

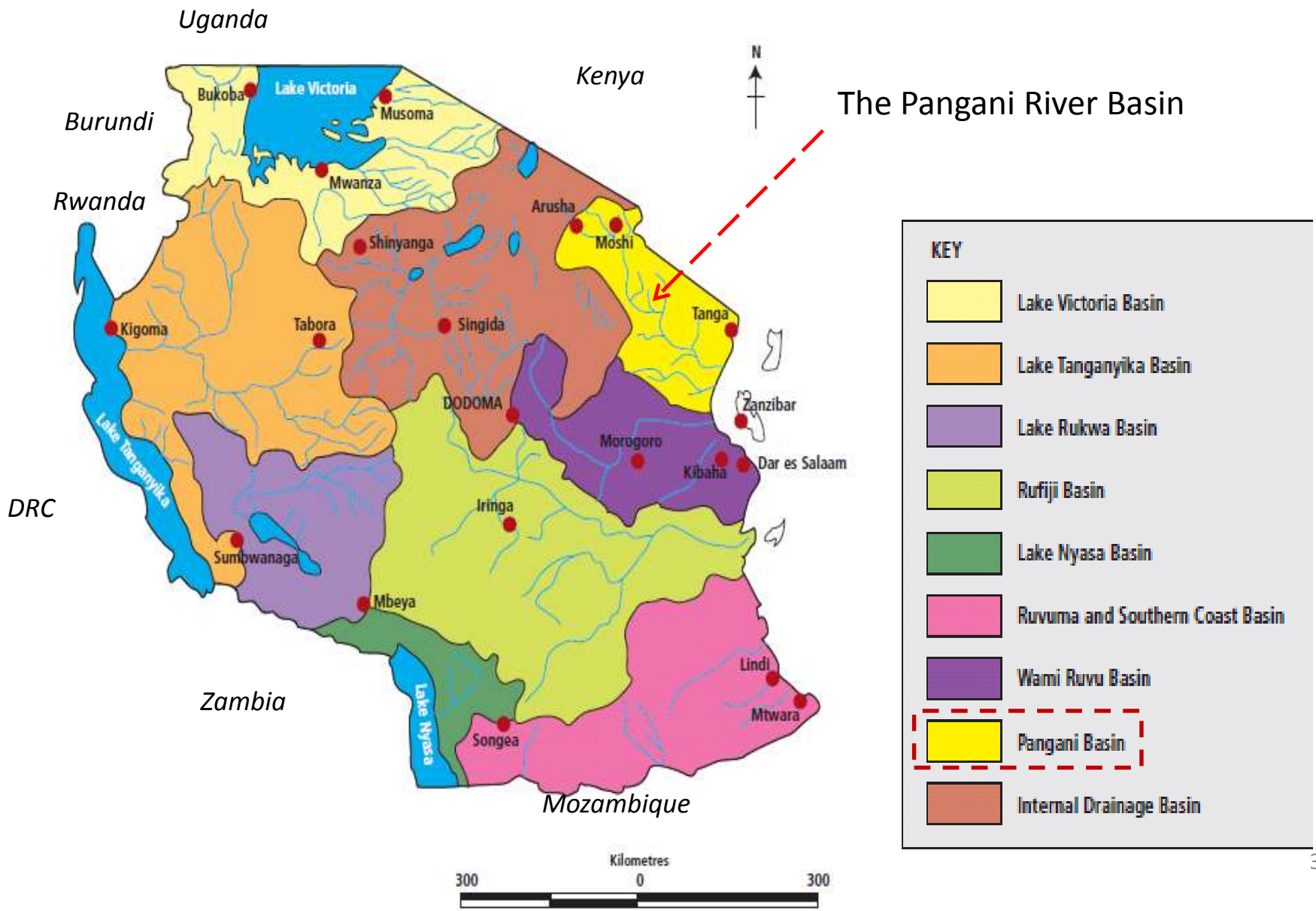
# **SPATE IRRIGATION LEADERSHIP COURSE**

**Protea Hotel Moshi  
7<sup>th</sup> to 11<sup>th</sup> March 2016**

# **Introduction of the Pangani Basin and the Makanya Flood Plains**

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**Sokoine University of Agriculture**

# Map of Tanzania showing Pangani River Basin



# INTRODUCTION



## Nine (9) drainage river basins in Tanzania

Name	Area (sq. km)
Pangani river:	56,330
Ruvu/ Wami river:	72,930
Rufiji river:	177,420
Ruvuma river & Southern coast:	103,720
Lake Nyasa:	39,520
Internal Drainage:	153,800
Lake Rukwa:	88,180
Lake Tanganyika:	151,900
Lake Victoria:	79,570



Area 56,000 km<sup>2</sup> in Tanzania, about 14,000 in Kenya

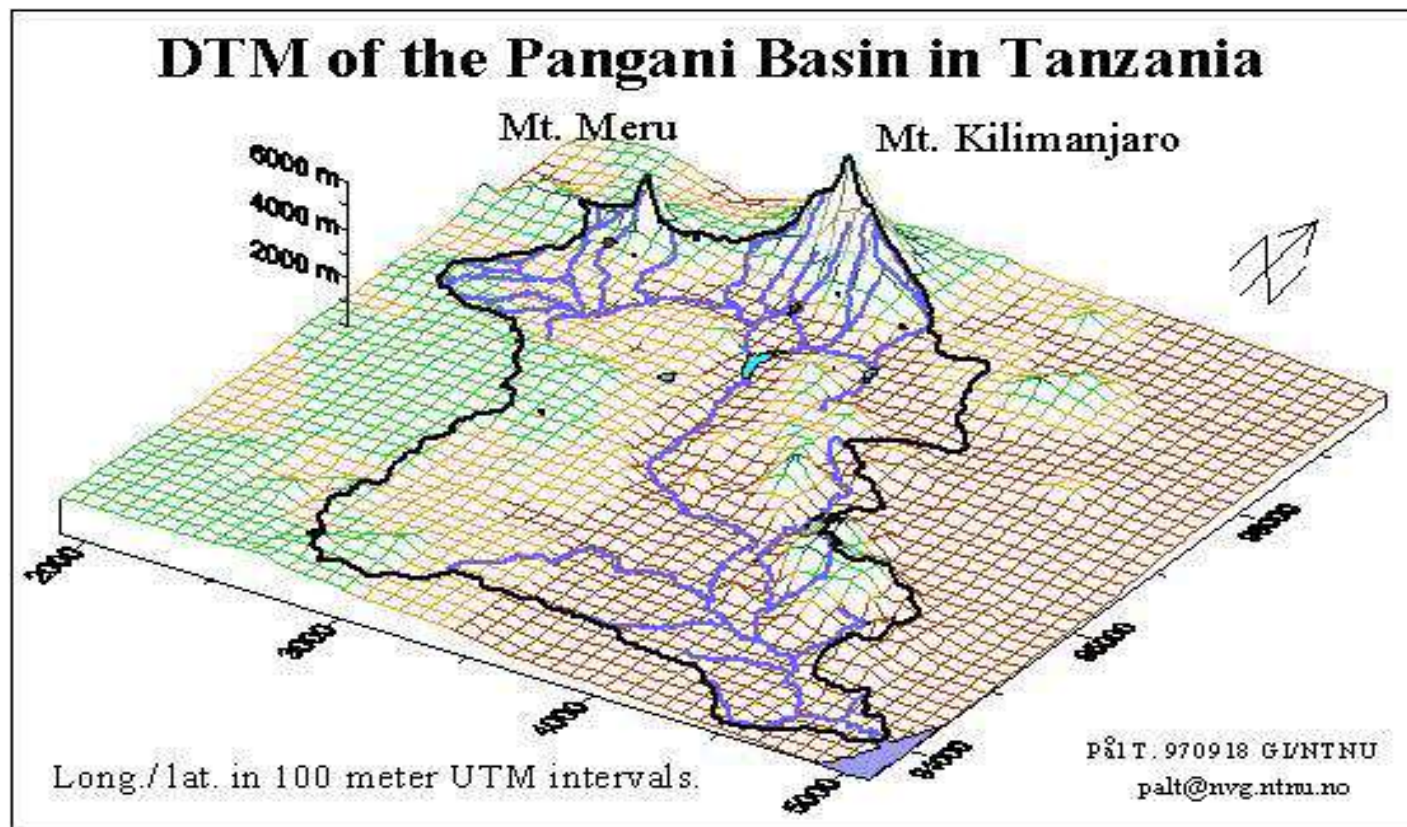
- Population >4 million
- Pop density >600 to <65 people km<sup>-2</sup>

# Introduction

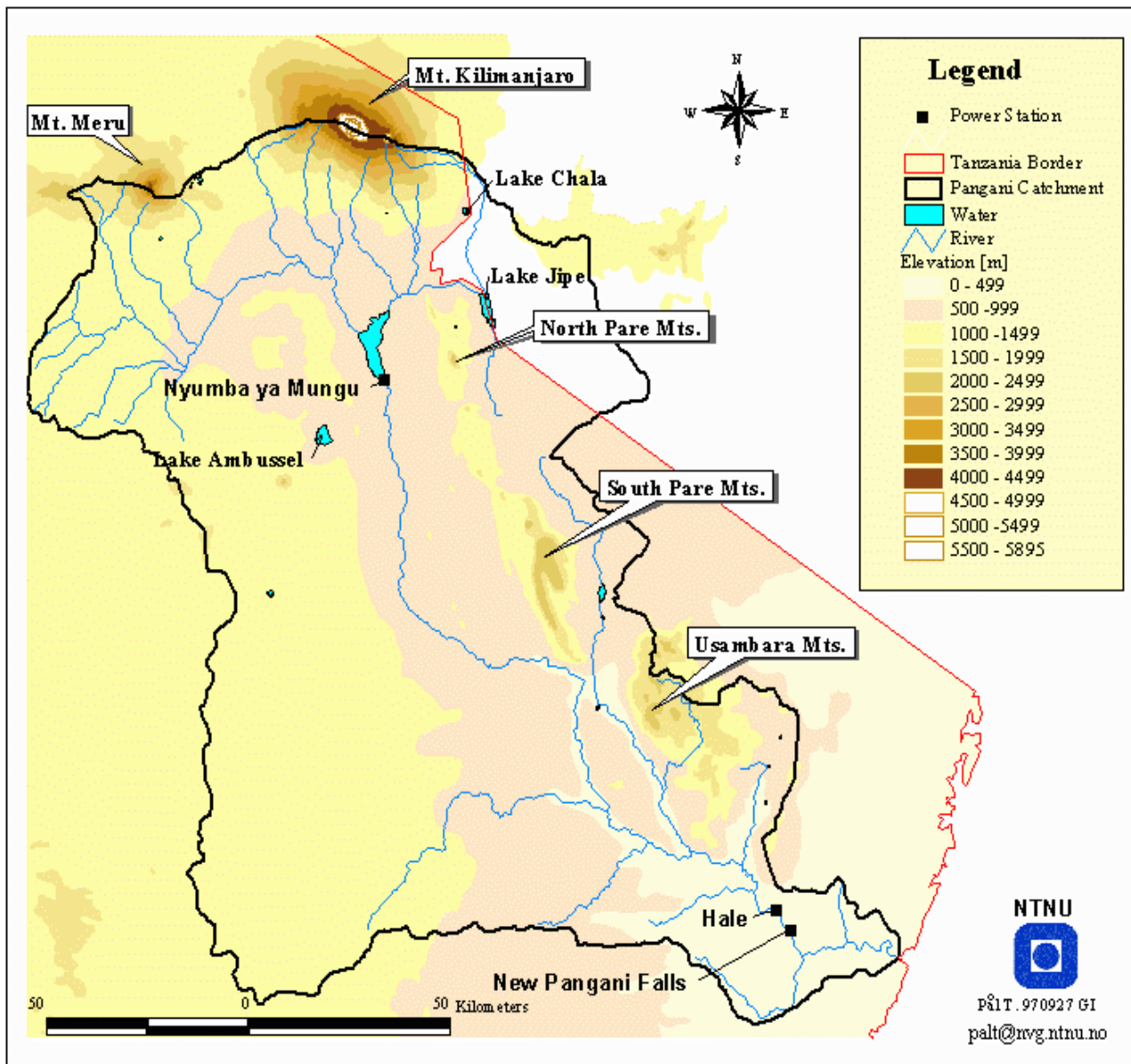
## **Major challenge**

- The Pangani River Basin, which sprawls across 48,000 square kilometres, is already stressed as it faces continued demands on its water resources and ecosystems.
- The basin is referred as a 'closed basin' – meaning no more water allocations can be made from the existing rivers without negative impacts downstream or to the environment





- Percentage of area under different altitude
- HIGH (40%), MEDIUM (20%), LOWLAND (40%)
- 90% of population in highlands, 80% depend on agriculture
- Livestock (cattle 4m, goats 2m, sheep 1.1m)



## Diverse climatic conditions and livelihoods

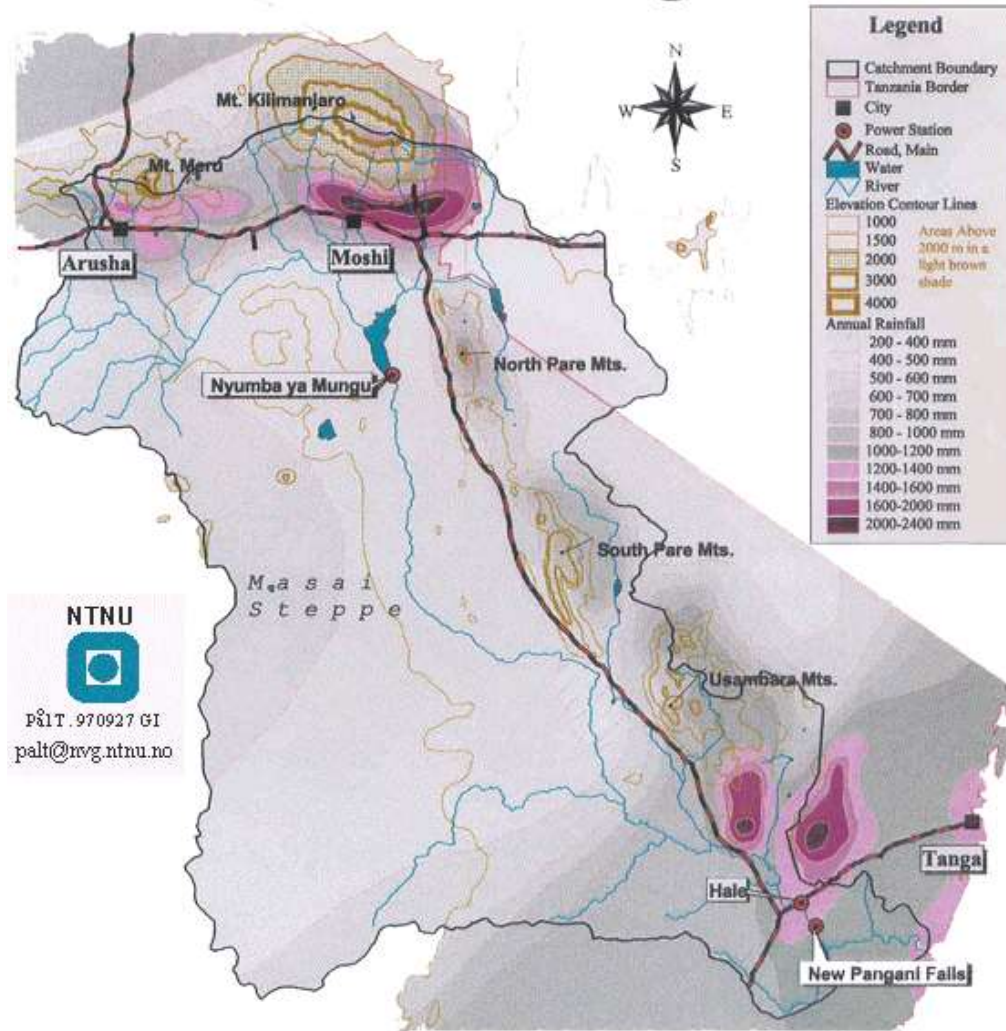
### Main rivers

- > Ruvu
- > Kikuletwa
- > Mkomazi
- > Sigi
- > Luengera

- 90% of population in highlands
- 80% depend on agriculture



## Rainfall in Pangani



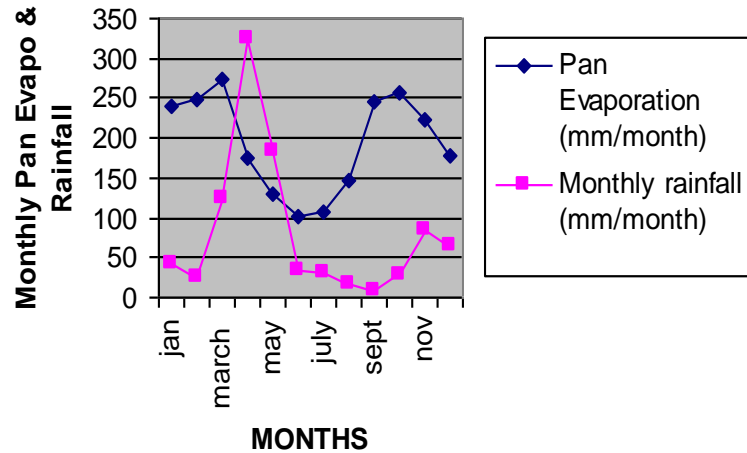
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Highest rainfall, 1000-2000 mm/year, occurs on the south-eastern slopes of Mount Kilimanjaro and Meru.

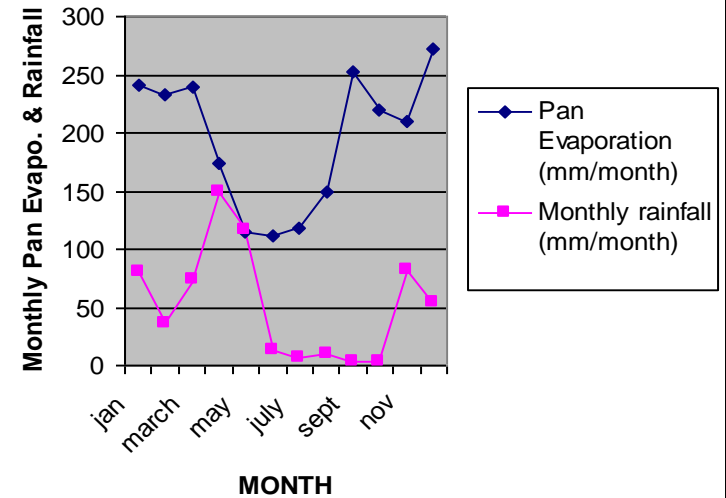
In a southward direction, the rainfall reduces to 500-600mm/year in the semiarid area of the central portion of the basin.

# Monthly rainfall & Evapot for Medium, dry and driest location

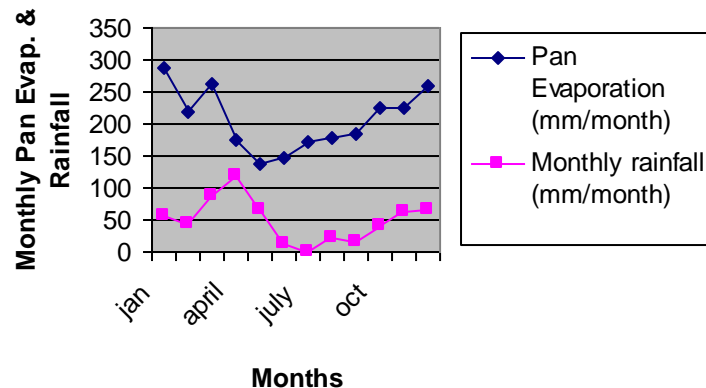
## MOSHI MET STATION



## KIA MET STATION



## SAME MET STATION



# LAND USE

## **PROTECTED AREA**

- **Forest reserve**
- **Game Reserve**
- **National Parks**
- **Conservation area**

## **AGRICULTURE**

**PASTURE/ GRAZING**

**PLANTED FORESTRY**

# FARMING SYSTEMS

- **Coffee-Banana**
- **Maize-legume-Vegetable**
- **Maize-Legume**
- **Maize-Livestock**
- **Livestock-Fishing-Rice**
- **Pastoralism**
- **Plantation**
- **Agro-forestry**

# TYPOLOGY OF WATER USERS

- **Highland traditional irrigation**
- **Large scale modern irrigation**
- **Water supply dept. (Urban + Rural)**
- **Improved small scale irrigation**
- **Lowland traditional small scale irrigation**
- **Pastoralists**
- **Hydro-power generation**

# Legislation and implementation

- **The New Water Policy (July 2002) and water resource management- gives comprehensive framework for promoting optimal, sustainable and equitable development and use of WRs :**
- **Available instruments include:**  

<b>TECHNICAL</b>	<b>ECONOMIC</b>
<b>ADMINISTRATIVE</b>	<b>LEGAL</b>
<b>REGULATORY</b>	<b>PARTICIPATORY</b>



# Possible links

- **Partched-Thist Model (Crop-Soil-Met-RWH-Management). Micro and Macro catchment**
- **Fertility management in RWH systems( options and strategies for sustainable mngt)**
- **Improved Management of Common Pool Resources (institutional step up for sustainable management of CPR)**

# Issues of Planning

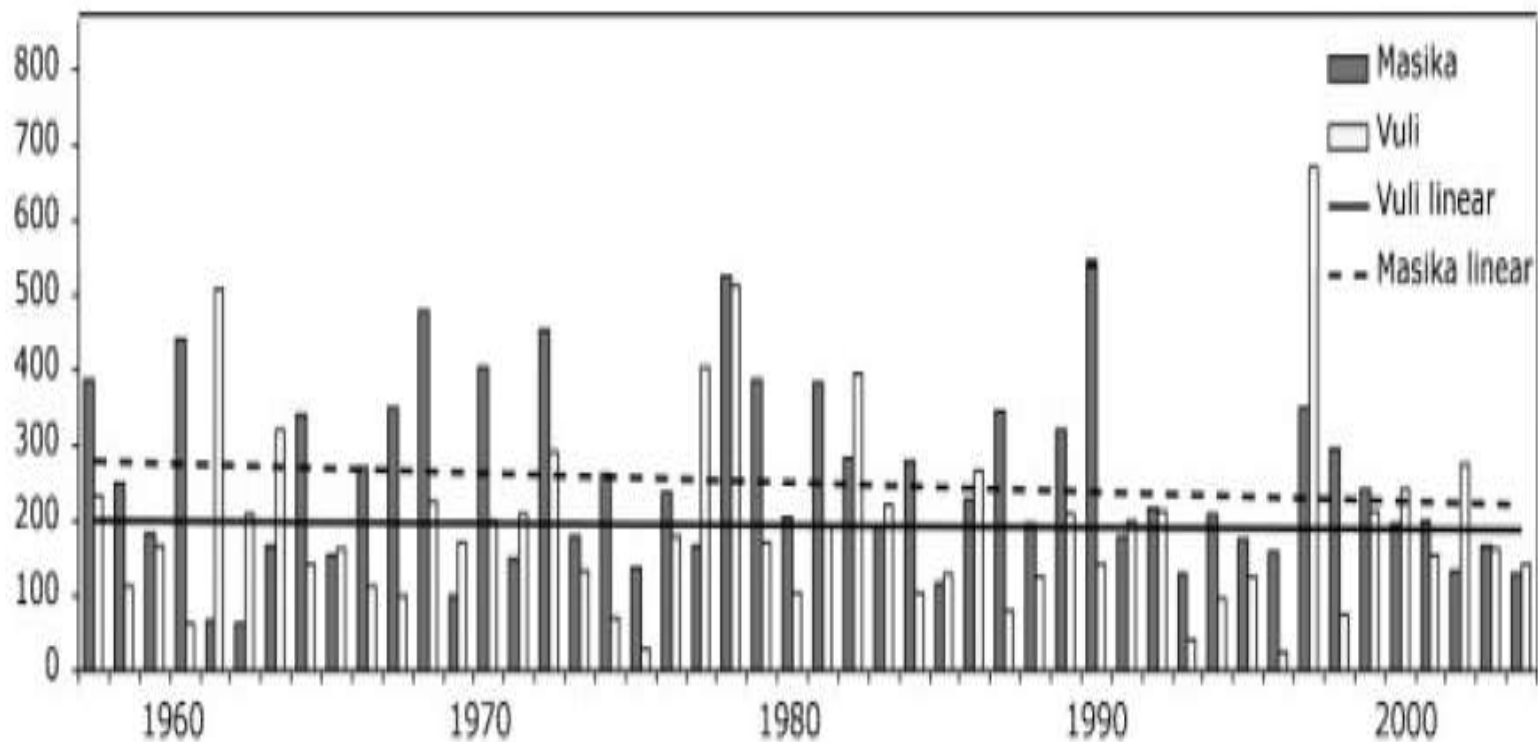
- **Strategies that improve livelihood through increasing productivity of water**
- **Strategies that improve access to CPR**
- **Strategies that increase adoption of appropriate management systems**

# Makanya sub-catchment

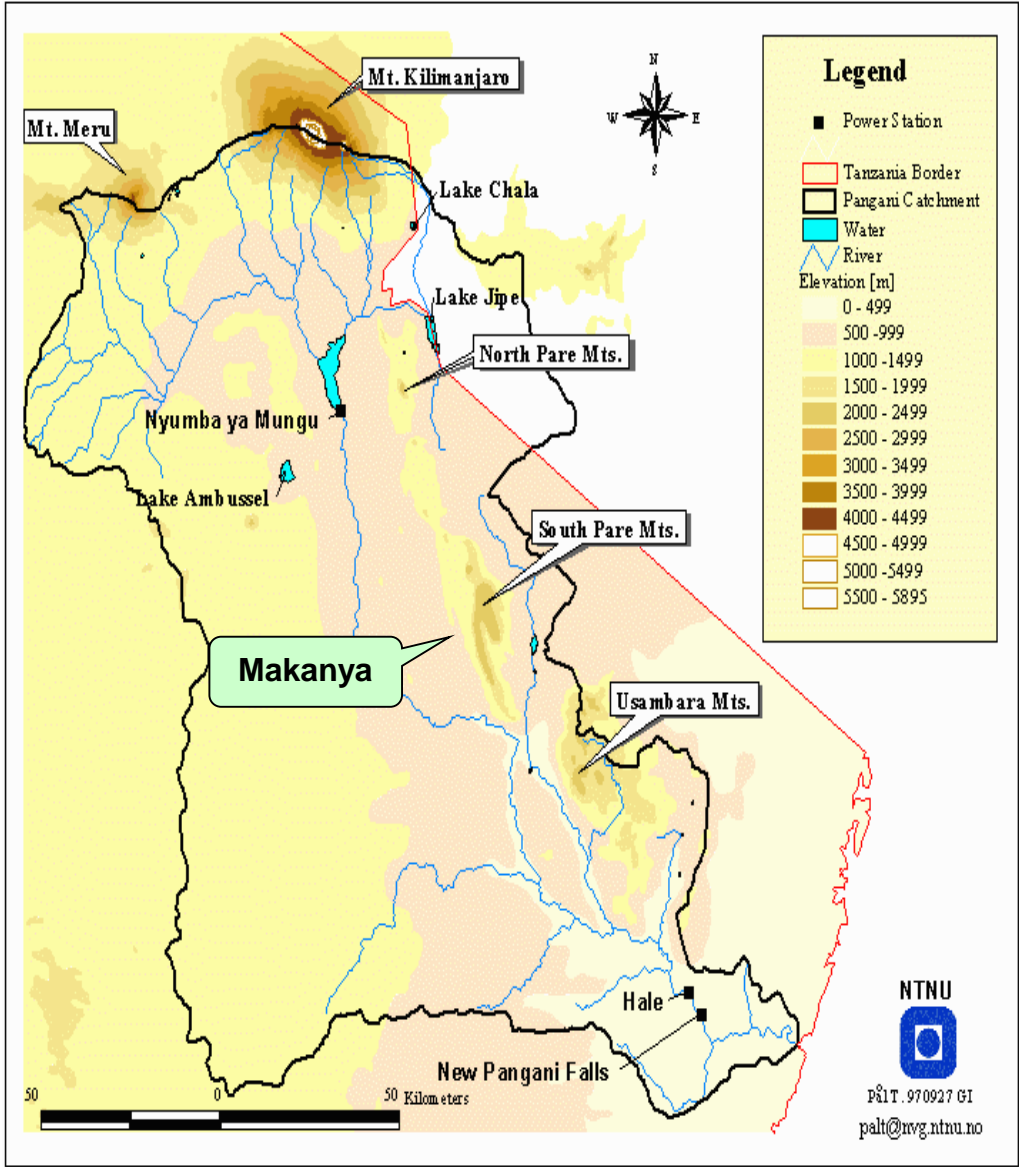
## Location, size and population

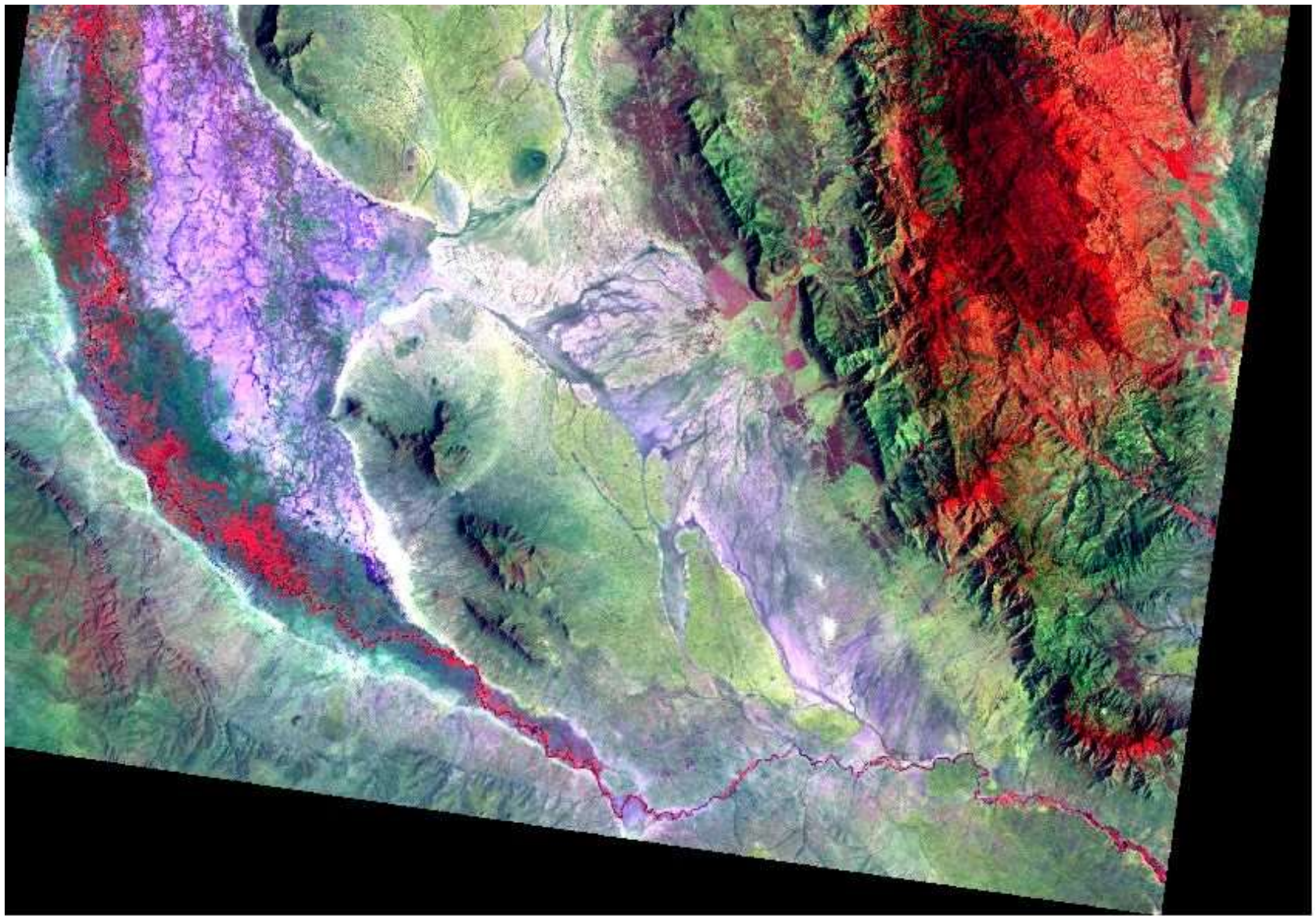
- The watershed lies between latitudes 4° 15' to 4° 21' S and longitudes 37° 48' to 37° 53' E.
- The watershed covers an area of about 975 km<sup>2</sup>.
- The population in the Makanya watershed is estimated to be 35,000 and is rapidly growing with an estimated growth rate of 1.6% per annum (URT, 2004).
- About 90% of the population in the catchment live in the highlands, of which, 80% depends directly or indirectly on agriculture

**Rainfall (mm) variation, Same Meteorological Station (1957-2004) [Source: Enfors and Gordon, (2007)].**



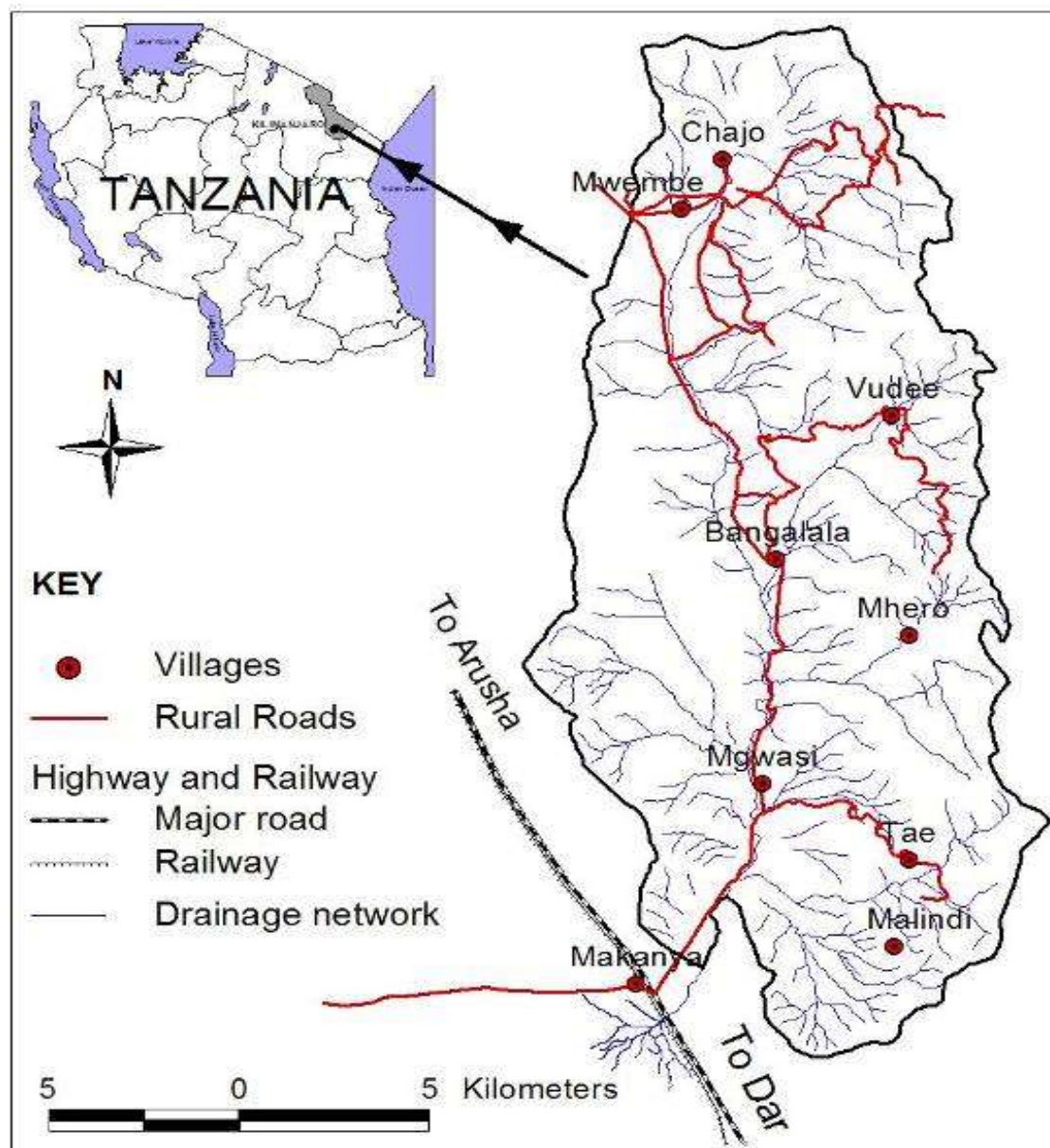
Map of the Pangani River Basin showing the location of Makanya Watershed area

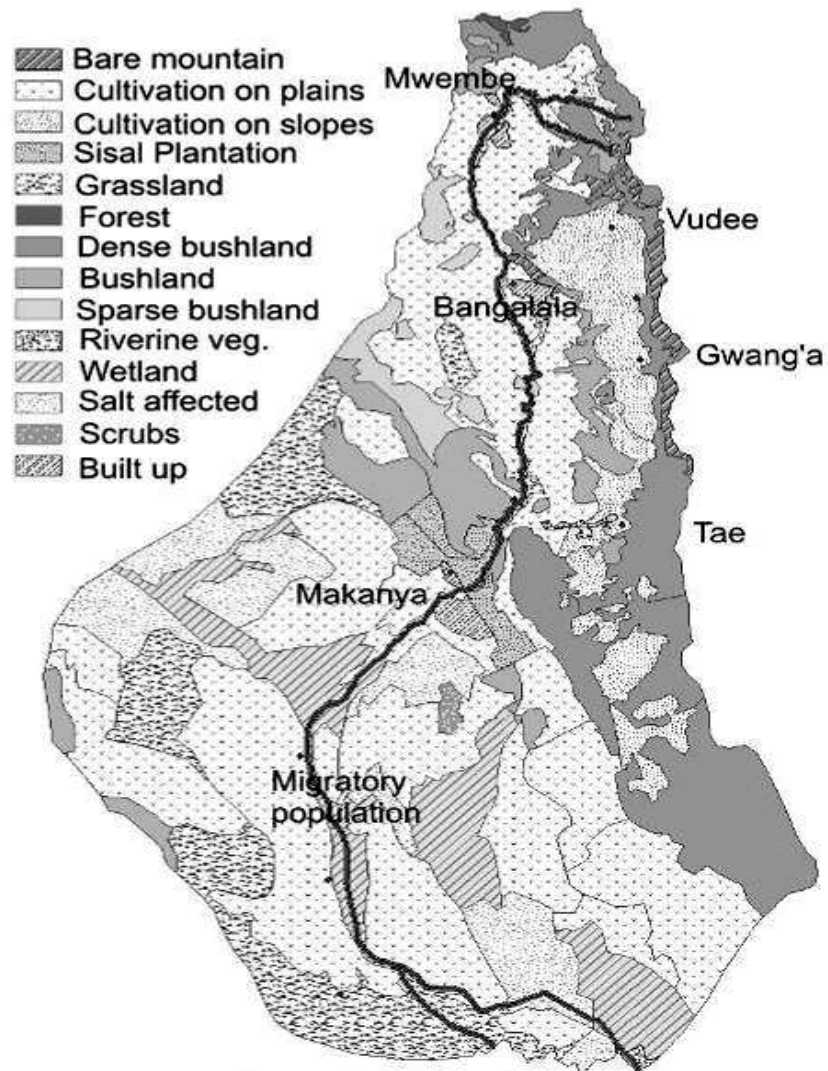




**Makanya-Pangani confluence**

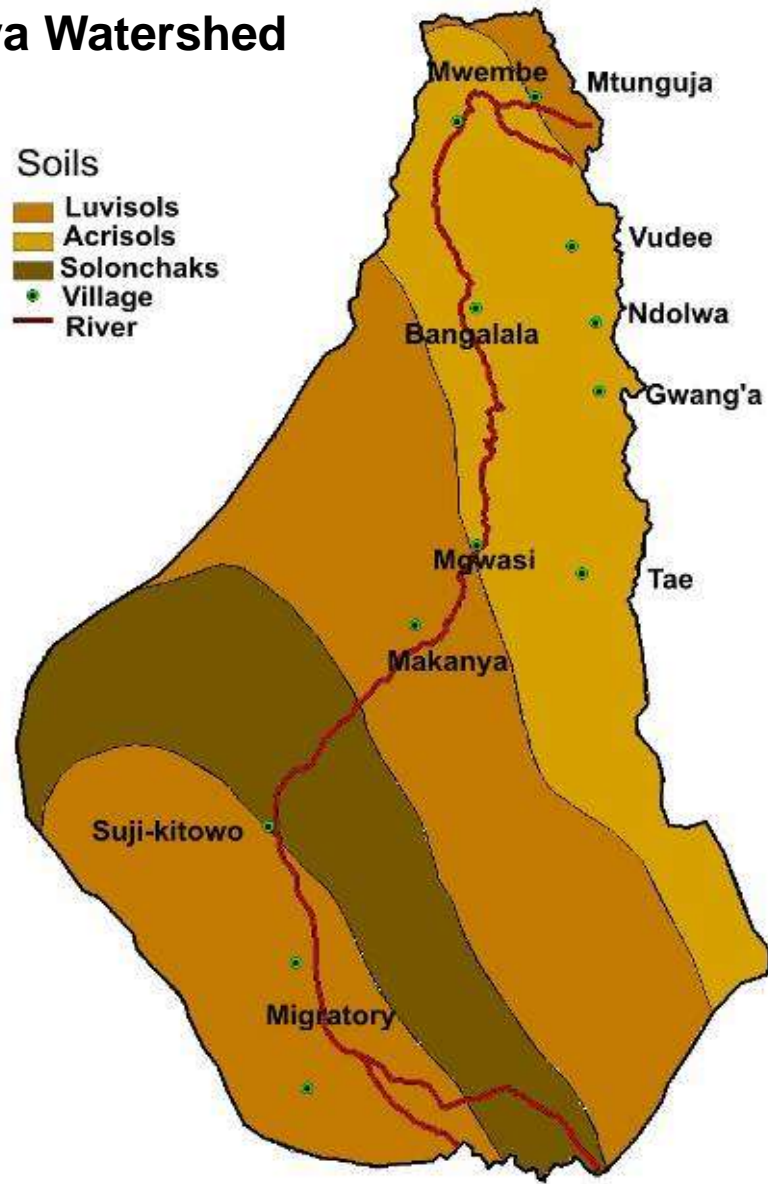




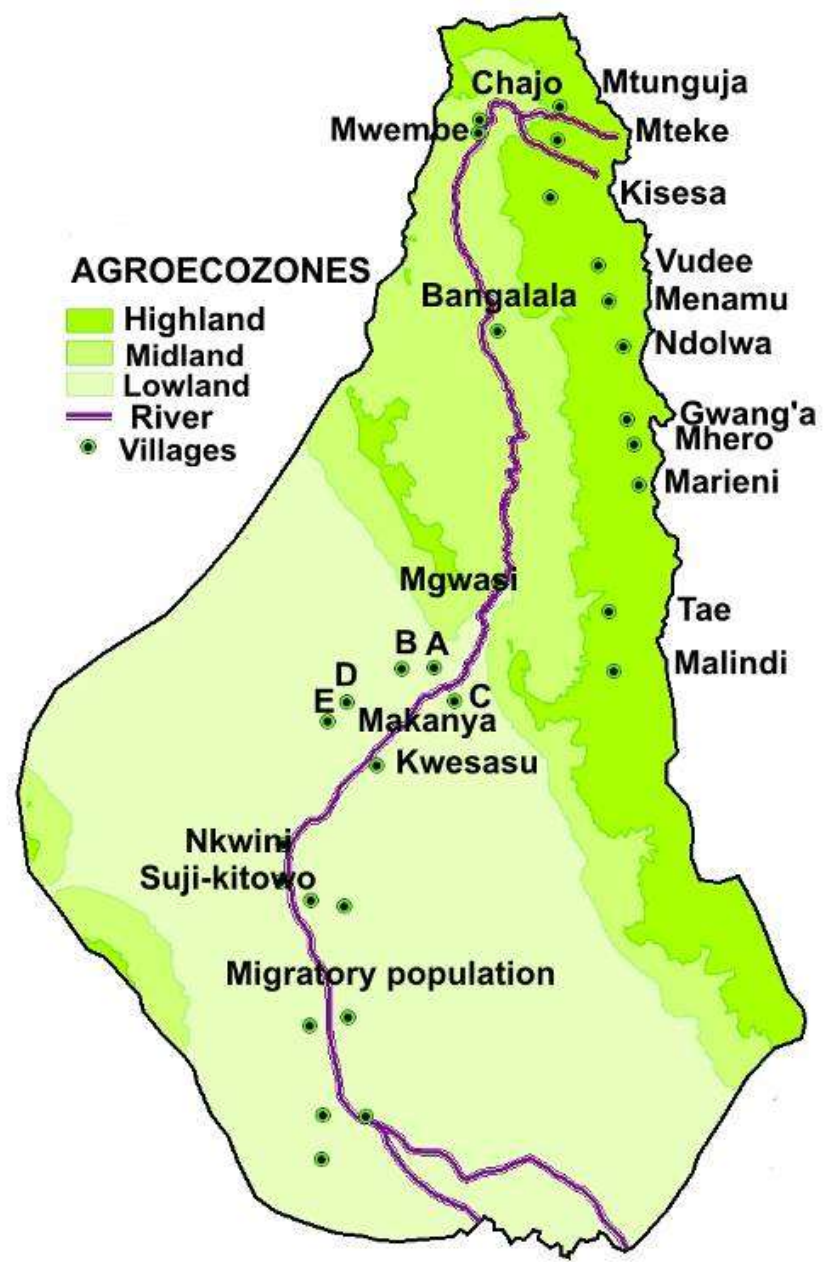


**Land use and land cover of the Makanya Watershed**

# Major soils of Makanya Watershed



# Agro-ecological zones of Makanya Watershed



Thank you for your attention