

Climate change impact on rain fed cotton production in Gokwe District: Zimbabwe

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Introduction and background

Agriculture in Africa – most vulnerable to climate change:

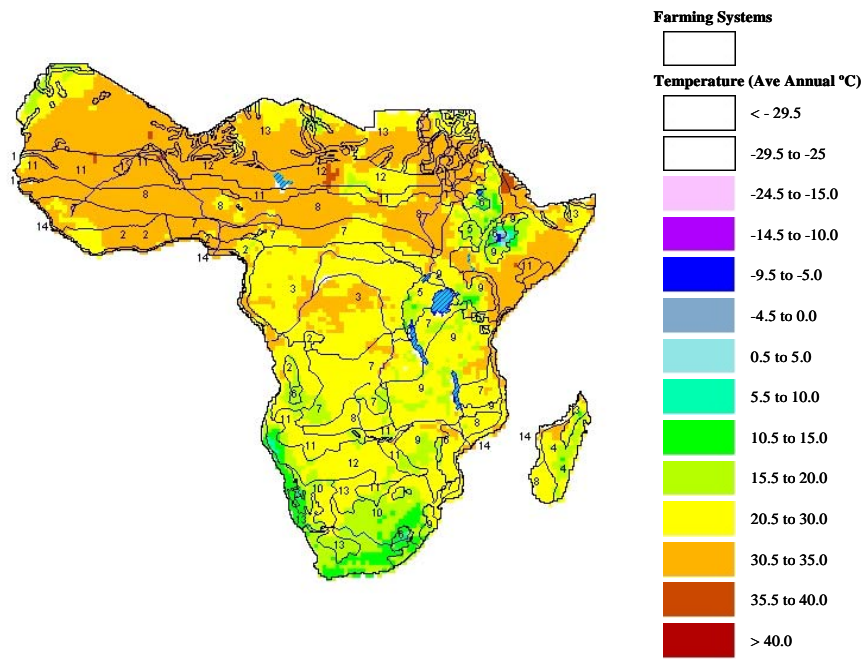
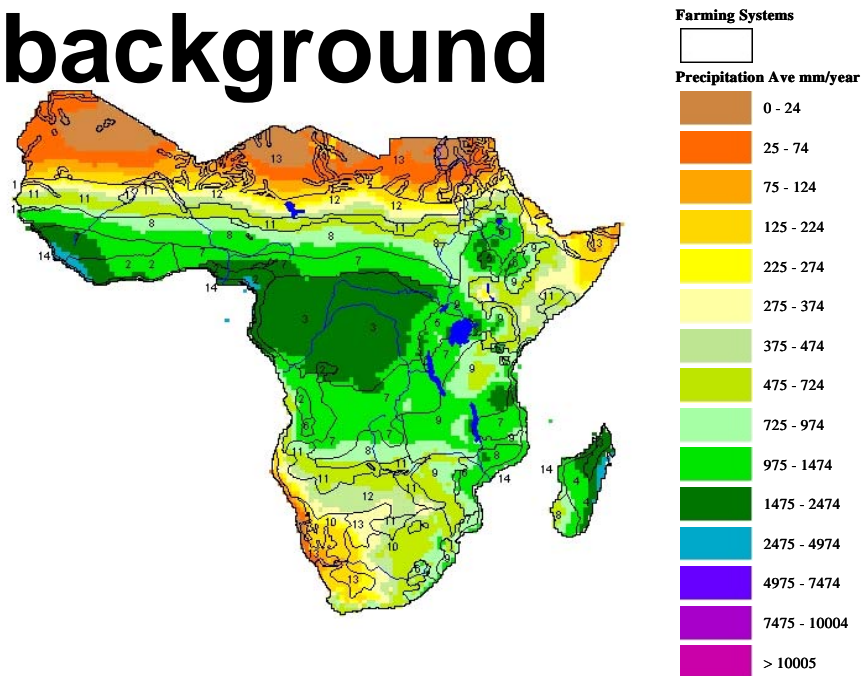
-Temperature already hot in most parts of Africa (Temps- 20 °C & more)

-Most areas are already water stressed (Rainfall-974mm & less for most parts of Africa)

– Main environmental constraints include: erratic and low rainfall, increases in warming and land degradation

-High dependence on agriculture – livelihoods

-Low ability of African farmers to adapt



- Livelihoods for most poor based on climate
- Adaptation is critical and of main concern because of the vulnerability of farmers to climate change
- Understanding farmer perceptions and determinants of choice important for adaptation policy.

Issues addressed in the study

- **What are the observed and projected effects of climate change on cotton production?**
- **To what extent does adaptation offer possibilities of reducing negative impacts?**
- **How can current knowledge on climate change effects inform farmers on suitable adaptation measures?**

Approaches and Methods

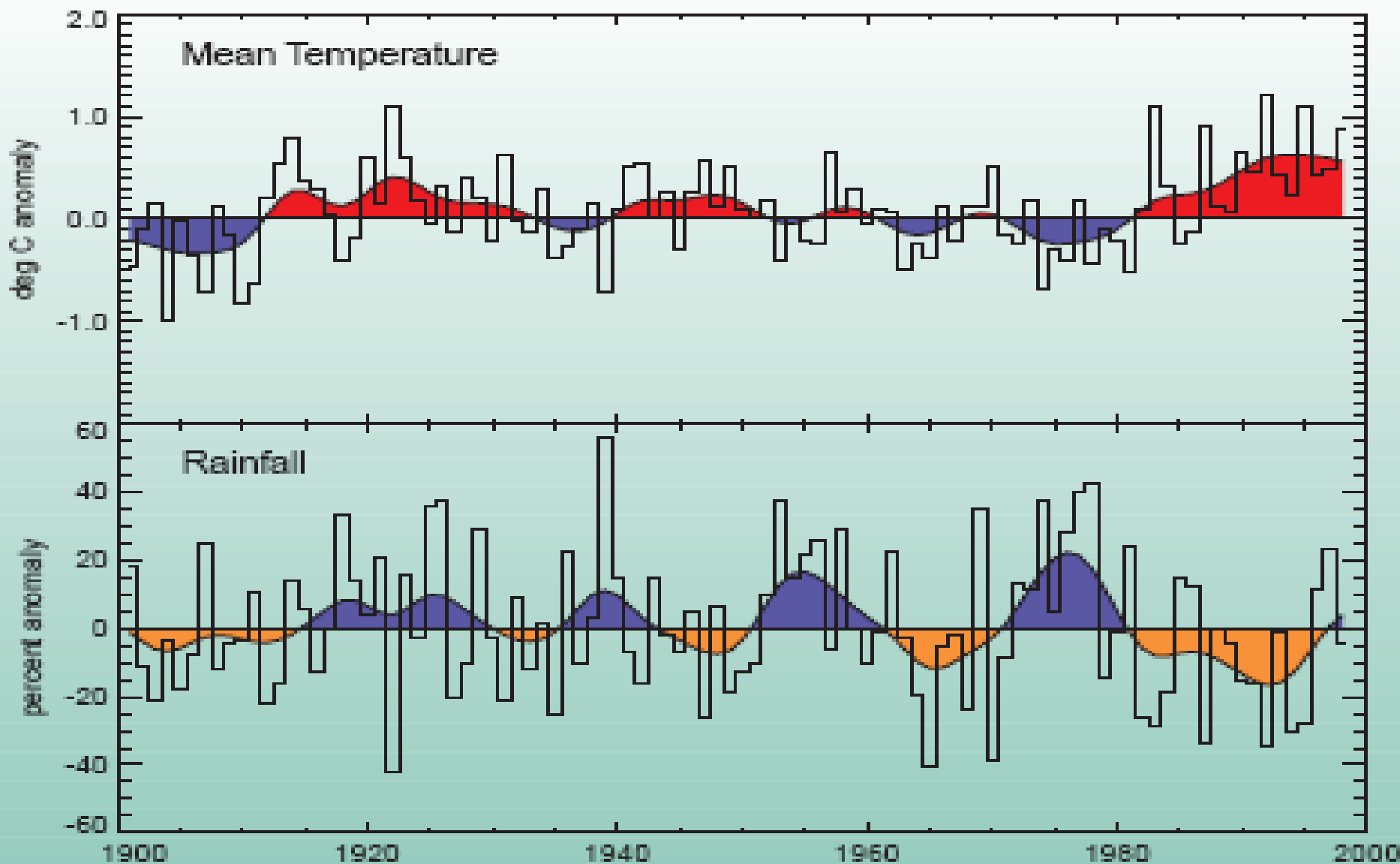
- Descriptive statistics
- Climate – cotton production trend analysis
- statistical correlation between cotton output and climate trends (temperature and rainfall)
- Cotton production output records delivered to market
- Temperature and rainfall data recorded by Department of Metrological Services in Zimbabwe
- Random Survey of farmers and other stakeholders to assess perception on climate change and adaptation options

Results and discussions

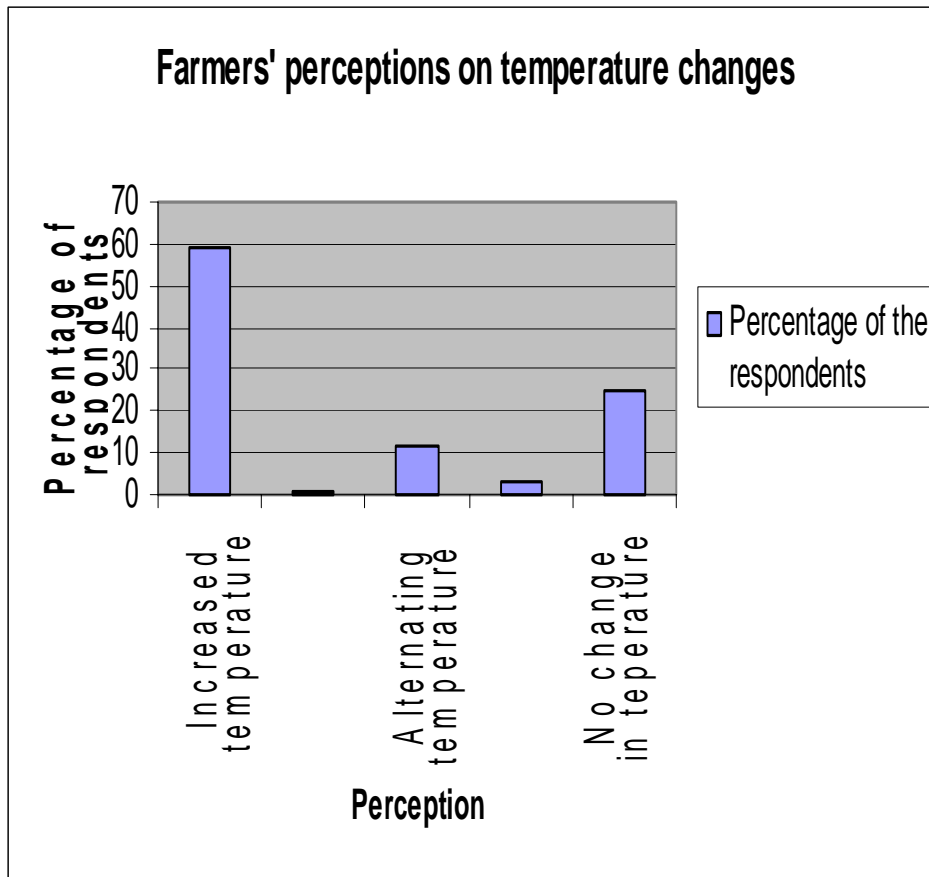
25 years Rainfall - cotton output trend relationship



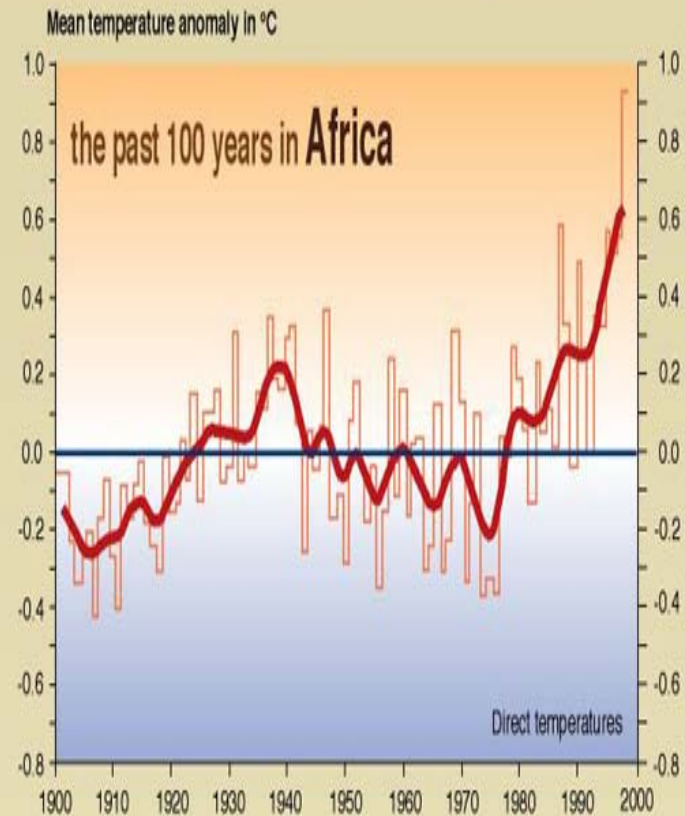
100 year temp/rainfall variation for Zimbabwe



Farmers' perceptions are that temperatures are warming

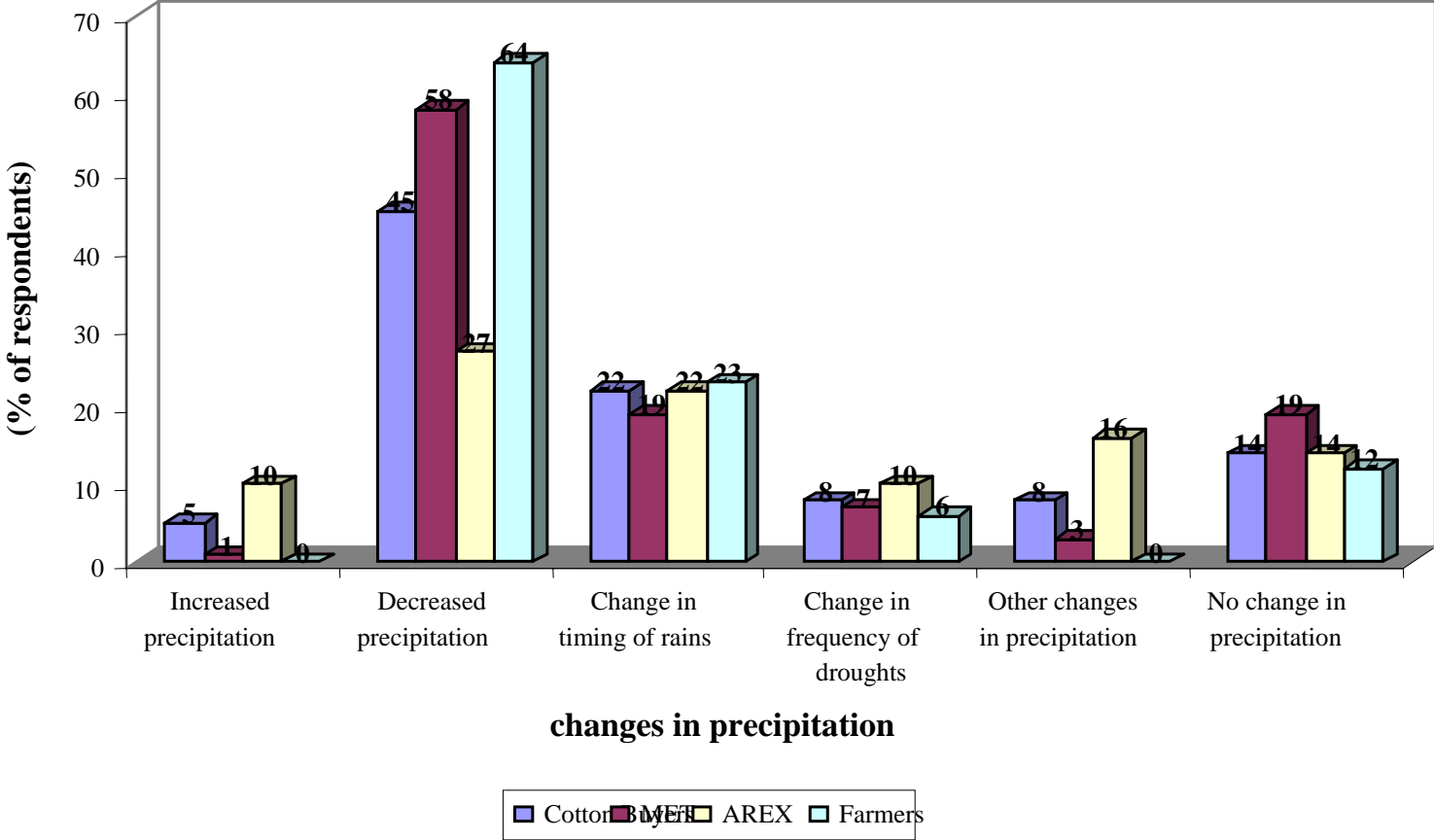


Variations of the Earth's Surface Temperature for...



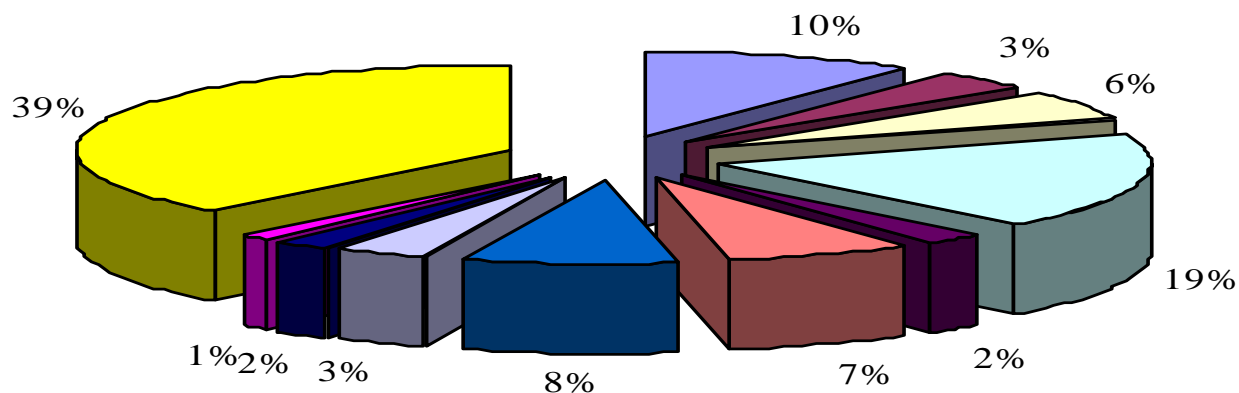
Perceptions on precipitation changes are that the district is getting drier and there are pronounced changes in the timing of rains and frequency of droughts

Perceptions on changes in precipitation



Some of the farmers' perceived adaptation strategies include: using different varieties, different planting dates, increased use of irrigation, increased use of water and soil conservation

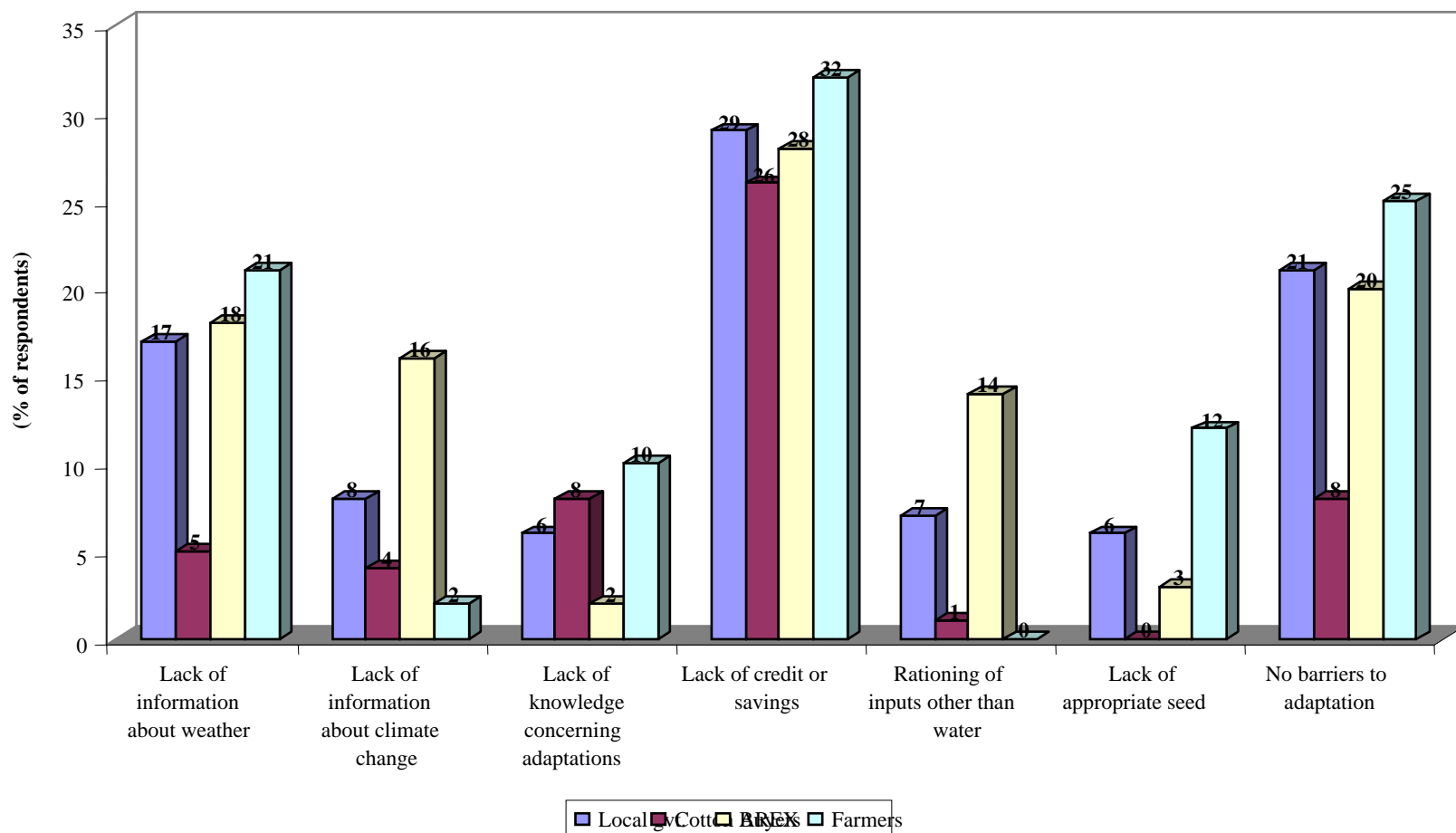
Adaptations options in SSA



- | | |
|--|--|
| ■ Different varieties | ■ Different crops |
| ■ Crop diversification | ■ Different planting dates |
| ■ Changing quantity of land under cultivation | ■ Change from farming to non-farming activity |
| ■ Increased use of irrigation / groundwater / watering | ■ Increased use of water conservation techniques |
| ■ Soil conservation techniques | ■ Shading and sheltering / tree planting |
| ■ No adaptation | |

Information concerning climate change forecasting, adaptation options and other agricultural production activities, are major constraint for most farmers

Perceived barriers to adaptation by country (% of respondents)



Determinants of perceived farm strategies

- Some of the factors that enhances farm-level adaptation include:
- farming experience
- access to free extension services
- access to credit
- Noticing changes in climate

What needs to be done

- **Improve our understanding of the effects of climate change on specific cropping systems and the possibilities to adapt to change**
- **Increase awareness among farmers**
- **Improve crops and varieties in terms of tolerance to high temperatures and drought**
- **Improve efficiency of irrigation systems and expand range of water sources for use**

Conclusions and policy implications

- farmers are aware of changes in climate variables (temperature and precipitation) and have some form of adaptation options in place.
- Information concerning climate change forecasting, adaptation options and other agricultural production activities is an important constraint to adaptation.
- Putting in place effective ways of ensuring that important climatic information is transferred to farmers are important in helping farmers adapt.
- Improving farmer's access to information (climatic and agronomic) as well as resources enhances adoption of adaptation measures to changes in climate.

Thank You