

CLIMATE CHANGE PERCEPTIONS AND ADAPTATION AMONG RURAL POPULATIONS IN THE GREAT RUAHA BASIN

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PRESENTATION OUTLINE

- **Background**
- **Climate Change in Africa**
- **Climate Change in Tanzania**
- **River Basins in Tanzania:
Livelihoods Opportunities &
Threats in the Great Ruaha Basin**
- **Climate Change Perceptions**

A decorative graphic on the left side of the slide features three balloons: a light green one at the top, a light blue one in the middle, and a light purple one at the bottom. Yellow streamers and triangular shapes are scattered around the balloons.

BACKGROUND: CLIMATE CHANGE

- Climate change and variability is among the key emerging challenges of the 21st century.
- Climate change involves serious disruptions of the entire world's weather and climate patterns including:
 - Temperature increases
 - Rainfall patterns,
 - Extreme weather events,
 - Sea level rise etc.

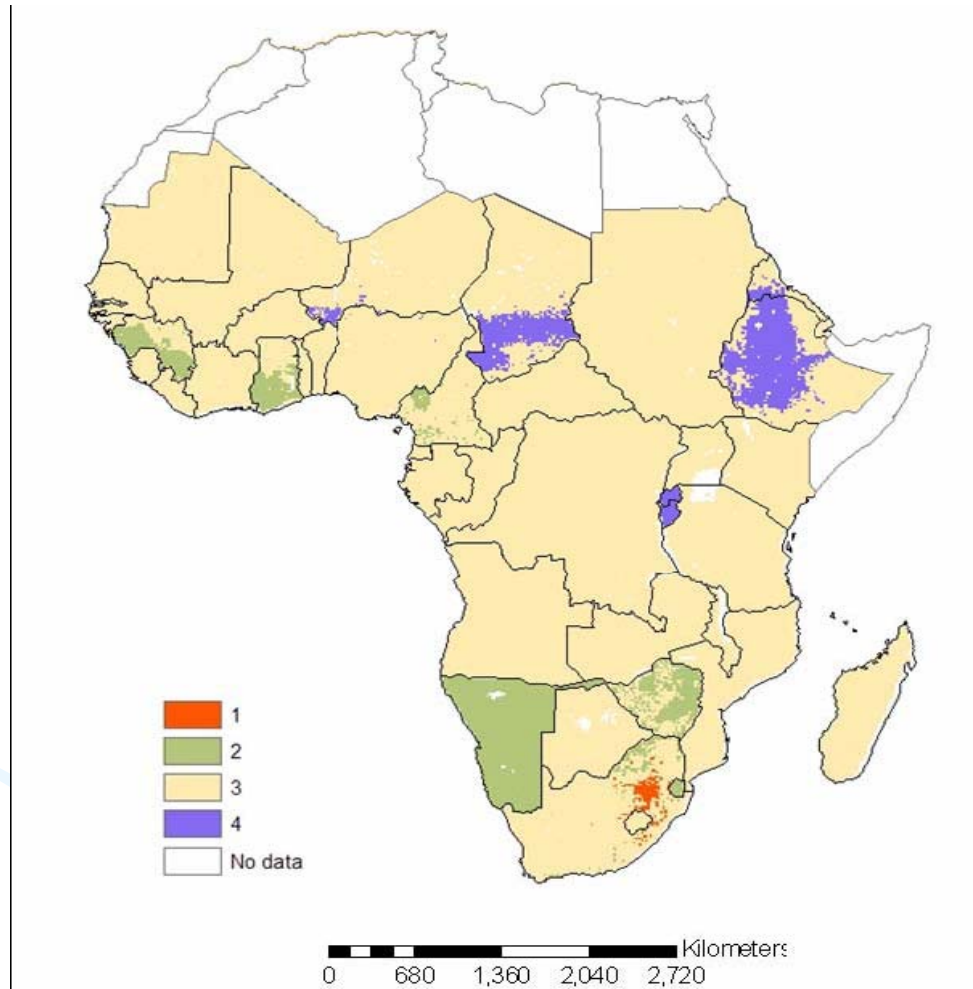


CLIMATE CHANGE IN AFRICA

- Africa is one of the most vulnerable regions in the world to climate change.
- Records show a warming up over most of the continent during the course of 20th Century, and a decrease of rainfall over large parts of Sahel.
- Rainfall patterns in Sub-Saharan countries since 1960 suggest that rainfall is fluctuating with some groups of good and bad years.

Country-by-systems, showing quartiles of the vulnerability indicator (quartile 1, "less vulnerable" – quartile 4, "more vulnerable")

source <http://www.dfid.gov.uk/research/mapping-climate.pdf>



TANZANIA: BACKGROUND INFORMATION

- Tanzania lies just south of the equator, at 1-11°S and has a tropical climate with regional variations due to topography.
- With the exception of a narrow coastal strip, most of Tanzania is highland; with a central plateau of around 900-800m.
- The coastal regions of Tanzania are warm and humid, with temperatures of around 28 - 30°C through most of the year, dipping just below 25°C in the coolest months (JJAS).
- The highland regions are more temperate, with temperatures around 20-23°C throughout the year.

CLIMATE PATTERNS IN TANZANIA

- Tanzania is not homogeneous from a climatic point of view. Some areas have bi-modal rains i.e. have two distinct rainfall seasons comprised of the long rains ("Masika") between March-May and short rains ("Vuli") between October-December.
- This pattern of rainfall is typical of north-eastern, north-western (Lake Victoria basin) and the northern parts of the coastal belt.
- According to Mwandosya et al. (1998) and URT (2003), there will be increased rainfall in some parts of Tanzania while other parts will experience decreased rainfall.



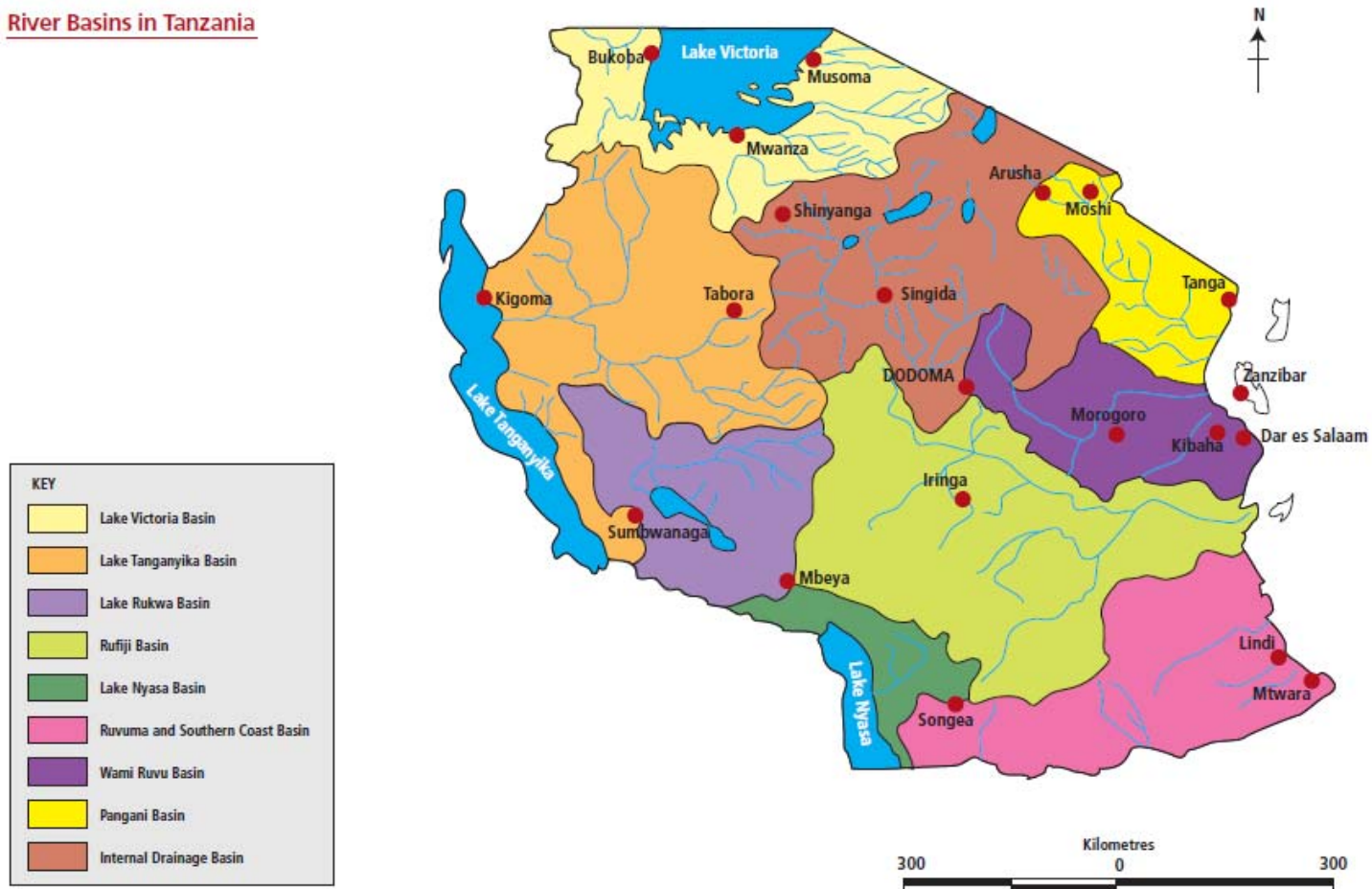
CLIMATE CHANGE IN TANZANIA

- **The areas with two rainfall seasons**, i.e. the north-eastern, the north-western, the Lake Victoria basin and the northern parts of the coastal belt **would experience increase in rainfall** for both seasons ranging from 4 percent to 15 percent.
- The other **areas receiving uni-modal rainfall** pattern, i.e. the south-western and western parts of the country **will experience a decrease in annual rainfall** by a range of between 1 percent and 10 percent.
- These precipitation predictions do offer greater regional specificity, however, the results should be interpreted with caution as they do not include an uncertainty analysis and rely on one or two older climate models (Agrawala *et. al.*, 2003).

NB: There is an increasing frequency of erratic rainfall pattern throughout the country.

MAP OF TANZANIA – RIVER BASINS

River Basins in Tanzania





Source: Ministry of Water and Livestock Development, Water Resources Division

Climate change is projected to have both positive and negative consequences for the major river basins:



THE GREAT RUAHA BASIN

- The Great Ruaha Basin is situated in the Rufiji River basin, which is the largest catchment in the south of the country
 - The Great Ruaha River rises in Tanzania's Kipengere mountains and flows through the Usangu plains (irrigated agriculture).
 - The Great Ruaha River Basin is economically important due to agricultural development & generation of hydropower at Mtera and Kidatu dams.
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LIVELIHOOD OPPORTUNITIES IN THE GREAT RUAHA BASIN

- It is estimated that over 6 million people live in the rivers catchment area; and depend on river for various livelihood activities
- About 90% of the population living in the basin consider farming to be their main source of income.
- They grow crops e.g. rice, maize, beans, vegetables etc.

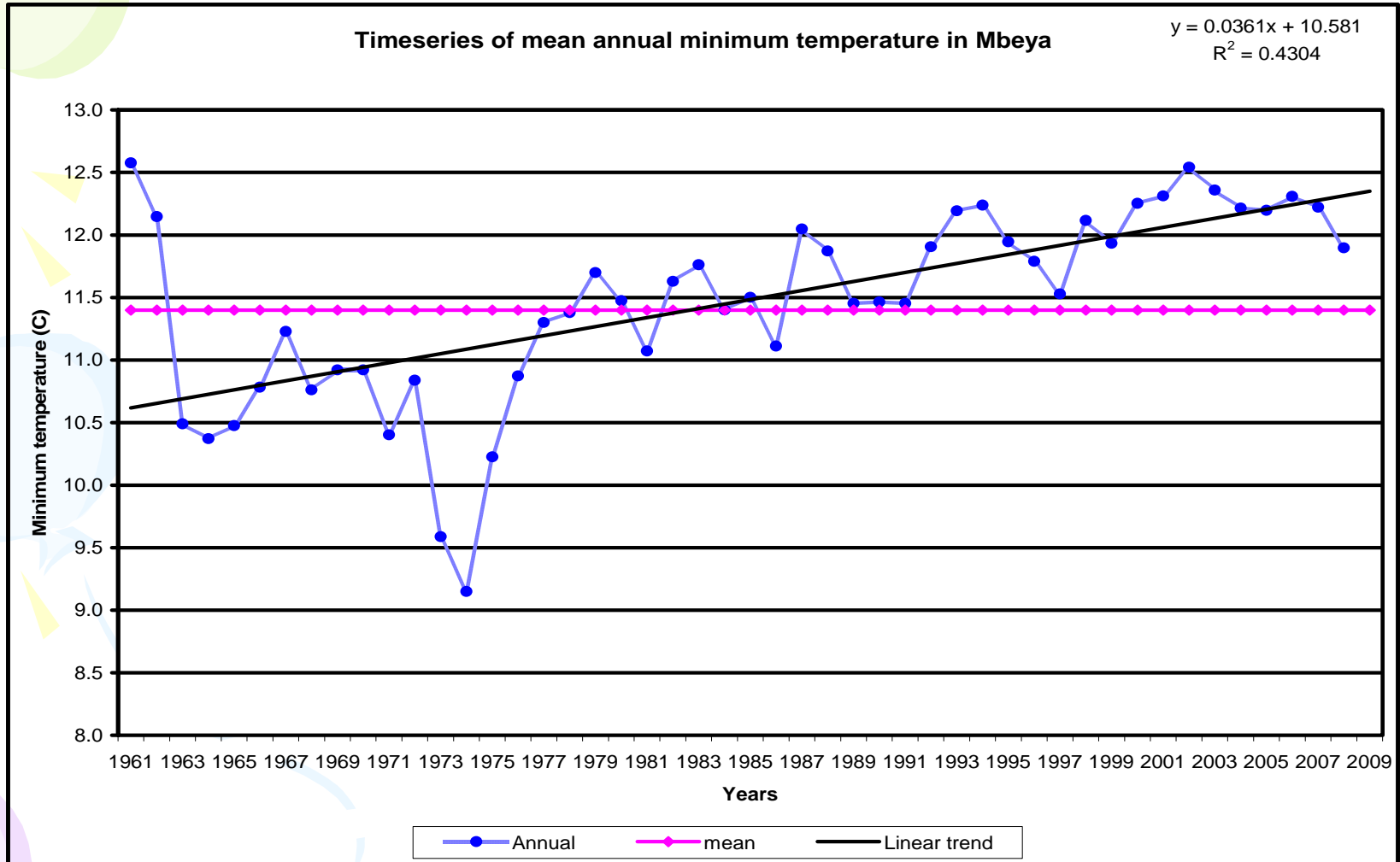
THREATS IN THE GREAT RUAHA BASIN

- Growth in human population, largely through migration has led to increased pressures on Natural Resources (land & water)
- This has impacted & is likely to continue affecting on agriculture, livestock keeping, deforestation, fishing and other economic activities
- This has also impacted on the Great Ruaha flows, which since in the 1990s have become seasonal, with amount of water declining especially during dry season.

LOCAL COMMUNITIES PERCEPTIONS IN THE GREAT RUAHA

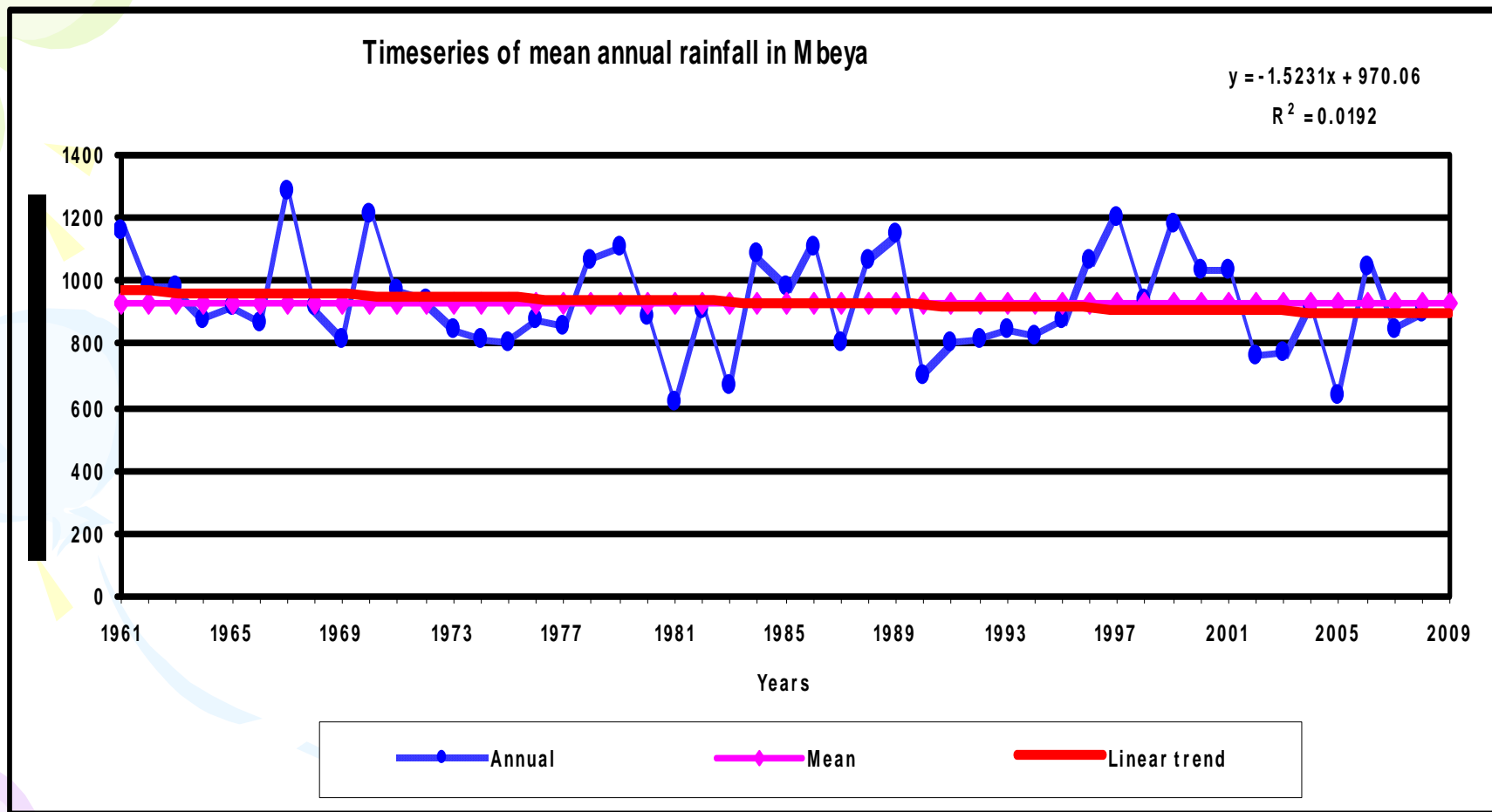
- **Changes in Rainfall Patterns:**
 - The start and end of rainy season is unpredictable
 - It is raining in patches within the same village as opposed to some years back.
 - Length of growing season has been shortened
- **Changes in Temperature**
 - It is becoming warmer
 - The cold period of the year has become shorter

Temperature trends (SHZ)



NB: Positive temperature trend has been observed
Source: Mbeya TMA

Rainfall Trends (SHZ)



NB: Slight negative rainfall trend has been observed
Source: Mbeya TMA



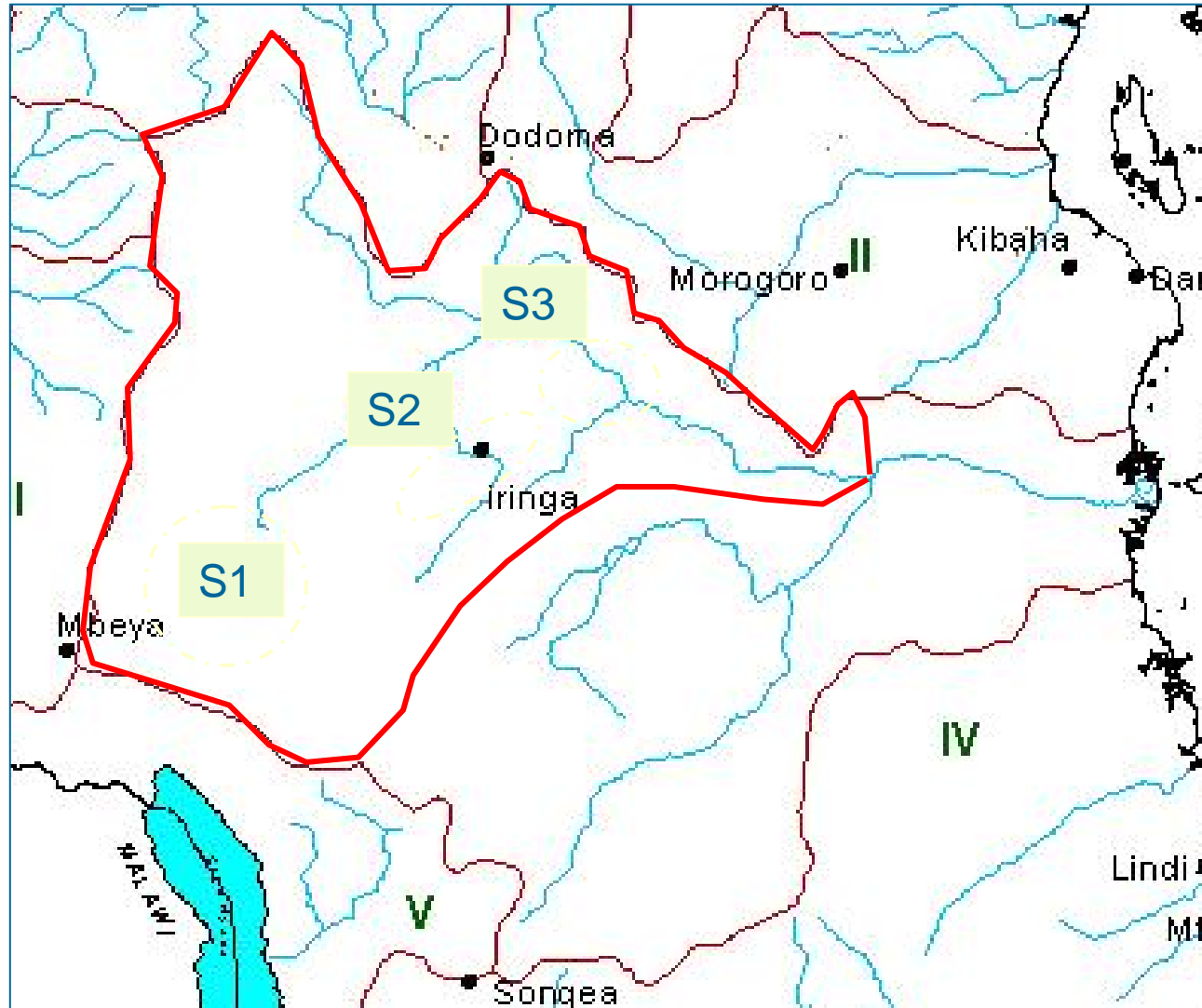
CLIVET - WP3

- **Analysing Climate Change Impacts and Adaptation Strategies within the Agricultural Sector**

The Proposed Study Areas

- Selection of the study area will be based on existing agro-ecological variations within the Ruaha Basin. The study will be conducted in 3 villages, representing:
 - '**Highlands**' (Usangu plains – Irrigated Rice)
 - '**midlands**' (Mazombe – Tomato zone)
 - and **lowlands** (Mbuyuni – Onion zone)

Ruaha River Basin



Great Ruaha River Basin

S1

Suggested study sites

S1: Rujewa – Usangu

S2: Kiponzelo – Mazombe

S3: Mahenge - Mbuyuni

Expected Outputs from WP3

- Analysis of past climatic extreme events, the local population's perception and experience of this, and the coping and adaptation strategies employed
- Mapping land use history – past (from 1960s) and present
 - Possible expansion of agriculture
 - Agricultural technologies (eg. Irrigation)
 - Change in crop composition and varieties
- Vulnerability assessment of local communities
 - to extreme events, in particular floods & droughts

Linkages with WP 1 & WP2

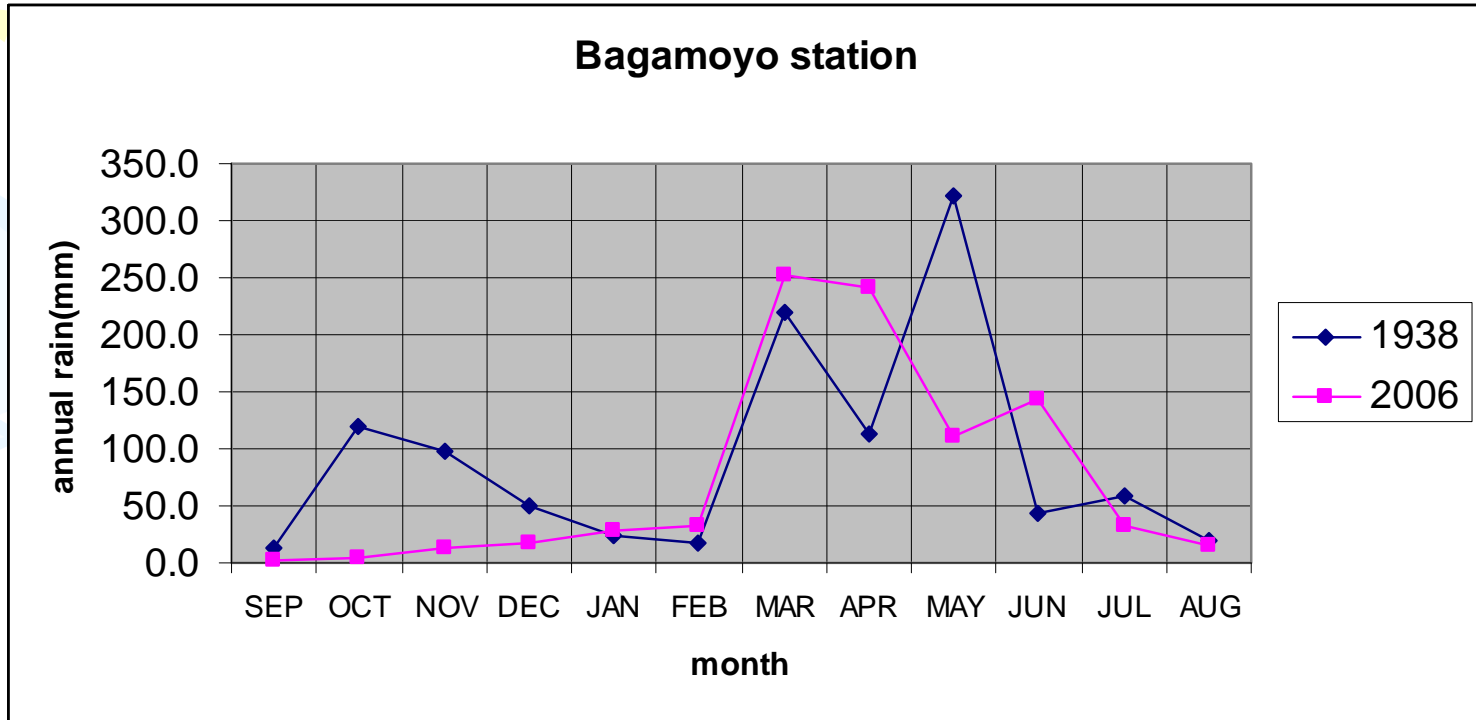
- **Precipitation:**

- Getting data from 1960s on rainfall pattern and major climate events (WP1)

- **Land use:**

- Establish an overview of livelihood and land use changes (from 1960s) within the Ruaha River catchment – based on secondary data (WP2)

Example: Analysis of Monthly climatic data





Thank You!