MAIZE CRP: Output-Outcome Mapping

**Strategic Goals**
- Positive sustainable change in the natural environment
- Enhanced livelihoods
- Enhanced food security
- Improve nutrition and improved health

**Intermediate Development Outcome**
- Increased productivity and stability of farming systems
- Increased income of smallholder farmers
- Improved maize varieties (high-yielding, stress tolerant, nutrient enhanced)
- Maize breeding gains are achieved more quickly and efficiently by public and private sector breeders with a broader genetic base

**Immediate Development Outcome**
- Profitable, resource efficient maize-based farming systems and value chain innovations adopted by smallholder farmers
- Smallholder farmers adopt improved maize varieties
- Smallholder farmers adopt post harvest technologies
- Cutting-edge data and knowledge on maize genetic diversity and sources of new allelic variation are utilized by public and private sector

**Research Outputs: products**
- Knowledge, tools, and methods for better targeting of interventions and policy and institutional innovations for enhancing maize technology adoption, inclusiveness, gender equity, market access, and reducing vulnerability
- Sustainable maize management advice and practices
- High yielding and stress tolerant maize lines and varieties
- International consensus for maize improvement
- Maize lines and varieties that are bio-fortified for pro-vitamin A, zinc, or essential amino acids.
- Data on the characterization of international maize landrace collections and valuable haplotypes available
- Genomics and bioinformatics tools, breeding and phenotyping approaches for NARS and SMEs
- Integrated approaches for reducing post harvest losses and mycotoxin contamination

**System Level Outcomes**
- Sustainable management of natural resources
- Reducing rural poverty
- Increasing food security
- Improving nutrition and health

**Results Strategy 1**
- Sustainable intensification and income opportunities for the poor

**Results Strategy 2**
- New maize varieties for the poor

**Results Strategy 3**
- Integrated post harvest management
<table>
<thead>
<tr>
<th>Research Strategy 1</th>
<th>Sustainable Intensification and income opportunities for the poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDO1</td>
<td>Increased productivity and stability of farming systems</td>
</tr>
<tr>
<td>IDO2</td>
<td>Increased income of small holder farmers</td>
</tr>
</tbody>
</table>

**Research Outcomes**

Results of ex-ante and ex-post analysis utilized by policy and decision-makers.

Profitable, resource efficient maize-based farming systems and value-chain innovations locally adapted by NARES and promoted by public, NGO, and private sector.

Profitable, resource efficient maize-based farming systems and value-chain innovations adopted by smallholder farmers.

Better targeting and support of new technologies and institutional innovations.

**Research Outputs**

Knowledge, tools, and methods for better targeting of interventions and policy and institutional innovations for enhancing maize technology adoption, inclusiveness, gender equity, market access, and reducing vulnerability.

Integrated and scalable innovations that improve market access and increase the productivity, sustainability, and resilience of maize-based farming systems.

Sustainable precision maize management advice and practices.

<table>
<thead>
<tr>
<th>Research Strategy 2</th>
<th>New maize varieties for the poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDO2</td>
<td>Increased income of small holder farmers</td>
</tr>
<tr>
<td>IDO3</td>
<td>Increased yields of maize for smallholder farmers</td>
</tr>
<tr>
<td>IDO4</td>
<td>Increased nutritional diet</td>
</tr>
</tbody>
</table>

**Research Outcomes**

Results of ex-ante and ex-post analysis utilized by policy and decision-makers.

Improved maize varieties (high-yielding, stress tolerant, nutrient enhanced) adapted and promoted by NARES, NGO, and private seed companies.

Smallholder farmers adopt improved maize varieties (high-yielding, stress tolerant, nutrient enhanced).

Better targeting and support of new technologies and institutional innovations.

**Research Outputs**

Knowledge, tools, and methods for better targeting of interventions and policy and institutional innovations for enhancing maize technology adoption, inclusiveness, gender equity, market access, and reducing vulnerability.

High yielding and stress tolerant maize lines and varieties.

International consortia for maize improvement.

Maize lines and varieties that are bio-fortified for provitamin A, zinc, or essential amino acids.

Data on the characterization of international maize landrace collections and valuable haplotypes available.

Genomics and bioinformatics tools, breeding and phenotyping approaches for NARS and SMEs.

<table>
<thead>
<tr>
<th>Research Strategy 3</th>
<th>Integrated Post-Harvest Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDO5</td>
<td>Reduced post-harvest losses</td>
</tr>
<tr>
<td>IDO6</td>
<td>Reduced aflatoxin in maize value chain</td>
</tr>
</tbody>
</table>

**Research Outcomes**

Results of ex-ante and ex-post analysis utilized by policy and decision-makers.

Smallholder farmers adopt post-harvest technologies.

Smallholder farmers adopt mycotoxin mitigation technologies.

Post-harvest technologies are promoted by NARES, NGO, and private companies.

Better targeting and support of new technologies and institutional innovations.

**Research Outputs**

Knowledge, tools, and methods for better targeting of interventions and policy and institutional innovations for enhancing maize technology adoption, inclusiveness, gender equity, market access, and reducing vulnerability.

Integrated approaches for reducing post-harvest losses and mycotoxin contamination.
Research and Engagement with Policy makers

New knowledge, tools and methods

New policies/instruments

Regional adoption

Improved Sustainable management of natural resources

Improved system productivity and stability and increased income of smallholder farmers

Profitable, resource efficient maize-based farming systems and value-chain innovations adopted by smallholder farmers

Profitable, resource efficient maize-based farming systems and value-chain innovations locally adapted by MAIZE CRP partners

Profitable, resource efficient maize-based farming systems and value-chain innovations locally adapted by NARES and promoted by public, NGO, and private sector

Crop and resource management practices and knowledge

System-level Impacts

External factors
Natural events trends

Assumptions
National government, INGOs and private sector scale-out the practices

Assumptions
The practice(s) and knowledge work

Assumptions
There is a willingness to change
Practice changes not seen as potentially detrimental
The practices and knowledge address locally important challenges and opportunities
Farmers, input providers and extensionists are willing and able to support the intervention

Assumptions
The right people are reached
The right message is delivered
The messages are understood

Implementation Theory

Outputs

Programme Theory

Research and Engagement with Policy makers

Research and Engagement with Policy makers

Private sector

NARS Communities

Knowledge on socioeconomic dynamics and drivers of agrarian change

New or better functioning institutions, input markets and maize value chains

Household & farm-level data used for targeting innovations
Figure 2. Theory of Change for Results Strategy 2: New Maize varieties for the Poor

Implementation Theory

Programme Theory

System-level Impacts

Improved SLOs

Regional adoption

Institutional, market and maize value chain innovations

Knowledge on socioeconomic dynamics and drivers of agrarian change

New or better functioning institutions, markets and maize value chains

Smallholder farmers adopt improved maize varieties

Seed Production

Variety Registration

Regional on-farm testing

Regional on-station testing

New high yielding, stress tolerant and nutrient enhanced maize varieties

Engagement

Outputs

Research and Engagement with Policy makers

New Knowledge, tools and methods

New policies/ instruments

Institutional, market and maize value chain innovations

Research and Engagement with Policy makers Private sector NARS Communities

Household & farm-level data used for targeting maize varieties

Research and Engagement with individuals households

National government, INGOs and private sector scale-out the new varieties

Assumptions

Seed companies & NARS have capacity (technical/financial) to produce breeders & basic seed.

Improved market opportunity for farmers

Assumptions

Farmers' are convinced of the value of new maize varieties and are willing and able to purchase.

Seed companies deliver quality seed, at a competitive price, in a timely manner.

New maize varieties are more profitable than existing commercial varieties or confer greater fitness for the farmers' environment.

Assumptions

Seed companies & NARS have capacity (technical/financial) to produce breeders & basic seed.

Assumptions

Seed companies & NARS are willing & able to put new maize varieties NPT testing &/or DUS

Assumptions

Public (NARS) and Private (SME seed companies) are willing and able to test new germplasm. Germplasm originating from MAIZE CRP is better than commercial checks

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Figure 3. Theory of Change for Results Strategy 3: Integrated Post-Harvest Management

Assumptions
- National government, INGOs and private sector scale-out the post-harvest technologies and/or Aflasafe

Assumptions
- A premium develops for higher quality/lower aflatoxin maize
- Maize storage technologies increase food security and health benefits (perceived and real)

Assumptions
- Farmers are convinced that they will increase profits through use of maize storage technologies and/or Aflasafe
- Farmers are convinced that they will retain a significantly higher proportion of the crop compared to traditional storage methods
- Farmers are convinced that they will improve the quality and health benefits of the stored crop

Assumptions
- Private entrepreneurs make profits from the production and distribution/sale of maize storage technologies and/or Aflasafe

Assumptions
- Farmers and development partners are convinced of the value-added of maize storage technologies and Aflasafe.