



**REGIONAL ASSESSEMENT OF  
AGRICULTURAL PRODUCTION,  
CLIMATE CHANGE,  
AGRICULTURAL TRADE AND  
FOOD SECURITY INCEPTION  
WORKSHOP REPORT**

**MAY, 2014**

**6th May, 2014**

**Nairobi Safari Club,  
Nairobi Kenya**



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## **SESSION I: OPENING**

The workshop started with opening remarks from Ms. Nancy Laibuni. In addition she gave a brief description of the institute. She noted that KIPPRA is an autonomous public institute that was established in 1997 established under an Act of Parliament.

The Institute undertakes the following activities

- Conducts objective research and analysis on public policy issues with the goal of providing advice to policy makers.
- Provides advisory and technical services on public policy issues to the Government, government agencies, and other stakeholders.
- Collects and analyses relevant data on public policy and disseminates its research findings to a wide range of stakeholders through workshops/conferences, internal seminars, research papers, policy briefs, a newsletter, and the Kenya Economic Report.
- Develops and maintains research resources and databases on public policy and related issues, and avails these to the Government, the private sector and academic institutions.
- Undertakes contracted public policy research and analysis for the government and clients from the private sector.
- Undertakes capacity building activities –young professional training.
- Serves as a point of contact and encourages exchange of views between the Government, private sector and other civil society.

A special address was delivered by Dr. H. Admassu from the UNECA secretariat. He pointed out the importance of evidence based policy research in dealing with climate change. He mentioned that the secretariat expectations in the workshop are to find out how the division of roles had been done in the project and to establish the efforts for partnership which had been undertaken. He also said that they were interested to find out whether there were any challenges that KIPPRA and WMO were facing in the implementation of the project.

Dear Dr John,  
Executive director of KIPPRA,  
Workshop participants,  
Lady and Gentle Men,

It is an honour and privilege for me and my colleague to be among you today representing the Secretariat of ClimDev Africa (Climate for Development in Africa) – ACPC (African Climate Policy Centre ) participate on this inception workshop on a project sponsored by ACPC. This will be of much help in order to assess the climate change effects and its changing potential in changing everything vital to human survival.

As we are well aware, agriculture in Africa contributes on average 34 per cent to the GDP and, supports the livelihoods of nearly 70 per cent of the population. Being almost reliant on rainfall resource, the sector remains highly vulnerable to the impacts of climate change and climate variability. Climate change also imposes significant threats to the achievement of Africa's developmental objectives in sectors like energy and water. The recently released IPCC WGR I Fifth Assessment Report has made it clear that African vulnerability to the impacts of climate change will even be heightened. Obviously, this will be a major stumbling block to the rising African transformative development. Without increased investment in combating climate change impacts, food production will never come closer to meeting the demands of ever increasing population. Therefore, science-informed and evidence-based policy, planning and practice are essential in ensuring that development is more resilient and less vulnerable to the negative impacts of climate change and in fostering sustainable development.

Dear Dr John,  
Workshop participants,  
Lady and Gentle Men,

ClimDev Africa programme was established by AUC (Africa Union Commission), AfDB (Africa Development Bank) and UNECA (United Nations Economic Commission for Africa) in response to the urgent challenge that climate change poses to the achievement of Africa's transformative development objectives. It seeks to overcome the lack of essential information, analysis and options required by policy and decision makers at all levels. ClimDev Africa is coordinated by the ACPC. The Centre has been functional since November 2010.

Dear Dr John,

Workshop participants,

Ladies and Gentle men,

Dear Dr John,

Workshop participants,

Ladies and Gentle men,

As a part of its mandate, ACPC has initiated a number of studies and analytical activities principally for knowledge generation specifically aimed at providing the empirical basis for policy recommendations. It has been focusing on linkages between the impact of climate change and policy response for effective development planning.

One of the ACPC initiatives is a regional study on agricultural production, climate change, agricultural trade and food security. These are being conducted in parallel one in the East African Community (EAC) and the other in the Economic Community of West African States (ECOWAS). The studies explore the impacts of climate variability and climate change on agricultural production in the regions, examine how regional trade policies influence food security and assess how the policies could be enhanced to promote agricultural production and intra-regional trade in food commodities for increased food security in response to the impacts of climate change. Obviously, one of the key partner's institutions for EAC is KIPPRA.

Dear Dr John,

Workshop participants

Ladies and Gentle men,

First of all, on behalf of ACPC secretariat, I would be very pleased to thank KIPPRA for organizing this workshop after delivering the detailed methodologies for each of the three components of the research areas. This will guide as division of roles and responsibilities among identified partners and will be helpful for gaining a common understanding of the task at hand .

Going through the agenda, I have noted that we will have the opportunity to discuss the various components of the project and ensure that the various partners will have good understanding of the tasks at hand towards achieving the outputs of the project.

Our mission includes, but not limited to:

- Gaining an insight about the status of implementation of the project,
- Assessing issues relating to the development of partnership as can be demonstrated by the number of countries represented and LoA's signed between KIPPRA and identified partners.
- We would also be assessing the challenges that KIPPRA has been facing in getting started and implementing the project activities since January 2014
- We would also be interested to gain understanding of the extent to which KIPPRA has brought on board a workable plan for all partners
- Assess preparedness of KIPPRA and the identified partners to share initial scientific knowledge emanating from the current research during CCDA-IV conference and Climate Summit 2014: Side Event on Climate Change in Africa which will be convened under the theme: "Moving against the tide! "Africa rising to seize climate change opportunities" – Water, food and energy

I hope that we will have very fruitful deliberations. I Thank you so much for your attention.

Habtamu Admassu, PhD

Senior consultant, Agricultural production, climate change, trade in agricultural commodities and food security

Africa Climate Policy Center

Special Initiative Davison

Nairobi-Kenya

06 May 2014

Nairobi-Safari Club

**Key note address: Harnessing Ecosystem-based adaptation approaches for food security: Implication for policy by Dr. Richard Munang.**

The key note address was delivered by UNEP-Africa Regional Office for Africa (RAO) coordinator for climate change, Dr. Richard Munang. He highlighted the major issues, goals and policy proposals in areas of resilience and risk management in relation to climate change and agriculture. He mentioned that climate change is no longer an abstract issue given the recent severe droughts in the Sahel in 2012 and in the Horn of Africa in 2011. He said that this underscores the urgent need to build resilient systems in order to reduce the vulnerability of Africa's one billion citizens. With respect to this, the presenter made reference to the [African Adaptation Gap Report](#) (AAGR) launched during COP19 which details exactly what is needed and what will happen under each scenario of warming; the report indicate that if mitigation efforts fail to keep temperatures below 2°C (a nearly eminent occurrence) and if the world hits 4°C (a 40% probability of occurring), the current maize, sorghum and millet cultivars will become unviable in their current locations, spiking food insecurity, and devastating health and livelihoods.



The presenter said that Africa's growing population may constitute 23% of the global total by 2050, which will necessitate governments and states to provide opportunities for food security. He said the big question therefore will be what types of measures and approaches are required for the changing needs for food security and climate change resilience? He mentioned that this will call for innovative solutions that build on an internally driven process of change by individuals, communities and institutions coupled with adaptation to climate change. The presenter identified one solution as the Ecosystem-based Adaptation (EbA) which provides flexible, cost effective, and broadly applicable alternatives for building robust food systems whilst adding climate change resilience. He said that current food security policies continue to focus on the same three issues – agricultural productivity, trade and macro-economic policies (IUCN, 2013) – all of which have an array of diverse actors seeking often unsustainable and sometimes opposed goals while neglecting the central role of ecosystem management. He emphasized that effective policy for food security should value ecosystems as productive assets. Dr. Munang mentioned that implementing EbA could carry the following benefits for Africa's trade:

- I. Increase trade volumes
- II. Increase national earnings
- III. Provide new products
- IV. Increase trade diversification (with same or similar resource use)
- V. Increase access to higher quality markets

He also mentioned that communities across Africa are already building resilience to climate change by stimulating their existing ecosystems. He said what is needed is to bring these isolated success stories to scale, to make them the rule rather than the exception. He said that this is the only way that Africa will be able to achieve the envisaged food secured society, in which its population does not experience the fear of want.

**Comments:**

- It would be more appropriate to combine the use of fertilizer and ecosystem based approaches to bridge the yield gap.

- How do we say that Africa has the potential to feed the world yet since independence we have been relying on foreign aid and given that we have a lot of untapped resources and most of our indigenous crops have been replaced by genetic crops?
- EbA is essentially what is commonly referred to as sustainable agriculture. It is a system that has been used in most developed nations and it has been successful in addressing issues of food security.

### **Response**

- Increase use of inorganic fertilizer provides short term gains but it is not a sustainable measure to bridge the yield gap.
- Ecosystem based approach is not the only solution to adaptation to climate change but one among many other solutions.
- Africa needs holistic approaches to solving food security problems and more importantly we need to adopt natural approaches.

## **SESSION II: CONCEPT NOTE PRESENTATIONS**

### **Explore the Spatial Effects of Climate Change on Agricultural Production and Food Security in the East African Community Region by Mr Joshua Ngaina**

The presenter started by giving background information on climate and agriculture. He said that warming of the climate system is unequivocal and the challenges climate change pose for development is considerable especially in the Agricultural sector. He said that countries in EAC continue to experience increasing climate variability, declining food production and hunger and these limits their ability to attain food security. He mentioned that climate and crop models are being used to understand effects of climate

change on agricultural production; he said that crop models are used to analyse climate sensitivity of agricultural systems, potential spatial shifts in agricultural areas and changes that affect food production, supplies and distribution. This will enable countries adapt their production techniques and productions to the new conditions

### **Component Objectives**

- To downscale climate models output
- To analyse historical, current & future trends in climate at both temporal & spatial time scale over EAC
- To determine the impacts of climate change/ scenarios on agricultural production systems over EAC

### **Project Component Activities will include:**

- Review literature on climate change modelling in the region
- Data collection, cleaning, geo-referencing, digitizing, formatting and storage of primary and secondary data
- Identify institutional partners for the component
- Determine and assess the skill of Regional Climate model in downscaling climate information
- Climate model simulation using different scenarios
- Identify the major agricultural production system critical for food security in the region
- Assess the skill of crop response models (APSIM and DSSAT) in simulating agricultural production
- Model simulation of the impacts of climate change on the production systems
- Report on the impacts of climate change on major agricultural production systems in the region (Capacity building through training & Sharing)

### **Scope of the Study**

He said the study will focus on EAC countries namely Kenya, Tanzania, Uganda, Rwanda, and Burundi and will be limited to maize crop production Agro Ecological Zones of countries in EAC

### **Climate and crop modeling approach**

#### **Review literature on climate change modelling in the region**

He said that desktop review of literature on climate change modelling in the region will be done as well as review of peer reviewed journal articles and published documents. He said that the focus will be on the applicability of the different climate (both RCMs & GCMs) and Crop response models in East Africa Region to identify best climate models.

#### **Primary & Secondary data collection/ Preparation**

He said that data collection and preparation will involve data cleaning and georeferencing, formatting, storage, updating and retrieval. He said the data will include soil profile data, soil characteristics, climate data (rainfall, temperature, and solar radiation), and crop management coefficients.

#### **Identification of institutional partners**

The presenter said that after a review of literature, a web search aimed at identifying the key issues and players in the field will be carried out. This will lead to compilation of a database that will identify and describe a broad set of institutions working on climate change modelling and food security in EAC. He said the information will then be integrated into a single national and regional database.

#### **Determination & assessment of the skill of Climate model**

He said that this will be done by determination of models comprising of both GCMs and RCMs which are appropriate for simulating climate information and by dynamical downscaling of climate information. He said that assessment of the skills of the climate model will be done using two statistical criteria; Model Efficiency Index and Normalized Root Mean Square Error

### **Climate Model simulation using different scenarios**

The presenter said that the model scenarios will be based on both the Special Report on Emission Scenario (i.e. A1B, A2 and B2) and Representative Concentration Pathways (RCP2.6, RCP4.5, and RCP8.5). He said the Statistical procedures (time series analysis, Mann Kendall trend test & Principal component analysis) will be used to investigate the spatial -temporal patterns in current and future climate conditions in the regional climate.

### **Identification of major agricultural production system in the region**

He said this will involve assessment of previous studies to identify major agricultural production systems critical in the region. He said that It will also utilize statistical procedures such as time series analysis, Mann Kendall trend test and Principal component analysis to investigate the spatial -temporal patterns based on past crop production information

### **Determination and assessment of the skill of crop response models**

He said this will be done using APSIM and DSSAT crop models. The crop models will be calibrated and validated using the available data (rainfall, minimum and Maximum temperature, solar radiation). He said each polygon of the available agro-ecological spatial maps will represent a homogenous unit. He mentioned that statistical measures which include model efficiency index and the normalized root mean square error will be used to assess the skill of these models

### **Impacts of climate change on the agricultural production systems**

The presenter said that crop models will be used to assess sensitivity of agricultural systems in the major agro-ecological zones (AEZs) under observed baseline and future climatic conditions. He said that AEZs will be considered as the smallest unit of analysis. Spatial analysis of crop model output will be displayed in thematic digital maps/GIS. It will include classifying changes in the outputs such as: 10 % (Very Low), 20 % (Low), >20 % (High - Hot spot) as defined by the project

### **Report on the impacts of climate change on major agricultural production systems**

He said this will involve compilation of a comprehensive report which will also provide an opportunity to disseminate the findings through workshop and training

### **Expected Results**

He said that the expected results from the project is a report on the Climate scenarios for EAC region and a report on the impacts of climate change based on scenarios on specific agricultural production system.

### **COMMENTS**

#### **Dr. Rao –ICRISAT (Discussant)**

- The methodology requires a lot of data because it is a data intensive method.
- Use the most current base year of 1971-2000 rather than the 1961-1990 base year.
- The methodology is a bit confusing. Is it the AEZ or the 25x25 kilometers grid?
- How will you capture the diversity within the agro ecological zones? It may require that you to perform many simulations.
- Calibration and validation of data may prove to be challenging. For you to do realistic assessment, it will necessitate the inclusion of many varieties as much as possible.
- How many Global Circulation Models are you planning to use and which ones are more useful to capture diversity.

#### **Prof. Laban Ogallo –Director ICPAC (Discussant)**

- Has climate change really occurred and if it has, what has caused it?
- What is the socio-economic status of the people who have experienced climate change?
- How will you be able to get accurate data?
- There is need to use the best models and the model must be able to build scenarios which are either positive or negative.

### **Plenary comments**

- The second objective on down scaling of GCM to regional scenarios is too general
- Look at the GCM models which can capture the case for the region.
- Why are you using AEZs which were generated long time ago?
- There is very limited data available on radiation. How are you going to address it and how is the data going to help you?
- Farmers are more concerned with climate variability in the current and future periods. How is the project going to capture climate variability particularly season to season variability?

### **Response**

- The choice of the base year will depend on which is robust between 1961-1990 and 1970 -2000.
- Intensive simulation will be done in each AEZ
- Solar radiation is a requirement it can be estimated even if there is no data.
- The down scaling technique will involve use of dynamic interpolation.

## **Climate Change and Agricultural Policy in East Africa Community by Dr. Richard Mulwa**

The presenter started by giving a motivation behind the study. He said that potential effects of climate change are not expected to be uniform, but unevenly distributed both between and within countries. He said that low income population dependent on the subsistence farming will increasingly face severe hardships because they have little flexibility to buffer potentially large shifts in their production bases. He said that along side climate change, there are a number of policies in individual countries in the region, and also region wide policies which influence agriculture and hence food security. He said the performance of these policies in a changing climate setting has not been assessed

## **Purpose and Objectives**

The presenter said that the main purpose of the second component is to assess the impact climate change and agricultural policies on welfare, and simulate policies which will achieve optimal welfare under changing climate. He said specifically, the project aim to:

- Assess the sensitivity of current production systems to climate change and change in agricultural policies in individual EAC member countries, and the whole EAC zone
- Assess the impact of climate change and change in agricultural policy on future agricultural systems in EAC
- Assess the impact of adaptation to climate change and adoption of climate change favourable policies on farmers welfare in EAC

## **Methods**

He said they were proposing to use either Trade-off Analysis (TOA-MD) or Partial equilibrium model. However they will choose the most appropriate based on data availability.

## **Comments**

- It will be preferable to use the partial equilibrium model rather than the trade off analysis model because of the complexities associated with it.
- Due to the challenge in quality of data it is better to use both tools of analysis.
- How will objective 2 be achieved using the proposed methods given that it has a component of poverty?
- It is good to use include the aspects of technological change in the modeling.
- Why did you not use CGE?
- How can you tell a policy scenario of a future date?
- The model seems not to capture the aspects of livestock and water quality.



## **Response**

- The presenter said that they have an experience of using the trade off analysis model because they have used it in a related assignment and they have been able to produce some results.
- The challenge of using both tools is that it will have an implication on the budget and time frame.
- Information on poverty will be generated from farm level interviews.
- A variable on technological change will be included.
- The third component of the project will involve the use of CGE model.
- It is hard model livestock because of differences in species and systems of farming.
- Water quality is hard to model because of temporal and spatial changes.

## **Assessing Climate Change, Agricultural Production & Trade and Food Security: Trade Analysis Model, Dr. Miriam W. O. Omolo.**

The linkage between climate change, trade and food security is important in achieving development at both national and regional level in cases where neighboring countries have a strong integration framework as is the case with the East Africa Community (EAC).

### **The objectives of the study includes to;**

1. Establish the regional and national agricultural and trade policies within EAC region.
2. Establish the agricultural commodities trade patterns at the regional and national level within the EAC.
3. Establish the impact climate change on agricultural commodity trade patterns and food security with in EAC using Computable General Equilibrium (CGE) and micro simulation models.

#### 4. Provide policy recommendations

The study will utilize Computable General Equilibrium Model (CGE)

FGT index will also be utilized used to quantify three well known elements of poverty, namely: level, depth and severity, which are also, respectively, known as incidence, inequality and intensity of poverty.

Data will be sourced from the Social Accounting Matrix (SAM) & the Integrated Household Budget Survey for Kenya, Uganda, Tanzania, Rwanda and Burundi.

### Comments from the discussants

#### 1. Paul Kamau

The topic trade and agriculture is important especially at this time of implementation of various integration strategies amongst members of the EAC. However some issues needs to be incorporated and includes;

- The topic seems to require huge data sets and therefore it is important that a methodology is developed ones data is available.
- The author seems to struggle in establishing the link between climate change, agricultural production and trade and food security
- objective 1&2 can be combined to come up with one smart objective
- On the background a lot of issues on history of EAC have been outline and background on the crop model that forms the basis of the study left out
- The Social accounting matrix (SAM) are different in terms of years and sizes across the various EAC countries, how will they be harmonized.
- What informed the choice of crops to be used in the study
- Modeling and merging results of the various EAC countries is not clear

#### 2. Christopher Onyango

- Simply show how the EAC integration strategies affects food security ,because despite the common market strategy, there still exist barriers to movement of food products
- Justify why CGE model was preferred

- It may not be easy to aggregate data from the various countries and utilize SAM for analysis but since climate change is cross cutting ,can consider using another model that can analyze climate change scenarios
- Need to choose crops that best suits issues of trade and food security

#### **Comments from participants**

- The motivation focuses much of EAC ,need to focus much on the simulations to be carried out
- The link between trade, food security and climate change is not clear in the theoretical framework
- Why has the study chosen to use CGE model
- It is not clear whether the model to be used is static or dynamic –dynamic model is more suited on climate change issues
- Since CGE mostly work with specific production models, how will climate change be captured then?
- It is not clear on the variables to be used on climate change and how it results in productivity changes
- It was also noted that Uganda has more recent data on SAM and household and budget survey

#### **Comments from the presenter**

- It is possible to marry objective 1& 2
- The choice of crops will be dictated by component 1 group since it is their output that will be utilized. It was also noted that to get results in component 3 a variety of crops must have been analyzed by component 1
- For productivity will use IFPRI model

## **SESSION III: GROUP CONSULTATIONS /FORMATION OF REGIONAL WORKING GROUPS**

Three discussion groups were formed among the 3 components (climate change & crop model, economic policy team and trade model team respectively). They were obligated to identify partners in all EAC countries, identify data sources and discuss some of the comments provided during concept presentations by the participants.

### **Group presentations**

#### **1. Group one: climate change crop model team (Component one)**

##### **Proposed methodologies**

Does literature review to Identify credible research from similar studies in the region so as to avoid repeating similar work.

##### **On Data**

- a) Identify key crops in the different countries
  1. Rwanda –Beans
  2. Kenya -Maize
  3. Uganda -Bananas
  4. Tanzania -Maize
  5. Burundi Beans
1. Soil data-Available from numerous surveys e.g. ILRI
- b) Climate data; Use available observed data to validate climate models and then use output from the model uniformly

##### **Regional Partners**

- Climate Data –All NHMCS
- CYMMT
- KARI
- RAP

- KEPHIS
- Universities in the region
- Agricultural Institutions in the region

### **Develop a road map**

- Identify key institutions and partners to help in identifying the methodologies
- Discussion forum
- Acknowledge their contribution

### **Identification of collaborators /contact persons**

1. Representatives from NMHCs
2. KPC Rao - ICRISAT
3. Dr. Gathenya –JKUAT
4. James Kinyangi – coordinator CCAFS
5. Prof. Siza tumbo Sokoine university
6. Prof. Majaliwa –Makere University
7. Dr Everlyne Komutunga NARO UGANDA
8. Dr. Daphrose Gahakwa, Head Of Department, Rwanda – RAP
9. Prof Yala/Majune –Dar es salaam University

## **2. Group two: economic policy team (Component two)**

### **Identification of collaborators /contact persons**

- Kenya-represented by KIPPRA and UoN
- Uganda-Isaac Shinyekwa (Economic Policy Research Centre)-he requested that Nancy formally notify EPRC on the collaboration.
- Rwanda –Paul Gatemberezi ( Kigali Independent University)
- Tanzania –Dr. Mulwa to follow up with Prof. Tumbo of Sokoine University
- Burundi - to get a name from Paul Gatemberezi

Some of the data sets required include farm level like household size, non agriculture income, farm sizes and enterprise proportions, farming systems, price of commodities,

fixed and variable cost of production per farm. For livestock will consider products like milk, beef among others.

#### **Concept Comments**

- A work plan will be provided
- Consider using both models i.e. trade-off analysis and partial equilibrium
- How can forecasting policy scenario be accomplished
- How will objective 2 be captured using the proposed methods

#### **Way forward**

It was decided that trade-off analysis methodology will be used rather than partial equilibrium that requires huge data sets that may not be available

### **3. Group three : trade model team (Component three)**

#### **Identification of collaborators /contact persons**

- Uganda-Dr. John Matovu –CGE & Isaac Shinyekwa – Initial Policy Section
- Tanzania: Nancy Laibuni- to contact REPOA and ESRF for Tanzania & to follow up with Prof. Tumbo of Sokoine University
- Burundi - to get a name Paul Gatemberezi
- Rwanda- Paul Gatemberezi- Kigali Independent University

#### **Concept Comments**

- Develop the link between climate change, agricultural trade and food security; How trade policies affect food security
- Merge objectives (1) and (2)
- What informed the choice of crops used in the model?
- Justify the relevance of the CGE model its advantages and its capability
- Look at data from RATIC and ILRI on cross border trade within the EAC.
- Develop climate change scenarios and link them to the variables in the CGE model.
- Find innovative ways of introducing climate change in the model

### **Methodology**

- Examine productivity A in the Cobb Douglas function
- Rainfall incidence, rainfall variability and temperature change- how it affects A- R. John Matovu to provide paper on Uganda
- Use a standard IFPRI model and SAMs and justify the country SAM
- Have all welfare indicators- farm output, farm incomes

### **Cross Cutting Issues**

- Confirm whether Crop Model Team will estimate the production function- Rainfall incidence, rainfall variability and temperature change

## **SESSION IV WAYFORWARD AND CLOSING REMARKS**

A team consisting of KIPPRA, WMO and UNECA was requested to meet shortly in order to finalize on the way forward. Ms. Nancy Laibuni (KIPPRA) thanked members for their participation and invited Dr. Elijah Mukhala (WMO) for a vote of thanks

## Annex 1: LIST OF PARTICIPANTS

	Name	Designation	organization	Email
1.	Dr. John Matovu	Economist	Economic Research Policy Centre-Uganda	jmatovu@gmail.com
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## Annex 2: WORKSHOP PROGRAM



6<sup>th</sup> May, 2014



08:30 – 16:00



Nairobi Safari Club, Nairobi

# Regional Assessment of Agricultural Production, Climate Change, Agricultural Trade and Food Security Inception Workshop

**Workshop Convener: Dr. Wilfred Nyangena**

## **Agenda**

08:30 – 09:00 Registration

**09:00 – 09:30 Session I Opening Ceremony**

**Opening Remarks:** Dr. John Omiti, Executive Director, KIPPRA

**Special Address:** Dr. H. Admassu, UNECA Secretariat

**Keynote Address:** Harnessing Ecosystem-based Adaptation Approaches for Food Security: Implications for Policy

**Dr. Richard Munang**– UNEP- Africa Regional Office for Africa (ROA) - Coordinator for Climate Change

**09:30-10:00 Tea Break and Group Photo**

**10:30 – 13:00 Session II Concept note presentations**

**Chair: Prof. Caleb Mireri (Environment and Natural Resources) – Kenyatta University**

- Explore the Spatial Effects of Climate Change on Agricultural Production and Food Security in the East African Community Region – **Mr. J. Ngaina**

**Discussants:**

*Prof Laban Ogallo*

*Director ICPAC*

*Dr. K.P.C. Rao Principal Scientist and Country Representative ICRISAT-Ethiopia*

- Assessing the Impact of Climate Change and Agricultural Policy on Smallholder Farmers' Welfare in East Africa – **Dr. R. Mulwa**

**Discussants:**

*Prof. Gideon Obare (Food security and policy) – Egerton University*

*Prof. Okello Ogutu (Food security and Policy) –Egerton University*

- Assessing the implications of Agricultural Production, Climate Change and Food Security on Regional Agricultural Trade - **Dr. M. Omolo**

**Discussants:**

*Dr. Paul Kamau – IDS Nairobi University*

*Mr. Chris Onyango - KIPPRA*

**13:00 – 14:00 Lunch Break**

**14:00 – 15:00 Session III Group consultations/ formation of Regional working groups**

**Chair: Dr. August Muluvi**

Group 1: Climate change and Crop model Team

Group II: Economic policy Team

Group III: Trade model Team

Plenary Discussion

**15:00 – 16:00 Session IV Way Forward and Closing Remarks**

**Chair:Dr. Wilfred Nyangena**

**Way Forward:** UNECA, KIPPRA and WMO

**Closing Remarks:** Dr. Elijah Mukhala, WMO Representative for Eastern and Southern Africa