




*THE ROLE OF INNOVATIVE
TECHNOLOGIES IN INCREASING
AGRICULTURAL PRODUCTIVITY IN
TANZANIA*

Elizabeth J Maeda

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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
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Situation in Tanzania

- **Rigid mindset of farmers**
 - **Farmers use antiquated traditional technologies**
 - **Inefficient extension services**
 - **New technologies not embedded in the local society**
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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**
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How Did We Get Here?

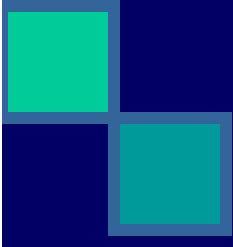

- **Soils not productivity**
- **Through policies**
- **Population pressure, land fragmentation**
- **Ineffectiveness of the linear model of top-down approach**
- **Ignorance of resourcefulness of farmers knowledge and skills**
- **No motivation offered to farmers for widespread adoption of desirable agricultural practices**
- **No coordination on recommended agricultural practices and techniques of land restoration**

Types of policies significant to ag. productivity

<i>Policy focus</i>	<i>Examples</i>
Agricultural and land use policies	Research and Extension policy, input policy and output pricing policy, land tenure reform
Macro economic and governance policies	Devaluation, Decentralization Public sector reform
Soil specific policies	Soil conservation legislation, soil rehabilitation



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
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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 sustain ably
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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**
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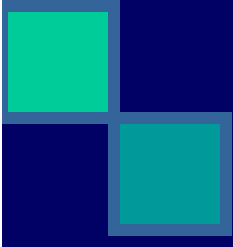

Conservation agriculture

- Conservation agriculture in farmer's field
- Mulching
- Cover crop



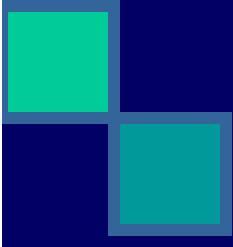



Innovations also used by farmers

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- **Agroforestry systems**
 - **Mixed cropping**
 - **Replenishing soil fertility with organic materials**
 - **Underground water for irrigation**
 - **Harvesting run-off water**
 - **Minimum tillage**
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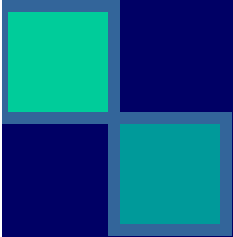



Best-bet options in nutrient management

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- 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*).
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Water management options

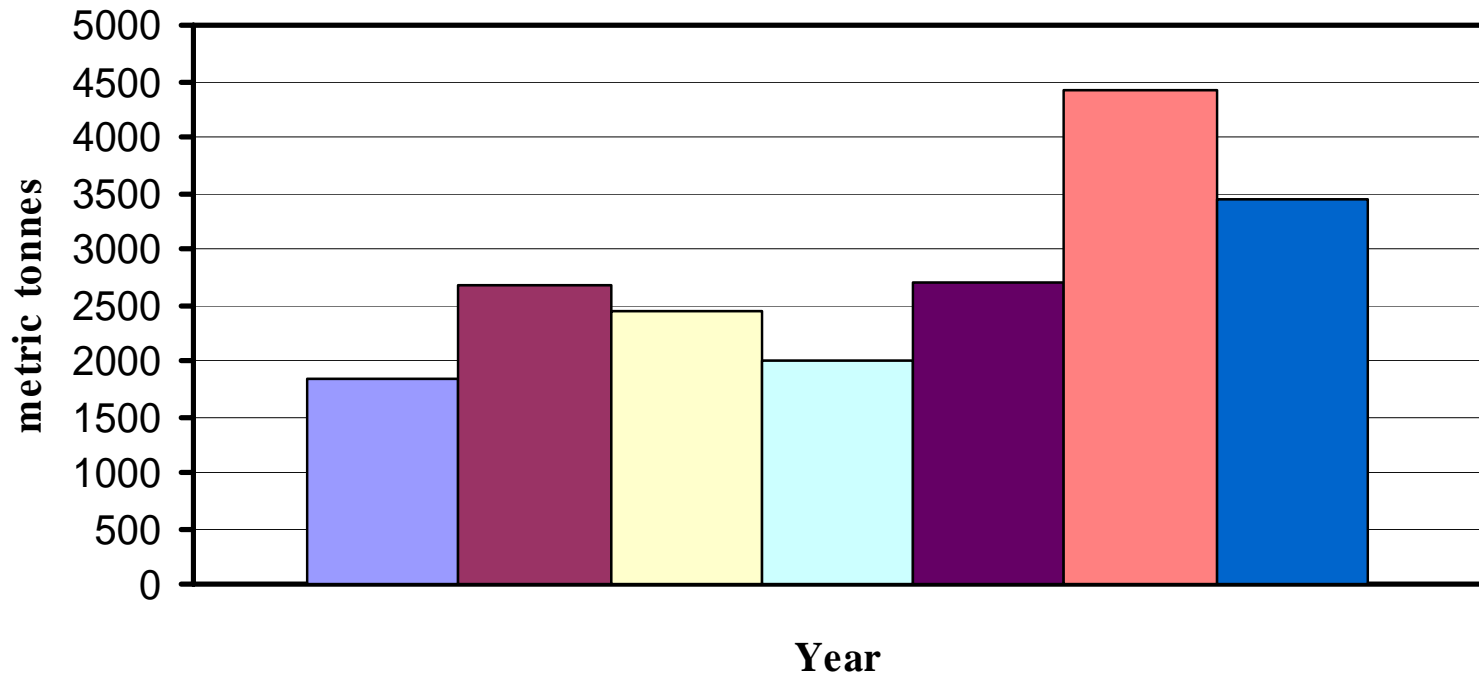
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- **Storage of the runoff through water harvesting**
 - **The flood water harvesting systems such as the the ‘majalubas’ of Tanzania**
 - **Small scale irrigation schemes**
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Current technologies used

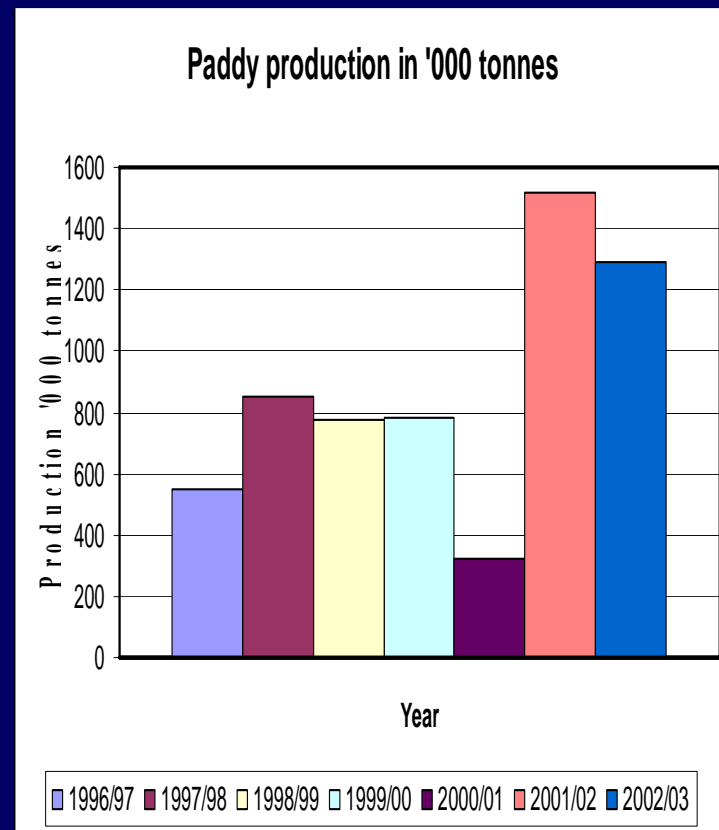
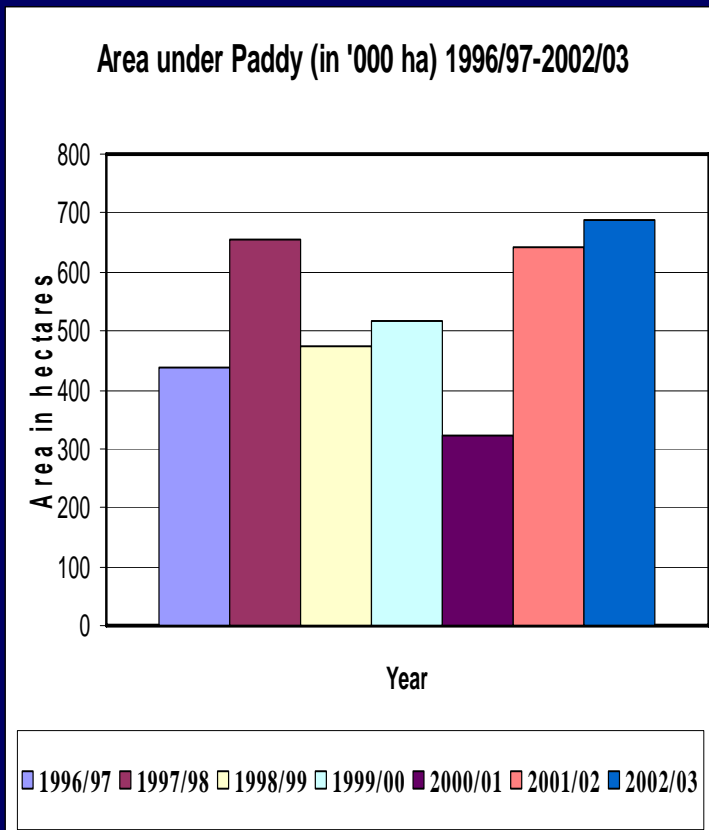
- **Extension services**
 - **Training and Visit**
 - **Decentralization system**
 - **Farmer-Field School**
 - **Bottom-up approach**
 - **Increase in participatory and collaborative research**
 - **Demand driven, client oriented**
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Maize Production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



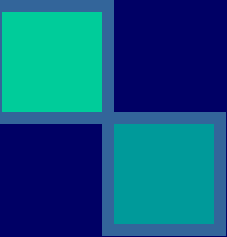

1996/97 1997/98 1998/99 1999/00 2000/01 2001/02 2002/03

Area and Production of rice





Other innovations used

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- **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**
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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**
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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**
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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**
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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**
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*Thank you for listening
asante sana!!!*

