THE ROLE OF INNOVATIVE TECHNOLOGIES IN INCREASING AGRICULTURAL PRODUCTIVITY IN TANZANIA

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Today’s Situation in Tanzania

- Food insecurity
- Poverty among the smallholder producers
- Low productivity
- Rudimentary technology
- Poor farming practices, pests & diseases
- Subsistence farming depends on farmers innovations and experimenting
Situation in Tanzania

- Rigid mindset of farmers
- Farmers use antiquated traditional technologies
- Inefficient extension services
- New technologies not embedded in the local society
Today’s situation

- Rainfall variability & adverse effects on drought
- Market inaccessible
- Renewed effort
- Production technologies on soil, water and nutrient management
- Embedded in local society
How Did We Get Here?

- Soils not productivity
- Through policies
- Population pressure, land fragmentation
- Ineffectiveness of the linear model of top-down approach
- Ignorance of resourcefulness of farmers knowledge and skills

- No motivation offered to farmers for widespread adoption of desirable agricultural practices
- No coordination on recommended agricultural practices and techniques of land restoration
### Types of policies significant to ag. productivity

<table>
<thead>
<tr>
<th>Policy focus</th>
<th>Examples</th>
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<tbody>
<tr>
<td>Agricultural and land use policies</td>
<td>Research and Extension policy, input policy and output pricing policy, land tenure reform</td>
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<tr>
<td>Macro economic and governance policies</td>
<td>Devaluation, Decentralization Public sector reform</td>
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<td>Soil specific policies</td>
<td>Soil conservation legislation, soil rehabilitation</td>
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Other policies of importance

- The national H₂O policy
  - H₂O use management
  - H₂O needs and demands
  - Promote efficient and effective use of H₂O
- Agricultural Policy
  - Produce more food enhance food security and reduce poverty= sufficient nation for basic food requirements
  - Educating farmers on better agricultural methods
National Strategies developed

- The Government development vision of 2025
  - Sustainable and equitable growth

- Poverty reduction strategy paper
  - Reducing income poverty
  - Improve human capabilities survival
  - Social well-being

- Rural sector development strategy
  - Reduce rural poverty managing resources sustainably
Land degradation-soil erosion

- Soil erosion caused by heavy rains
- Pollution of lowland areas
- Removal of soil nutrients
- Poor renewal of nutrients on the soil
Objectives

- To understand the impact of innovative technologies on agricultural productivity
Available Options used by farmers

- Conservation tillage
  - Minimum soil disturbance
  - Permanent soil cover
  - Crop rotations/associations
- Mulch farming
- Compost
- Agricultural intensification
- Water conservation and management
- Afforestation
- Fallowing and cover crop
- Integrated nutrient management
- Restoration of eroded soils
Conservation agriculture

- Conservation agriculture in farmer’s field
- Mulching
- Cover crop
Innovations also used by farmers

- Agroforestry systems
- Mixed cropping
- Replenishing soil fertility with organic materials
- Underground water for irrigation
- Harvesting run-off water
- Minimum tillage
Best-bet options in nutrient management

- Inorganic fertilizer applications
- Organic-inorganic fertilizer combinations
- Crop and other residue management
- Crop rotations and mixtures with legumes
- Biological nitrogen fixation
- Green manuring (using *Sesbania rostrata* or *Azolla*).
Water management options

- Storage of the runoff through water harvesting
- The flood water harvesting systems such as the ‘majalubas’ of Tanzania
- Small scale irrigation schemes
**Current technologies used**

- Extension services
  - Training and Visit
  - Decentralization system
  - Farmer-Field School
- Bottom-up approach
  - Increase in participatory and collaborative research
  - Demand driven, client oriented
Maize Production in '000 tonnes in Tanzania

Year

metric tonnes

Area and Production of rice

Area under Paddy (in '000 ha) 1996/97-2002/03

Paddy production in '000 tonnes
Other innovations used

- Multiple cropping
- Soil management methods that enhance organic matter and soil life
- Crop protection by natural means
- Use of genetic diversity varieties of crops
- Use of improved animal traction instead of hand tools
- Rain water harvest and small scale irrigation scheme developed
The Way Forward-Strategies to increase productivity

Agricultural Sector Development Strategy
- Address weakness facing agriculture sector
- Transforming agricultural sector
- Modern, commercial, highly productive and profitable sector
- Intensification of participatory system and linkages between farmers-researchers and extension agents
and ... 

- Future in agriculture-Precision agriculture
- Precise delivery of inputs or water for irrigation to the crop at precise amount and quantity
- Improve air and water quality
- Reduce soil erosion and protect the natural resources
Strategies

- Precision Farming
- Move to GPS and intensify remote sensing of soil physical properties
- Enable precise fertilizer recommendations
- Huge impact on sustainability in use of fertilizer and water
**Precision farming**

- Effective use of water
- Effective application of agro-chemicals
- To be able to capitalize on the GNSS technology on
  - Early warning system
  - Disaster management etc
- More precise information = informed decisions and sustainable development
Thank you for listening
asante sana!!!