ASARECA Agro-biodiversity and Biotechnology Programme
Outline

- African Vision for Agriculture
- About ASARECA
- Context of the Programme
- Highlights of the Programme Strategy and Priority setting
- Highlights of Projects under implementation and those that are planned
- RABESA Project
- Some recommendations
African Vision by AU/NEPAD

Regional agricultural production to grow at an annual rate of 6% by 2015. This will happen through:

• Dynamic agricultural markets among nations and between regions
• Net export of agricultural products
• Available and affordable food
• Equitable distribution of wealth
• Strategic investments in agricultural S&T development
• A culture of sustainable use of natural resource base

Vision is shared perfectly by ASARECA
ASARECA
Association for Strengthening Agricultural Research in East and Central Africa

Regional agriculture research coordinating organization with a strong in regional orientation
ASARECA’s Strategy 2006-2016

Mission Statement

Promoting Economic Growth, Fighting Poverty, Eradicating Hunger and Enhancing Resources through Regional Collective Action in Agricultural Research for Development, Extension and Agricultural Training and Education
Comprehensive Governance

New ASARECA Members

- UNIVERS
- FARMER ORGAN.
- CIVIL SOCIETY
- PRIVATE SECTOR
- COMESA
- CGIAR
- 10 NARIS
Established 7 Programmes

- Staple Crops
- Non-Staple Crops
- Livestock and Fisheries
- Agro-biodiversity and Biotechnology
- Policy Analysis and Advocacy
- Natural Resources Management
- Technology Upscaling and Knowledge Management
Context of the Agro-biodiversity and Biotechnology Programme

Harnessing biotechnology and biodiversity in an integrated manner to contribute to:
- Agricultural trade and bio-resources utilization
- Food and nutrition security and wealth
- Agricultural science & technology and development
- Sustainable use of the natural resource base

Add value to other ongoing efforts and initiatives
Value addition to ongoing efforts

- Tissues culture – banana, coffee, cassava, sweet potato
- Use of Markers in national breeding programmes
- Molecular characterization for crop genetic diversity studies and pathogen variability and to establish evolutionary processes
- Molecular diagnostics for crop and animal diseases and vectors
- Genetic modifications in various crops – Cassava, Banana
- Vaccine development and optimization – livestock and human diseases
Considers Current Trends

- Emphasis on output traits
- Commercial value added products
- Mobilizing Science and Technology to strengthen livelihood strategies of society.
- Access to technologies by farming communities
- Holistic, cross-sectoral regional research and training approaches
- Regional interventions that generate regional public goods with spill over effects
Programme Goal, Purpose and Result areas

Goal
Increased economic growth and improved livelihoods in the ECA while enhancing the quality of the environment

Purpose
Enhanced sustainable productivity, value added and competitiveness of the sub regional Agro-biodiversity and Biotechnology system

Result areas
1. Generation and uptake of demand driven agro biodiversity and biotechnology innovations facilitated.

2. Capacity and competencies of NARS for implementing agro-biodiversity and biotechnology IAR4D paradigm in the ASARECA sub-region strengthened.

3. Communication and learning framework to support agro-biodiversity and biotechnology innovation system in the sub region developed and enhanced.
Strategic Objectives

1. Development of Agro-biodiversity and Biotechnology networks that are strategic, responsive and impact oriented.

2. Mobilization of capacity and competencies for IAR4D in agro-biodiversity and biotechnology in the region.

3. Harmonization of existing bio-policies for biotechnology and agrobiodiversity use and access.

4. Establishment of a communication and learning framework that supports the up-scaling of biotechnologies in the region.
Theme 1

Strengthening in-vitro production, conservation and access to genetic and clean planting materials

- Enhancement of plant tissue culture applications in eastern and central Africa region
- Establishment of virus indexing system for tissue culture materials in eastern and central Africa region
Theme 2

Enhancing effective and efficient utilization of biotechnologies to improve breeding processes

• Development of improved methods for controlling and diagnosis of tick-borne diseases in ECA using biotechnologies.

• Development of biotechnologies to manage biotic constraints in for enhanced productivity

• Breeding crops for resilience to drought and biotic stresses to diseases using molecular marker assisted selection.

• Use of molecular genetic markers to improve resistance to gastrointestinal nematode parasites in small ruminants (sheep and goats).

• Strategic bioengineering of crop plants for niche expansion, improved productivity and conservation
Theme 3

Conservation, management and use of agro-biodiversity to support sustainable agricultural productivity

• Conservation and sustainable utilization of crop genetic resources through the application biotechnology
• Enhancing the conservation and utilization of the ECA’s underutilized plant species
Theme 4

Enhancing biotechnology and agro-biodiversity resources development, transfer and commercialization

- Developing pilot novel biotechnology and business incubation models and biotech business development training modules for the ASARECA region.

- Capacity building and mobilization for biotechnology and agro-biodiversity resources development, transfer and commercialization in the ASARECA region.

- Developing global access mechanisms for proprietary and non proprietary novel and applied biotechnologies and agro-biodiversity resources for the ASARECA region

- Regional and global assessment, validation, selection and documentation of applied biotechnologies and agro-biodiversity resources
Priority ranking of Themes

- Strengthening in vitro production, conservation and access to genetic and clean planting materials.

- Conservation management and use of ECA agro biodiversity to support sustainable agricultural productivity.

- Enhancing effective and efficient utilization of biotechnologies to improve breeding processes and productivity of crops and livestock in the ECA region.

- Enhancing Biotechnology and Agro-biodiversity Resources Development, Transfer and Commercialization in the ASARECA Region.
Priority setting criteria

- Economic growth
- Social welfare
- Quality of environment
- Capacity building
- Regionality.
Projects under implementation

- Establishment of regional Genetic Transformation Platforms for Cassava in Eastern and Central African region

- Enhancement of Cassava and Sweet potato tissue culture applications in eastern and central Africa sub-region and establishment of indexing system for Cassava and Sweet potato and Banana in the central Africa (ECA) sub-region.

- Genetic Engineering of Maize against drought and Marker assisted Breeding of Cassava against pests and diseases.

- Conservation and sustainable utilization of sweet potato genetic resources through the application biotechnology
Projects under development

- Enhancing the conservation and utilization of the ECA’s underutilized plant species

- Development of improved methods for controlling tick-borne diseases in ECA using biotechnologies.

- Regional and global assessment, validation, selection and documentation of applied biotechnologies and agro-biodiversity resources for ASARECA region

- Developing pilot novel biotechnology and business incubator models and biotech/agro-biodiversity business development training modules for the ASARECA region.
Applying tissue culture to improve access to cassava and sweetpotato clean planting materials

Project Purpose
- Enhanced utilisation of tissue culture application in cassava and sweetpotato multiplication in the ECA sub-region.

Project Outputs
- Appropriate cassava and sweetpotato tissue culture technologies made available for multiplication
- Capacity for cassava and sweetpotato tissue culture in the NARS strengthened
- Information on cassava and sweetpotato tissue culture made available to stakeholders

Partners
- NARIS
- Private Tissue culture labs
- CGIAR Centres
- NGOs
Conservation for Sustainable Availability of Cassava and Sweetpotato Germplasm through Biotechnology Applications

Project Purpose
- Enhanced utilization of conservation technologies in cassava and sweetpotato in the ECA sub-region.

Project Outputs
- Appropriate cassava and sweetpotato conservation technologies generated and made available to breeders
- Capacity for cassava and sweetpotato conservation in the Kenya Genebank and other NARS strengthened
- Information exchange and utilization of cassava and sweetpotato germplasm conservation enhanced

Partners
- NARIS
- Kenya Gene Bank
- BecA
- CGIAR Centres
Genetic Engineering of Maize for Drought tolerance in Eastern and Central Africa

Project Purpose
- Enhanced utilization of genetic engineering technologies to provide drought tolerant maize germplasm to maize breeding programmes in the ECA sub-region

Project Outputs
- Drought tolerance conferring genes identified, isolated and characterised
- Locally adapted maize germplasm transformed for drought tolerance
- Transformed maize accessions evaluated for drought tolerance
- Capacity for development of drought tolerant transgenic maize strengthened
- Information on transgenic drought tolerant maize made available.

Partners
- NARIS
- Kenyatta University
- BecA
- CGIAR Centres – CYMMIT
- Syngenta
- Ghent University
- University of North Carolina
- University of Capetown
- AATF (WEMA)
Establishment of Platforms for Genetic Transformation in the ECA

Project Purpose
- Enhanced utilization of cassava transformation technologies to provide improved cassava in the ECA.

Project Outputs
- Capacity for cassava genetic transformation in the NARS strengthened
- Information on cassava biotechnology platform activities made available.

Partners
- NARO – Uganda
- KARI – Kenya
- MARI – Tanzania
- CIAT
- Donald Danforth Centre
Overview of RABESA

Delivering Agricultural Biotechnology to African Farmers: Linking Economic Research to Decision Making
May 19 – 21, 2009
Imperial Resort Beach Hotel, Entebbe Uganda

M. Waithaka, M. Kyotalimye, D. Wafula, C. Mugoya
RABESA Scope and Strategic Focus

To support COMESA countries harmonize biosafety policies
Historical Background of RABESA

• In November 2001 in Kampala the COMESA Ministers of agriculture mooted the idea of harmonizing policies on GMOs at the regional level

Concerns in the COMESA community

- Increased regional integration and pursuit of free trade arrangements has made borders porous-transboundary unregulated movement of GMOs was undesirable

- Unprecedented diffusion rates of GMOs likely to impact on trade and access to emergency food aid in unprecedented ways
Translating Ministerial Directive to a Regional Project

- The COMESA Secretariat approached ASARECA for technical support in designing a regional project on harmonization of biosafety policies.

- ASARECA-collaborated with other partners to design RABESA with a focus on GMOs, trade and emergency food aid.

- In Sept. 2003 COMESA endorsed implementation of RABESA at the maize trade policy conference held in Nairobi

- RABESA phase I was implemented 2004 - 2006
RABESA Implementing Partners

CAADP Pillar 4

ASARECA
Transforming Agriculture for Improved Livelihoods

ISAAA
International Service for the Acquisition of Agri-biotech Applications

PBS

ACTS
Nesting within ASARECA

ASARECA RESULT 3
Policy options for enhancing performance of the agricultural sector in the ASARECA sub-region facilitated

PAAP Research Theme 2
Rationalization, harmonization and advocacy of policies and legislation

PAAP Project 1
- R and H of policies, laws and regulations in the agricultural sector in ECA
- 4 MODULES on root crops, dairy, seeds and biosafety
RABESA phase I activities 2004-2006

1. Data collection and analysis in the six countries 2004-2005
   - Stakeholder analysis to understand the actors and the terrain
     - Commercial export risks
     - Emergency food aid vis-à-vis GMOs
     - Estimation of economic gains from GM crops


3. Regional consultative meeting held in 2006
Analysis done under RABESA revealed that the magnitude of commercial risks associated with GMOs will be relatively small for COMESA/ASARECA countries.

African countries heavily export to Europe commodities such as tea, coffee, sugar and cocoa (commodities not available in GM form).

Intra-regional trade in commodities such as maize and cotton (available in GM form) is high in the COMESA/ASARECA region.

Intra-regional commercial risks likely to be high if COMESA countries go for planting of GMOs.
Research Findings-emergency food aid

• Countries exhibit high dependency on food aid. Food aid shipments to COMESA countries amounts to about 85 percent of all food aid shipments to SSA (WFP)

• A large proportion (about 65%) of food aid to COMESA countries is sourced by WFP from countries that plant GMOs (Canada and United States) without segregation

• High probability that Food aid distributed is GM

• Keeping the COMESA region GM-free would diminish access to needed food imports under emergency situations
Economic analysis revealed that:

- Farmers' incomes in the COMESA region would increase significantly if they adopted GM insect resistant varieties of cotton and maize compared to the conventional ones (Economic analysis component)
Identified priority areas for harmonization in the COMESA/ASARECA region

• The COMESA regional consultative meeting held in 2006 identified 3 priority areas for harmonization
1. Commercial planting of GMOs
2. Trade in GM products
3. Emergency food aid with GM content
RABESA II

- Recommendations of the RABESA regional workshop were presented at the 4th meeting of the COMESA Ministers of Agriculture held in Khartoum in March 2007.

- The ministers endorsed implementation of RABESA phase II.

- At the 5th meeting of the COMESA Ministers of Agriculture held in Seychelles in 2008 the need to hasten the harmonization process was reiterated.
RABESA II outputs

1. Drafting of regional biosafety guidelines & policies for handling commercial planting of GMOs, trade in GM products & emergency food aid

2. A guide on how designated regional centers of excellence can support COMESA harmonization efforts - risk assessment and management, identification and testing of GMOs and capacity building

3. Develop and implement COMESA outreach and communication strategy - the strategy defines effective mechanisms for disseminating information, fostering coordination and collaboration among different regional partners and other RECs
4. Biosafety Roadmap-developed and adopted

- The roadmap is a practical tool to guide COMESA member states in implementation of national biosafety frameworks. Most COMESA country biosafety regulatory systems are still at the initial stages of development.

5. Updated profile of progress in institution building and policies for biosafety in COMESA
## Status of COMESA country biosafety frameworks

<table>
<thead>
<tr>
<th>Status</th>
<th>COMESA Country</th>
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<tbody>
<tr>
<td>Approved Biotech/Biosafety policy and biosafety law</td>
<td>Kenya, Malawi, Zambia and Zimbabwe</td>
</tr>
<tr>
<td>Approved Biotech/Biosafety Policy and Draft Biosafety Law</td>
<td>Madagascar and Uganda</td>
</tr>
<tr>
<td>Approved Biosafety Law but no stand alone policy on biotechnology and</td>
<td>Mauritius</td>
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<tr>
<td>biosafety</td>
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<tr>
<td>Working Biotech/Biosafety Policy and Draft Biosafety Law</td>
<td>Sudan and Rwanda</td>
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<tr>
<td>Draft Biotech/Biosafety Policy and Draft Biosafety Law</td>
<td>Burundi, DR Congo, Eritrea, Swaziland and Comoros</td>
</tr>
<tr>
<td>No stand alone policy but references to biotechnology and biosafety in</td>
<td>Djibouti, Egypt, Ethiopia, Lybia and Seychelles</td>
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<tr>
<td>other government policy documents</td>
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Review and endorsement process

• Panel of experts under RABESA II has been constituted

• Role- Provide oversight and ensure that the project remains focused and consistent with the goals of COMESA

• The RABESA II outputs will be reviewed and endorsed by the COMESA panel of experts, regional stakeholders and final endorsement by COMESA Ministers of Agriculture

• Regular updates at the COMESA Technical Committee on Agri and Ministerial meetings
Expected outcomes

- Enhanced capacity of the COMESA member states to make informed decisions on handling of GMOs

- Reduced trade barriers, increased agricultural productivity and food security

- Enhanced collaboration and coordination between COMESA and other RECs

- Enhanced level of awareness and understanding of the potential impacts of GMOs on trade and access to food imports (including emergency food aid) among policy makers.
Trends in Harmonization of Biosafety Policies in Africa

• Harmonization is an emerging trend in the continent (unprecedented speed at which biotech is evolving and associated concerns)

• Efforts evident in almost all the sub-regions of Africa (ECOWAS, SADC and EAC)

• The AU encourages cooperation and coordination in matters of biosafety (Freedom to Innovate Report of AU/NEPAD panel of experts)

• AU focusing on coming up with African Strategy on Biosafety to promote and coordinate harmonization of biosafety in the continent

• COMESA largest trading bloc—provide models for other regions to follow
Envisaged benefits of harmonization

- Capacity building support through designated regional centers of excellence
- Minimized costs and duplication in testing and approval procedures
- Mitigation to potential impacts of GMOs on trade and access to emergency food aid
- Enhanced information sharing and coordination on regulatory approvals/ transboundary movement of GMOs
Concluding Remarks

• Biotechnology is critical to Sub-regional development goals as spelt out by NEPAD

• Need for more investments in agricultural biotechnology to address long-term issues Food and nutrition security and wealth creation

• Need to build on existing efforts instead of starting new projects

• Need to learn from what works best in Africa

• Need to support the policy and regulatory development process

• Urgent need to work towards a harmonized approach by governments

• Urgent need for capacity building and sharing of information and resources at sub-regional level;

• Socioeconomic considerations are important
Recommendations

- Strengthening of political commitment for increased R4D funding through a proactive policy
- Holistic integrated approach for the smallholder farmer
- Promotion of national, regional and international collaboration
- Promotion of more private sector involvement in R4D
- Establishment of functioning biosafety and IPR systems
- Up grading of the laboratories and research facilities
- Awareness Raising and Biosafety Information Exchange
www.asareca.org