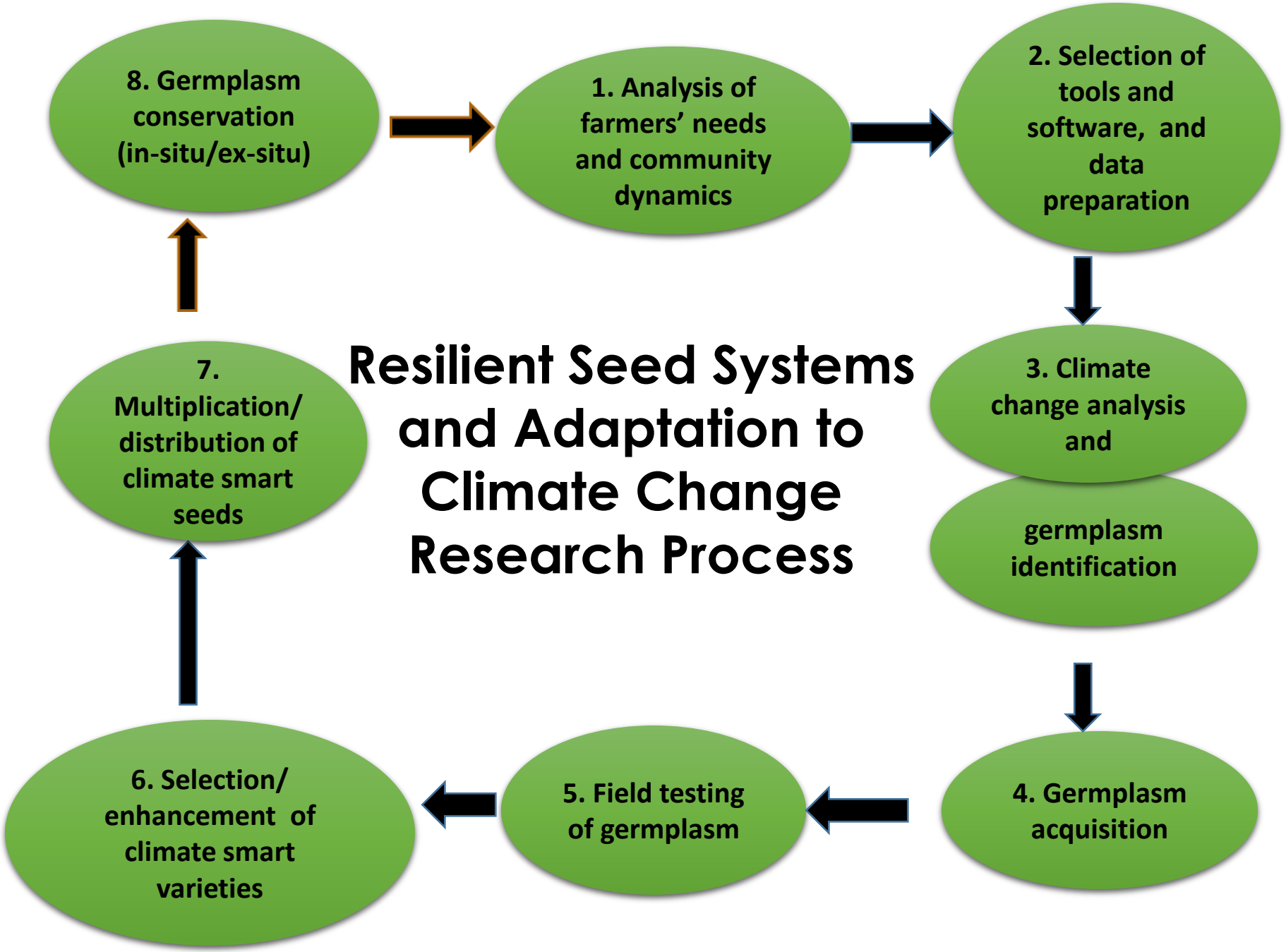
Co-organizers

In cooperation with

# Resilient seed systems and Adaptation to climate change: Some Results from Participatory Climate & Crops Suitability modeling in 8 African Countries

Otieno Gloria

Date: 16-20th November 2015, Addis Ababa


Resilient Seed Systems and Adaptation to Climate Change Research Process
1. Analysis of farmers' needs and community dynamics
2. Selection of tools and software, and data preparation
3. Climate change analysis and germplasm identification
4. Germplasm acquisition
5. Field testing of germplasm
6. Selection/ enhancement of climate smart varieties
7. Multiplication/ distribution of climate smart seeds
8. Germplasm conservation (in-situ/ex-situ)

# Methodology 1: Climate change Analysis

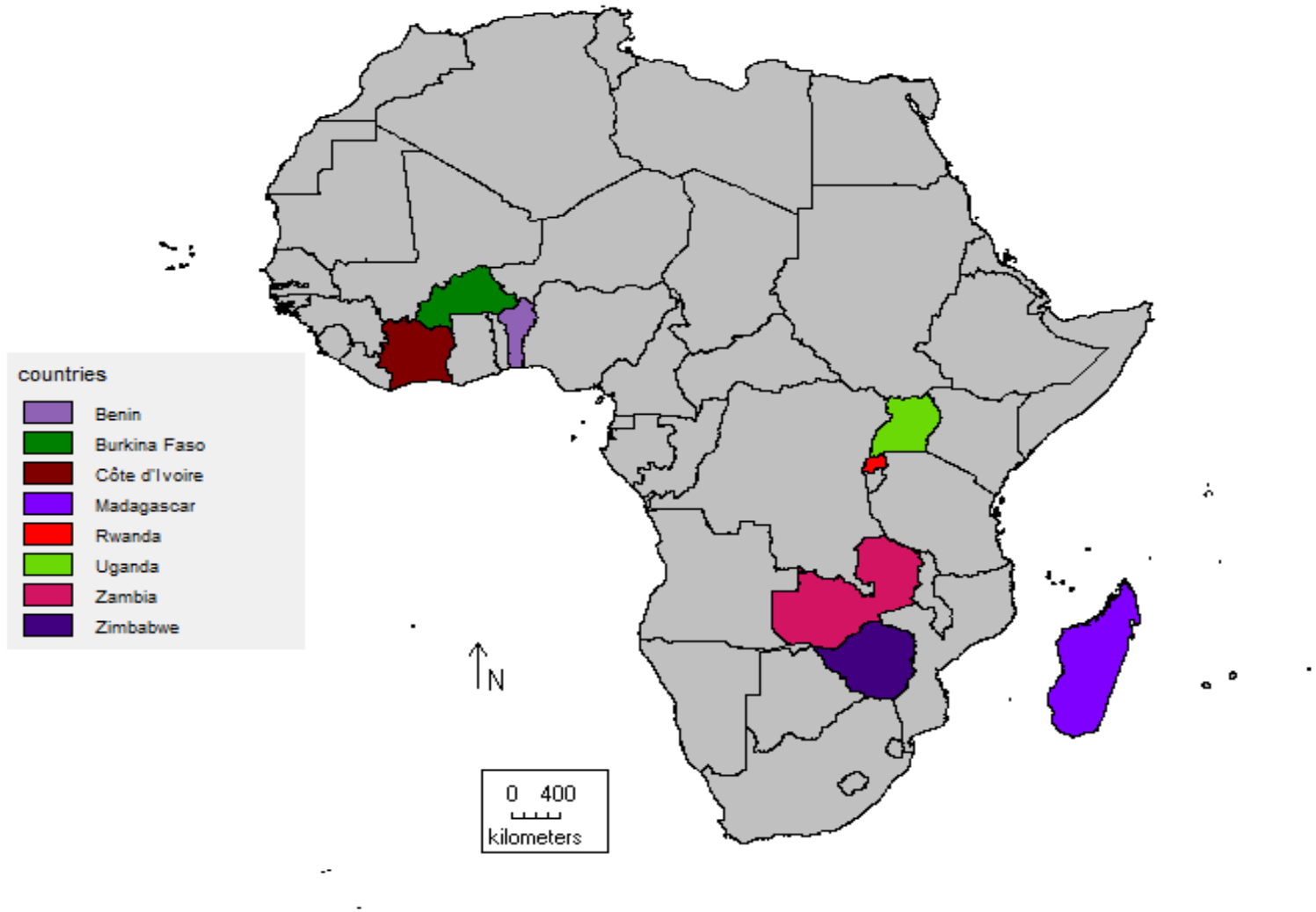
- Past to present:
  - Meteorological data and
  - Focus group discussions with farmers ( local indigenous knowledge)
- Future climate change: predictions from World Clim (www.worldclim.org )

# Methodology 2: Identifying suitably adapted germplasm

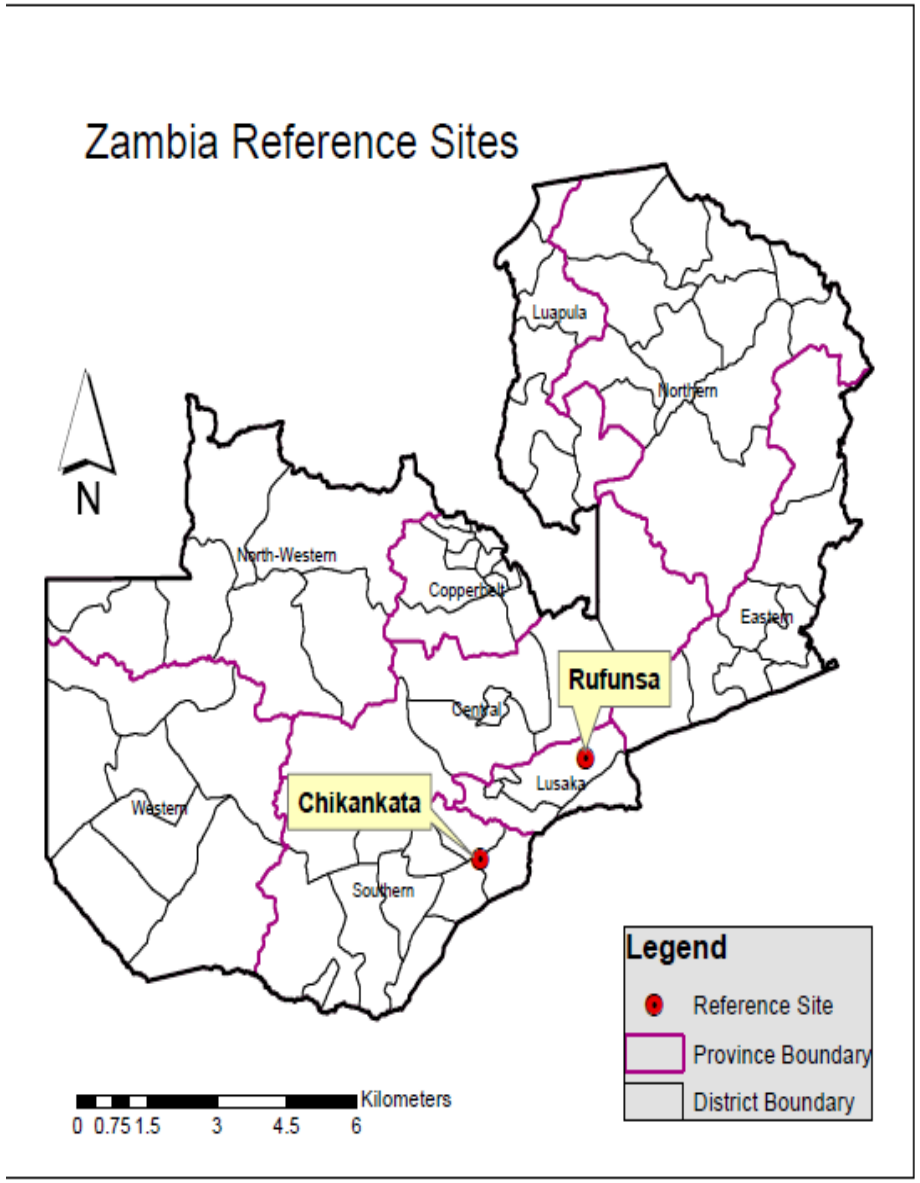
- **GIS + Climate modeling: matching Accessions with climates**
- **Identifying specific climate challenges**

  **(present and future)**
- **Identifying Accessions through GIS and crop suitability modeling**
  - **National gene bank accessions**
  - **International gene bank accessions (www.genesys-pgr.org**
  - **Locally adapted germplasm ( Local indigenous knowledge)**

# The countries



# Zambia Results: Chikankata



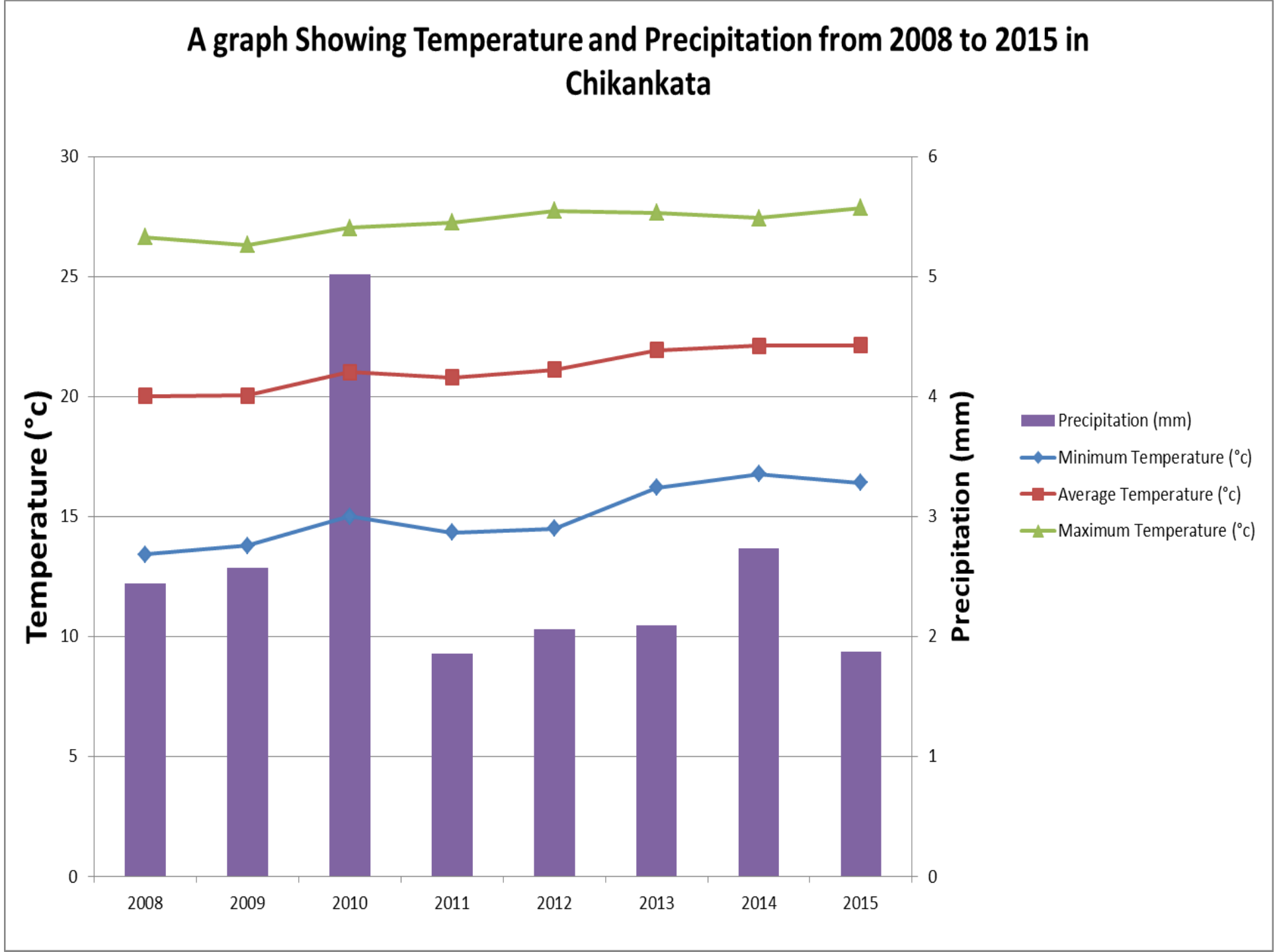

**Located in SW part of Zambia**

**Rainfall amounts - 600-1000mm**

**Average temperature -13-27°C**

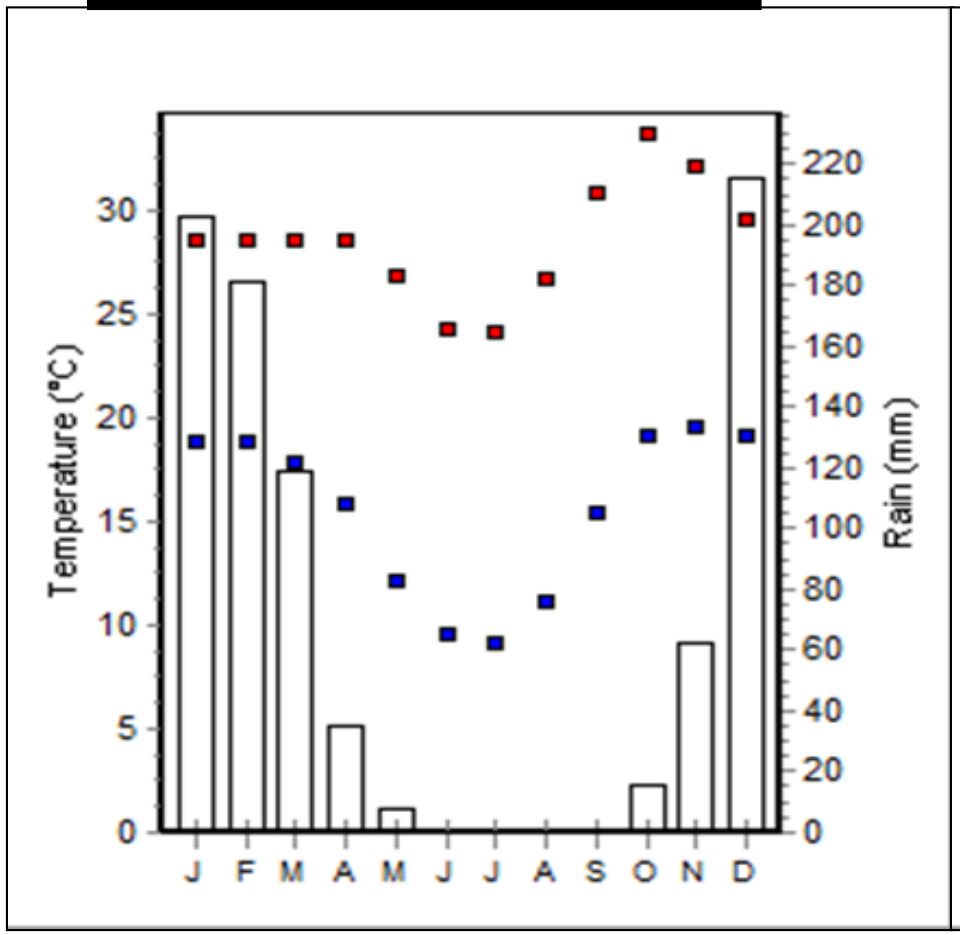
**Mixed cropping systems – livestock, maize (staple), sorghum, bambara nut, beans, pumpkins, yams….**

**Climate challenges: Shorter rainy season, Erratic rainfall and prolonged dry spells**

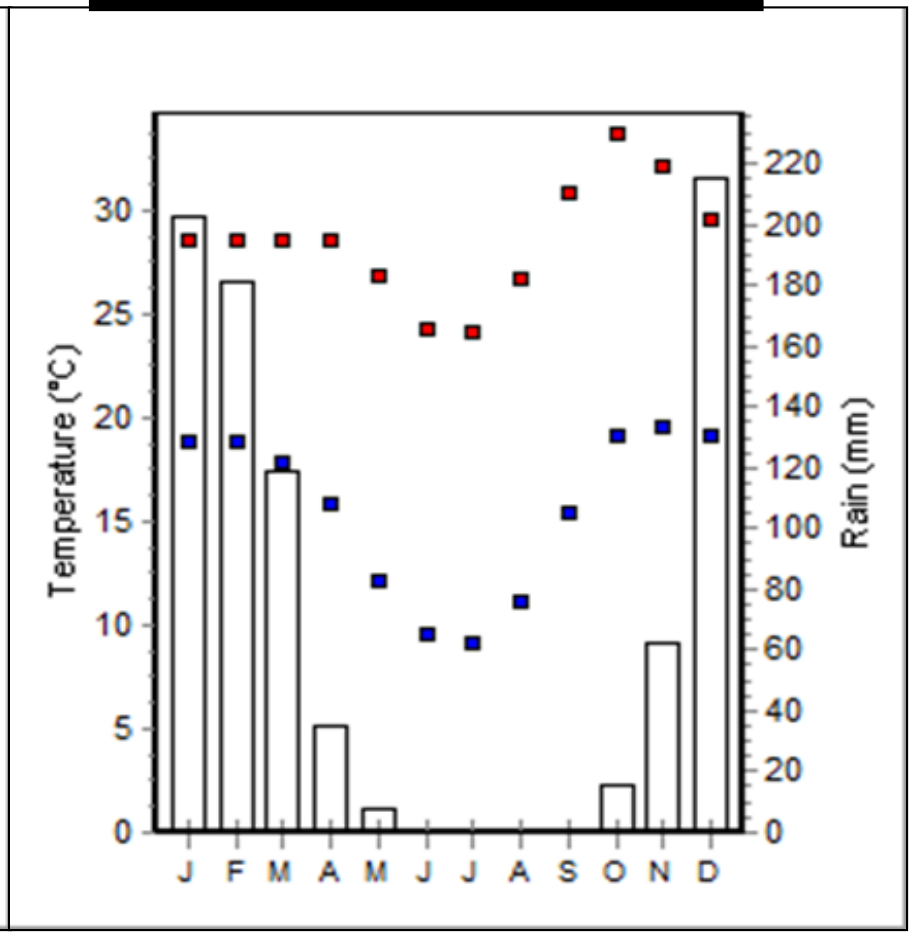

A graph Showing Temperature and Precipitation from 2008 to 2015 in Chikankata
Temperature (°c)
Precipitation (mm)
30
25
20
15
10
5
0
6
5
4
3
2
1
0
2008
2009
2010
2011
2012
2013
2014
2015
Precipitation (mm)
Minimum Temperature (°c)
Average Temperature (°c)
Maximum Temperature (°c)

# Present & future climate challenges

**Present Temperature & Precipitation**



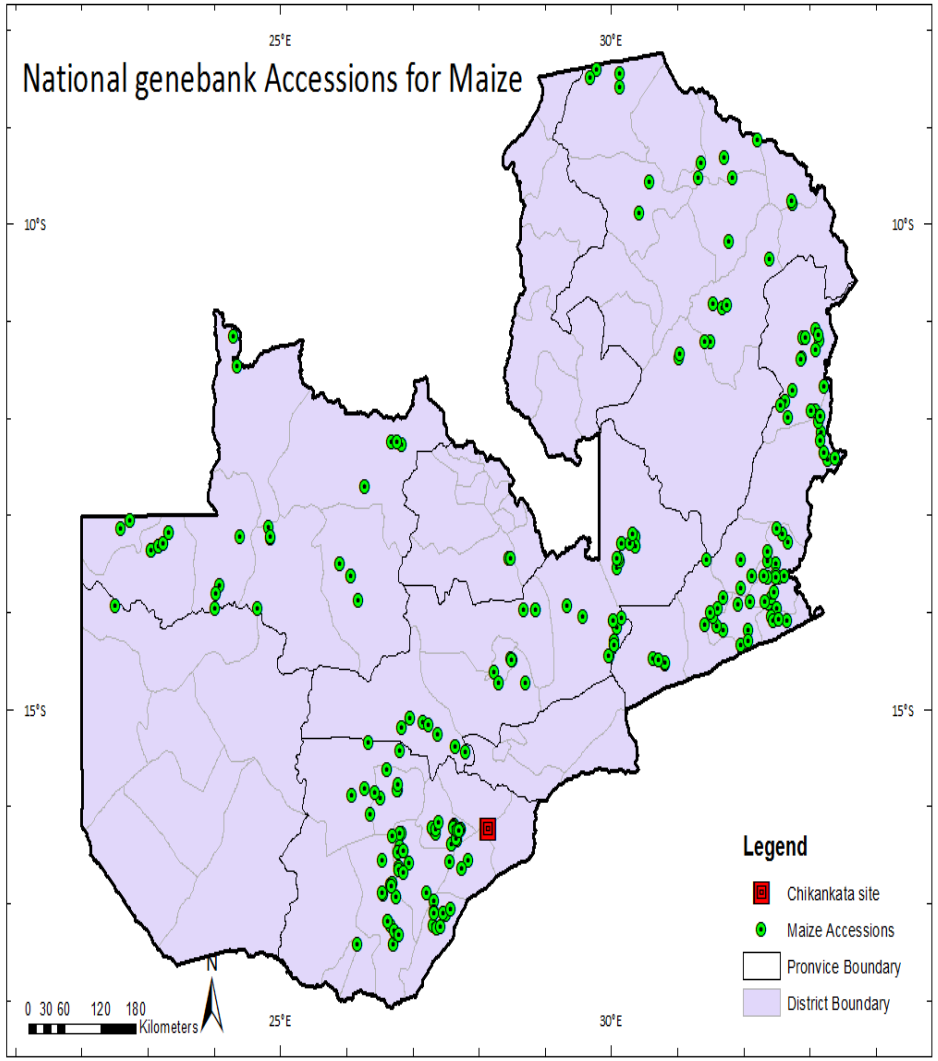

**Temperature & Precipitation for 2050's**

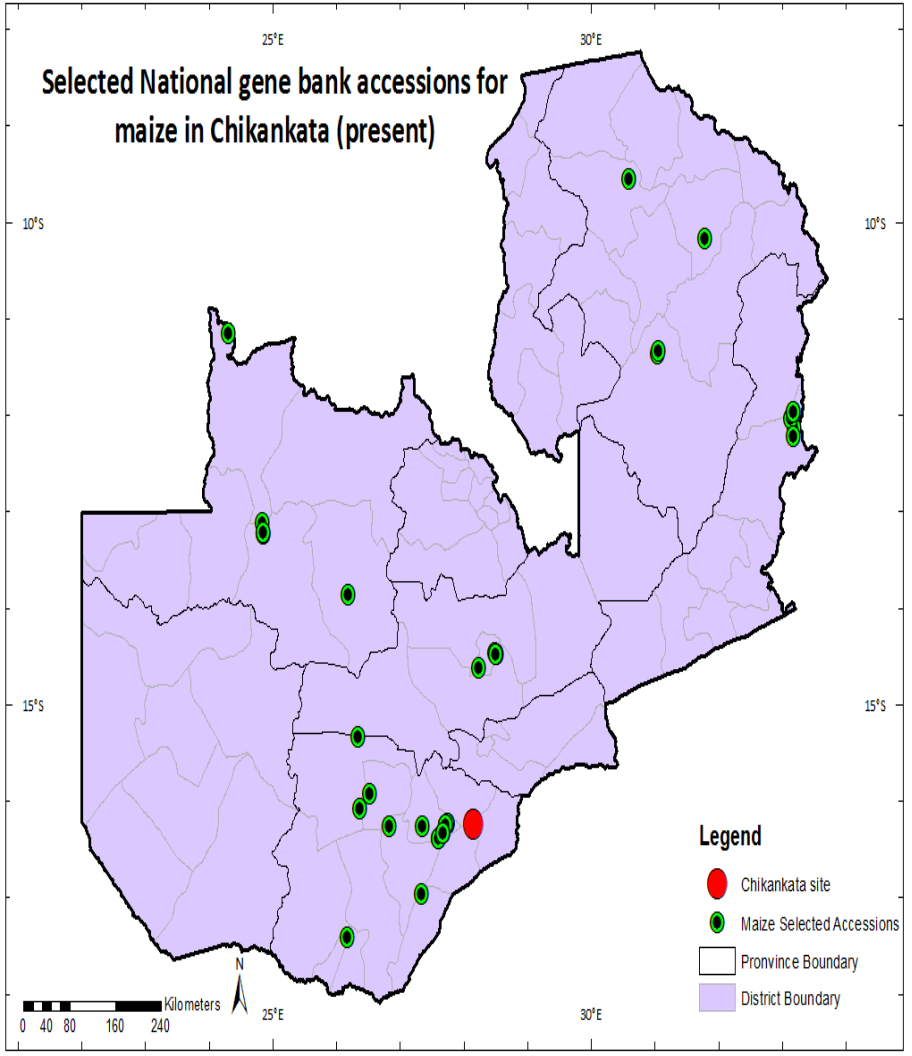


# Participatory exercises with farmers

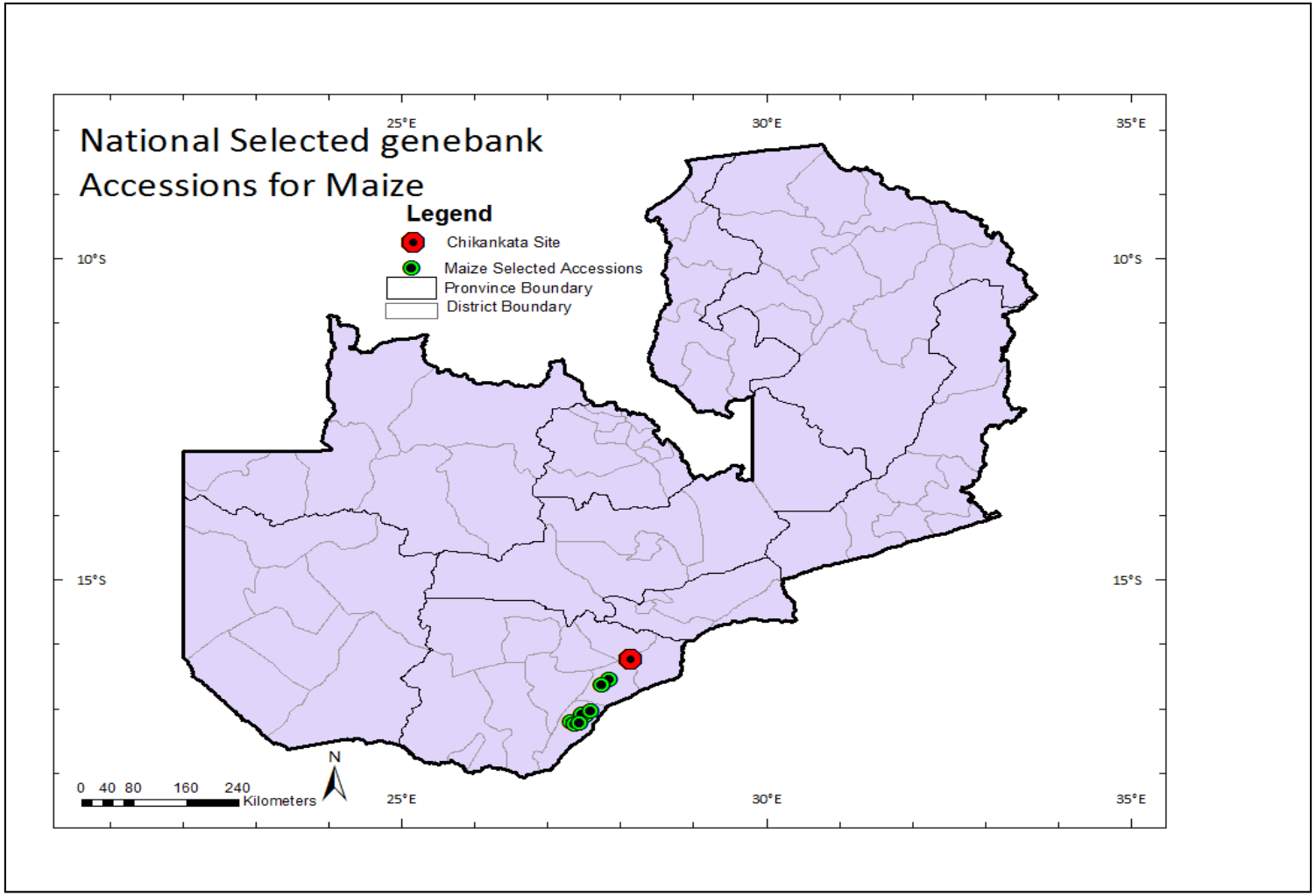
- Climate change perception
  - shortening of the growing seasons (less number of rainy days
  - Erratic Rainfall
  - Prolonged dry season
- Loss of diversity (due to climate change)
- Preference for earlier maturing varieties
- 3 out of 14 local maize varieties identified for climate change

# Potentially adapted material from national gene bank (present) (34 out of 98 Accessions)

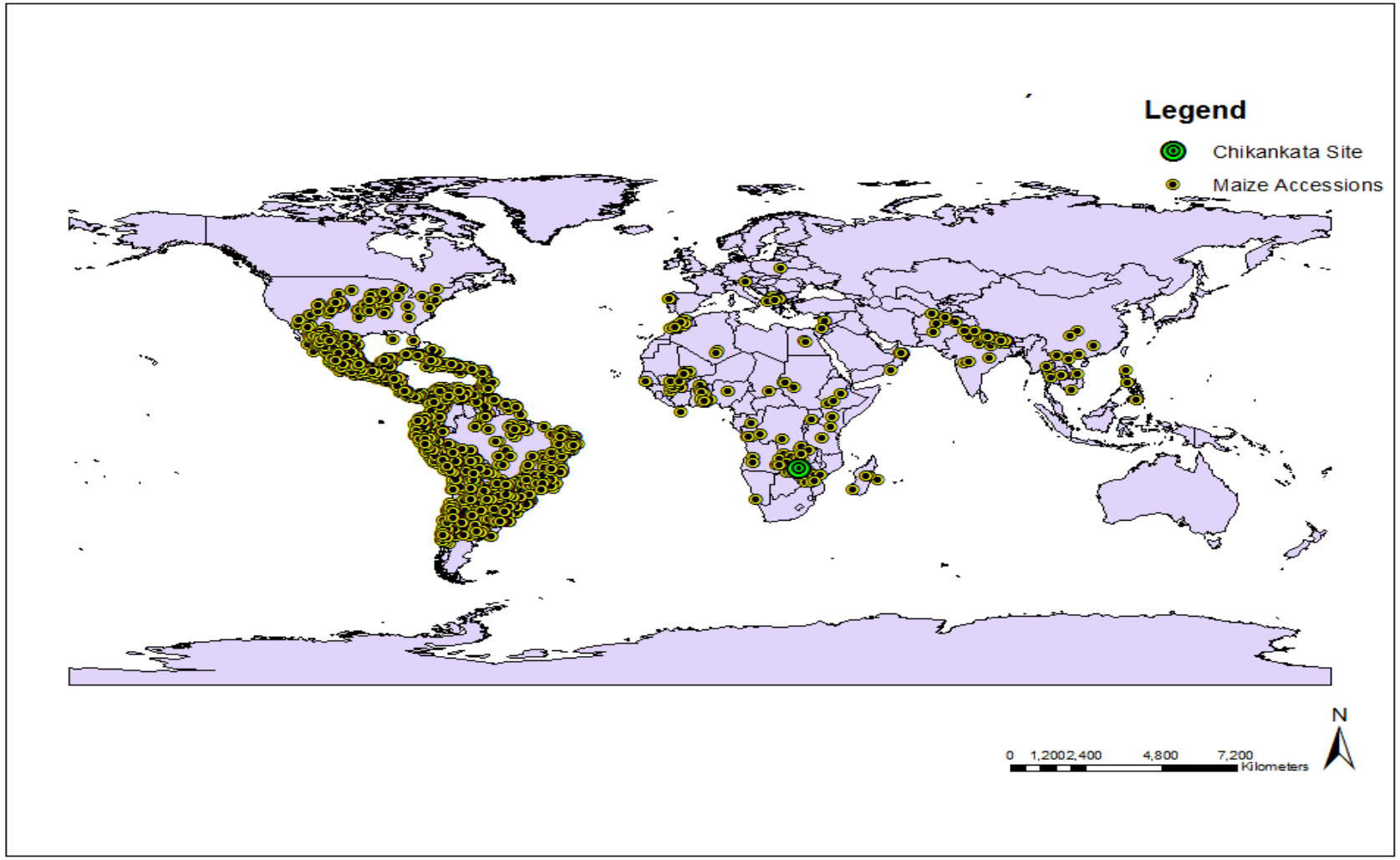


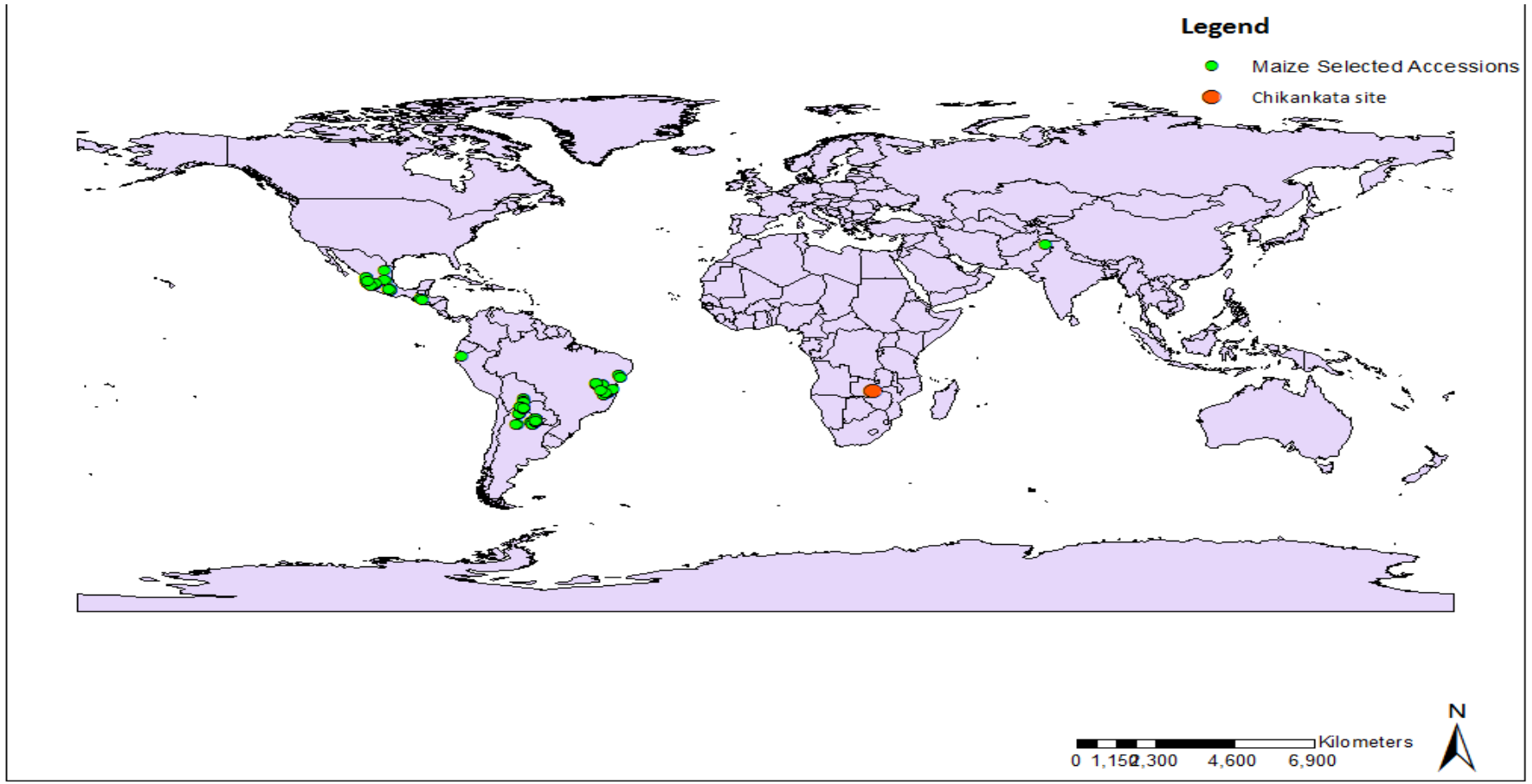
# Potentially adaptable material from national gene bank (2050's) (11 Accessions)



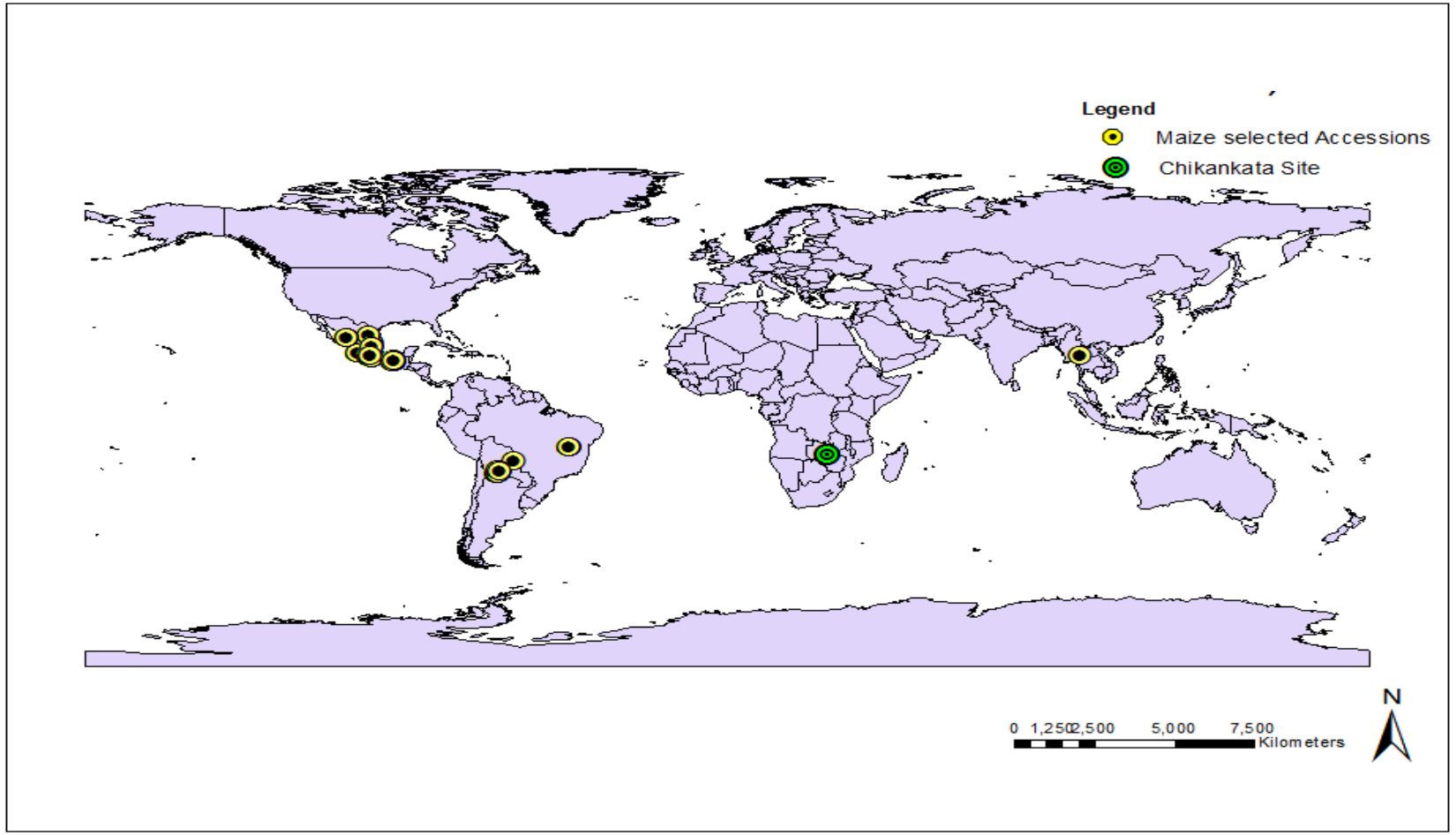
# Geographic origin of 22,000 accessions of maize in collections around the World



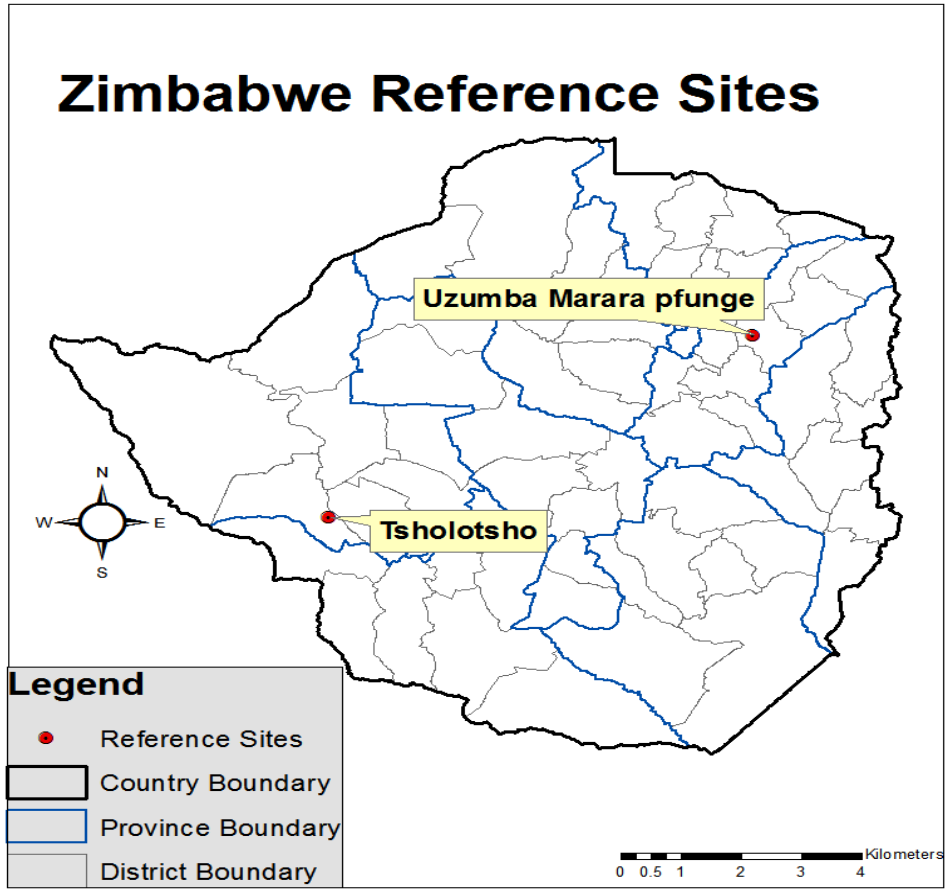
# Potentially adaptable material for present climate conditions (280)



# Potentially adapted material for future climate conditions for Chikankata, Zambia (109)



# Results Zimbabwe: Tsholotsho




**Located in SW part of Zimbabwe**

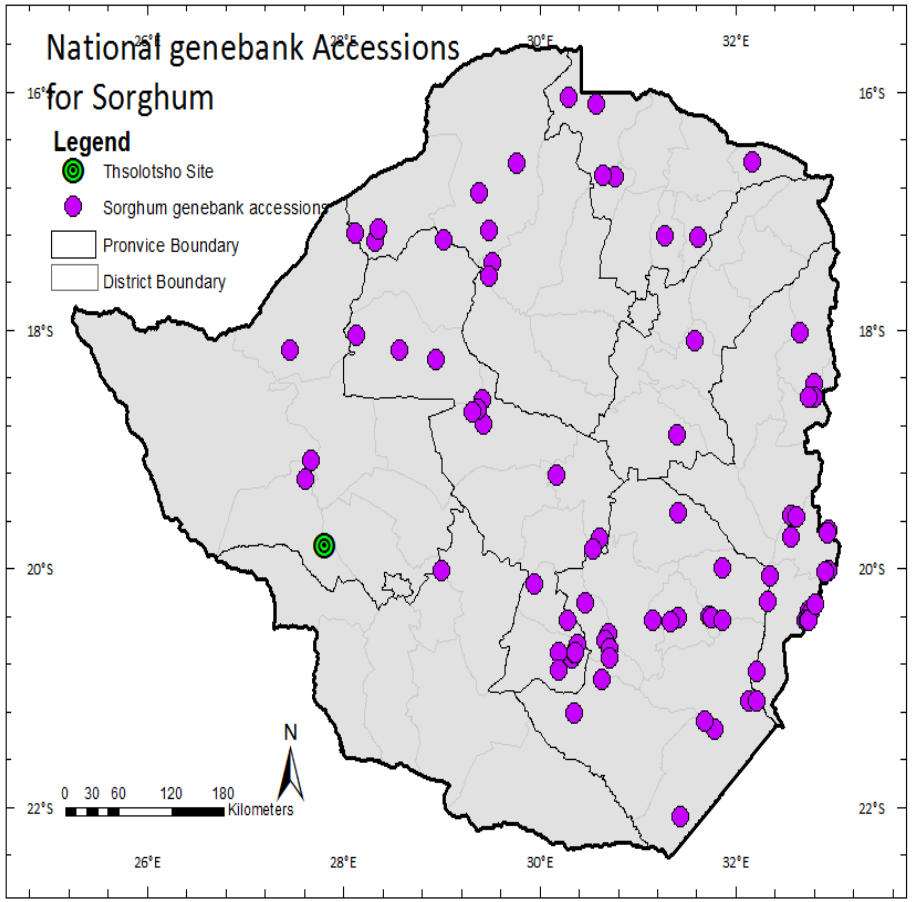
**Rainfall amounts - 400-600mm**

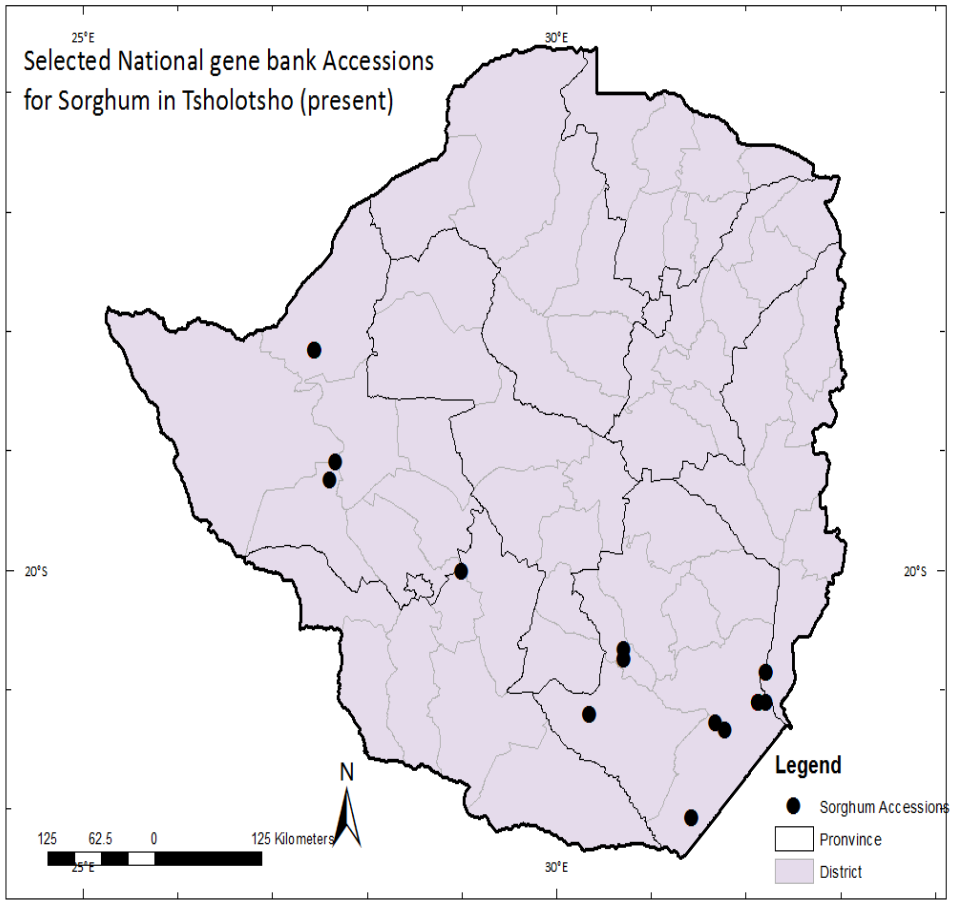
**Average temperature - 13.5-28°C**

**Mixed cropping systems – livestock, sorghum, millets, maize**

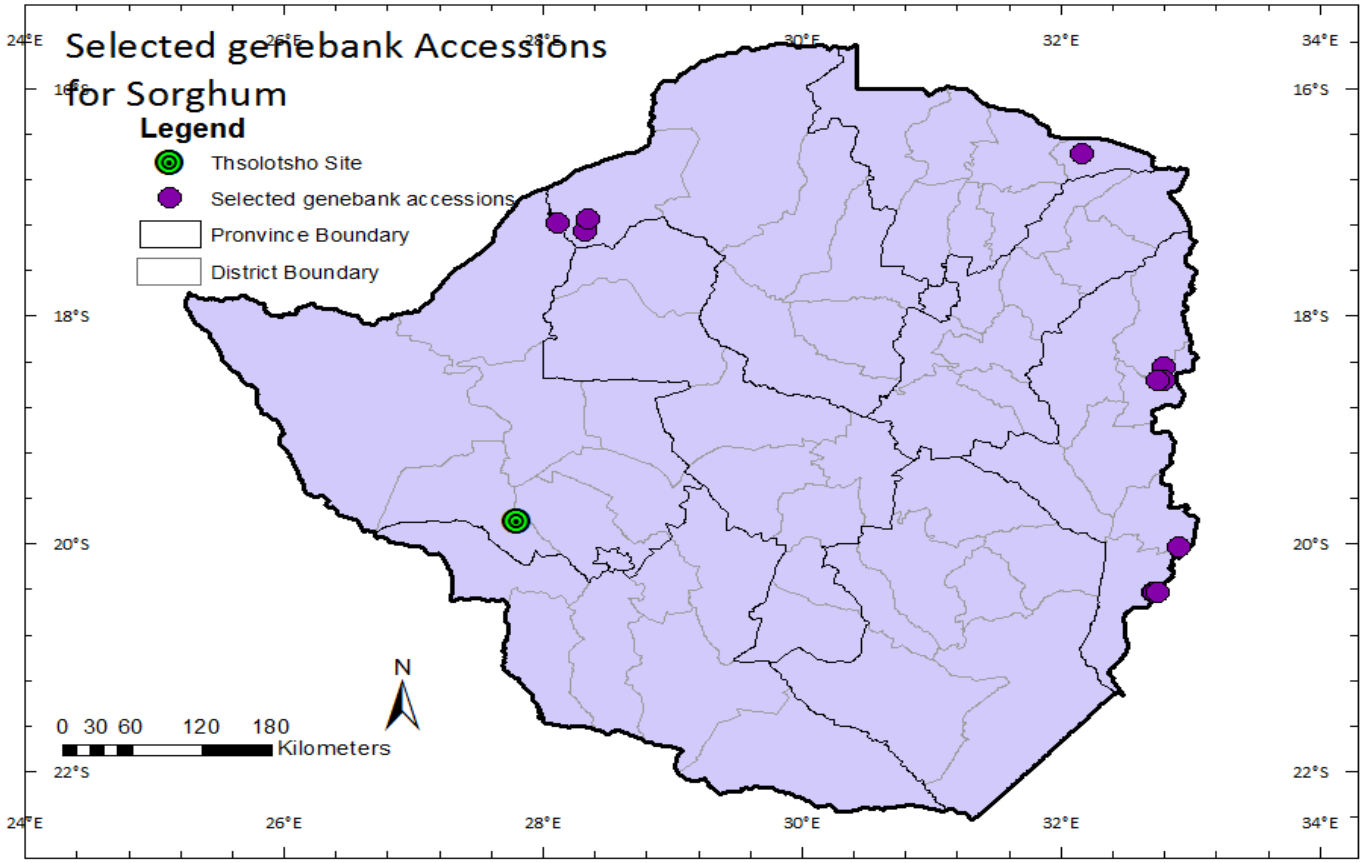
**Climate challenges: Erratic rainfall and prolonged dry spells**

# P0tentially adaptable sorghum materials from national gene bank (34 out 0f 98)

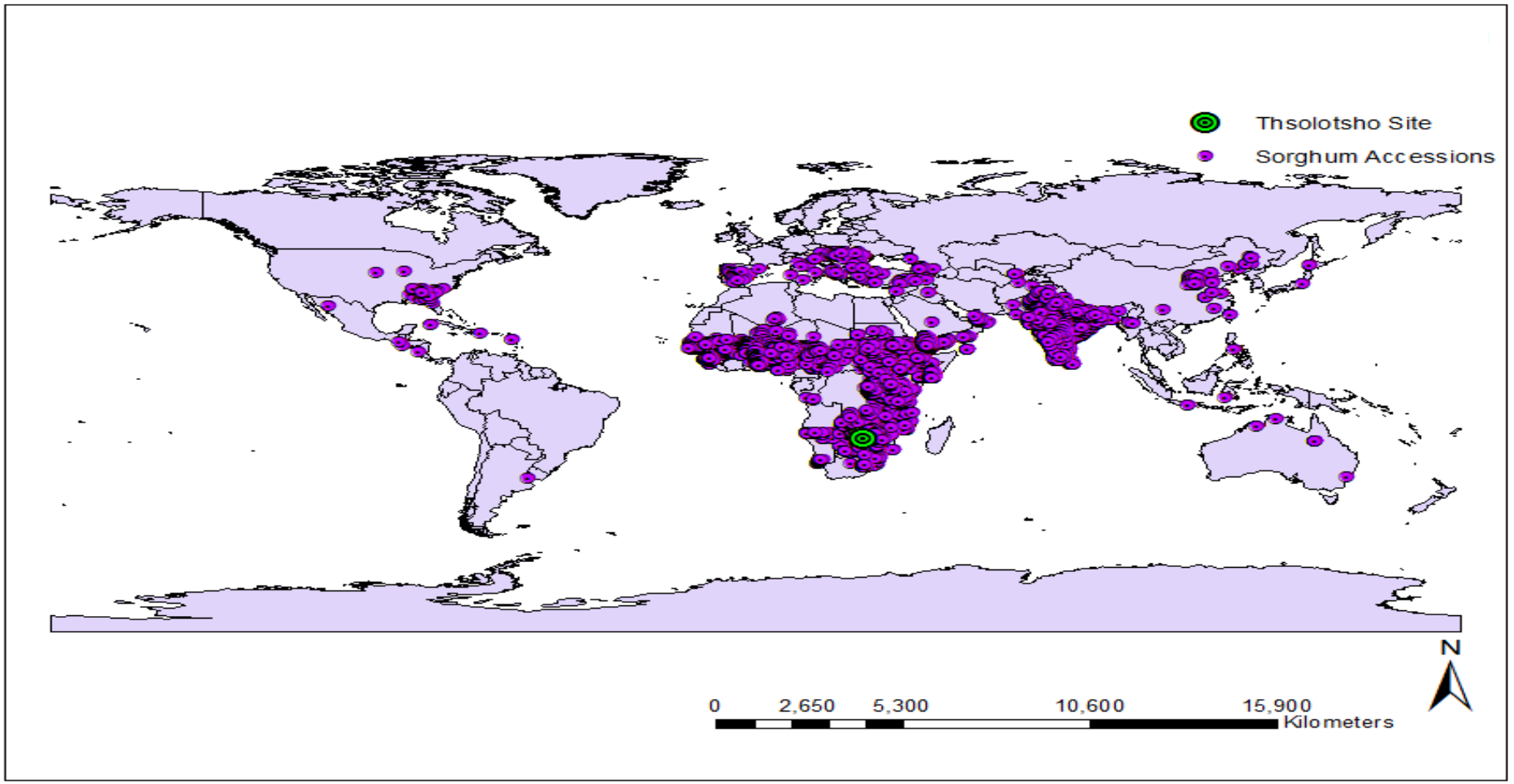


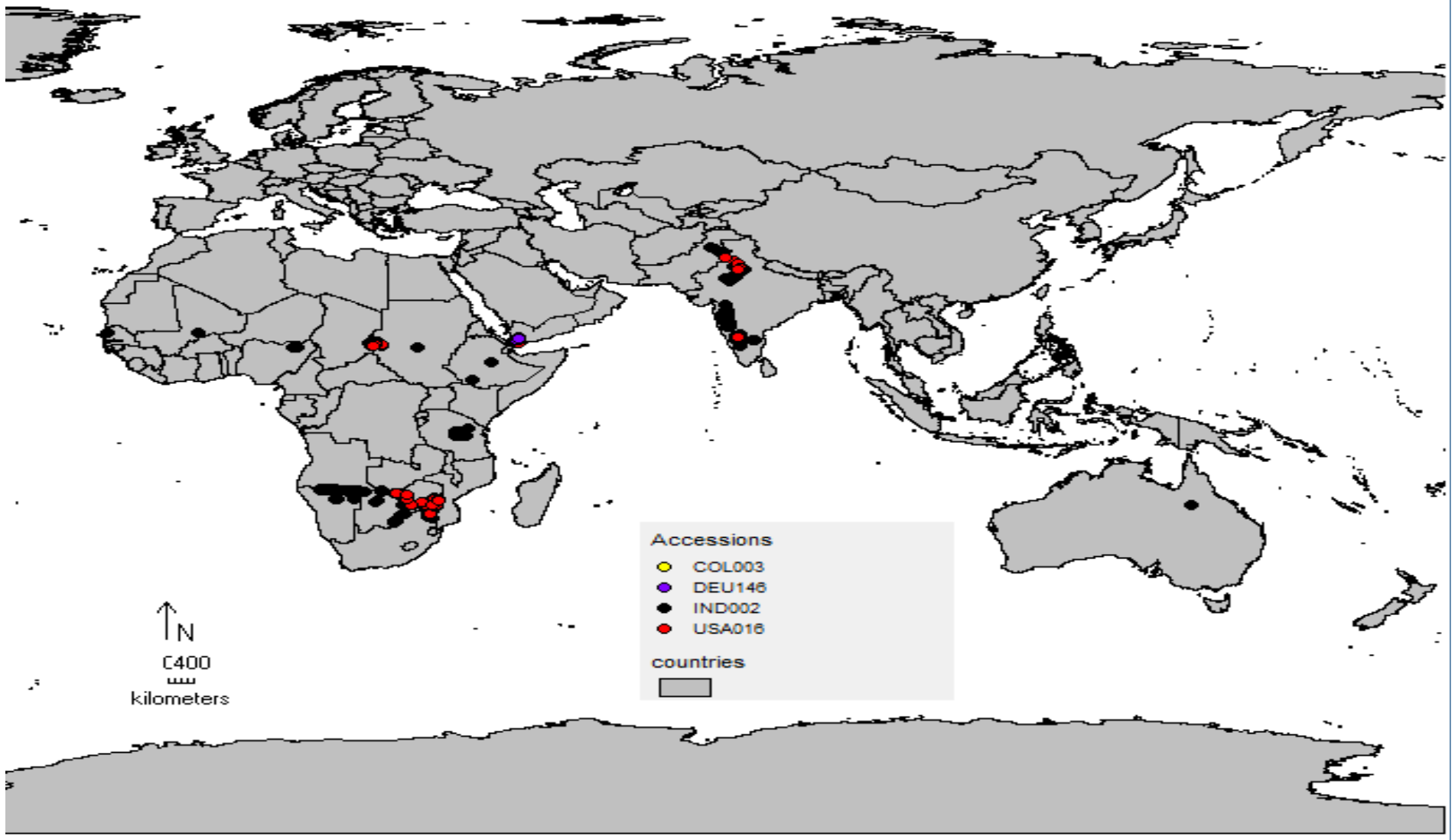
# Potentially adaptable material from national gene bank (2050's) (11 Accessions)



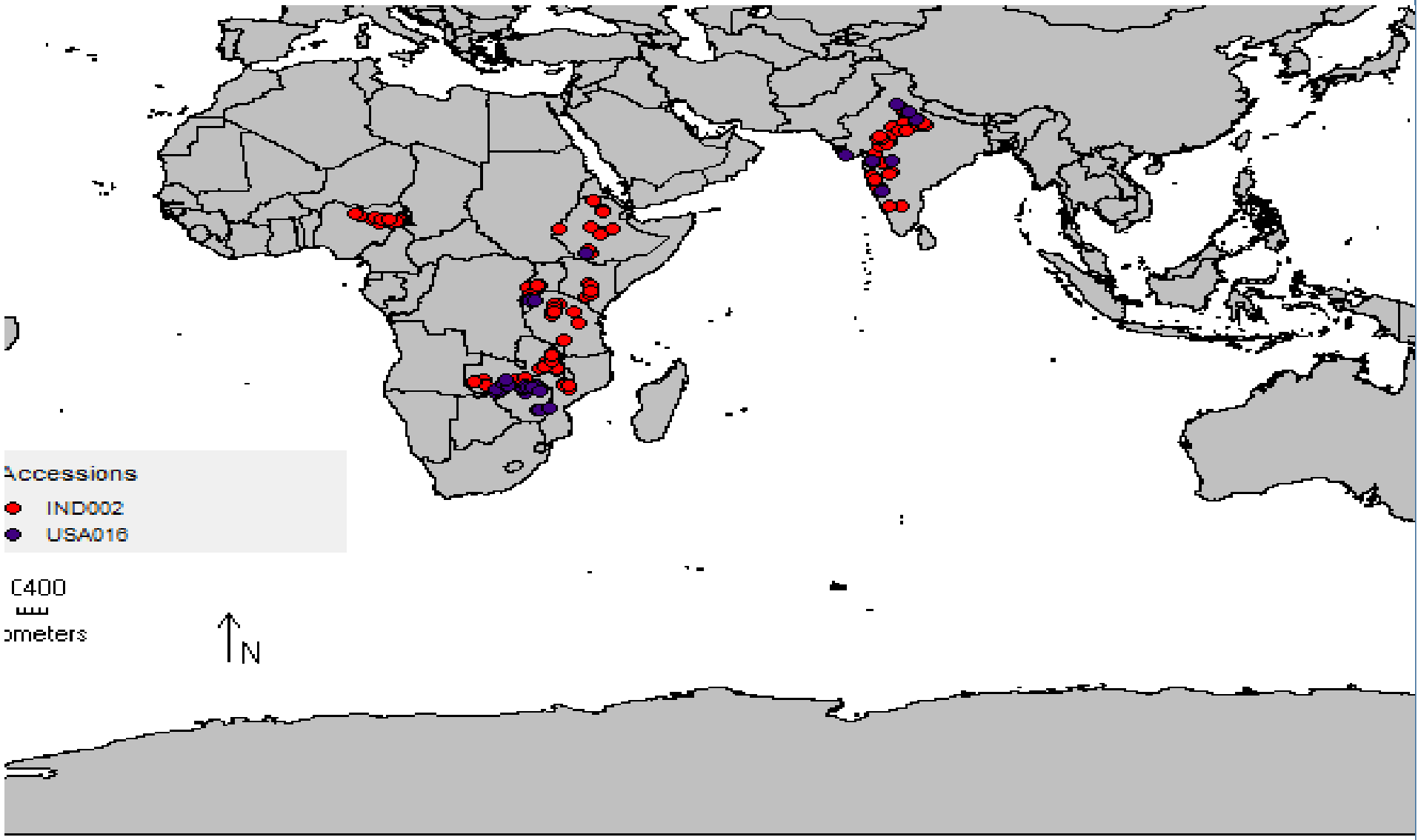
# Geographic origin of 22,000 accessions of Sorghum in collections around the World



# Potentially adapted material for Present climate conditions for Tsholotsho, Zimbabwe(1593 Accessions)



# Potentially adapted material for future climate conditions for Tsholotsho, Zimbabwe (1232 Accessions)



# Implications for ABS

- What does this imply for future climate change and adaptation? (countries may need materials from elsewhere, and countries may be asked to provide)
- ACCESS
  - MLS material – (CIMMYT and ICRISAT) accessible through the SMTA (ITPGRFA)
  - Non –MLS material (NAGOYA PROTOCOL)
    - For example held by USDA (national law – not ITPGRFA or CBD or NP members)
    - Materials in Farmers Hands (national implementing the NP if they are NP member state)

# Benefit sharing

- Access to adaptable germplsam
- Partnerships
- Tech transfer
- Capacity building
- Benefit sharing fund
- Monetary if NP

# Thank you

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