



UNIVERSITY OF ZAMBIA

SCHOOL OF AGRICULTURAL SCIENCES



CAPACITY BUILDING OPPORTUNITIES IN CLIMATE SMART AGRICULTURE

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Presentation Guide

- Introduction: definition/role of CSA
- 'Knowns' on CSA in Zambia: results of baseline studies
- Niche/role of the School of Agricultural Sciences in CSA
- Concluding remarks

Climate Smart Agriculture

- **Climate-Smart Agriculture (CSA)** addresses the challenges of:
 - **food security,**
 - **climate adaptation, and**
 - **mitigation in an integrated fashion, rather than in isolation.**

- **CSA seeks to sustainably:**
 - **increase agricultural productivity,**
 - **Increase agro-ecosystem resilience (adaptation) to climate change,**
 - **reduce greenhouse gas emissions by agricultural production systems, and**
 - **enhance the achievement of national food security and development goals.**

- **To achieve food security:**
 - **agricultural production must increase by 70% to feed over 9 billion people by 2050,**
 - **whilst conserving the natural ecosystems.**
- **Agricultural activities are highly sensitive to climate and weather conditions, and**
- **the **accelerating pace** of climate change adds to the challenge of meeting the food security needs of the growing population.**

CSA Project Objectives

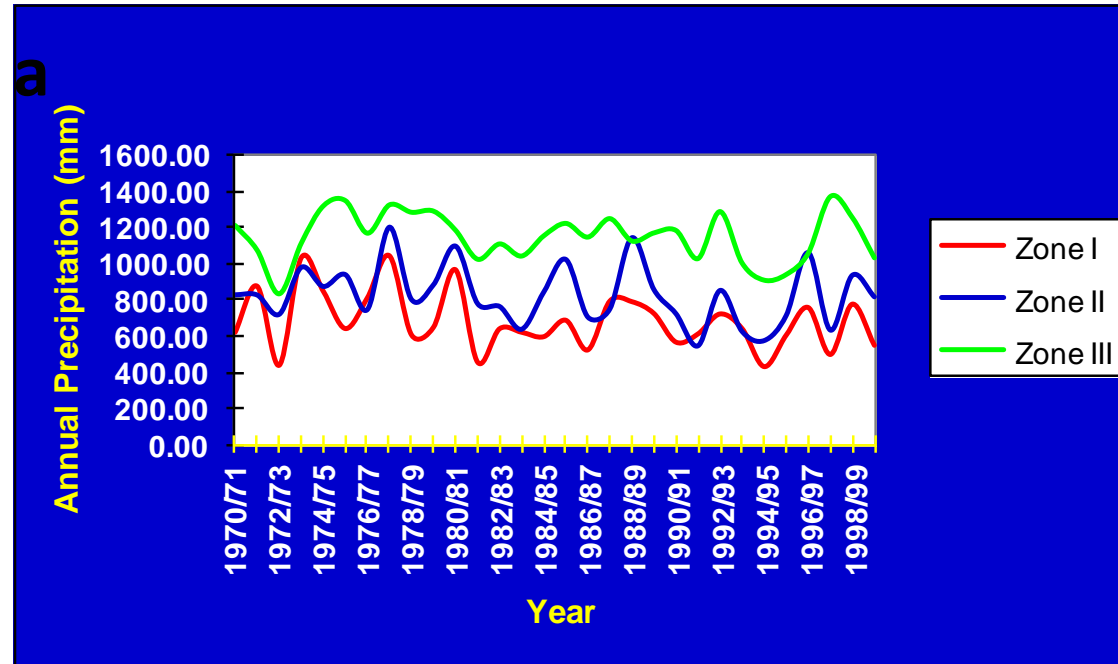
- ✓ Provide an evidence base for identifying, developing and implementing practices, policies and investments for climate smart agriculture**
- ✓ Develop a country-owned strategic framework to guide action and investment on CSA**
- ✓ Formulate climate smart agriculture investment proposals and identify possible financing sources**
- ✓ Build capacity to plan, implement and finance climate smart agriculture on the basis of the results.**

- **Evidence base for:**
 - **Climate Change, and**
 - **Smart agriculture**
- **The relevance of smart agriculture for a country depends on:**
 - ✓ **Existing, and**
 - ✓ **projected climate variability,**
 - ✓ **The current production patterns and practices.**

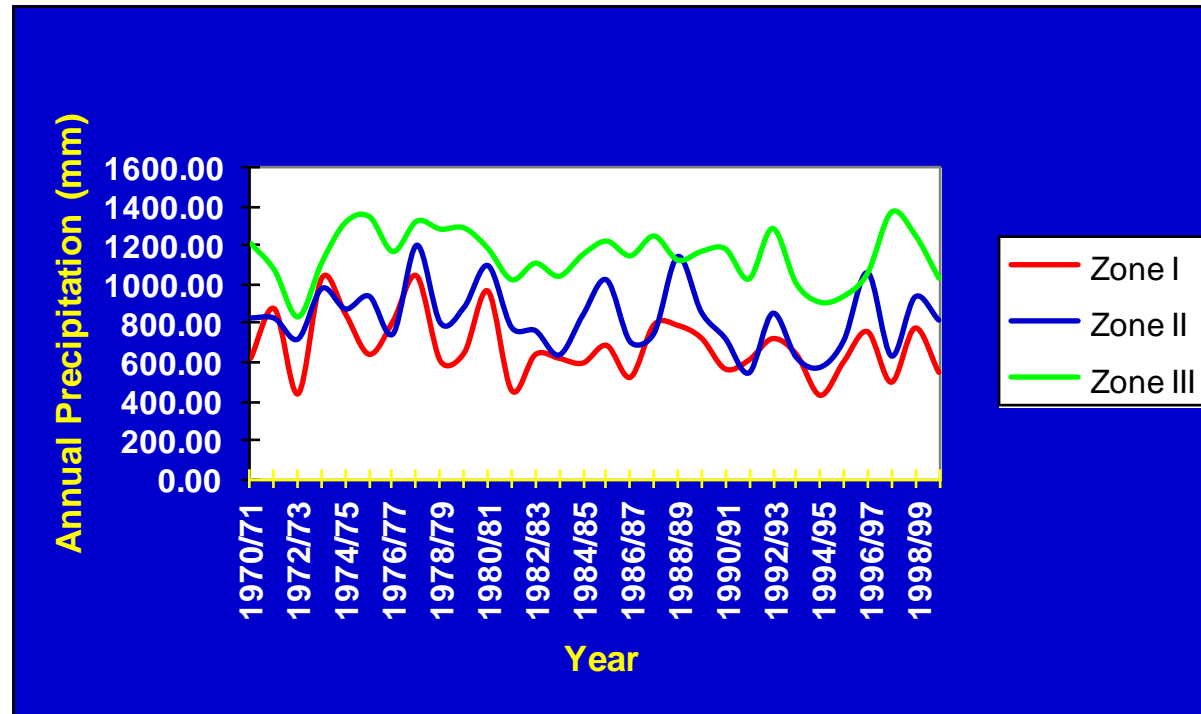
Context for Zambian situation

- **The effect of climate change in Zambia was assessed through climate variability in the three Agro-ecological regions of Zambia based on precipitation.**
- **Both:**
 - Baseline (1970 – 2000)**
 - Projections (2010 -2070)**
 - **Showed lowest average rainfall in Region I (684 mm) and II (830 mm) and increase in average rainfall in Region III (1151 mm) and in addition also**
 - **Showed below and above normal years in precipitation.**

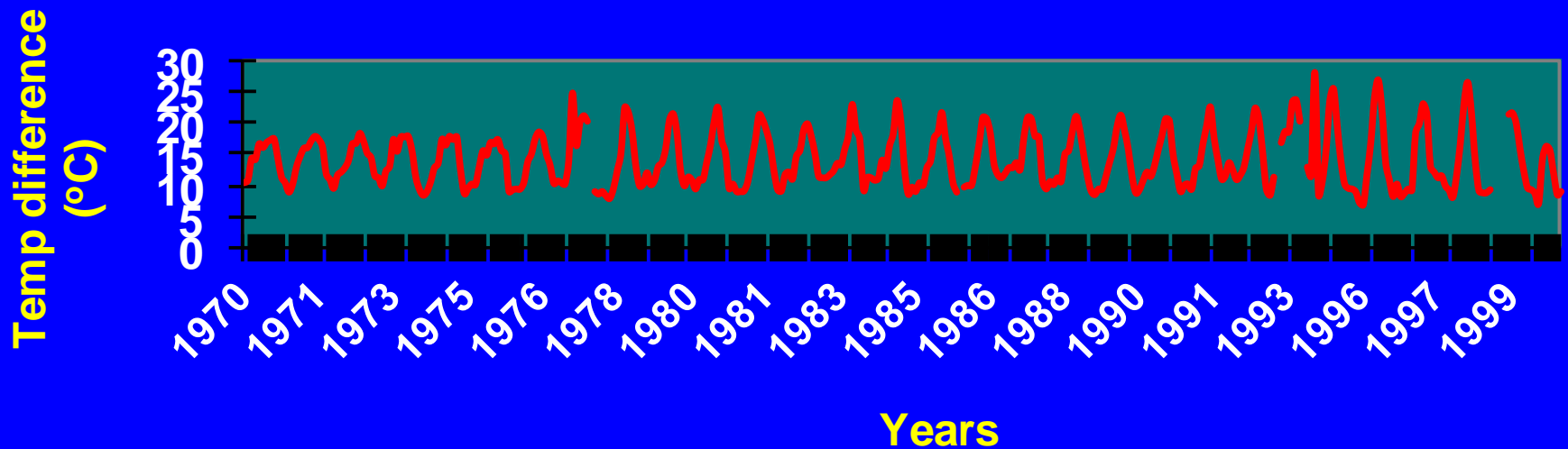
- Both baseline and projected data show a trend towards lower rainfall in Region I and II especially in Region I.
- The trend was therefore towards climate change.



- And the change was towards **lower rainfall** in Region I and II especially in Region I.
- In contrast Region III is expected to have an increase in average rainfall.



The mean temperature scenarios show a steady increase over all the Regions especially in Region I with a change towards warming especially in Region I.



GHG SUMMARY RESULTS

- In the year 2000, Zambia was a net source of CO₂ emissions at 34.1 million tonnes compared to 36.11 million tonnes in the year 1994, registering a decline of 5.5 %.**
- The net source situation comes from deforestation caused by on site burning (18.14 million tonnes of CO₂), followed by off site burning(14.34 million) and on site decay (3.63 million tonnes), representing 48.0%, 38.0% and 3.6% of total annual emissions from the sector, respectively.**
- On site burning and decay are due to deforestation mainly caused by land clearing for agriculture (176,000 hectares per annum), infrastructure(68,000 hectares), charcoal production(19,000 hectares) and timber harvesting(7,000 hectares).**

Baseline and Mitigation Scenarios Development

- **The scenarios covered:**
 - ✓ **agriculture and food security,**
 - ✓ **human health and**
 - ✓ **natural resources, wildlife and fisheries.**

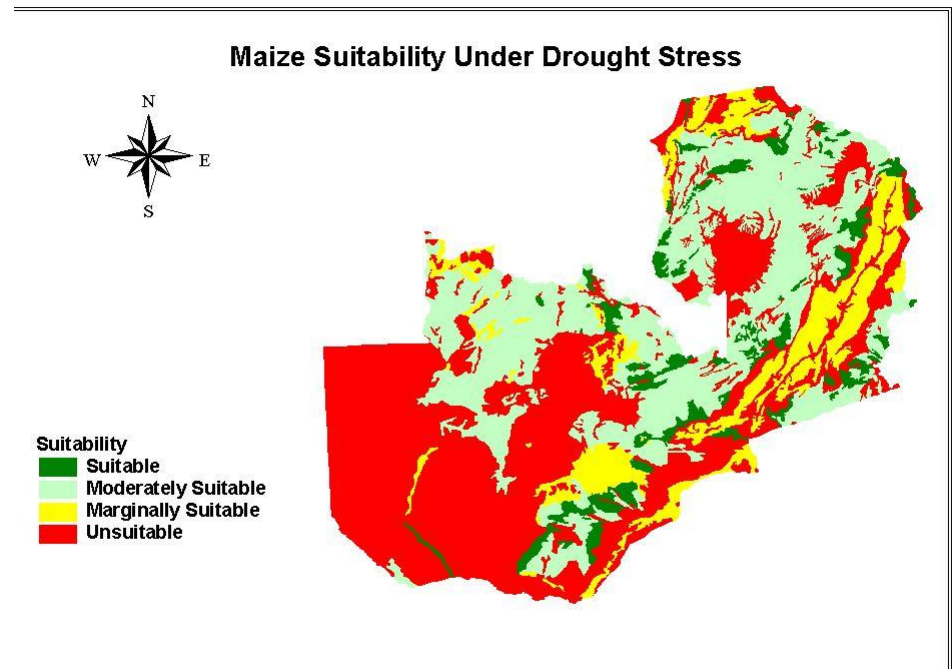
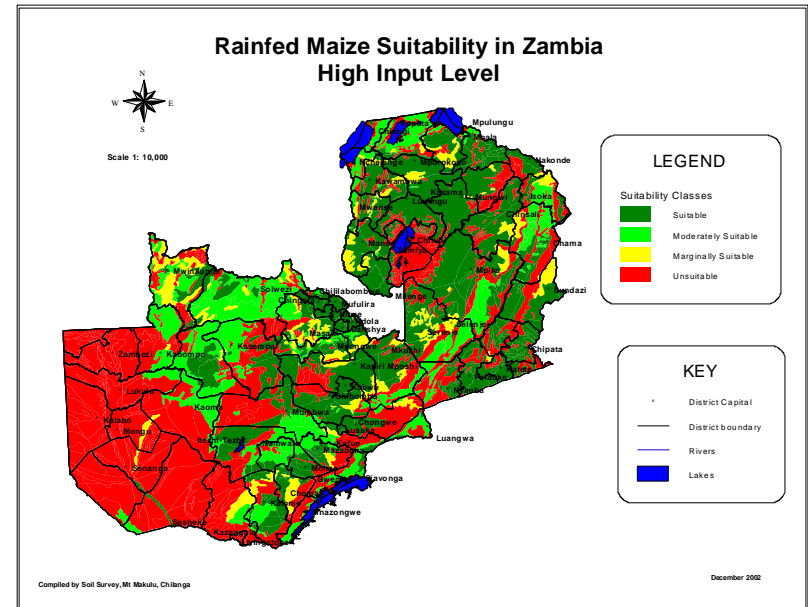
Vulnerability Assessments

Agriculture and Food Security

- **Region I is extremely vulnerable.**
- **This is followed by Region II in terms of arable cropping.**
- **Hence planning for climate change in these two regions is definitely a necessity.**

- Results from crop production, suggest that key crops, particularly maize, would not mature due to shortening of the growing season in agro-ecological Regions I and II, respectively.
- This would in turn lead to widespread yield reduction

There will be a high potential decrease in crop yields such as maize in Zambia.



- For livestock, as temperatures rose, the cattle population reduced, and as they fell, the population increased.
- This scenario was related to the amount of rainfall.
- Extreme temperatures are associated with droughts (less rainfall) and vice versa.

- The USCSP study on fisheries on the effect of variations in climatic indicators on fresh water fishery and fish farming revealed that lower rainfall would:
 - Reduce nutrient levels in rivers and lakes, and
 - Impact negatively on fish breeding activity and as well as depletion of fish species in the long-term.
 - The most vulnerable fish species being the breams and sardines in the drought-prone agro-ecological Region I and II.

- The main climatic hazards that threaten the forestry sector are:
 - extended droughts, which lead to land degradation and loss of soil fertility, as well,
 - as forest fires.
- To be impacted greatly would be low-income families dependent on biomass fuel for their lighting and cooking.

- Potential research areas to be considered were:
 - Conservation Agriculture
 - Climate smart agriculture investment proposals are formulated and possible financing, including from climate finance, is identified.
 - Capacity for evidence-based planning, implementing and financing climate smart agriculture is built in the three partner countries.

Current	Additional issues (University Contribution)
1. Conservation agriculture and soil and water conservation	
2. Diversification of production (dairy, legumes)	Diversification in crop production including legumes
3. The role of agriculture as a driver of deforestation (Zambia is a UN – REDD country)	
4. Improved crop varieties	Utilization and development of crops with stress tolerance.

Development of projects

S/N	COMPONENT	ACTIVITIES	RESPONSIBLE	OUTPUTS	TOTAL
1	Adaptation	Develop improved crop varieties for stress tolerance	School of agricultural Sciences	Improved cropvarieties	100,000.00
2	Mitigation	Develop land and water management practices for sustainable agricultural production	School of agricultural Sciences	Improved cropvarieties	98,000.00

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Concluding Remarks

Objective	Interventions by SoAS
<p>1. Provide an evidence base for identifying, developing and implementing practices, policies and investments for climate smart agriculture</p>	<p>Identify altered abiotic and biotic environments due to climate change. Modeling of impact of climate change on Agricultural production.</p>
<p>2. Develop a country-owned strategic framework to guide action and investment on CSA</p>	<p>Information for policy guidance</p>
<p>3. Formulate climate smart agriculture investment proposals and identify possible financing sources</p>	<p>Identify and develop improved crop varieties with stress tolerances and management practices for sustainable agricultural production</p>
<p>4. Build capacity to plan, implement and finance climate smart agriculture on the basis of the results.</p>	<p>Training in human resources on identified training needs</p>