moses Osia Mwanje	CECM	Busia County
25	Dr. Paul M.Guthiga	Senior Policy Analyst	ILRI/RESAKSS
26	Dr. Priscilla Wainaina	Postdoc Researcher	Tegemeo Institute
27	Dr. Robert M. Gesimbi	Senior Lecturer	Egerton University

	NAME	TITLE	ORGANIZATION
28	Dr. Samuel Mburu	RF	Tegemeo Institute
29	Edward Kenneth Mudibo	Chairman	Agricultural Industry Network
30	Elijah Lukoye	Farmer	
31	Elizabeth Mutua	Admin. Assistant.	Tegemeo Institute
32	Ephiphania N. Kinyumu	SRA	Tegemeo Institute
33	Erastus Kemboi	Farmer	Tegemeo Institute
34	Eric Njue	Researcher	Tegemeo Institute
35	Eunice Nyango	Research Officer	NCPB
36	Franciah Nyokabi	Admin. Assistant	Tegemeo Institute
37	Fredrick K. Siele	Manager	NCPB
38	George Mburathi		ACIAR
39	Gregory Musau	Farmer	Kauti Development Forum
40	George Wamae		KMT
41	Harry G. Mwangi	Deputy Director	MoALF
42	James Nyoro	Deputy Governor	Kiambu County
43	John Mburu	RA	Tegemeo Institute
44	John Nyongoro	Farmer	
45	Johnson Irungu	Director-SDA	MoALF-SDA
46	Joseph Opiyo	SRA	Tegemeo Institute
47	Joseph Wambugu	S/Manager	MEA Ltd
48	Joyce Makau	RA	Tegemeo Institute
49	Josephine Muhandia	Auditor	Kenya Flower Council
50	Judy Kimani	COO	Tegemeo Institute
51	Judy Oloo	CCO	Uasin Gishu County
52	Kamau Kuria		KMT
53	Kevin Onyango	RA	Tegemeo Institute
54	Lena Manoa	CE Assistant	Monsanto
55	Lydia Kimani	Executive Director, Agribusiness for African Markets- KEPSA	KEPSA

	NAME	TITLE	ORGANIZATION
56	Machera Lucas	Farmer	
57	Makau J. Mulei	CHCO	Kakamega county
58	Mike Kibebe	Consultant	Agri-Experience
59	Moses Mwanje	CECM	Busia County
60	Nicholas Githinji	FAM	Tegemeo Institute
61	Nicholas Mileke	Sales Manager	Monsanto
62	Nicholas Odhiambo	RA	Tegemeo Institute
63	Njeri Kananu	Programme Officer	Rural Outreach Programme
64	Noel Templer	Client Assignment and Research Manager	Agri-Experience
65	Phoebe A. Odhiambo	Programme coordinator	ASDSP
66	Prof. George Owuor	Director, African Centre of Excellence in Sustainable Agriculture and Agribusiness Management	Egerton University
67	Prof. Isaac Kibwage	DVC-APD	Egerton university
68	Prof. Symon Mahungu	Rep. DVC R&E	Egerton University
69	Prof. Rose Mwonya	VC	Egerton university
70	Prof. Rose Nyikal	Prof/Researcher	UoN
71	Rati Rajan		
72	Rispah Okelo		ICED
73	Robert Otundo	RA	Tegemeo Institute
74	Samuel O. Ogola	Interim Head	AFA
75	Samwel K. Langat	Farmer	
76	Stephen Kiseve	DCDA	Makueni County
77	Stephen Ogallo		CMA
78	Susan Kidemi	D/Director, Settlement	NLC
79	Susan Maina	Sector Manager	Kenya Markets Trust
80	Vincent Okoth	DCDA Siaya	Siaya County
81	Wafula Mukhone Mathias	Technology Packaging Officer	MOALF-SDA
82	William Lay	Chairman	Business Advocacy Fund