



**TEGEMEO INSTITUTE OF AGRICULTURAL
POLICY AND DEVELOPMENT**

Tegemeo Conference 2015: Proceedings

**Transforming Smallholder Agriculture in Kenya in the Context of Climate
Change, Devolution & Increasing Land Constraints**

Kenya School of Monetary Studies, Nairobi

10th to 11th November 2015

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FOREWORD

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 as well as providing 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 developed 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 government, the private sector, development agencies, and civil society, among others.

The Institute organised a two-day conference to disseminate its research findings on the theme ‘Transforming Smallholder Agriculture in Kenya in the Context of Climate Change, Devolution & Increasing Land Constraints’. In collaboration with Michigan State University and with the support of the USAID Mission in Kenya, research was carried out on the implications of various challenges affecting the agriculture sector and findings were shared at the two-day conference held in Nairobi. Key discussion points were organized in sub-themes focusing on land access, climate variability and change, input intensification and subsidies, agricultural information systems, devolution and innovations.

This conference was aimed at providing policy options to the challenges facing smallholder farmers based on the evidence gathered from the research. It also provided a platform for the exchange of ideas between experts on the issues discussed. The conference drew participants from the public sector, specifically from the Ministry of Agriculture, Livestock and Fisheries; semi-autonomous government agencies in the agricultural sector; County governments; private sector organizations; civil society organizations; development agencies; universities and research institutes; farmer representatives among others. Presentations were mainly from Tegemeo Institute and Michigan State University researchers on the first day of the conference. On the second day, presentations and panel discussion were mainly from invited guests representing the public sector, private sector, research institutes, and the civil society.

ACKNOWLEDGMENTS

We are grateful to the United States Agency for International Development (USAID) for the financial support in undertaking the research work for the conference. We particularly want to thank the USAID/Kenya Mission Director Ms. Karen Freeman and other mission staff for their support and participation. Special thanks to the Cabinet Secretary in the state department of Agriculture Livestock and Fisheries Mr. Adan Mohamed and other ministry officials for their participation and support. We highly appreciate the management of Egerton University: former Vice Chancellor, Prof. J. K. Tuitoek, the Vice- Chancellor, Prof. Rose Mwonya, Deputy Vice-Chancellor Research and Extension Prof. J. G. Mwangi, and the Deputy Director of Extension and Outreach Prof. Bockline Bebe 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 who provided 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 organising committees, the researchers from Tegemeo/MSU and invited speakers for their high quality and informative presentations, and colleagues at Tegemeo for their support.

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LIST OF ACRONYMS AND ABBREVIATIONS

AAAE	Association of African Agricultural Economists
AI	Artificial Insemination
ASAL	Arid and Semi-Arid Areas
ASCU	Agricultural Sector Coordinating Unit
ASDS	Agricultural Sector Development Strategy
CAADP	Comprehensive African Agricultural Development
CDA	County Director of Agriculture
CEC	County Executive Commissioner
CGA	Cereal Growers Association
CIDP	County Integrated Development Plan
CIG	Common Interest Groups
CoG	Council of Governors
CS	Cabinet Secretary
CSA	Climate Smart Agriculture
DVC	Deputy Vice Chancellor
EAFF	East Africa Farmers Federation
EAGC	East Africa Grain Council
FAC	Future Agricultures Consortium
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GHG	Green House Gases
IAPRI	Indaba Agricultural Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
ISP	Input Subsidy Program
KALRO	Kenya Agricultural and Livestock Research Organization
KAPAP	Kenya Agricultural Productivity and Agribusiness Program
KAVES	Kenya Agricultural Value Chain Enterprises
KENAFF	Kenya National Farmers' Federation
KIPPRA	Kenya Institute of Public Policy Research and Analysis
KMS	Kenya Meteorological Services
KNBS	Kenya National Bureau of Statistics
MC	Master of Ceremony
MLE	Monitoring Learning and Evaluation
MOALF	Ministry of Agriculture Livestock and Fisheries
MSU	Michigan State University
MTP	Medium Term Plan
NAADS	National Agricultural Advisory Services
NAAIAP	National Accelerated Agricultural Input Access Program

NASEP	National Agricultural Sector Extension Policy
NCCAP	National Climate Change Action Plan
NCCRS	National Climate Change Response Strategy
NCPB	National Cereals and Produce Board
NDMA	National Drought Management Authority
NIB	National Irrigation Board
NIMES	National Integrated Monitoring and Evaluation System
OFW	Off Farm Work
PAM	Policy Analysis Matrix
SDG	Sustainable Development Goals
SDL	State Department of Livestock
SSA	Sub Saharan Africa
TAPRA	Tegemeo Agricultural Policy Research and Analysis

Day One

DAY ONE - SESSION ONE: OPENING AND INTRODUCTION

The two-day conference started with a word of prayer led by Dr. Julius Kilungo from South Eastern Kenya University (SEKU). The master of ceremony (MC), Dr. Simon Kimenju of Tegemeo Institute, welcomed Prof. Rose A. Mwonya, the designate Vice Chancellor, Egerton University (former Deputy Vice Chancellor, Academic Affairs), to chair the first session. After making a few remarks, Prof. Mwonya invited Prof. Gowland Mwangi, Deputy Vice Chancellor, Research and Extension, Egerton University to make his opening remarks, on his behalf and that of Prof. James K. Tuitoek, the outgoing the former Vice Chancellor, Egerton University

She thereafter invited Mr. Mike Jones, Deputy Director of the United States Agency for International Development (USAID) representing Ms. Karen Freeman, the Country Director for the USAID mission in Kenya to give his address. Ms. Ann Onyango the Director of Policy Research and Regulation, Ministry of Agriculture, Livestock and Fisheries (MOALF) representing the Cabinet Secretary MoALF read the speech on behalf of the latter, and officially opened the conference.

Dr. Mary Mathenge, the Director of Tegemeo Institute then gave an overview of the conference outlining its objectives, content and expectations. The MC ended the session by inviting participants for a group photograph.

SPEECHES

Deputy Vice Chancellor (Academic Affairs) and Vice Chancellor Designate, Egerton University

-Prof. Rose A. Mwonya

The designate Vice-Chancellor Egerton University, Prof. Rose Mwonya, welcomed the participants to the conference. Prof. Mwonya emphasized that the conference was a great engagement initiative by Egerton University through Tegemeo Institute. The conference, she said sought to see how livelihoods of smallholder farmers could be transformed in the context of climate change, devolution and increasing land constraints. She elaborated that Tegemeo Institute has been instrumental in shaping agricultural policies in the country.

Prof. Mwonya pointed out the need to support Tegemeo's agricultural policy work and partnerships in order to foster development in the country. She urged the youth to take up agriculture as a core area of study to support smallholder farmers' agricultural productivity and enhance food security in Kenya. She further emphasized on the need to look at the following three important issues to maximize agricultural productivity in the country:

- **Marketing-** The farmer's objective is to get the best possible returns for their produce, which usually means largest possible output at maximum prices. Manufacturers' seek least expensive, best quality produce from farmers so that they can sell it at competitive/profitable prices. Traders and retailers want high quality and reliable supplies from the manufacturer or farmer, at the most competitive prices. Consumers are interested in obtaining high-quality products at lowest possible prices. Hence, there is a need for proper marketing of agricultural produce.
- **Distribution of food-** Poor infrastructure leads to high transportation costs for agricultural inputs and products. It also leads to spoilage of perishable commodities during transportation and causes high losses to smallholder farmers.
- **Pest and Diseases-** Pests and diseases have continued to cause a lot of losses to farmers. This is caused by lack of information by the farmers on how to control these diseases. Post-harvest losses are caused by poor handling and storage facilities. Extension services can be instrumental in helping to reduce pre and post-harvest losses caused by pests and diseases.

Deputy Vice Chancellor Research and Extension, Egerton University:

-Prof. J. Gowland Mwangi

“Madam Ann Onyango, the Director of Policy Research and Regulation, representing the Cabinet Secretary, MoALF; Mr. Mike Jones, the Deputy Director of USAID mission to Kenya; Egerton University Vice-Chancellor designate Prof. Rose Mwonya; Dr. Mary Mathenge, Director Tegemeo Institute, Distinguished Guests, Ladies and Gentlemen...

I take this opportunity to welcome you to this conference. *Karibuni sana.*

I also take this opportunity to convey apologies from the VC, Prof. James Tuitoek who is not able to be with us here today because he got held up with some commitments but would have loved to be here.

In Africa, and Kenya in particular, agriculture is extremely important both in terms of social and economic development. Two out of three Africans rely on it for a living. Most of Kenya's poorest people live in rural areas and depend mostly on agriculture for food and income. These people are the most vulnerable to hunger and dependence on food relief. In Kenya, smallholders are approximately 80 percent of the farmers and therefore play a key role in development of the agricultural sector. Transforming the sector, which is a priority of the Kenya government, requires an environment in which farmers can practice business-oriented farming to produce affordable, market-competitive and consumer-friendly products in terms of safety and quality.

It also requires an effective model of extension technology delivery system as well as climate-smart agriculture (CSA), which simultaneously increases productivity, strengthens resilience to climate variability and change, mitigates green-house gases (GHG) emissions and contributes to food security. It further requires use of seasonal climate forecast in agricultural decision-making.

The major challenges slowing down transformation of the sector include low productivity and increasing land fragmentation into smaller farm units partly due to rising population, real estate development and rapid urbanization. Land fragmentation makes it harder for smallholder farmers to benefit from economies of scale and to change from subsistence to commercial farming where break-even is difficult in some enterprises. However, intensive production can ensure profitable farming, to achieve this; proper training is needed right from farmers to policy makers to make them fully understand their role in addressing the consequences of land fragmentation. Other challenges facing smallholder farmers include; rising cost of land, which makes access to land a reserve of the affluent in society; limited use of farm machinery for making work easier and more cost effective; unaffordable farm credit; poor access to timely extension advice and improved technologies; disorganized and unreliable markets; lack of adequate market information; climate variability and change as well as soil infertility and inadequate soil moisture.

Over 80 percent of smallholder farmers are concentrated in less than 20 percent of Kenya's land mass as the rest of the country is arid or semi-arid (ASAL). People who move to the ASAL in search of greener pastures lack the knowledge and skills to manage the fragile ecosystem in these areas. To succeed in the new environment, they need adaptation skills, which only experts in

agro-climatology and the local people can provide. In this context, how can policy makers and scientists help them deal with soil fertility and limited soil moisture?

Egerton University, under which Tegemeo Institute falls, conducts research geared towards improving smallholder agriculture and has organized this conference to give participants an opportunity to reflect together on how well we are doing as a country in our efforts to transform smallholder agriculture. How, for instance, can Kenya transform its smallholder agriculture despite the increasing land constraints?

Kenya is particularly vulnerable to climate change, variability and disaster risks due to its limited adaptive capacity, high poverty levels and other development challenges. It experiences adverse weather with increasing frequency, which poses a burden to sustainable development and is a threat and impediment to achieving the Sustainable Development Goals (SDG). In Kenya, climate change lengthens the growing season during the short rains of October-December while decreasing the long rains of March to May (Kalungu; Folho & Harris, 2013; NCCRS 2010). This effect has implications on crop and livestock production, which are key livelihood sources for many Kenyans. Famine cycles in Kenya, as you are probably aware, have reduced from 20 years (1964-1984), to 12 years (1984-1996), to 2 years (2004- 2006) and to yearly (2007-2009), necessitating government distribution of relief food annually for 3.5 million to 4.5 million people (Mutimba et al., 2010).

Temperature changes, increased flooding and drought are likely to have profound negative consequences on smallholder agriculture. Climate change is affecting the supply and quality of water not only in Kenya but in the whole of Africa. Around 300 million people (>40%) in sub-Saharan Africa currently lack access to safe drinking water and the situation is unlikely to improve. Smallholder farmers suffer the largest proportion of losses from climate variability and change, both of which are human-induced global problems (FAO 2015; Intergovernmental Panel on Climate Change - IPCC 2014; Kalungu Folho & Harris, 2013). Humans are responsible for losses in biodiversity as a result of excessive extraction of natural resources, forest clearance for pasture or cropland, large-scale mono-cropping and use of chemical fertilizers and pesticides. In 2002, 13 million people in Southern Africa needed food relief due to drought. By 2020, yields from rain-fed agriculture in some African countries could reduce by up to 50 percent and crop net revenues could fall by as much as 90 percent by 2100, with small-scale farmers being the

most affected (IPCC, 2007, Summary for Policy Makers). In most parts of Kenya, the temperature has gradually increased since 1960 (The National Climate Change Response Strategy-NCCR, 2010). Use of Irrigation, Climate Smart Agriculture (CSA), and crop insurance, has been suggested as adaptation mechanisms. FAO (2010) defines CSA as agriculture that simultaneously increases productivity, strengthens resilience to climate variability, mitigates GHG emissions and contributes to achieving food security and development objectives. A FAO pilot study on CSA in Kaptumo Nandi County in 2014 showed that integrated crop-livestock systems can be relatively climate-friendly when combined with agroforestry and improved pasture management. How viable are these adaptation mechanisms and are there alternative options for addressing climate variability, change and unpredictability?

In implementing government policy on devolution, many functions in the agricultural sector were devolved to County Governments to speed up development at the grassroots. To its credit, devolution has brought key agricultural support services to the people leading to improved infrastructure particularly rural roads, which have improved smallholder farmers' access to markets. Many Common Interest Groups (CIGs) have transformed themselves into Cooperative Societies, which are legal entities giving members an opportunity to benefit from economies of scale in procuring goods and services and in selling their farm products. Largely because of devolution, most local leaders now feel empowered to fast-track development in their respective areas. On the negative side, devolution has come with new challenges that must be firmly and effectively addressed. These challenges include mismanagement of available scarce public resources partly due to lack of preparedness for the job, inefficiency and widespread corruption; delays in disbursement of funds from the State to County Governments and negative politics. Other challenges include new taxation rules, un-harmonized standards, conflict of interest during the budget approval process as well as inconsistency and lack of effective coordination between the State and County governments. Being a key development expert in your respective discipline, what advice would you give the government on how to effectively address devolution challenges to ensure success of the transformation initiative?

Other challenges requiring your input and advice on how they should be effectively addressed include input intensification and subsidy. Use of subsidies enables newer and modern technology to reach smallholder farmers, which is crucial in improving agricultural productivity and farmers' livelihoods. In your view, is the government's goal of using subsidies to improve farm

productivity and farmers' livelihood being achieved? How successful are Kenya's subsidy programs and what adjustments would you recommend? If I were privileged enough to be a man of collar, I would say: 'Speak now or forever keep your silence'!

Smallholder farmers' access to technology is crucial in transforming their agriculture. But do they get extension advice in real time when they need it for decision-making? What innovations propel smallholder farmers towards higher productivity and incomes? Which innovations do you recommend for up-scaling and out-scaling? To the conference organizers and professionals present here today, I ask:

1. As a country, have we made substantial new investments to build infrastructure that can withstand flooding, or to improve irrigation to make agriculture less vulnerable to drought?
2. Have we substantially changed the patterns of Kenya's smallholder agriculture by making it more resilient to climate change, variability and unpredictability?
3. Are we managing our shared water and other resources in the most effective manner?
4. Are there resources that would be better managed at the national level to enable Kenya achieve its goal of improving food supplies faster?
5. Do smallholder farmers in Kenya have adequate access to science and knowledge to inform their responses to the impacts of climate change?

Although the Kenya Meteorological Services (KMS) regularly issues seasonal climate forecast such as this year's prediction of El Nino, rarely is climate forecast meaningfully integrated in decision-making despite its great utility in sensitive sectors of the economy such as agriculture. Coelho and Costa (2010) attribute this partly to climate science used in production of seasonal climate forecasts (1-6 months at coarse spatial resolution of 100–200 km). They also attribute it to system science which investigates impacts of climate and decision-making. The effort to improve the quality of forecast by using regional climate models is a step in the right direction. However, we need to improve decision-making in a way that gives smallholder farmers more confidence in the accuracy of weather forecasts. We must at all costs minimize politics in seasonal climate forecasts where politicians use climate forecast to lobby for relief food or money that is later used

for unintended purposes rather than using the available scarce resources to improve agriculture.

6. Are we conducting adequate and appropriate research to understand regional and local variations in Kenya's climate and sharing this information with those who need it most?

I hope by the time you leave this Conference you will have gained something useful that you can use to bring about the much needed transformation of Kenya's smallholder agriculture.

Thank you and welcome.”

http://www.tegemeo.org/images/downloads/conferences/2015/Opening%20Remarks%20SH%20Agriculture_Prof%20Mwangi.pdf

Deputy Director of USAID

-Mr. Mike Jones

The representative of the Cabinet Secretary, Ministry of Agriculture, Livestock and Fisheries, Ms. Ann Onyango, Egerton University Vice-Chancellor designate, Professor Rose Mwonya, Deputy Vice Chancellors, Director of Tegemeo Institute, Distinguished guests, *Mabibi na Mabwana...*

I am honored to be here to represent the mission Director. May I first, convey apologies from Ms. Karen Freeman, Director of the USAID Mission to Kenya who was unable to attend this meeting due to other commitments. May I also applaud the partnership that USAID has had with Tegemeo Institute and the work it does to inform agricultural transformation through evidence based policy analysis in the country. I now read the speech by the Director, USAID mission for this conference...

Director, USAID Mission to Kenya, Ms. Karen Freeman

-Speech as read by Mr. Mike Jones

I am delighted to be here with you today at the launch of this conference. This event is the 12th conference since the inception of Tegemeo Institute of Agricultural Policy and Development of Egerton University. I congratulate the Vice Chancellor Prof. Tuitoek, the Deputy Vice Chancellors, and the Director and staff at Tegemeo Institute for organizing this conference.

We at the USAID are happy to be associated with Egerton University and with Tegemeo Institute, for the work they do in informing agricultural policy in Kenya through evidence-based policy analysis.

USAID has been the key development partner of Tegemeo since its inception. Over the last 20 years, Tegemeo Institute has grown from a project (Policy Analysis Matrix - PAM) to the now highly respected and home-grown Policy Research Institute with a focus on agricultural-policy research. Collaboration in training programs and joint research projects between Tegemeo Institute of Egerton University and Michigan State University, as well as with other international institutions has strengthened Tegemeo policy research and analysis capacity. In so doing it has developed demand for locally driven policy research and analysis.

The main challenges facing Kenya and, indeed, the whole of Sub-Saharan Africa (SSA), are in two-folds. The first is to foster sustained growth of national economies for the next 20-30 years. The second is to attain food security, eliminate poverty and hunger, and improve nutrition. We all recognize that farm sizes are declining as population pressure increases. In addition, only about 20 percent of Kenyan land is suitable for farming, and maximum yields have not been reached in these areas, leaving considerable potential for increases in productivity through the right technology and support in information, extension and financial services.

We have to employ innovative and efficient ways of using the available land to meet the growing needs. We need affordable innovations and technologies that smallholder farmers can employ to increase farm output, and, consequently, food supplies and incomes.

On its part, the USAID has over the years been at the forefront in supporting agriculture and private-sector development in Kenya. We have been proud to provide support for cutting-edge agricultural research, innovation, policy research and analysis, development of markets and strengthening of the private sector to provide services and markets for smallholders. USAID has supported the dairy, horticulture and maize sub-sectors in the past. This support has come through such programs as the Kenya Horticulture Competitiveness Program, Kenya Maize Development Program and Kenya Dairy Sector Competitiveness Program. Currently, USAID agriculture development strategy is implemented through President Obama's Feed the Future (FtF) initiative. FtF is a United States government global hunger and food security initiative through which the U.S. is working with partner countries, development partners, and other

stakeholders to tackle the root causes of global poverty and hunger. Feed the Future is helping Kenya capitalize on opportunities in agriculture to meet the Kenyan food-security and nutrition challenges.

The goal of FtF Kenya is two-fold: reduce by 20 percent both the prevalence of poverty and the number of children suffering from stunting in Feed the Future target regions. To achieve its goals, FtF is making key investments to;

- i.) Promote value-chain growth and diversification
- ii.) Increase incomes
- iii.) Enhance food security
- iv.) Increase resilience to climatic and economic shocks and stressors and
- v.) Improve the nutritional status of women and children.

The conference agenda is loaded with issues of great interest and importance. It is my hope that what we discuss during this two-day program will help achieve the goals of improved incomes and food and nutrition and security. Once again, I commend the leadership of Egerton University for its commitment to knowledge development and capacity building in the agricultural and rural sectors. Ladies and gentlemen, thank you for making time to participate in this very important conference, and I wish you fruitful deliberations.

Thank you.

Director of Policy Research and Regulation, MoALF

-Ms. Ann Onyango

Good morning.

Before I read the Cabinet Secretary's speech, I will just say a few words on my own behalf because Tegemeo Institute and Egerton University have been long time partners in our agricultural development. I have worked quite closely with many of the staff both at Tegemeo and Egerton and some were even my colleagues in the Ministry. Kilimo (Ministry of Agriculture) has been a good breeding ground for policy research scientists and am happy to be able to associate with them over the years in terms of addressing issues of Agricultural development both at rural levels and national levels.

I will not subscribe to what Prof Mwangi said about holding our silence. We have to keep on talking and dialoguing to be able to get a grip on this animal we call agricultural development because this is where many of our people, the majority of the population derive their livelihoods. What we need to address is the quality of the livelihoods that they are deriving from agriculture.

Kenyans are known to come up with very good policies but I think the weakest link is in the implementation of those policies. It is known that other countries would come, pick our policies, dust them off the shelves and go out and implement them and achieve much more than what we set out to achieve when we formulated those policies. I think the challenge is on us for we don't have a lack of policies to implement: it is how to implement them that is really a challenge. I think Tegemeo should take that challenge and be able to guide us in direction we need to move to be able to effectively implement those beautiful policies that we come up with.

In our mindsets, we need to think about a paradigm shift because smallholder agriculture is not going away very soon. It is after all the way of life. What paradigm shift gear can we move into so that we are able to succeed in smallholder agriculture because I believe it can be done? The brains in this auditorium this morning attest to the fact that it can be done so let's work together in partnership to be able to move together. No particular sector can go it alone but if we join hands and bring our ideas to the table then we shall be able to address the most pressing challenges some of which we are going to be addressing in the next two days. Thank you

She then proceeded to read the speech by the CS Agriculture...

Cabinet Secretary MoALF, Mr. Adan Mohammed

-Speech as read by Madam Ann Onyango

The VC of Egerton University Prof. James Tuitoek, the VC designate Prof. Rose Mwonya, the Director USAID Kenya mission, representative Mr. Mike Jones, Director Tegemeo Institute Dr. Mary Mathenge, distinguished guests, Ladies and Gentlemen...

It is my pleasure to join you today during the opening ceremony of this important conference on transforming smallholder agriculture in Kenya in the context of climate change, devolution and rising land constraints. This is a theme which resonates well with our transformative agenda which we have adopted as a ministry of Agriculture, Livestock and Fisheries. I'm happy to note that this gathering brings together stakeholders who are key in charting a way forward for this

important sector. I understand that this is the 12th conference since the inception of Tegemeo Institute of Agricultural Policy and Development of Egerton University. I therefore congratulate the VC of Egerton University and the team, the Director and staff at Tegemeo Institute for successfully hosting this conference.

The theme is very timely coming at a time when the agriculture sector continues to face increasing challenges some of which have persisted for a long time while others have emerged in the recent past. It is in line with the goals of the Agriculture Sector Development Strategy (ASDS) and also captures the aspirations of the National Climate Change Response Strategy (NCCRS) 2010 and the National Climate Change Action Plan (NCCAP) 2013 - 2017.

I am informed that researchers at Tegemeo Institute have been researching on some of the challenges facing the agriculture sector in Kenya. The research by Tegemeo looks at strategies to improve and transform the smallholder sector given the prevailing challenges. I would urge the Institute to become more aggressive in following up on the recommendations that they do give and the findings they get from the research that they carry out. During this conference the research results will be shared with a view to eliciting debate and feedback on alternative policy options. We in the government find this kind of fora where information and views are exchanged to be very helpful especially when there are clear targets to be met and several options for overcoming the challenges of the day.

Allow me to mention some of the issues facing the food and agriculture sectors in our country and which should be encompassed within the theme of this conference. We are well aware of the challenges posed by climate variability and change particularly the frequency of occurrence in the recent past. In Kenya, this phenomenon is real and continues to intensify as is evident from country-wide temperature increases as well as rainfall irregularity mainly resulting in more frequent and prolonged droughts given the variability and unreliability. Due to our reliance on weather, agricultural production will bear the brunt of this variability and change. This calls for mitigation and adaptation strategies geared towards enhancing resilience of the farmers and ensuring they engage in agricultural activities that sustain the environment and improve their incomes. It is imperative that we ask ourselves a few questions;

- 1) What are these innovations that smallholders can adopt to deal with the challenges?
- 2) Where does policy come in and how will it be employed to assist farmers?

3) What are the requisite synergies that we can build together to bring long lasting impact?

In the area of devolution, we know that the majority of functions in the agriculture sector are now being implemented by the County governments leaving only formulation of policy remaining with the National government and the issue of quality and standards. This transfer of activities to the County level is indeed a step forward towards bringing key agricultural services and support closer to the farming community. It is therefore important that we reflect on the status of the agriculture sector in the context of devolution as pertains to the funding for the sector, the implementation of policies under the devolved system of government as well as challenges that the sector has faced since devolution took root in the counties and in the country. However, more importantly, I propose that in order to move agriculture forward, it is imperative that we reflect and focus on the opportunities that have come with devolution and the lessons that have been learnt so far. These lessons are critical in shaping the actions that we shall take in the short and long term. It really does call for a paradigm shift in our thinking. With regards to land, we are well aware of the declining land per capita due to the increased Kenyan population. This definitely poses a challenge to a sector that is aimed at growing by at least 10 percent annually to lift Kenya to middle income status by 2030. This trend in land sizes coupled with cases of arable land put under non-agricultural uses will continue to hamper the growth we desire to achieve in the sector. In order to achieve the requisite growth, smallholder production which accounts for the majority of agricultural production needs to transform to cope with the changing production and marketing environments. But how can the sector achieve this transformation? What are the institutional and policy reforms that are needed today for the Kenyan smallholder agriculture?

There are issues of climate change, devolution and limited land sizes that greatly influence the ability of households to improve incomes and meet their food and nutrition security needs. As a government therefore, we continue to put in place strategies and programs that will improve livelihoods of Kenyans in the face of these issues which taken together, bring very complex dynamics for the sector. In particular, the government seeks to increase its spending to agriculture to 10 percent of its budget focused mainly in expanding irrigated land and improved rural infrastructure. The 10 percent was declared by the heads of states and governments in Maputo in 2010 and I think as a country we are still not very close to achieving this 10% expenditure.

The government is aware that to meet the stated goals then this increased spending in agricultural development especially in the areas of research and development, extension and in value addition is what would bear fruits. The County governments therefore have a big role to play in prioritizing agriculture in terms of funding particularly in areas where agriculture is the backbone of the Country's economy. In the past, the government recognized the need for support for many smallholder farmers who are caught in the vicious poverty trap. Such require investment and policies that will alter the environment on which they operate. In recognition of this, the government provided targeted subsidies that are directed at addressing issue of food insecurity and malnutrition. I do believe that there are lessons that can be drawn from such subsidy programs to ensure that smallholder agriculture continues to grow. Here is another challenge for Tegemeo; are these subsidy programs well informed? What did inform them at the beginning? In addition, the government continues to put in place other short and long term measures to help consumers and producers alike, mitigate or adapt to the effects of prolonged droughts and other weather related phenomenon including El Nino that is expected to adversely affect some areas of the country. These measures include, provision of relief food and other emergency supplies, provision of inputs such as improved drought tolerant seeds among others. The government is also in the fore front in partnering with the private sector in designing and providing insurance cover against weather related crop failures and loss of livestock. The ministry has already brought to parliament a warehouse receipt systems bill which has gone to its second reading. We have even had a meeting with the parliamentary committee on agriculture to discuss the best format of enacting this bill. This will improve grain marketing and provide a structured way of building stocks which would then work in to a commodity exchange system. We recently had a bench-marking trip to India and I believe the lessons learnt will be incorporated in this bill on warehouse receipt systems.

Finally, I would like to say that the government is cognizant of the importance of policy research in formulation of better policies and in monitoring and evaluating the effectiveness of the diverse menu of policies and programs. Up-to-date evidence is crucial for decision making and policy formulation, planning of the projects and programs. I would therefore like to commend Tegemeo Institute for their quest to provide reliable evidence to be able to inform future development programs. I encourage policy makers and development practitioners to support and partner with Tegemeo in achieving long lasting solutions. I appeal to policy researchers such as Tegemeo

Institute to take cue from the economies who drove the green revolution in Asia by identifying and advocating on practical policies that can really work in our context. Clear and implementable policy research findings and how to deal with challenges arising from climate change, limited land sizes and devolution are timely and will go a long way in informing policy and planning of future programs.

In the ministry we are also in the process of putting in place a Kenya census of agriculture which has never been done before to be able to inform the programs that we put in place. Again I would appeal to Egerton to jump on this vehicle and see if we can come up with a comprehensive data compendium that will be able to inform future programs in the agriculture sector. I wish you fruitful deliberations and I look forward to sharing your policy options that will arise from the conference aimed at overcoming challenges facing the important sector of our economy.

With these remarks, it is now my pleasure to declare the Tegemeo Conference 2015 officially open. Thank you.

Overview of the Conference and Objectives, Director Tegemeo Institute

-Dr. Mary W.K. Mathenge,

Dr. Mary Mathenge, the Director Tegemeo Institute welcomed all participants thanking them for sparing time to attend the conference and discuss issues affecting the agricultural sector in Kenya. She also acknowledged the presence of distinguished guests and appreciated their detailed speeches touching on many aspects of the sector and the relevance of the conference theme. She then clarified that the theme of the conference was on transforming smallholder agriculture, in the context of climate change, devolution, and rising land constraints. She said that there were many other issues in Agriculture sector that could be highlighted such as issues of markets access, competitiveness, and many others but could not be discussed all in one sitting.

Dr. Mathenge reminded participants of the important contribution of agriculture to economic growth as comprehensively stipulated in the economic pillar of Kenya's Vision 2030 and that according to the economic survey 2015, Agriculture contributes 27 percent to the GDP. She further explained that about 80 percent of farmers in Kenya are smallholders producing 75 percent of the total agricultural production in the country and that these farmers face multiple challenges that affect their production. She enumerated climate change and variability,

increasing land constraints, limited access to and high costs of inputs, poor access to agricultural information and other services as some of the challenges that the sector and smallholder farmers continue to grapple with on a daily basis. She also recognized the changing delivery systems occasioned by devolution in Kenya as another challenge in the sector. Dr. Mathenge emphasized that Tegemeo Institute would continue to research on these issues and their impacts on the sector to provide evidence-based information that would be useful in the policy arena.

Explaining the role of the Institute, Dr. Mathenge said that Tegemeo is under the division of Research and Extension, Egerton University, established under the statutes of the University under the Universities Act 2012. She informed participants that the Institute had been doing policy research since the early 1990s and that currently Tegemeo is a reservoir of data and information on rural and urban livelihoods. She further explained that Tegemeo Institute works with a large group of collaborators in its research efforts including USAID, MoALF and other ministries, other universities, agriculture stakeholders, civil society, farmers and many more. She outlined the Institute's activities under four main themes;

Policy Research: to generate and promote evidence-based research to inform and influence policy direction on Kenya's agriculture and rural sectors.

Outreach/Advocacy: work with policy makers and other stakeholders to identify appropriate policy options

Monitoring and Evaluation: to monitor changes in the Agricultural sector and assess impacts of alternative policies for Government, development partners and other stakeholders

Training/Capacity Building: to build capacity in data collection and management and policy analysis for public sector and other stakeholders

Dr. Mathenge then acknowledged the effort the government had put in addressing some of the challenges affecting the sector. She informed participants that various measures and interventions had been put in place including input support programs; large-scale irrigation projects; Climate-Smart agriculture (CSA) programs; innovations such as e-extension and land & policy reforms. She added that the research that had been conducted by the Institute would inform on the effects of some of these programs and projects.

Dr. Mathenge then presented some of the broad questions around the conference theme that the event needed to answer. These included:

(a) How the agriculture sector could achieve the transformation needed in the face of increasing land constraints given increasing population and diminishing land sizes as well as the effectiveness of land and policy reform.

(b) What are the effects of climate change on smallholder farmers; the likely impacts on crop production and household welfare and the status of some of the existing coping strategies?

(c) On the use of agricultural inputs to increase productivity; have we increased our productivity and what is the performance of some of the relevant interventions currently in place including NAAIAP?

(d) How has the agriculture sector performed with devolution and has the new structure lead to effective and efficient services delivery?

(e) How has agricultural information and extension influenced production choices of the farmers and whether there are innovations that can be scaled up to improve access to information by farmers?

(f) What are the roles of Monitoring Learning and Evaluation in agriculture?

In conclusion, Dr. Mathenge acknowledged the support from the Government of Kenya through MoALF, MoENR, County governments, and USAID through the TAPRA program and more specifically for their support in the collection and maintenance of the household panel data. She further acknowledged support from other donors including Bill & Melinda Gates Foundation; Rockefeller Foundation; Ford Foundation, among others. The Director then thanked Michigan State University for the long-standing partnership in research, other Universities/research organizations; private sector; civil society especially farmer organizations: CGA, KENAFF, EAFF; farmers & other actors along value chains and many other organizations committed to seeing Tegemeo achieve its goals. She then thanked participants and wished them a fruitful day of deliberations.

<http://www.tegemeo.org/images/downloads/conferences/2015/Conference%202015%20Overview.pdf>



Figure 1: Tegemeo Conference 2015 participants group photo

DAY ONE - SESSION TWO: KEYNOTE ADDRESS

The session was chaired by Dr. Mercy Kamau, Director, MLE Unit, Tegemeo Institute who started by welcoming the participants to the session. She then proceeded to introduce the first presenter for the day, Prof. Thomas Jayne. She stated that Prof. Jayne's career has been devoted to working with colleagues in Africa promoting effective policy responses to poverty and hunger in Africa. She introduced him as a Professor in the department of Agricultural, Food and Resource Economics at Michigan State University (MSU), and that in June 2015 he was honored with a MSU foundation professor title. The chair further elaborated that Prof. Jayne is an adjoined Professor at the Indaba Agricultural Policy Research Institute (IAPRI) in Lusaka Zambia and a Distinguished Fellow of the African Association of Agricultural Economists (AAAE).

On Prof. Jayne's work, Dr. Kamau explained that he has mentored dozens of young African professionals and played a major role in building the MSU partnership with African research institutes serving as a co-director of several grants from Bill and Melinda Gates Foundation which focused on building sustainable research capacity in Africa. She then informed the participants that Prof. Jayne has over 25 years of experience conducting research on agricultural productivity and markets and sits on the editorial boards of several professional journals.

On his achievements, Dr. Kamau stated that Prof. Jayne received a top paper award in 2004 from the International Association of Agricultural Economists, co-authored a paper awarded the TW Schultz award in 2009 at the International Association of Agricultural Economists and also received the 2009 outstanding article award in Agricultural economics. Further, Prof. Jayne received a research excellence award in 2011 from MSU Agricultural, Food, and Resource Economics department.

The chair explained that Prof. Jayne currently serves on the advisory boards of several initiatives dedicated to building institutional capacity in SSA including the Global Development Network which networks global research capacity building program and Regional Network of Agricultural Policy Research Institutes (ReNAPRI) working in East and Southern Africa. Finally, she concluded by informing the participants that Jayne's current interests are in farm productivity growth, agricultural input, and output markets, land use dynamics, population, and agricultural intensification.

She then welcomed Prof. Jayne to give the key note address.

Transforming Smallholder Agriculture in the 21st Century and Beyond

-Prof. Thomas Jayne, Michigan State University, USA

Prof. Thom Jayne in his keynote address noted that population growth and increasing land constraints are some of the most important threats to the agricultural sector's potential to contribute positively to food security and alleviation of poverty. He focused on six mega trends of transforming smallholder agriculture in the face of rising land scarcity and low productivity, namely:

- Urbanization and shift from farm to off-farm employment
- Huge rise in demand for marketed food
- The 'Youth Bulge'
- Rising land scarcity
- Rise of medium-scale 'investor' farmers
- Climate change.

He noted that for the next 2-3 decades, most Africans will be engaged in farming. For 60 percent of these, it would be difficult to pull them out of poverty via farming, but raising their

productivity will contribute indirectly to poverty reduction. Migration from the farm would thus be a strategy to transform smallholder agriculture since this migration is associated with income growth. He, however, wondered whether farmers in Africa would be pulled out of agriculture like it happened in Asia. He observed that in time, most rural people are expected to gradually exit farming, but the pace at which they leave will depend on the growth of the non-farm sector. He also noted that the non-farm sector growth will also depend on the growth of the agricultural sector. He emphasized that business, as usual, will not deliver the transformation desired in Africa and that there is urgent need to make conscious and deliberate decisions to increase investments in research and development, extension systems, infrastructural development and support to local policy analysis units.

<http://www.tegemeo.org/images/downloads/conferences/2015/Transforming%20Smallholder%20Agriculture%20in%20the%20Face%20of%20Rising%20Land%20Scarcity%20and%20Low%20Productivity.pdf>

Plenary Discussion

A participant asked Prof. Jayne to comment on the use of organically grown foods now that many people are more focused on foods that are not contaminated with chemicals yet there is significant fertilizer use and spraying to raise productivity. In response, Prof. Jayne said that the mainstream views among soil scientists and agronomists for Africa are that there will be a niche market for the organic foods but they will be more expensive because the yields will be lower when not using the inorganic fertilizer. That means it will be more costly. For those with the purchasing power for the organic products, it's good that they can have that option but it will probably just be a niche market and not the mainstream one. Over the longer term, it may be possible to move to a safer system that relies on increased biomass for production. He explained that getting more biomass into the soil is a way of getting carbon or organic matter into the soil and that good quality soils have high carbon content. He added that when we can get enough organic matter to the soil, then we don't need to rely as much on inorganic fertilizer. He further explained that another great thing about having high carbon content is that it absorbs water much better thus making the soils less vulnerable to drought conditions because, for each percentage point rise in carbon in the soil, there is apparently about 8kg more of water retained in the soil per acre. He said that if we could get to a system like that then the necessity of the inorganic fertilizer could be lowered but noted that it will be decades before we can get to that point in

Kenya. He explained that over time by using inorganic fertilizer we can increase the amount of biomass to replenish back the soil. He emphasized that about 60 percent of all of the biomass that is produced on crops is from the roots so our ability to really increase carbon content will in the short run depend on the inorganic fertilizer to increase the amount of biomass both above and below the surface and then we can probably reduce the amounts over time.

Another participant sought clarification on what made the green revolution work in Asia and not in many parts of Africa. In response, Prof. Jayne said that if you look at the agricultural growth statistics for SSA from 2000 to 2012, there have been some very fast growing agricultural economies like Ghana which has had a rapid reduction in poverty rates, and Burkina Faso, Nigeria, Ethiopia are other examples. He explained that Ghana used to have 70 percent of its workforce in small scale farming and that is now down to 44 percent and so they are rapidly transforming the way that their economy is structured. He added that agricultural growth has had a lot to do with the transformation since there is a system where the growth of the non-farm sector depends on the growth of agriculture and this is a symbiotic relationship. He explained that one of the major differences between Asia, South Asia, and Africa is that only 4 to 5 percent of Africa's area under cultivation is irrigated while in South Asia it is 50 percent and 80 percent in Bangladesh. It is much easier to introduce the hybrid seeds and the inorganic fertilizer into an environment where there is water. By contrast, he said, a lot of SSA is semi-arid and drought-prone so getting sustainable fertilizer use is more challenging in many of these areas.

Again, Asia had an export manufacturing sector that was outward oriented so as people succeeded in agriculture and at the same time there was growth in the non-farm sector, this pulled people into the manufacturing sector, into textile and to white industries. Places like China, Vietnam and Bangladesh developed very successful export-oriented non-farm sectors. The job growth could be sustainable but where in Africa do we have a vibrant export-oriented manufacturing sector? This means that the non-farm growth in much of Africa will be dependent on domestic demand generated from within the region because the export orientation is not yet there.

A participant noted the big contradiction in the way the transformation of smallholder agriculture was being discussed and one would think we are improving the condition of smallholder but essentially we are promoting large-scale agricultural land acquisition. He explained that the

World Bank started with the principles of responsible investment in agriculture, when they discovered that these only benefited the large-scale farmers, they went to World Food committee of FAO, and came up with the rationale that smallholder agriculture provides decent jobs and food security.

How do you address this contradiction? Is transformation basically a total change from small to large? In response, Prof Jayne acknowledged that this was the heart of the debate as to what the transformation is really going to look like. Evidence shows that it is possible and if governments want to retain land rights for small-scale or smallholder and invest in it properly to pull in the research and development (R&D), extension, market support, service provision to meet their needs then it could succeed. If the political will is there, it could succeed but there are so many political economy questions on governance. Finally, he commented that if small-scale agriculture succeeded in Asia then why can it not succeed in Africa?

The chair thanked Prof. Thom Jayne for the captivating presentation and discussion.

DAY ONE - SESSION THREE: LAND ACCESS AND POLICY

The session was chaired by Mr. Ibrahim Mwachane, Chairman of the Land Development & Governance Institute. He welcomed the presenters and participants to the session. He mentioned that Kenya has been undergoing land reforms and there has been a national land policy developed. He urged the participants to keep watch whether the presentations will be in line with the national land policy and the land reforms. He requested that all the presenters be allowed to present their findings and then have the plenary thereafter.

Emerging Land Issues in Kenyan Agriculture and their Implications for Food Policy and Institutional Reforms

-Dr. Milu Muyanga, Michigan State University, USA

This presentation looked at land size, ownership and population dynamics that affect small holder farming. Most agricultural production in Kenya is by smallholder farmers, therefore, a smallholder-led strategy holds the best prospects for economic development in Africa. However, declining arable land per household in agriculture in the context of unsustainable intensification has serious implications for smallholder-led agricultural transformation. Given the different

rural-urban-rural migration dynamics in Africa and the consequent phenomenon of ‘emergent’ farmers, the Asian model may not be replicable in Africa. Unlike in the Asian green revolution model, a one-way directional farm to off-farm employment may not generally apply in Africa. In choosing appropriate land policies, production efficiency while relevant, should not be the only factor in guiding agricultural and land policies. Other aspects like scale with the largest multiplier and employment effects, and scale with the highest marginal propensity to consume are important considerations. It is also important to assess how supportive the land allocation and agricultural policies are to smallholders.

<http://www.tegemo.org/images/downloads/conferences/2015/Emerging%20Land%20Issues%20in%20Kenyan%20Agriculture%20and%20Their%20Implications%20for%20Food%20Policy%20and%20Institutional%20Reforms.pdf>

Land Reforms in Kenya: A Curse or a Blessing?

-Dr. Fabian Lukalo, Director Research & Advocacy, National Land Commission

Land reforms are synonymous with reforming the tenure system or redistributing the land ownership rights but the concept has been broadened to recognize the strategic role of land and agriculture in development. Land reform has become synonymous with agrarian reform involving land tenure system, the pattern of cultivation/farm organization, scale of farm operation, terms of tenancy and institutions of rural credit, marketing, and education. Land reform occurs in several ways namely: title to land and terms of holding, land distribution, the scale of operation, pattern of cultivation and supplementary measures such as credit, marketing, and extension services. The success of land reform is likely to affect productivity and poverty. The national land policy comprehensively addresses the major issues on land in the country. However, there are challenges in land reforms. These include: restricted access to land and farming inputs by millions of small producers, lack of political will to promote equitable access to land through redistributive reforms or progressive land tenure reforms, slow expansion of the productive capacities of the poor, manipulation of the African customary law and customary land rights to advance land concentration, and neglecting poor and smallholder farmers and the landless whose labour is critical for sustained agricultural production.

<http://www.tegemo.org/images/downloads/conferences/2015/Land%20Reform%20in%20Kenya%20A%20Blessing%20or%20a%20Curse.pdf>

Plenary Discussion

The chair encouraged participants to look at how the three presentations by Prof. Jayne, Dr. Muyanga, and Dr. Lukalo were ‘speaking’ to each other. For instance, how does the proposed minimum and maximum land ownership policy affect smallholder agriculture, agricultural transformation and food security? He then welcomed questions and comments.

A participant sought to know if the production efficiency in Dr. Muyanga’s presentation was based on maize only or included other enterprises that are not land demanding. Dr. Muyanga responded that as land diminishes, farmers move to higher value crops but for that particular study, maize productivity was used. On zoning, he observed that people must accept the concept because it cannot be imposed on them.

Another participant commented that Kenya does not really have idle land to utilize for a green revolution. She suggested agro-zoning where smallholder farmers would aggregate land to commercialize and move to efficiency. She also requested a soil expert to comment on whether it was possible to manufacture targeted blended fertilizers for particular soils. Finally, she wanted to know the meaning of TAPRA, which had been mentioned severally in presentations. Dr. Lukalo observed that further investment in research and development on smallholder issues is required. She suggested the development of incentives to make land owners release it to the landless. She informed that the land commission has a research wing so that decisions are based on empirical evidence. There are challenges of documenting where land is given to women to inform what will happen say ten or more years from now. Women are also buying land by themselves but there is no data on how many. She responded that she does not believe in land titling given that 13 percent of the land is public, 19 percent private and 68 percent is communal.

Another participant noted that land and specifically land reforms are just one side of the coin. Land reforms started in the 1950s with the Swinnerton plan. He asked the presenters whether the focus should be on land ownership considering land is a finite resource or land access since land is a factor of production. He said it’s also of importance to consider the symbolic aspects of land (like burial, home etc.). He observed that Dr. Lukalo’s presentation did not address the customary aspects of land. Finally, he wondered whether the conference should advocate for land titling given that the process is quite flawed. Dr. Lukalo responded that the policy need to be clear on how to engage women and youth in land ownership reform especially as land use changes from

agricultural to commercial. On land ownership, given that land has mainly been owned by men, it is important to document what proportion of women own land. She noted that until now when women ask for or inherit land from their parents, it 'feels bad' to the men. She finally said that the role of women in land use research should be increasingly encouraged.

In summary, the chair recommended that agricultural policy researchers need to work together with the land sector so that gains made in agricultural policy development are not eroded by land dynamics. He appreciated the stature of having a representative from the national land commission and said that agriculture and land sectors need to reach out to each other in order to have a good fusion.

DAY ONE - SESSION FOUR: CLIMATE CHANGE AND LIVELIHOODS

The session was chaired by Eng. Omedi M. Jura, National Climate Change Secretariat, Ministry of Environment Natural Resources and Regional Development Authorities (RDAs) who said he was privileged to preside over the session having come from the secretariat of National Climate Change in Kenya. He then proceeded to inform the participants that climate change is real and presents real challenges and opportunities as well as cutting across all sectors. He invited the presenters and alerted the participants that the presentations involved interesting topics touching on various aspects of climate change.

In this section, three papers were presented:

1. Effects of Climate Variability and Change on Agricultural Production and Household Welfare in Kenya presented by Dr. Justus Ochieng of Tegemeo Institute and Miss Ayala Wineman from Michigan State University.
2. Uptake of Crop Insurance in the Face of Climate Change: Evidence from Smallholder Farmers in Kenya by Mr. Eric Mukundi of Tegemeo Institute
3. Economic Viability of Irrigated Maize Production by Dr. Dennis Otieno of Tegemeo Institute.

Effects of Climate Variability and Change on Agricultural Production and Household Welfare in Kenya

-Dr. Justus Ochieng, Tegemeo Institute & Ms. Ayala Wineman, Michigan State University

Agriculture is the mainstay of the Kenyan economy and remains an important contributor to employment and food security of rural populations. Climate variability and change have adversely affected this sector and is expected to worsen in the future. Their study estimated the effect of climate variability and change on general crop production and on maize and tea specifically. Findings showed that crop revenue including that from tea and maize are significantly affected by persistent climate variability and change. However, long-term effects of climate change on crop yields are larger than short-term effects, thus, farmers need to adapt effectively to build their resilience to reduce the latter effects. Additionally, findings also showed that in Kenya, temperature as a contributor to global warming has higher effects on crop production than rainfall. Extreme weather affects household well-being, although effects sometimes differ by income and calorie intake levels.

Climate change will adversely affect agriculture in 2020, 2030 and 2040, with greater effects in the Kenyan tea sector if nothing is done.

Policy recommendations

- It is necessary to rethink the likely harmful effects of climate change in the future and integrate it into agricultural and environmental policy formulation processes in the country.
- Given that human activities are the major drivers of climate change; it is necessary to invest in adaptation measures at national, County and farm level, especially in the tea growing regions as a way of building farmers' resilience.
- Programs and policies to improve access to credit and savings could assist households to prepare for, and recover from exposure to bad weather.

The second part of the presentation, derived from a paper 'Let it rain: Extremes and Household Welfare in Rural Kenya' looked at the impacts of various weather shocks on household welfare in rural Kenya and across the population, the channels through which it affects household welfare and ways of helping to offset the negative effects of low rainfall.

Key findings & Policy recommendations

Results from the study showed that inadequate rainfall reduces income from both on and off-farm sources but does not significantly affect calorie availability for households in Kenya. The households are able to purchase food from food markets in years of poor weather. The effect of

different weather shocks such as high and low rainfall, heat and wind also differ by agro-ecological zones. The findings from this study further indicated that financial services (credit provision and savings devices) are an important coping mechanism among the factors which offset the negative effects of low rainfall on income.

The study made specific policy recommendations as follows:

- Policies tailored towards improving rural access to financial services have great potential to improve household resilience to extreme weather
- A well- functioning food market is equally important for households to adjust their calorie sources in response to poor weather. Therefore, it is crucial for the policy makers to aim at improving access to the food market for rural households
- Policy makers should remain vigilant especially where households lack the capacity to withstand exposure to poor weather

<http://www.tegemeo.org/images/downloads/conferences/2015/Effects%20of%20Climate%20Variability%20and%20Change%20on%20Agricultural%20Production%20and%20Household%20Welfare%20in%20Kenya.pdf>

Uptake of Crop Insurance in the Face of Climate Change: Evidence from Small holder Farmers in Kenya

-Mr. Eric Mukundi, Tegemeo Institute

Risk and uncertainty are integral components of agricultural production in Kenya since majority of farmers depend on rain-fed farming systems. This implies that weather conditions will have direct influence on agriculture productivity and overall performance. Mitigation of these risks is, therefore, becoming a priority in reducing income loss and enhancing smallholders' well-being. With growing concerns about impact of climate change, crop insurance – though not a new concept – has gained recognition and support from public and private institutions as an important risk management tool.

Results showed that uptake of crop insurance is very low and declining and the insurance concept is also not well understood by farmers. In addition, basis risk hinders uptake of crop insurance since majority of the farmers exhibited high levels of dissatisfaction with claim payments. Results further showed that awareness and training on crop insurance, density of automated weather stations and ownership of savings account are integral factors in enhancing its uptake.

The study highlights the need to educate farmers on the principles of crop insurance and different products that exist whilst integrating crop micro-insurance with other financial products (credit) to tackle financial liquidity at the household level. The study made specific recommendations as follows:

- Government to support upscale and uptake of insurance through supply of key infrastructure and targeted smart subsidy programmes for the poor and vulnerable populations
- Promotion of public-private partnerships
- Promote training on importance of crop insurance as a critical factor of production and not as an avoidable cost
- Advance innovation in the micro-finance sector with financial solutions which focuses mainly on climate change to prevent further environmental degradation and ensure that crop insurance has a solid framework which can help in increasing its uptake by farmers in different agro-regional zones.

<http://www.tegemeo.org/images/downloads/conferences/2015/Uptake%20of%20Crop%20Insurance%20in%20the%20Face%20of%20Climate%20Change.pdf>

Economic Viability of Irrigated Maize Production

-Dr. Dennis Otieno, Tegemeo Institute

The study was conducted in Lower Kuja, Bunyala, Nandi, Lower Nzoia, Perkerra, Mwea, Bura, Hola and Galana-Kulalu Ranch. Data for this study came from key informant interviews, household interviews, TAPRA 2014 Survey, and published materials. The major objective was to understand if irrigated maize was profitable, whether the farmers were willing to accept and pay for irrigated maize production and lessons from irrigated maize production which can be replicated in other similar production.

Dr. Otieno noted that climate variability and change, declining access to arable land, human activities, and an increasing population has increased pressure on arable land in Kenya resulting in increased poverty amongst the vulnerable Kenyans particularly the youth. To tackle the problem of food insecurity in the country, the government has adopted irrigation as a strategy to increase food production. However, poor performance in the 80's and 90's, inadequate information and the high cost of production associated with irrigation resulted to low engagement and investment in irrigation.

Results from the study indicated that irrigated maize production is viable and sustainable meaning that it can enhance Kenya's food security and household welfare. The country is 71 percent inefficient in irrigated maize production. The study also revealed that the economic value of irrigation water was much greater than operations and maintenance costs.

The study recommends that efficient use of fertilizer; water and land would lead to increased productivity and thus low per unit cost of production. This would have the potential of improving both the household food security and welfare of the rural resource-poor farmers.

<http://www.tegemeo.org/images/downloads/conferences/2015/Economic%20Viability%20of%20Irrigated%20Maize%20Production.pdf>

Plenary Discussion

The chair noted that the presentations provided interesting findings and opened the floor for questions, clarifications, comments or any suggestions. A participant from Acre Africa gave a

comment regarding the work his organization is undertaking in relation to crop insurance. He noted that the organization was an authority in the field of agricultural index insurance services and largely agreed with the findings presented on uptake of crop insurance. They have come up with indices for other products besides maize including sunflower, beans, potatoes, barley and many other crops which are unique for different regions. In 2015, they did a lot of sensitization and managed to insure over 233,000 smallholder farmers in Kenya, Rwanda and Uganda and are targeting more in 2016.

He acknowledged the fact that there is limited awareness of crop insurance and called upon other stakeholders to come on board, including both the national and County governments to increase efforts in sensitizing farmers on the need for crop insurance cover. He concluded by saying that they are working together with other insurance companies to improve the rate of insurance uptake. The organization has installed automated weather stations which are able to communicate frequencies regularly.

In response, Mr. Mukundi acknowledged that the Institute is aware of the developments done by Acre Africa in weather-based index insurance. He believed that the supply side constraint which is the basis risk is something that can be addressed with continued innovation as time goes by. The only challenge is the demand-side constraint seen in farmer's sensitivity to premium prices. He said that better understanding by farmers about crop insurance is important and the government has a major role to play in sensitization process.

A participant who had a bias for livestock in arid and semi-arid areas sought to know what Tegemeo Institute had done on uptake of insurance specifically for livestock. This was in consideration of the fact that arid and semi-arid areas cover over 80% of the country and majority of the communities derive their livelihood from livestock rearing. The uptake of livestock insurance is estimated to be lower than that of crops; the ministry would want to have data on livestock insurance in the arid areas. She also challenged the institute to do more research in the arid areas. On the request on livestock insurance data for arid regions the presenter said that it's an ongoing work and that it is an area that the institute would be willing to move in to.

Another participant from the University of Nairobi posed a question to the audience, "Is there a problem of collusion between the operators in the insurance industry and certain farmers that has

led to the low uptake?” When a farmer is not compensated because the satellite pictures or predictions show that his/her zone was not vulnerable, whoever did the ground work should be answerable so that people can know how crop insurance works. Lastly on insurance he urged the government to join hands in creating awareness on insurance. The agricultural insurance providers are purely business people and should therefore go out and do their promotion with their own budget. The insurance operators are part of the government to his understanding.

A participant from the University of Nairobi commented on energy intakes especially on the amount of calories available to every household member, saying that the biggest problem with the vulnerable is ‘hidden hunger’. He urged the researchers to go an extra mile and identify the micro nutrients deficiencies which are sometimes totally ignored for the sake of just getting calorie intake.

A participant from KALRO commented that Tegemeo as an organization has put a lot of focus on maize leaving other high-value crops with respect to climate change. She said that KALRO has worked on a number of other alternative crops to help farmers adapt to climate change, e.g. orphan crops and high-value crops which have been distributed to farmers Countywide. There is, therefore, need to make a follow up on these crops to see whether there is any impact or not.

Dr. Ochieng began by addressing the concerns raised about Tegemeo Institute focusing on maize crop. He said that the institute focuses on all crops although the genesis of Tegemeo was maize. He appreciated and took it as a challenge to undertake other studies on high value and orphaned crops to investigate their response to climate change.

A participant commented that a lot of work/input went into formulating the irrigation bill and wondered whether there is likelihood of better coordination between the central and County governments once the bill has been enacted into law. A farmer from Kakamega County observed that most speakers were in agreement that the small holder farmers are disadvantaged. He wanted to know whether and how often policy makers include small holder farmers into their discussions. He appreciated the initiative by County governments to provide subsidized fertilizer and certified seeds but these efforts are not worth anything to the common farmer if they are done late as different regions have different season onsets. He observed that Irrigation projects have been moved to regions where maize cultivation can achieve three harvests using specific varieties yet in Lugari, where he comes from, there is only one harvest. He urged the national

government to start the similar projects in Lugari so that they can also have abundant output through harvesting several times a year.

In his response to the irrigation bill, one of the presenters explained that the research was done focusing on maize crop which is a very important staple for many households in Kenya and also an avenue for politics for many leaders. By the time devolution came in there were no structures to support the development hence constant conflicts between the national and County governments. But with time and with clear definitions of the role of both levels of government, he believes there will be improved coordination. Challenges will always be encountered especially where a donor or private entity is brought on board by the national government to implement the use of improved technology in a specific irrigation project. The locals, including the County government will have no choice but accept what they are offered.

In relation to starting an irrigation project in Kakamega County, Dr. Otieno responded that there was a plan to have an irrigation project at River Nzoia but politics came in and the project implementation was never realized. Additionally, the performance of maize depends on the climatic conditions and achieving three maize crops seasons in a year depends on the region. Most ASAL areas can support specific varieties that take a short period to mature. However, in Lugari which is considered a highland, the crops take up to nine months of maturity unless more research is done to provide new varieties with shorter maturity periods for the area.

The chair asked the audience to think about several actors in the policy arena as the discussion on policy went on; the custodian of the policy, the stakeholders involved in the implementation and other actors. He said that most people never recognize who the custodian of policies is, their core business, and the guiding policy?

The chair ended the session by thanking the presenters for their interesting presentations and findings.

DAY ONE - SESSION FIVE: INPUT INTENSIFICATION, SUBSIDIES AND OFF-FARM WORK

The Executive Director, Eastern Africa Grain Council (EAGC), Mr. Gerald Masala chaired the session. He welcomed the presenters and participants to the session.

Effects of NAAIAP Programme on Small holder Production and Incomes

-Dr. Lilian Kirimi, Tegemeo Institute

Input intensification is critical in the context of rapid population growth in Kenya and other developing countries. Increasing population implies that there is increased demand for output. Declining land sizes mean that there is more pressure on available land to produce more output. With these challenges, use of productivity enhancing inputs is seen as an option that can lead to increased output to support the growing population although the capacity to intensify or to access some of the productivity enhancing inputs is still limited among farmers more so the resource poor farmers.

In a bid to deal with this challenge, the government launched the National Accelerated Agricultural Input Access Program (NAAIAP) in 2007 focusing mainly on maize growers. The specific goals for which the program was created included improving access and affordability to fertilizer and seed; raising productivity and output, and increasing food security and incomes thereby reducing poverty. The program had two components (a) Kilimo Plus which basically distributed free fertilizer and seed to selected resource-poor farmers, and (b) Kilimo Biashara which was initiated with the hope that farmers would see the effects of input use from Kilimo Plus and graduate to continued use of fertilizer and seed purchased through subsidized credit. Implemented from 2007/08, Kilimo Plus, the main focus of the study, aimed to provide 100 kg of basal fertilizer and 10 kg of improved maize seed to resource poor smallholder farmers with the goals of increasing their access to inputs, raising yields and incomes, improving food security, and reducing poverty.

The study focused on analyzing and understanding whether the program achieved its goals and key lessons that could be drawn from it. The study also compared effects of the program to those of other input subsidy programs (ISPs) implemented in Malawi and Zambia. Results suggest that despite replacing what would have been commercial fertilizer purchased by farmers; Kilimo Plus substantially increased maize production and reduced poverty gap and severity of recipient households. Moreover, the program's positive effects were somewhat larger than those of ISPs in Malawi and Zambia. Much of Kilimo Plus's relative success vis-à-vis the Malawi and Zambia programs is likely due to its effective targeting of relatively resource-poor farmers and its implementation through vouchers redeemable at private agro-dealer shops. From the results, it

could be said that NAAIAP compared to other ISPs was a ‘smarter’ program due to its effective targeting and sound implementation strategy that did not interfere with the general input flow and distribution in the country.

Given that ISP design and implementation have significant implications for program impacts, it is important to ensure that official and effective (in practice) targeting match in order to maximize impacts. Prioritizing use of existing private sector input distribution mechanisms will encourage private sector participation and reduce distortionary effects of subsidy on private fertilizer market. Also, the country needs to have a more holistic approach to improving production and sustainable intensification by increasing complementary public/private investments in improving soil health and in research, extension, irrigation, transport infrastructure, information, as well as affordable and appropriate innovations and technology. Findings from this study can provide useful lessons for design and implementation of other programs such as the County-run farm input support programs.

http://www.tegemeo.org/images/downloads/conferences/2015/Effects%20of%20NAAIAP%20program_9th%20Nov_Rev.pdf

Off-farm Work and Fertilizer Use among Smallholder Farmers in Kenya

- Mr. Joseph Opiyo, Tegemeo Institute

The study sought to identify the role of the off-farm sector as a way out of poverty in rural development strategies. Rural households diversify to off-farm sector either because of push or pull factors. The study found generally high off-farm work shares of 31 to 67% in total household income across all types of households. OFW is also increasing overtime and across income groups. Households engaged in OFW have significantly higher total household incomes and lower crop shares. In general, households engaged in OFW have relatively low use of fertilizer on three crops (maize, tea, and vegetables). The effect on fertilizer use differs by crop with negative effects observed in maize and vegetables and positive ones in tea. Accounting for the timing of OFW however, the effects of fertilizer use on maize are positive and complementary, alluding to a possible reinvestment of off-farm earnings in fertilizer use by maize farmers. The high OFW shares in low agricultural potential areas may be a possible sign of structural transformation in these rural economies. It also implies a possible entry point in reaching these disadvantaged households. It is, therefore, important to factor OFW in the overall

strategies of transforming smallholder agriculture and reducing rural poverty considering the interactions between the farm and off-farm sectors. Such include a need for investments in growth of rural economies

<http://www.tegemeo.org/images/downloads/conferences/2015/Offfarm%20Work%20and%20Fertilizer%20Use%20among%20Smallholder%20Farmers%20in%20Kenya.pdf>

Plenary Discussion

Following the presentations, the chair invited participants to the plenary session and noted that a few issues drew his attention during the presentations. He observed that from Dr. Kirimi's presentation, the Kilimo Plus participants were poor and remained poor even after the program. He also noted the need to ascertain whether the beneficiaries of Kilimo Plus really needed fertilizer and seed in the first place or something else. The chair also noted that since beneficiaries of Kilimo Plus were hoped to graduate to Kilimo Biashara, it was important for policy to know how many of them actually graduated. He then requested participants to ask their questions.

The County Director of Agriculture (CDA) from Uasin-Gishu noted that the presentation on NAAIAP painted a rosy picture and as one of the implementers, he explained that the program had its share of challenges. He emphasized that going forward; the NAAIAP program has to be designed well so as not to be counterproductive. He explained that the program needs to be well targeted to yield meaningful results, include all stakeholders and reduce the dependency syndrome. He gave an example of NAAIAP recipients who continued to expect support during the subsequent years. He concluded by saying subsidy is good but it ought not to interfere with existing systems such as private input markets. Commenting on the same issue, Dr. Kirimi agreed that the program needs to be well designed to reduce dependence and include the private sector and that no stakeholder should be left out.

A participant from MEA Fertilizers sought clarification on whether a post-NAAIAP research had been done to ascertain whether the beneficiaries purchased fertilizer in the subsequent seasons since the program was designed as a one-off supply with expectations that the recipients would upgrade to Kilimo-Biashara and purchase inputs from stockists. On the same note, he wanted to know whether the national fertilizer usage had increased. He also noted from the presentations that the average yield for fertilizer users was 558.2 kg/acre translating to about six 90kg bags per

acre and wondered what the yields for households not using fertilizers were. In response, Dr. Kirimi said it is not necessarily true that non-recipients were not buying fertilizers before the subsidy program. She explained that the non-recipients could have been buying fertilizers before and may have even continued buying after the program. She, however, admitted that she could not confirm whether the quantities these groups of farmers were using were more or less. On National fertilizer use, Dr. Kirimi noted that from the TAPRA data, about 75 percent of the farmers were using fertilizers and that the figure increased marginally over the years. She also noted that the Kilimo-plus in Kenya was so small compared to those in countries like Malawi and, therefore, did not translate into a significant increase in the national fertilizer usage.

A participant from ReSSAKS suggested that in the absence of universal support for the subsidy program, there is a need for a real Cost-Benefit Analysis to discern the costs and the benefits of the program. He added that the program by design seem to have envisaged a one off event where the beneficiaries were expected to graduate to actual commercial users of fertilizers. He noted that there seems to be an opportunity for Tegemeo Institute to provide the cost-benefit analysis given the new wave of TAPRA 2014 data. Dr. Kirimi in response said that the Institute had not focused on Kilimo-Biashara in its current analysis and noted that it would be interesting to do the analysis, especially for policy. She also noted that a post-Kilimo Plus study would be important to also look at the welfare change for the beneficiaries and analyze whether the program achieved its goals and whether the impacts were big enough to cause people to see changes in terms of increases in production or even incomes.

The chair appreciated Tegemeo Institute for hosting the conference and the good work it is doing in research and specifically that done on maize at the beginning of the year on cost of production. On behalf of the private sector, he underscored the importance of the work Tegemeo was doing and confessed that at EAGC they had started to take up some of the research findings in their decisions. He also said that there was a lot of legislative work going on in the country and expressed his joy that the Institute could contribute to the bills e.g. the ware-house receipt system bill. He concluded by posing the question, “since previous presentations had shown that small-scale farmers were approximately 75 percent in Kenya, how much do they produce? How much land do they hold and will this remain the same? ” He added that a previous presentation had shown that the medium scale farmers are usually forgotten and asked whether it is possible to bring them on board.

DAY ONE - CONCLUDING REMARKS

- Deputy Vice Chancellor (DVC) Research and Extension, Egerton University

- Prof. Gowland Mwangi

Prof. Mwangi began by thanking the conference organizers, facilitators, presenters and audience for the fruitful discussions and the opportunity to learn. He then commented on the evidence-based research and the need to increase funding for research and development (R&D) noting that most economies growing in agriculture invest more on research than Kenya. He challenged those in decision-making levels to allocate more money to agriculture so as to attain the desired growth and food security. He also urged the private sector to invest some of their resources in improving agriculture and facilitate development to provide opportunities to the youth. He argued that there is need to make agriculture more attractive to the young. He noted that studies have shown growth in agriculture can be realized by households with more than 10 acres and wondered what could be done to those with smaller land sizes being the majority in Kenya and given that most SSA countries will still be depending on farming in the next 2-3 decades.

Prof. Mwangi emphasized on the need for infrastructure development and gave an example of India which is able to feed the increasingly high population because they invested heavily in infrastructure and markets. He said that he was amazed one day he travelled to Zanzibar and on his way he could not get food on the road-sides, not even tea. He reminded the participants that Kenya is a blessed country where one doesn't need to own a cow to take a cup of milk tea. Hence, he emphasized on the need for the leaders to be good managers reminding the participants that the President had directed that the ministries should work closely with universities on management and policy related issues. He then called upon the stakeholders to work with Egerton University to do research and advice policy makers on what to do since evidence-based research makes it easy to inform the government when something is wrong. He then thanked the participants and invited them to the next day's sessions.

Day Two

DAY TWO - SESSION ONE: INTRODUCTION

The second day of the conference started at 9.30 a.m. with Dr. Simon Kimenju, the Master of Ceremony, calling the conference to order. He then welcomed everyone to the forum and invited Dr. Lilian Kirimi to give a word of prayer. After the prayers he invited the Director, Tegemeo Institute, Dr. Mary Mathenge, to welcome participants to the second day of the conference.

Introduction

Director, Tegemeo Institute

-Dr. Mary Mathenge,

Dr. Mathenge welcomed the participants to the meeting and expressed gratitude that the participants had made it for the second day of the conference to conclude the deliberations which had started the previous day. She also appreciated the discussions of day one and hoped that the participants would continue discussing on how to transform smallholder agriculture in Kenya and Africa as a whole. The Director reiterated the importance of smallholder farmers and that they cannot be wished away both in Kenya and Africa in any debate or deliberations touching on their livelihoods. She emphasized the need for stakeholders to seriously think about smallholder farmers and their role in economic growth of the country and stressed that agriculture was indeed a driver of economic growth in Kenya. She urged all stakeholders to work together to make agriculture more productive. She concluded with a brief overview of presentations to be made and invited Dr. Mercy Kamau to give a summary of deliberations made in the first day of the conference.

Summary of Day One Deliberations

-Dr. Mercy Kamau, Tegemeo Institute

Dr. Mercy Kamau welcomed participants and informed them that during the first day there were five sessions where mind-provoking and stimulating speeches and presentations were made. She explained that in her opening remarks, the Egerton University VC Designate, Prof. Rose Mwonya noted that Tegemeo Institute had been around for a long time informing policy and

reforms in the agriculture sector and urged different players in the sector to work hard in order to increase productivity, especially from smallholder farmers.

Dr. Kamau then added that in his speech, Prof. Gowland Mwangi, the DVC Research, and Extension had noted that about two-thirds of Africa's population rely on agriculture and that they are faced with a myriad of challenges such as low productivity, land fragmentation, poor infrastructure and threat of climate change. She highlighted the view depicted by Prof. Mwangi that infrastructure development was important to the agriculture sector growth and the need to address issues of employment for the youth in agriculture. She also noted that the DVC challenged Tegemeo to continue contributing to the improvement of the agriculture sector through evidence-based research and policy analysis.

Summarizing the speech by the director of the USAID Mission to Kenya, Dr. Kamau explained that Mr. Michael Jones noted that Tegemeo had grown and set precedence in policy research and called for the strengthening of policy research in order to increase agricultural production and eradicate poverty in Kenya.

Dr. Kamau further explained that the opening speech was given by Madam Ann Onyango who represented the Cabinet Secretary (CS) in the Ministry of Agriculture, Livestock and Fisheries who emphasized the important role played by evidence-based research in decision making and acknowledged that Kenya is strong in making good strategies, policies and plans but poor in implementation. The CS had noted that the theme of the conference was timely and relevant given the challenges facing the agricultural sector in Kenya today. She noted that the CS had commended the Institute for its empirical research based evidence and that he was happy with the objectives of the conference. The CS had however challenged Tegemeo Institute to be more active particularly on issues such as climate change and decreasing land sizes to transform agriculture in the country. She further explained that the CS had urged for more partnership and collaboration with the Institute from different partners to push forward the policy reform agenda and drive growth especially among smallholders in Kenya.

On the key note address, Dr. Kamau explained that Prof. Jayne had identified six mega trends that were impacting the agricultural sector including; urbanization and a shift from farm to off-farm employment, huge rise in demand for marketed foods, the 'youth bulge', rising land scarcity, rise of medium scale investor farmers, and climate change. She informed the

participants that Prof. Jayne had acknowledged the challenges to smallholder agriculture and wondered whether Africa would follow the path by Asia in the transformation of its agriculture. She also added that Prof. Thom had concurred with the idea that Kenya would still continue with its agriculture but noted the rising emergence of medium-scale farmers in Kenya. Dr. Kamau also gave a summary of all other Day One presentations.

DAY TWO - SESSION TWO: AGRICULTURE AND DEVOLUTION

The Deputy Director for Extension and Outreach at Egerton University, Prof. Bockline Bebe chaired the session. He invited the presenters and proceeded to inform the participants that agriculture will continue to be the engine of economic growth in Kenya and Africa. He then requested the participants to think through the points discussed the previous day in view of the interface between agriculture and devolution.

There were three presentations in this session:

1. Status of the Agricultural Sector and Key Lessons after Devolution to County by Dr. Tim Njagi from Tegemeo Institute.
2. Improving Agricultural Performance under County Governments: Challenges and Opportunities by Hon. Agatha Thuo, the CEC for Agriculture Livestock and Fisheries Nyandarua County & also the secretary of the Caucus of the CEC for Agriculture, Livestock, and Fisheries.
3. Implementation of Policies and Programs under Devolved System of the Government by Dr. Isaiah Okeyo, the Deputy Director of Agriculture, MoALF

Status of the Agricultural Sector and Key Lessons after Devolution to County Governments

-Dr. Timothy Njagi, Tegemeo Institute

The presentation covered a series of studies carried out by researchers from Tegemeo Institute between 2014 and 2015. The study was conducted in 16 counties in four regions; Western, Rift Valley, Central and Eastern regions. Data for these studies came from key informant interviews with County Executive Committees Members (CECMs), County Officers (COs), County

Directors of Agriculture (CDAs) and TAPRA Survey 2014. The major objective was to understand how the sector had adjusted after the transition to County governments, how County governments had prioritized activities for the sector, and identify lessons, challenges and opportunities for the sector.

Key Findings

Transition: Although the constitution provided for a three-year phased transfer of functions to counties, this was not adhered to as the national government declared blanket devolution of functions from 1st July 2013 for political reasons. This had led to a number of challenges such as duplication of roles/activities between national and County governments.

Planning: Counties had developed the County Integrated Development Plans (CIDPs) as mandated by the Constitution and Public Finance Management Act, 2012. However in the preparation of the CIDPs, they paid most attention to the governors' manifestos and public participation. There was little involvement of technical staff in shaping the CIDPs. This led to CIDPs which were not viable. However, a majority of the counties have now revised their CIDPs making them more realistic and technically feasible.

Communication: Before devolution, there was a clear and well-defined channel of communication and a steady flow of information from the Ministry headquarters down to the divisional level. After devolution, the procedures changed and the current channel being used has become long resulting in delayed arrival of information and failure to reach the action points. This resulted in distortion of information and wastage in information verification process. However, this has been rectified and a secretariat established at National level headed by a Liaison Officer who is mandated to communicate with relevant officers at County level.

Human Resources: Although the new constitution of 2012 required that the transition to devolved systems be done in phases for a period of three years, transfer of functions and staff was done hastily. As a result, there was no structured handover which created several challenges to the County governments including inadequate technical staff at both at Sub-County and ward levels particularly departments of livestock, fisheries, and cooperative development. There was also a lack of scheme of service, lack of clear guidelines on promotion and transfer of staff leading to low staff morale, political interference on recruitment process at County levels and a wide mismatch between skills and roles of County staff.

Budget and flow of funds: Generally, agricultural funding had increased at County level and also, the recurrent and development budget had been separated by County in the current financial year as compared to the first year when most counties were clustered together. Counties have also adopted program-based budgeting system where budget ceilings are set for different departments and are approved by County assemblies. However, the funds are centralized at County levels which result in delays in accessing them, particularly at sub-County levels.

Recommendations

Overall, the study found that some counties had taken over some projects previously implemented by the national government, counties had revised their CIDPs, there is increased funding for the sector, there is poor coordination between national and County governments and finally poor transition posed challenges to devolution. The study made specific recommendations as follows:

- There is a need to clarify functions that have been devolved and those not yet devolved and a need to prepare counties to take up functions yet to be fully devolved
- There is need for improvement of coordination between County Governments and the National Government, and among County Governments by improving communication channels and information flow
- Strengthening of planning and budget making processes at the County level should be prioritized
- There is a need for building and developing capacity at the counties for effective discharge of functions
- There is a need to address the human resource challenges at the County level
- There is need to increase funding to the counties to cater for increased functions

<http://www.tegemeo.org/images/downloads/conferences/2015/Status%20of%20the%20Agricultural%20Sector%20and%20Key%20Lessons%20after%20Devolution%20to%20County%20Governments.pdf>

Improving Agricultural Performance under County Governments: Challenges and Opportunities

-Hon. Agatha Thuo, County Executive Committee Member (CECM) for Agriculture Livestock and Fisheries, Nyandarua County & Secretary to the Caucus of the KCECM Agriculture, Livestock and Fisheries

Hon Thuo's presentation covered the areas under the Kenya Constitution which states the objectives and functions of both devolved and national governments in relation to the agricultural sector, opportunities under devolved system of government, agricultural funding, and role of County assemblies, Nyandarua County priority agricultural value chains, and challenges at County level.

The Constitution, 2010: The presentation highlighted the importance of the Kenya Constitution 2010, Chapter 11, Article 174 (d) on Devolved Governments which recognizes the right of communities to manage their affairs and further their social and economic development and Schedule 4 of Kenya Constitution 2010 which enumerates the distribution of functions between the national and County governments.

Opportunities: The new constitution, through devolution, brought many opportunities to the counties which included bringing services closer to the people, public participation, the involvement of members of the public in the budget process and preparation of CIDPs and participation of local leaders and stakeholders in planning processes. It also enhanced farmers' organizations through the revival of farmer cooperatives and initiation of issuance of milk coolers, dispensers, hay seeds, livestock vaccines and improved feeder roads networks to facilitate produce transportation.

Agricultural funding: Devolved agriculture has also increased agriculture budget allocation from the national government with 15% of Gross Domestic Product (GDP) funding to the Counties.

County Assemblies: Under the new constitution, 2010, the County assemblies have been mandated to scrutinise and approve budgets, develop County agricultural policies and laws and audit the performance of County staff

Nyandarua County priority agricultural value chains: Devolved governments and devolved agriculture sector have enabled Nyandarua County to prioritise their major agricultural projects

which will benefit their farmers immensely. These projects include dairy development through subsidized AI and milk processing, potato value development and fertilizer subsidy, soil testing and revival of pyrethrum sector. Further, the constitution has allowed counties to create Inter-County trading blocks to foster market access and trade.

Challenges at National level

Despite these great opportunities brought about by devolved agriculture, there are several challenges. These include:

- Delayed disbursement of funds from the National Government
- Duplication of devolved functions by the National Government through service units such as KAPAP and ASDSP
- Support to extension service by development partners reduced leading to poor mobility of extension staff
- Lack of well-defined intergovernmental relations
- Unwillingness by national government to release devolved functions and resources to the counties

Challenges at County level: The presentation concluded by enumerating specific challenges faced by County governments in execution of their mandates:

- Political interference by farmers, political groupings and Members of County Assembly
- Reduced allocation of funds due to poor understanding of critical role played by agriculture in the country's economy
- Lack of resources for funding mega projects e.g. irrigation infrastructure.

<http://www.tegemeo.org/images/downloads/conferences/2015/DEVOLVED%20AGRICULTURE%20-%20OPPORTUNITIDES%20AND%20CHALLENGES.pdf>

Implementation of Policies and Programs under Devolved System of Government

-Dr. Isaiah Okeyo - Deputy Director of Agriculture, MoALF

The presentation covered constitutional and legal basis for transfer of agriculture functions to Counties, implementation of project/programmes at the County level, implementation challenges

and the way forward. In the introductory remarks, Dr. Okeyo said that the implementation of projects and programs under the new constitution aims at addressing four broad areas of smallholder development: creation of an enabling environment through policies and legal frameworks; increase of agricultural productivity and production; enhancement of national food and nutritional security; and improvement of market access and trade.

Constitutional and Legal basis for Transfer of Agriculture Functions to the County: The new constitution under articles 4 and 6(2) gives legal backing for the transfer of agricultural functions, and it also defines the functions of both national and County governments and the procedures to be followed to ensure smooth transition of the functions. But some of the functions are not clearly defined as stipulated in the 4th schedule of the constitution. Such functions include food security, disaster management and pests and disease management. It further gives key functions both at national and County government under new devolved structure of agricultural sector. It also highlights the major policies formulated under the new constitution which are being implemented as stipulated under the new constitution.

However, the policies, programmes and projects initiated under the new system of government have posed a lot of implementation challenges both at national and County governments. These include: lack of linkage between the County Integrated Development Plans and National Medium Term Plans, no changes in prioritization, planning and implementation of projects and programmes, lack of harmonization between national and County level goals and inadequate farmer participation.

Financing of agriculture at County level: Under the devolved system of government, financing of the agricultural sector has seen major variations from different counties, some giving a priority and allocating substantial amounts of money while others giving it very little. As a result, financing of the agricultural sector has been inadequate which might have a great impact on food security in the country.

Challenges of devolution: The paper concludes by highlighting some of the major challenges facing the agricultural sector after devolution. They include:

- Inadequate consultations when making major decisions particularly at the County level

- Long and tedious bureaucratic communication channels between the national and County governments often leading to late arrival of information to the action points or distortion of the information
- Job insecurity due to lack of structured scheme of service and clear guidelines on promotion and transfer of County staff
- Existence of Liaison offices at County level with little or no defined roles
- Conversion of agricultural training centers into universities and colleges, and use of farm machinery in road construction in many counties will have negative impact on food production and food security in the country
- Lack of effective enforcement of nationally set guidelines, standards and regulations
- Inadequate leadership for devolved systems
- Inadequate reference to national policy documents (MTP, Vision 2030) in preparation of County integrated development plans (CIDPs)
- Lack of a functional financial system
- Political interference by MCAs on budgets, impeachment of County Governors yet they are the custodians of County development agenda

Way forward: For devolution to succeed, he recommended the following:

- Regular meetings of Governors and stakeholders
- Harmonization of working relationship among counties and between counties and the national government
- Improvement of communication strategies
- Alignment of CIDPs and the MTP
- Implementation of relevant ACTs such as the Inter-Government Relations Act.

<http://www.tegemeo.org/images/downloads/conferences/2015/Tegemeo%20agriculture%20and%20devolution%20SoMS%20202.pdf>

Plenary Discussion

The chair invited participants to discuss the presentations and proceeded to note that good lessons could be drawn from the presentations but there are challenges depicted that required the

attention of stakeholders. He expressed the need to have an analysis detailing the differences between counties that had committed more than 10 percent of their budget to agriculture against those that have not. In response, Dr. Tim Njagi agreed with the chair and said that Tegemeo has data on that and would follow it up.

A participant enquired about the role of NGOs in the support of various activities such as funding of smallholders at the grassroots and whether there is any impact. She expressed her concern over the management, monitoring and regulation of NGOs activities in Kenya. She added that the NGOs should be directed on where to invest their money and the activities/projects/programs to fund. In response, Hon. Agatha acknowledged that management and regulation of NGOs was a challenge and accountability from them was elusive. She, however, noted that there exists an opportunity through the summit, the Council of Governors (CoG) and the counties to ensure that all NGOs are accountable for their activities in the country.

The Chair admitted that the process of devolution seems to have been done in haste without much thought of people being together and charting the way forward and added that initially there was a lot of suspicion between the two levels of government assuming each was to operate independently. She clarified that in the agriculture sector, most functions had been devolved including institutions such as Agricultural Training Centres (ATCs), Agricultural Mechanization Centres, and extension programs. She confirmed that there exists an Inter-Governmental Relations secretariat coordinating activities between counties and counties are now working together.

A participant sought to know the relationship between the national and the County government and the impact of this on development. He observed that there seem to be only weak vertical relations and near absent horizontal relations between the County governments. He emphasized that poor coordination cited in the presentation was as a result of the weak or absent vertical and horizontal relations. Dr. Njagi agreed with the participant and emphasized that for successful implementation of agricultural functions by both the national and County governments; there must be proper coordination across the two levels of government to exploit synergies and existing infrastructure for mutual growth. He further emphasized the need to fully operationalize the Inter-Governmental Relations Act to address this challenge.

A participant from the University of Nairobi sought to know whether devolution points to poor and uncoordinated utilization of resources giving an example of Nyandarua County using a budget of Ksh.10 million to establish a soil testing laboratory while there is a KALRO soil lab in Ol-jororok and that the money could be used elsewhere. He also wanted to know the logic behind the establishment of local dairy cooperatives in Nyahururu while KCC already exists there. He advised that the devolved units could first use the existing structures before inventing new ones because of technical challenges. In response, Hon. Agatha said that counties incorporate first the governors and party manifesto when preparing the County development priorities in order to cater for the promises they made to the electorates. On the issue of establishing dairy cooperatives, she said most of the dairies in the County are owned by individuals, therefore there is a need to have ones owned by the farmers where farmers can have a say on them.

Another participant sought clarification on the issue of mutual accountability and how counties are handling it especially now that the CAADP process has been cascaded to the counties. She also sought to know which of the three bodies recently established (Agricultural sector Intergovernmental Consultative Forum, Transformation Initiative, and the Intergovernmental Secretariat) handles what used to be handled by ASCU. Dr. Okeyo clarified that indeed ASCU moved but through the Cabinet Secretary (CS) it was being revived though coordination remains a challenge since the ministry has since been restructured and that only Agriculture, Livestock, and Fisheries are existing original ASCU members. He also explained that CAADP was a Pan-African program and that the national government is its custodian. He also noted that the functions of CAADP were not defined in the constitution but the national government ought to take full responsibility for its implementation.

A participant from the Ministry of Devolution made an observation on the implementation of programs at the County level noting that many counties still plan and implement programs in their 'own cocoons'. Counties should try to practice inter-County sharing of resources. She illustrated this pointing out that 4 counties (Isiolo, Garissa, West Pokot and Wajir) have come together to put up export-targeting slaughter houses. She urged the counties to do a survey and identify what resources exist that they can share in. Another participant sought to know whether the County staff had been brought on board through induction or orientation to actively

participate in agricultural growth at their levels. He advised that training should be done to County staff especially on the international requirements for exports and value addition.

A CDA from Meru emphasized that different counties were doing agriculture differently and requested Tegemeo to do County specific analysis so as to come up with 47 County specific results and recommendations. She also noted that devolution is important but expressed reservation at the system where technical issues were being managed by politicians especially where the sector funding ceilings are set in a non-objective manner. She added that counties should be empowered to come up with locally tailored policies as long as they don't contradict those formulated at the national level. In response, Hon. Agatha expressed the need for capacity building for the MCAs for them to understand the importance of the sector and its correct management. A CDA from Makueni emphasized the role of extension as the 'software' for agriculture without which agricultural growth would not be achieved. She also noted that the country was still far from achieving the Maputo declaration and that deliberate effort needs to be put both at the national and County levels to try and achieve it. She also urged Tegemeo to take the findings from the devolution study to CoG. Another CDA from Transzoia sought to know how much of the budget is given to agriculture sector in Nyandarua County is actually used given the many hurdles that hinder its utilization.

DAY TWO - SESSION THREE: AGRICULTURAL SERVICES AND INNOVATIONS

The session was chaired by Dr. Mary Kamau, the Director of Agricultural Extension and Training at the MoALF. She welcomed the participants to the session and acknowledged the presence of the VC, Egerton University, Prof. James Tuitoek. She emphasized the need to transform small-scale farmers since they produce 60 percent of the total production and they are about 5 million in number.

Agricultural Information Sources and Their Effects on Farm Productivity in Kenya

-Ms. Rosina Wanyama, Tegemeo Institute

Ms. Wanyama first observed that agricultural extension is an important tool for disseminating agriculture information to farmers, and has been highlighted as a critical agent needed to transform subsistence farming into a modern and commercial agriculture to promote household food security, improve incomes and reduce poverty. However, prolonged underinvestment in

agricultural extension has led to very low coverage, especially after the government, which was the main service provider, scaled down its involvement in national extension. This has therefore given rise to an emergence of multiple extension service providers to fill the gap.

This study, therefore, sought to examine the extent to which farmers are accessing extension information from the available sources, the factors influencing farmers' preference for particular information sources, and the effect of these choices on farm productivity. The study used cross-sectional household survey data collected in 2014 by Tegemeo Institute.

The results show that the three major sources of agricultural information in Kenya are public (Government extension agents, Research organizations), private nonprofit (non-governmental organizations, farmer organizations, community-based organizations, another farmer) and private for-profit (private firms, processing, and marketing enterprises among others). However, farmers' preference of any source is significantly influenced by a number of socio-economic characteristics. Moreover, despite the existence of multiple information sources, only about 21 percent of the sampled households are accessing agricultural information in Kenya. This is relatively low considering the large number of farmers in need of such information. In addition, although the public extension system has overly been criticized for its inefficiency, the findings indicate that the choice of information sources is dependent on the enterprise in question. Efficient delivery of quality and relevant extension services can be realized through increased investment in extension and strengthening the modalities for coordination between public and private extension service providers. Moreover, adoption of effective dissemination channels is necessary to increase coverage.

<http://www.tegemeo.org/images/downloads/conferences/2015/Agricultural%20Information%20Sources%20%20their%20Effect%20on%20Farm%20Productivity%20in%20Kenya.pdf>

Promising Innovations for Transforming Smallholder Agriculture

Ms. Titianne Donde - Chief of Party, Kenya Feed the Future Innovation Engine

As an introduction, Ms. Donde said the Kenya FtF innovation engine has the role of identifying, fostering, and bringing to scale innovative market led solutions to food insecurity, under nutrition and poverty. She, however, noted that agriculture is not innovated in a big way, mainly because many potential innovators do not reflect on the important questions of why, for who and

how. She observed that for innovations to work in agriculture an innovator should consider the policy environment, the wholesomeness of the relevant value chain and the amount of effort required for an innovation to work. In addition, innovators should consider finances, cash flow and business growth and should stay focused not losing determination. Innovations that hold promise are those that are desirable (address a market need), are feasible (technically and in terms of organization) and viable. For an innovation to yield benefits, beneficiaries have to be aware of an innovation, see its value, and adopt it.

<http://www.tegemeo.org/images/downloads/conferences/2015/Transforming%20Smallholder%20Agriculture%20in%20Kenya%20Agricultural%20services%20and%20innovations.pdf>

Plenary Discussion

The chair highlighted that the essence of the NASEP policy enacted in 2012 was to harmonize extension services and make it more effective in service delivery. She added that between 1980 and 2006, there has been a lot of attrition and retirement of extension personnel resulting in a ratio of extension workers to farmers of 1:1000. She emphasized that NASEP generally works with other stakeholders. It has 4000 staff of which 2000 are diploma holders while 2000 are certificate holders who were devolved to County governments. However, it is difficult for 4000 extension staff to reach each of the over 5 million farmers. She added that the ministry of agriculture was working on extension guidelines. She acknowledged that majority of farmers in Kenya are old, making it difficult to change their mindset while the extension staff in the public sector are also old which may result to further reduction in extension services in the near future if measures will not be taken now.

She highlighted that in as much as we talk of private extension services in some areas the public extension is still dominant. She said that the ministry is currently promoting e-extension by use of phones and laptops. A total of 600 laptops were purchased but it was not possible to know how this affected the farmers since there was a lack of servers.

She commented on Ms. Donde's presentation by reminding the participants that the three important things for a viable innovation are; who is it made for, how is it implemented and why it is being implemented. She urged the participants to think of business growth and the value chain since if one spot is triggered, the rest of the value chain is also affected. She added that

there is need to think of the market for the innovation since it has to be demand-driven. She also emphasized on the need to draw the youth to agriculture which could be achieved by targeting them using technology and group approach. She concluded by emphasizing on the need to include all stakeholder in the value chain in testing and piloting of innovations.

A participant commented that the East African Grain Council offers extension on cross border prices. However, he sought to know whether extension is equal to information. He was surprised that public extension was leading in offering extension because according to him, Kenyan public extension service ‘died’ a long time ago. In response Ms. Wanyama said that extension is a way of passing information. She also pointed that public extension has reduced but is not dead. This is because a number of KARLO staff who are public officers, are still offering extension services. The chair commented that extension was devolved and called on each County to look for ways of facilitating their extension services. She emphasized that extension is not dead. However, she wondered whether farmers actually implement the information given to them. If you tell farmers to use fertilizer and they don’t use it, who is to blame?

The chair added that in 1986 (and the post-independence period prior to this time) everything was streamlined, however, after liberalization in the 1990’s, all structures collapsed. During the post-independence period, 13 percent of the total budget went to agriculture but now it’s only three percent and is not worth saying we finance extension.

A participant commented that group extension may be the way to go because of the large numbers of small scale farmers. He, however, wondered if medium and large scale farmers were considered since from the presentation, 80 percent were small scale farmers. Another participant wanted to know whether small-scale farmers with less than one hectare are accessing extension. Ms. Wanyama explained that since proportions accessing extension services are low it is still good to go further in the data and disaggregate by area size.

One participant commented that the presentation didn’t contain much discussion on incentives for extension to drive innovation, and wondered why extension workers are not well remunerated if their performance warrants that. The chair responded that extension is devolved and it’s the prerogative of each County to look at ways of increasing incentives. The chair also commented that if we pay good salaries to the extension workers and we don’t facilitate them to work, they will stay in office and do nothing. She said there is need to harmonise what was in the extension

policies prior to 2010 to the current and the need to review them. She added that there are so many Common Interest Groups (CIGs) that we need to improve because that is what NASSEP policy advocates for without compromising the farmers. She finally said it took the United States 200 years to harmonise her devolution and Kenya is one day old in devolution and that we need to promote our farmers.

A participant commented on the need to restructure the process of innovators qualification to aid in creating awareness. Ms. Donde responded that she agrees that they receive more application in the first stage innovation than the final stage innovators. She said that awareness can't be created by moving from one farmer to another but they advise the innovators to use groups and aggregators in order to reach many farmers.

A participant suggested that before thinking of new innovations it is important to make use of what is there. Ms. Donde responded that we need to understand the farmers whom the innovation is being developed for. In many cases, innovations are developed for small-scale farmers who on the other hand think it was not meant for them.

A participant wanted to know whether some innovations are public or private goods. In response Ms. Donde said that most innovations are public goods, however, an innovation may not be solving a problem that farmers perceive to exist. Concern was raised on the affordability of the innovations to small scale farmers. Ms. Donde responded that farmers are aware of the importance of these technologies in increasing their productivity. She added that farmers have money to purchase these innovations as long as the innovators don't ask for money upfront and the innovation gives value to their money.

DAY TWO - SESSION FOUR: MONITORING LEARNING AND EVALUATION

The session was chaired by Prof. Willis Kosura, a professor from the Department of Agricultural Economics, University of Nairobi. He thanked the Institute for organizing the conference and mentioned that all the issues in the theme were very important. He emphasized the importance of monitoring and evaluations in organizations. He welcomed the presenter and participants to the session and requested all to listen and participate in the discussion afterwards.

MLE in the Agricultural Sector: Role of Tegemeo Institute

-Maria Nankya, Tegemeo Institute

As an introduction, Ms. Nankya observed that MLE has changed from the 1970s when the focus was on the monitoring of inputs and outputs to currently where it is used as a tool for accountability, efficiency and results demonstration. MLE is used for new project identification, programming, and roll out. Its results guide effective decision making, resource allocation, and informs project management if the implementation is going on as planned. In the agricultural sector, it supports tracking of sector performance and country-specific performance. It also helps in the diagnoses of the constraints limiting accelerated agricultural growth and hence informing design of country-specific interventions for agricultural development. It also supports policy dialogue and debate since MLE reports provide evidence-based policy implications and recommendations. Ms. Nankya informed that Tegemeo has been involved in the MLE sector in Kenya through impact evaluations, external evaluations, monitoring and tracking changes in key indicators, and baseline studies. The Institute has used TAPRA I and TAPRA II rural household panels as well as urban surveys to track changes in the sector. Tegemeo has also provided support to programmes and projects by development agencies such as outcomes under the agricultural sector for USAID's Feed the Future Initiative, among others. The new MLE unit in Tegemeo will help the institute to broaden its range of MLE services from just implementation support (from baseline to end line) to systems design which involves developing theories of change and MLE frameworks.

<http://www.tegemeo.org/images/downloads/conferences/2015/Monitoring%20Learning%20and%20Evaluation%20MLE%20in%20the%20Agricultural%20sector-%20Role%20of%20Tegemeo%20Institute.pdf>

Plenary Discussion

The chair of the session once again emphasized the role of Tegemeo Institute in monitoring and evaluation and opened the question and answer session.

One participant from the USAID noted that this was an exciting presentation. He suggested that Tegemeo should think forward into working with the government organizations like the National Integrated Monitoring and Evaluation System (NIMES) to conduct MLE on government for broad higher level indicators. Since ASCU's exit from the ministry there is now the

Transformational Initiative (TI) which links with NIMES. Another participant wanted to know the recommended micro-level indicators and their availability that can guide agricultural interventions especially for the NGO fraternity. Ms. Nankya responded that the MLE unit is working closely with the government through NIMES to see how best these indicators can be tracked. In summary the chair noted that Tegemeo alone cannot provide MLE services for the whole sector since interventions in agriculture are multi-sectoral partnerships. No one institution can do it alone therefore there is need for collaboration.

DAY TWO - SESSION FIVE: PANEL DISCUSSION

Introduction and Panelists' Views

This session was chaired by Dr. Joseph Karugia, the coordinator of the Regional Strategic Analysis and Knowledge Support System-East and Central Africa (ReSAKSS-ECA). He welcomed the panelists to introduce themselves. These were; Mr. Antony Kioko the CEO of Cereal Growers Association (CGA), Mr. Abraham Barno, Senior Assistant Director of Agriculture in the national government, Mrs. Dorcas Mwakoi, Kenya Program Manager, Africa Lead II, Mr. Simon Gathara, the Assistant Director for Kenya Meteorological Services (KMS), Dr. Joyce Malinga, the Director of Food Crops Research at KALRO Kitale and Mr. Mulinge Mukumbu, the Deputy Chief of Party for the Kenya Agricultural Value Chain Enterprises (KAVES).

The chair started by pointing out that Kenya is among more than 40 countries that are implementing the Comprehensive Africa Agriculture Development Program (CAADP), an initiative under which countries are being supported by the African Union Commission (AUC) and NEPAD to monitor sector-level indicators. This is part of the Africa Peer Review Mechanism (APRM) where bi-annually, heads of states will be reporting to their peers on the performance of the agricultural sector. To be able to monitor the sector performances, partnerships are required and what is being done in Kenya now is helping to catalyze this mechanism by bringing together the various partners that need to work together to monitor the sector performances. Kenya has a major role in this initiative through a body called the Kenya SAKSS (Kenya Strategic Analysis and Knowledge Support Systems), which works together with (MoALF) and other stakeholders to get the mechanisms running smoothly.

The chair said that the panel session was the last one in the conference but the most important because that was where all participants would pull together their deliberations to come up with recommendations that can be followed up, to accelerate the process of smallholder farmer transformation. He reminded the audience that agriculture was contributing 25% of GDP and 75% of labor force is employed in the agricultural sector. However, he observed that those in the non-agricultural sector were earning three times more than those in the agricultural sector. He wondered how the gap can be closed so that all sectors earn equitably. The panelists as experts in their own fields were to help identify and give recommendations on the constraints in agriculture.

The panel was to first identify conditions necessary to create the knowledge base that will drive the transformation process then learn from the lessons from other economies or countries and showcase how Kenya can take advantage of the existing opportunities in the regional integration agenda and the globalization process that is accelerating very fast. Lastly, the panel was to provide ways of how smallholder farmers can exploit these opportunities.

The first panelist to contribute was the Chief Executive Officer of Cereal Growers Association Mr. Antony Kioko. Being a representative of farmer organizations, he addressed three key issues:

First, he pointed out that farmer organizations need to be business oriented so that they can take advantage of upcoming business opportunities. Secondly, he referred to devolution as both a blessing and a curse to farmers. A blessing in the sense that on one hand, access roads and other infrastructure have been improved, cooperatives have been revived and these have helped in creating opportunities to the farmers. On the other hand, there has been an increase in the cost of doing business where farmers are required to pay cess for produce within each County they pass through. For example, a farmer transporting produce from Trans Nzoia to Nairobi will have paid levies more than three times. He revealed that CGA had gone to court to challenge these levies and the practice was found to be unlawful. The problem still exists because in Kenya, winning a court case and having a problem solved is a difficult task. Finally, he mentioned the conditions necessary for these farmers to take advantage or benefit from the changing circumstances including access to technology and information in a better form through research and

development to benefit farmers more. He also said that farmers need to be assisted to access new markets and in diversifying their enterprises and income sources.

The second panelist was the Senior Assistant Director of Agriculture in the National Government, Mr. Abraham Barno. He said that the department of agribusiness has been looking at how to transform smallholder farmers into entrepreneurs. The general feeling within the department has been whether there is need to continue focusing more on small-scale farmers given the fact that they have been trained and given additional resources. He said that the greatest challenge impeding farmers' transformation is poor technology adoption resulting into persistent low production, poor organization of farmers, inadequate access to credit and insurance, and poor support policies in marketing of produce.

He added that innovative ways of credit access should be identified where the banking sector should come in strongly. He informed the audience that on 10th November 2015, he had attended the launch of Barclays Bank Agribusiness component, to see how they can start investments in the small scale agricultural sector. He mentioned the credit guarantee system being implemented by the ministry under 'Kilimo Biashara' was done through Equity bank, Cooperative Bank and Kenya Women Finance Trust. He acknowledged that the strategy did not actually facilitate access to the small scale farmers but it was a good intervention which ought to be revised and strengthened. The dependence on rain-fed agriculture was another challenge for which the national government had already allocated funds to develop irrigation systems.

Mr. Barno admitted that implementation of marketing policies by the government had been poor and the strategy of putting markets before production so that farmers can produce with an intention to satisfy demand has been the weakest point. The role of National Cereals and Produce Board (NCPB) had not been very well articulated in terms of being the buyer of last resort and how they are supposed to source under the strategic grain reserve component. He pointed out that Tegemeo Institute's research on maize value chain in 2015 was very critical because it revealed that majority of those selling maize to NCPB were not small scale farmers. This revelation has prompted the National government to look keenly at those selling their maize to the cereals board so that the element of price support mechanism which has been put by the government to allow farmers to at least break even is achieved. The sector needed a tailor made capacity building strategy yet the national government had failed to assist the County governments

especially in areas such as policy making. He asked about the availability of technology which farmers can purchase to access market information and suitable insurance products for farmers. He felt that County governments are unable to identify potential local, regional and international markets and, therefore, national governments must do it so that counties can take advantage. Another area he noted was the need for improvement of last mile marketing infrastructure including the adoption of structured trading practices. The EAGC had already started pushing for the adoption of the warehouse receipt systems and commodity exchange, and other market strategies which can help both in cushioning farmers against their risk (mitigation) and also facilitating them to get instruments for collateral for acquiring credit as they wait to sell at the right price.

The third panelist of the session was Mrs. Dorcas Mwakoi, Kenya Program Manager, Africa Lead. She said that under the current credit portfolio of agriculture, only 3% was being utilized. There is need for appropriate policies to enhance credit access or access to finance by smallholder farmers. On policies and appropriate regulatory mechanisms that affect the smallholder farmers, she said Kenya was good at developing wonderful policies which are never implemented effectively. She gave an example of how Nigeria picked Kenya's ASDS and implemented it in their country and wondered why Kenya was very poor in policy implementation. Before the year 2013, a number of policies were allowed to pass yet their alignment to new constitution and relevance in the light of current structures in devolved units were questionable.

Touching on inputs and appropriate technology access to farmers, she was categorical that governments should not engage in fertilizer business but instead create an enabling environment that will enhance growth to the private sector by encouraging appropriate business models.

She also said that there was an overhaul of National Agricultural research system that paved way for the current Kenya Agricultural and Livestock Research Organization (KALRO). However, there is no inter-phase between KALRO and the County governments. She stressed that the role of demand driven technology through research and development should not be lost and that there are great opportunities at the continental level for Kenya and Africa as a whole. Kenya is ranked among the fastest growing economies and was recently ranked high by the World Bank in terms of the ease in doing business yet the country can only sustain an average of 13% of its own

needs. She asked participants to think about the reason why there is a large population in need of food.

Under supply opportunities, she said that Africa has a potential of an annual agricultural output increasing from the current 280 billion US dollars to 800 billion US dollars by the year 2030. Smallholder farmers should be encouraged to take up the opportunities at the County level now that the World Bank has projected that agriculture and agribusiness will grow to become a multitrillion dollar sector. She lauded the national government for coming up with a new agricultural policy but challenged them to evaluate how the agricultural strategies are aligned to the continental goals and opportunities with devolution in place.

In conclusion, she made four key comments;

- Rethinking about the strategic approaches Kenya needs to adopt to enhance smallholder agriculture, success from a policy perspective can be realized through evidence-based planning using valuable information derived from valid data.
- Mutual accountability framework: everyone must be accountable - right from the government, private sector to the development partners. How actively involved are non-state actors like the farmers and what are their roles? When the government says that farmers have been over trained but no improvement is being realized, who bears the blame?
- Coordination and inclusiveness is important and Kenya has done well in its dealings with development partners where the latter is required to sign a code of conduct governing their engagement with the government.
- There is need for appropriate policy plans and institutions. Kenya has all the resources but transformative leaders, mindsets and changed attitudes are vital. The County governments inherited staff from the national government while others were employed at the County level. All these should be harmonized for actions and results and increased partnerships.

The fourth panelist was the Assistant Director of the Kenya Meteorological Services, Mr. Simon Gathara. He emphasized that he wanted to highlight the main constraints in transformation of smallholder farmers with respect to climate change and variability and focus on the role of KMS. The constraints were directly related to the weather advisories or climate information. There were three factors he wanted participants to consider;

- First, he explained that the role of the Kenya Meteorological Services (KMS) was to issue a whole range of reliable climate forecast-daily, weekly, monthly updates and the most importantly the seasonal climate forecast.
- Secondly, he said that with all these forecasts, KMS has the responsibility to ensure that this information is disseminated in time.
- Lastly, when the farmer has the information it's important to know whether they know how to use it while making decisions in their normal agricultural activities.

He wanted to make it clear to everyone that issuance of reliable and timely climate forecast squarely lies on the responsibility of KMS while application or the utilization of this information requires collaboration with the Ministry of Agriculture, Livestock and Fisheries to aid in interpretation. The KMS has its own data which is continually collected and updated, also gathering more data from other continents e.g. El Nino data from all ocean stations around the world. He informed the audience that KMS had already decentralized their services by transferring senior staff to the counties as the County Directors of Meteorology whose responsibility is to ensure that users understand clearly the information relayed to them in their respective locations. They have to work hand in hand with other County staff to be able to conceptualize the effects of diverse climatic conditions forecasted. The Department is also determined to improve its capacity especially in human skills to do much more accurate forecasts through the use of modern technology.

He concluded that KMS was also working with partners and stakeholders through Participatory Scenario Planning (PSPs) where they discuss and come up with single conclusive advisory that has all elements expected to impact all socio-economic sectors.

The fifth panelist of the session was the Director of Food Crops Research Institute at Kenya Agricultural and Livestock Research Organization (KALRO), Dr. Joyce Malinga. She started by making reference to a recently released book called Africa's Potential for Agriculture 2015 by Howard G. Buffet. According to the author, the returns on interventions would best be earned if improved farming techniques were undertaken. This recommendation arose from a research done in various African countries which she explained showed a possibility of getting an improvement of 50% in agriculture production and productivity. These improved farming techniques could

also be termed as modern farming and is composed of improved seed, mechanization, improved soil fertility management and pesticide use.

She noted that research has not been supported to do or undertake crop management with a lot of focus being on plant breeding and release of varieties. The Vision 2030 is based on science, technology and innovation. She said that no financier will fund what it doesn't drive and as KALRO is heavily donor funded the whole institution does work that belong to the donors even though that is not their desire. She implored on decision makers to try and inform on what they think the country needs if it has to achieve different goals. As the agriculture function had been devolved to the County governments with a mandate to make decisions, she wondered whether they are willing to support research. Kenya has the facilities and human resources but lacked commitment to fund research where KALRO can help in coming up with good quality data.

She observed that according to Howard Buffet, there is no information on the number of agriculture graduates that are coming out of our universities. She asked Tegemeo Institute if that information is vital especially now that research has shown that at least 90 graduates are able to assist 1 million farmers in Ghana. She said there is need to start focusing on agriculture from the primary level education, to excite young people at the formative years and allow them to make choices willingly to pursue agriculture later at the university which will surely bring some change.

On women and agriculture, she concluded that men should be closely involved in the strategies that target women because it is they who have the power of control over key agricultural resources.

The last panelist was the Deputy Chief of Party of Kenya Agricultural Value Chain Enterprises (KAVES), Mr. Mulinge Mukubu. He had prepared to share his views and perceptions which he had developed over his interactions with issues that had been discussed, his experiences of about 25 years working on policy analysis, development projects design and implementation most of which took place outside government.

He addressed three issues; smallholder transformation, devolution and land issues. Smallholders cannot be transformed without their active involvement because they are part of a supply chain system that delivers commodities to and also receives other commodities from the system. He gave an example of a recent opportunity where they were introducing a very effective post-

harvest handling technology and farmers were very ready to take it up but later discovered that there was no private sector delivery system for it. The adoption could not therefore work. Farmers have knowledge but because of the policy environment and capacity constraints the system cannot help satisfy the intention.

Looking at land matters from an agricultural transformation and economic perspective, he advised that Kenya should dwell more on land use than land ownership. He felt there is too much focus on land ownership yet land is just a factor of production and the size isn't really a constraint to the transformation. We should appreciate that transformation in history has occurred through an interphase of technology and a policy environment that allows the agricultural supply chain to work. He said that we should ask ourselves whether we need a land use policy that targets people that use land as a factor of production and actually earn the highest returns from it. He proposed a land policy system that penalizes people for idle land or using land sub-optimally including those that use it to bury their deceased relatives. The policies should also give incentives for people to generate higher returns from land. Unless this is done we will never stop talking about 13% of the land being idle.

He reminded the participants that there are countries in the world drier than northeastern Kenya but produce fruits and other crops more competitively for international markets while others have reclaimed land to do dairy production efficiently.

Lastly, he said that despite all the challenges faced in devolution, it is the best thing that ever happened to the country because it can be a spring board towards agricultural transformation. One of the challenges he had found is that the private sector is viewed suspiciously by the public sector. There is a dose of suspicion that drives the policy agenda which has gone from the national government to the devolved units. He said that County governments feel they should be "everything to everybody"; investing in markets, factories, doing the trading while the private sector players are viewed as basically thieves and scandalous people going around exploiting farmers. He concluded that transformation will be achieved through an interphase between policy makers commitment within an environment where technology can be adopted by farmers and by the rest of the players in the supply system that farmers work in.

The chair thanked the panelists and highlighted a couple of issues from the discussion. They included:

- Importance of strengthening farmer organizations
- The need of the national government to recognize the role of supporting policies. Lack of implementation of good policies is a constraint.
- Opportunities in the continental frameworks and the need to align with them.
- Need for metrological data to be reliable and properly communicated so that it is of help to users However, there is need for good perception by the public on the metrological data.
- The need for increased local funding of research and also proper prioritization of research areas for funding
- Our policies and interventions need to put into consideration the important role that women play in agriculture.
- Need for increased incentives to land use. With policies giving incentives for people to generate higher returns from land, land will be less of a constraint than perceived.

Questions, Comments and Clarifications

A participant from Future Agricultures Consortium questioned the ethics in our places of work. He said that work ethics should be driven by trust and fairness. He further said that incentives should be structured to recognize and reward performance. The participant also raised issues in power relations. He noted that there is a tendency in Kenyans to be obsessed with power and money and which can interfere with employer-employee relationships.

A participant from Farm Concern International commented on the issue of NGOs supervision. He said that the main concern with NGOs is not supervision but rather the little collaboration with departments in the central and County governments. He said that this is depicted mostly in the agricultural departments. He asserted that NGOs have good models and cited the commercial village model. The model incorporates all the production factors including; capacity building, youth, and women among other needs in the market. He also said that there is a need for key advisers to the government to work towards bringing inclusive collaborations between the government and other stakeholders such as NGOs, input dealers, and even education curriculum developers.

The participant also wanted to know the interpretation of weather forecast data from the Kenya Metrological Department concerning above or below normal rains/temperature. He was particularly concerned with the term “normal”.

In response to the question, Mr. Gathara said that they have historical data from which a long term mean of a particular region over the past 30 years is calculated and is termed as normal. A forecast ranging between 45 to 75 percent to the mean is normal. Above 75 percent is above normal while below 45 percent is termed as below normal. He also advised the participants to visit their website for such explanations.

There was a concern by a participant on youth involvement in agriculture. The participant observed that farmers are aging and consequently, ways and means of bringing youth on board should be explored. She said that technology and youth should be considered as we focus on improving productivity. She also suggested that the education curriculum should be reviewed so that youth are introduced into agriculture.

A participant from USAID-Kenya said that farming in Kenya is expensive compared to other countries thus making it uncompetitive. He cited mechanized irrigation and green houses as examples of expensive ventures. He said that most irrigation projects collapse and the only surviving ones are on gravity systems. Their high costs of mechanization are traced to taxation. He said that our tax regime should focus on the affordability of our agricultural inputs.

He also advised that our focus should be on conservation of the soil and water as opposed to limiting ourselves to fertilizer use. This, he said is because the soil is composed of only about 10 to 15 centimeters in depth hence making it a very fragile part of the land.

Another participant from USAID-Kenya said that in the last five years Kenya has made a lot of progress. On devolution, he reiterated the fact that it took the United States of America nearly 200 years to sort out relationship issues between the states and the federal government. He said that there is nothing more important than getting devolution right as far as agriculture is concerned. He acknowledged the existence of problems and issues but was confident that with available intellectual leadership, they will soon be sorted out and agriculture will get to where it ought to be.

He commented on intergovernmental structures to transition into devolved units saying they should be effective so that strategies and approaches between the national and County governments are clearly defined and communicated.

He also focused on the issue of having one strategy that people can relate to. He said that there should be mutual support for a project so that development partners and everybody is conversant with the strategy and can, therefore, align themselves to support it. He said that as the national government takes into account devolution and role of counties, there is a lot to draw on.

He asked the Director of Crops at KARLO to clarify why there have been a number of technologies developed but not yet released to the public. He further said some of the technologies are in the value chains where the government has an important role. He cited several seed varieties developed by KALRO yet they are not released.

A participant was concerned about the fact that since the 1980s, the focus has been on increasing access to fertilizer and extension services for the smallholder farmers. The constraints, he said have, however, increased to include declining unit fertilizer response rate and the population increase that have led to land fragmentation. With many transformations not being realized, he challenged the participants to ask themselves what they have not been doing right or rather where effort needs to be put so that transformation and success can be realized in agriculture.

The VC-designate, Egerton University, Prof. Rose Mwonya made an observation on the Kenya meteorological department's predictions. She said that the predictions in other countries are accurate while those from the KMS are inaccurate and wondered what could be the reason behind it. She termed inaccurate predictions to be affecting farmers.

Reaction to Questions and Comments

The chair noted that the session had run out of time. He therefore, asked each panelist to pick questions/issues that he/she can directly answer in the shortest possible time.

The first panelist to react was Mr.Kioko. He reaffirmed the comment raised earlier by a participant on youth involvement in agriculture. He made an observation that youths are sometimes placed in the wrong corner of the value chain; mostly confused with the actual tilling of land. He advised that youth should be rightly positioned. He gave an example of youth involvement through service provision in drier technologies (threshing) that CGA and KAVES

introduced. He further said that youths who have joined groups could be involved as trainers as they are better placed to carry out training on behalf of other group members.

Mr. Kioko restated what was said earlier about tapping on the resource and partnerships. He encouraged the County governments to look at what they can partner to do with the private sector. He said that from his experience, companies including East Africa Breweries, Bidco among others are willing to work with the County governments and use their resources to promote specific value chains from which they can derive some benefits. He placed the issue of partnerships as a take home challenge to the participants.

Mr. Barno addressed the issue of taxes on technologies. He said that taxes on technologies (includes machinery or equipment) is an issue which has generally been raised in other forums. He said Kenya Private Sector Alliance (KEPSA) which is the lobbying body for the private sector has got a forum called the presidential round table which deals with issues of taxes targeting different sectors.

He also talked about the support received by bills related to agriculture. He gave an example of the recent issue of sorghum with EABL in which exercise tax was waived and, therefore, farmers are able to sell sorghum to EABL. He advised that for any discussion on taxes to be successful, the government looks at a win-win situation whereby with any alterations, generation of adequate taxes will still be realized.

Ms. Mwakoi was the third panelist to give her reaction. On ethics and values, she observed that the best thing that can happen to this country with devolution is all about enhancing governance. The whole question lies with the repercussion, i.e. what we can do to those involved. Kenya can borrow from countries that have done well, for instance, Singapore, with whom Kenya was at the same level in the year 1963 and why they have moved further than us in economic development. She said that there are many lessons we can borrow from other countries.

On the issue of enhancing intergovernmental relations and how structures can be made to work better, she talked of two approaches: function following the form or form following the function. She said the key issue is that there is probably a lot of the form following the functions as a lot of structures being put in place without a guiding policy framework that clearly defines the structure and roles of these functions. She said that the issue is important and needs to be looked at. She, however, said that the ministry is undertaking a lot of studies within CAADP framework

especially to strengthen policy implementation. Under the same framework, ReSAKKS is undertaking the review of the joint sector process. Joint sector review enhances mutual accountability frameworks and was done in 2011. She said that the joint sector review needs to be enhanced such that each player asks themselves what their roles, goals they had as a sector and whether they have achieved, what they need to change or put afresh in terms of the issues like those raised in the conference. Within the joint sector review process that is taking place, there is deliberate effort to have an in-depth institutional architecture review, for instance, the intergovernmental structures that will guide the sector better.

Mr. Gathara was the fourth panelist to comment. He said that for some time, people had wrong perception about the weather forecasts issued by the department and have carried the same up to now. He however said that things have changed for instance from around 1997 (the time when El nino first occurred) when KMS started the whole range of climate outlook forum. He said that the forecast given at the beginning of every season is not developed by Kenya Metrological Service alone but in collaboration with other centers of climate prediction excellence in USA, South Africa and Europe among others. He further said that there has been a consensus with traditional forecasters. Thus, the forecast has both scientific as well as traditional aspect and is therefore forecast out of consensus.

He said that western countries are able to give more accurate forecast because they have been doing it for many years (older than us) and they are better in many ways. Their technologies are better developed hence the modelling as well as computers used in Kenya come from those western countries. They also live in the extra tropics where some of the weather patterns are much easier to monitor than where we are located.

Dr. Maling'a responded to the question on availability of developed seed varieties. She said that KALRO is using value chain approach to develop seeds. She recognized, though, that not all things can be done in the value chain system. She said that maize is an important crop and currently there are at least sixty maize varieties commercialized. It is recognizable that KALRO do have other crop varieties for instance green legumes like beans. Due to the importance of maize to the community, seed companies see mainly opportunities in producing maize varieties.

She said that the conversation on seed availability has been taking center stage since the year 2014. At around June 2015, under the auspices of Agri-experience Limited, KALRO held a

meeting with twenty seed companies to discuss the issue of seed availability. Seed companies claimed that making money out of variety development takes between two to four years as they have to bulk it. They further claimed they do not find enough seeds from KALRO even after signing up for them. She clarified that KALRO gives out seeds through licensing. This means that anyone obtaining seeds has to be licensed. She said that the process has been a drawn back as access has been limited. She however said that KALRO is in the process of availing information on the website because they recognize that seed companies are the ones who can drive the economy by availing the seed to farmers. Though the process is a bit complicated, she said that they are working on it.

Mr. Mukumbu was the last panelist to give his views following the question session. He termed the issue of ethics as one of the biggest challenges the country faces as it moves forward. He said that everything else depends on it. It determines how both the public and private sectors behave. Money and greed, he said, have been exalted to a level whereby it is no longer just public sector corruption. Part of the reason why our farmers are finding great difficulty to trade in the international and even local markets is due to the fact that their products are very expensive. He gave an example of groundnuts where a farmer in Malawi can deliver them to Thika at KES 45 a kg while a farmer in western Kenya would deliver the same at KES 175. For both farmers, the cost of production could be about KES 30 a kg. However, Kenyan farmer wants to make a huge profit. He termed it as greed. He consequently said that we need a revolution on greed as it determines our work ethics, attitudes, and it breeds a lot of suspicion especially between players whether private or public.

On devolution, he said that one of the opportunities of devolved units is in the area of market development. He said that from the analysis that they have done, first level aggregation is one of the biggest challenges to transformation and the ability of smallholder farmers to play their role effectively in the value chain. This is because they cannot easily achieve the volumes and the quality that the rest of the supply chain requires. He, therefore, proposed that counties put their investments in developing markets in collaboration with private sector players in a genuine private-public partnership, where the public sector truly believes that the private sector has the national good at heart though they still have to make a profit. Most of the County governments are developing markets. However, they still want to run them even with known mismanagement, notwithstanding the fact that government cannot do business. To make it a major intervention,

County governments should concession its running to the private sector on well-agreed rates and frameworks. To reduce competition on land he said (on a lighter note) that County governments should follow the example of Kiambu County where penalties are put on those burying people on agricultural land and encourage to burry on well planned and developed cemeteries.

Close of Discussion

Bringing the session to a close, the chair highlighted some of the suggestions as to why good policies are not being implemented. He added that inappropriate policies are also being implemented very swiftly giving an instance of the multiple taxes among others.

Some of the reasons for not implementing good written policies include:

- Lack of effective stakeholder engagement and inclusiveness: National government is not engaging genuinely with the County governments, farmers, the private sector, development partners and the civil society so that the policies, plans and strategies have the input of all the actors.
- Secondly, the planning and development of the policies are disconnected from budgeting processes. Having plans without budget associated with them makes them not to be implemented. He said that budgeting process needs to be linked with planning.
- Thirdly, lack of monitoring learning and evaluation. We never ask the questions such as “Did we get to where we wanted to go, and if we did, why and what lessons do we learn as we move on?”

VOTE OF THANKS

-Director, Tegemeo Institute

-Dr. Mary Mathenge

Dr. Mathenge appreciated all the participants for their work in the two days of the conference. She acknowledged the financial support from USAID to the Institute. She further acknowledged the support and participation from the MoALF, County governments, KMS, KNBS, NCPB, NIB, as well as other parastatals and government departments. She also appreciated civil society and private organizations such as EAGC, CGA, KAVES, FTF Innovation Engine; other research institutes and universities, for instance, KALRO, KIPPRA, ReSAKSS and various universities; colleagues from Egerton University; and collaboration from Michigan State University among others. Dr. Mathenge further appreciated the entire conference planning committee led by Dr. Lilian Kirimi for their effort to make the event a success. In addition, Dr. Mathenge pointed out as a way forward:

- Policy briefs related to all the presentations will be put on the Institutes' website for stakeholders to access.
- The power-points will also be put online
- Suggested corrections will be incorporated in the respective draft papers and also put on-line after being finalized
- Conference proceedings will be prepared and shared to all the participants

After Dr. Mathenge, Prof. Rose Mwonya appreciated Tegemeo Institute for organizing the conference and also appreciated the participants for their patience. She mentioned that the Egerton University's Institute of Capacity Building, Institute of Crop Management and Institute of Gender will deal with some of the issues raised. She praised the out-going Vice Chancellor, Prof. James Tuitoek for his keen interest in issues of gender.

CLOSING REMARKS

-The outgoing Vice Chancellor, Egerton University

-Prof. James K. Tuitoek

In his closing remarks, Prof. Tuitoek expressed the pleasure of Egerton University, through Tegemeo Institute, to host the team of researchers to deliberate on key issues, which makes the university achieve its objective of engaging its stakeholders in agricultural policies. He mentioned that although Egerton University has expanded to deal with other sectors, the university still believes in agriculture. Moreover, a majority of the staff at the university are members of the faculty of agriculture. Even as he prepared to leave the University, Prof. Tuitoek believed that Tegemeo would be strengthened as a research institute. He emphasized that continuous engagement is important so as to learn of new issues. He mentioned that the Seeds of Gold magazine and TV program, which are products of collaboration between the University and Nation Media Group, have reached a large coverage, and as a result, many farmers make calls to ask questions. Despite this, the university faces a few challenges:

1. How can the various challenges in different counties be dealt with?
2. The agricultural sector is poorly funded and County governments seem to be an extension of the national government because funding of the County government is controlled by the treasury/national government. There is need to give counties autonomy in expenditure and leave them to account for their spending

He mentioned that many extension programs have been tried in the past e.g. the T&V system, farmer systems, and farmer schools, yet all were not as successful and farmers are still the same. Even the famous extension program in Uganda, NAADS, was abandoned because it was unsuccessful.

To address some of the challenges facing smallholder farmers, he mentioned that Egerton University has remodeled its field attachment program. The program now involves students continuously monitoring individual farmers over time and recommending to them appropriate farming technologies. This is aimed at transforming the smallholder farmers to be commercially oriented. However, a major challenge for this program is the rising demand from other counties

since the University's scope is limited to Nakuru and Baringo counties. He called on other universities to adopt the same system and to address the problems facing smallholder farmers.

In terms of policy, Prof. Tuitoek mentioned that Tegemeo Institute serves to address policy issues in agriculture. He said that the Institute is unique in the sense that it has a supervisory board which monitors its effectiveness on a periodic basis. While expanding its mandate, he believes Tegemeo is an institute serving East Africa. He promised to offer his continued support to the Institute even as he leaves office and wished Tegemeo success. He called on the participants to engage the Institute in policy research and officially closed the conference.

After these closing remarks, the conference ended with a word of prayer from Ms. Beatrice King'ori of the National Irrigation Board.