

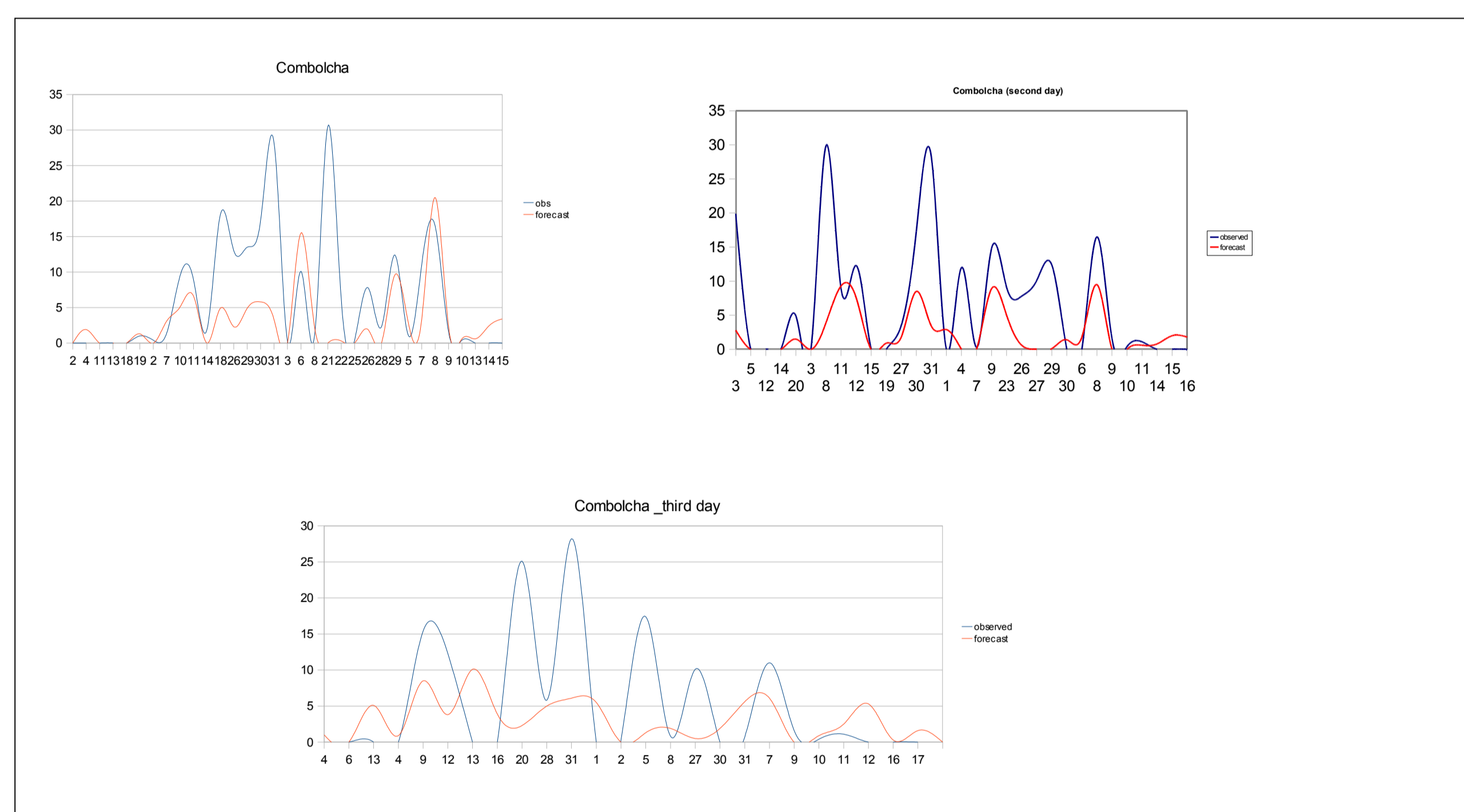
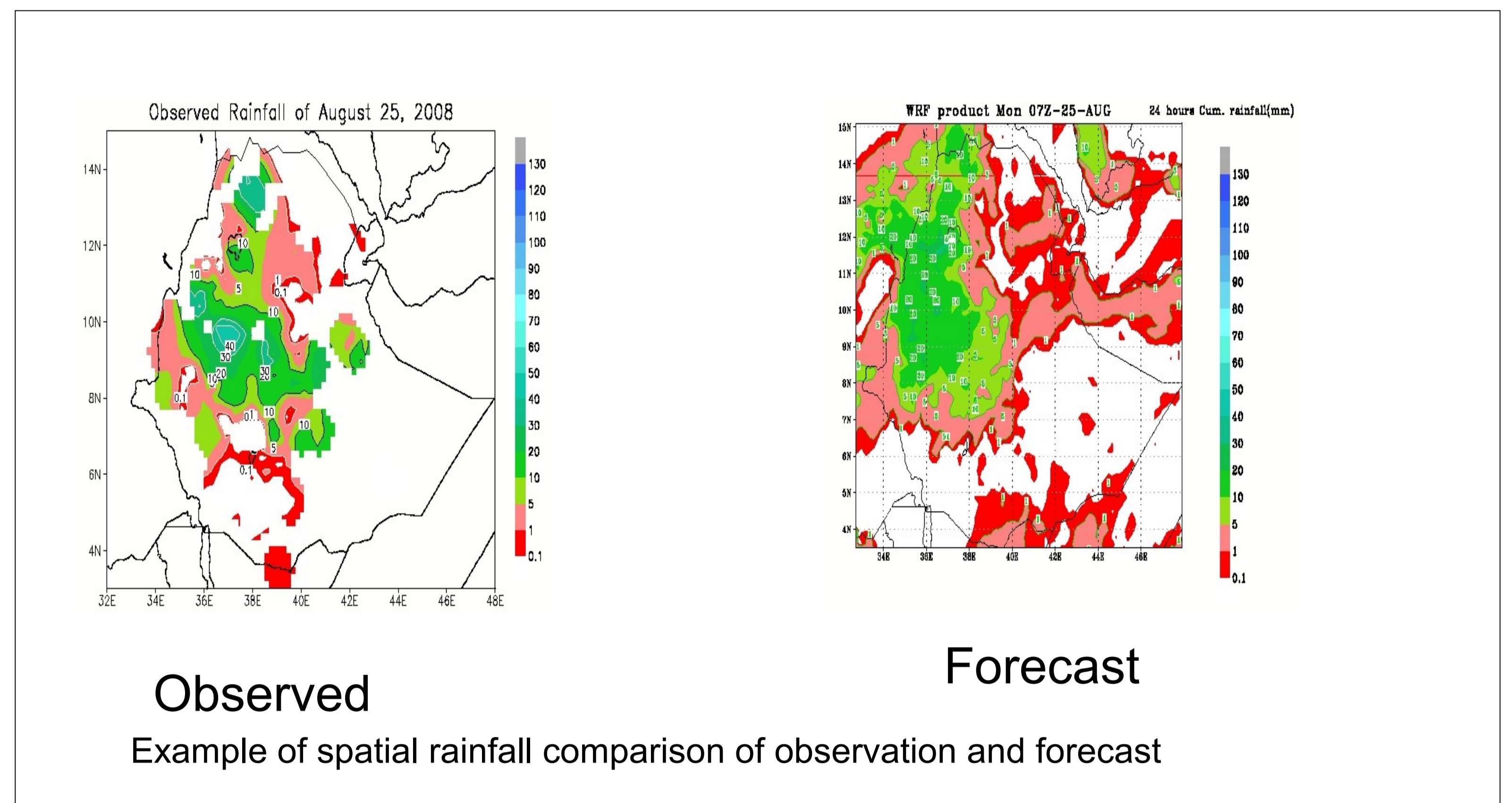
Rainfall prediction performance of WRF model over complex terrain of Ethiopia

Girmaw Gezahegn Bogale
National Meteorological Agency
Ethiopia

Background

- We used only 33 runs (samples are few)
- Taking only 11 stations
- Only for main rainy season (Kiremt)

Objectives of this study is to compare the observation and the forecast rainfall so that we are able to know the skill of WRF model over Ethiopia

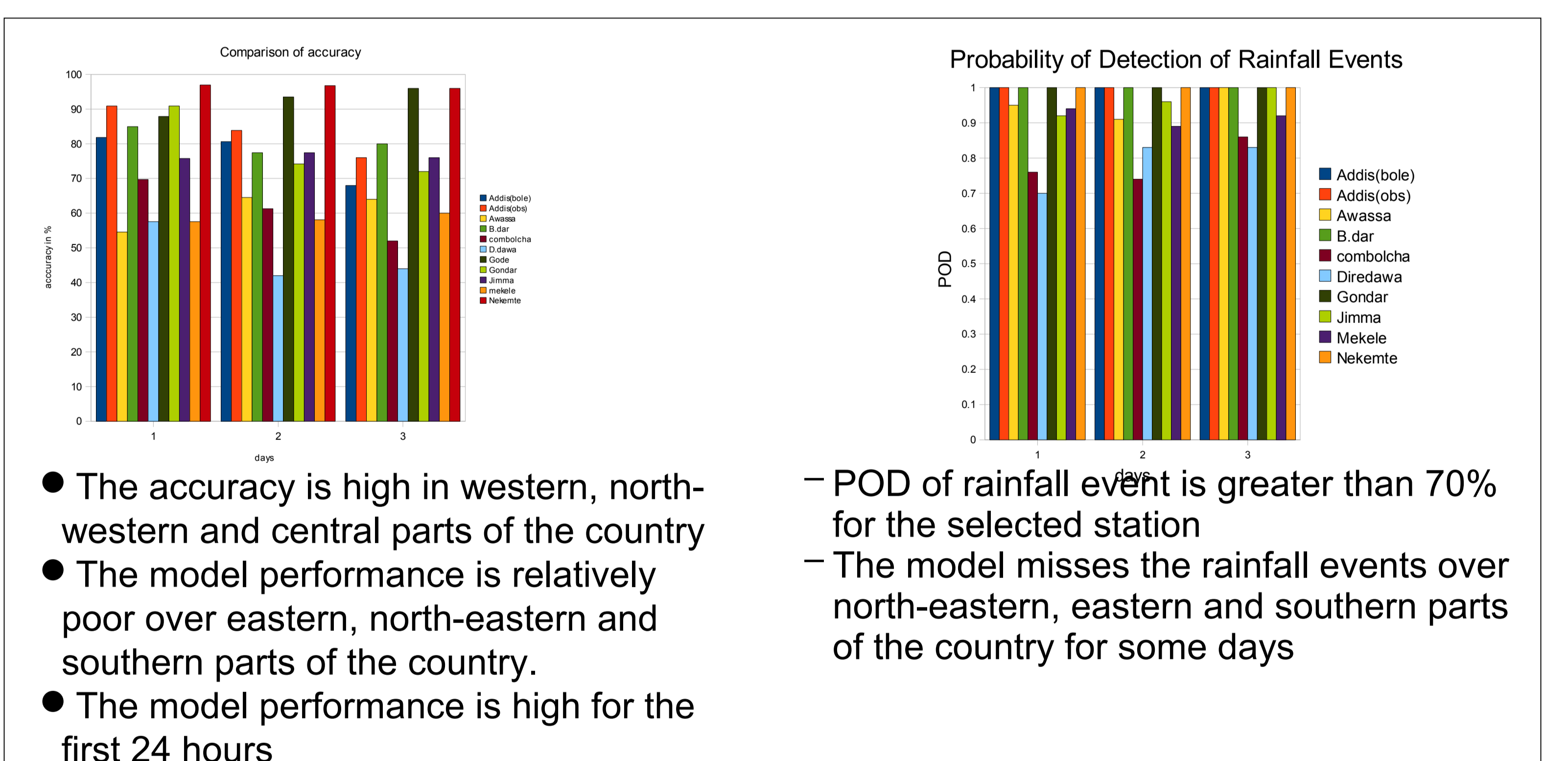


Methodology.

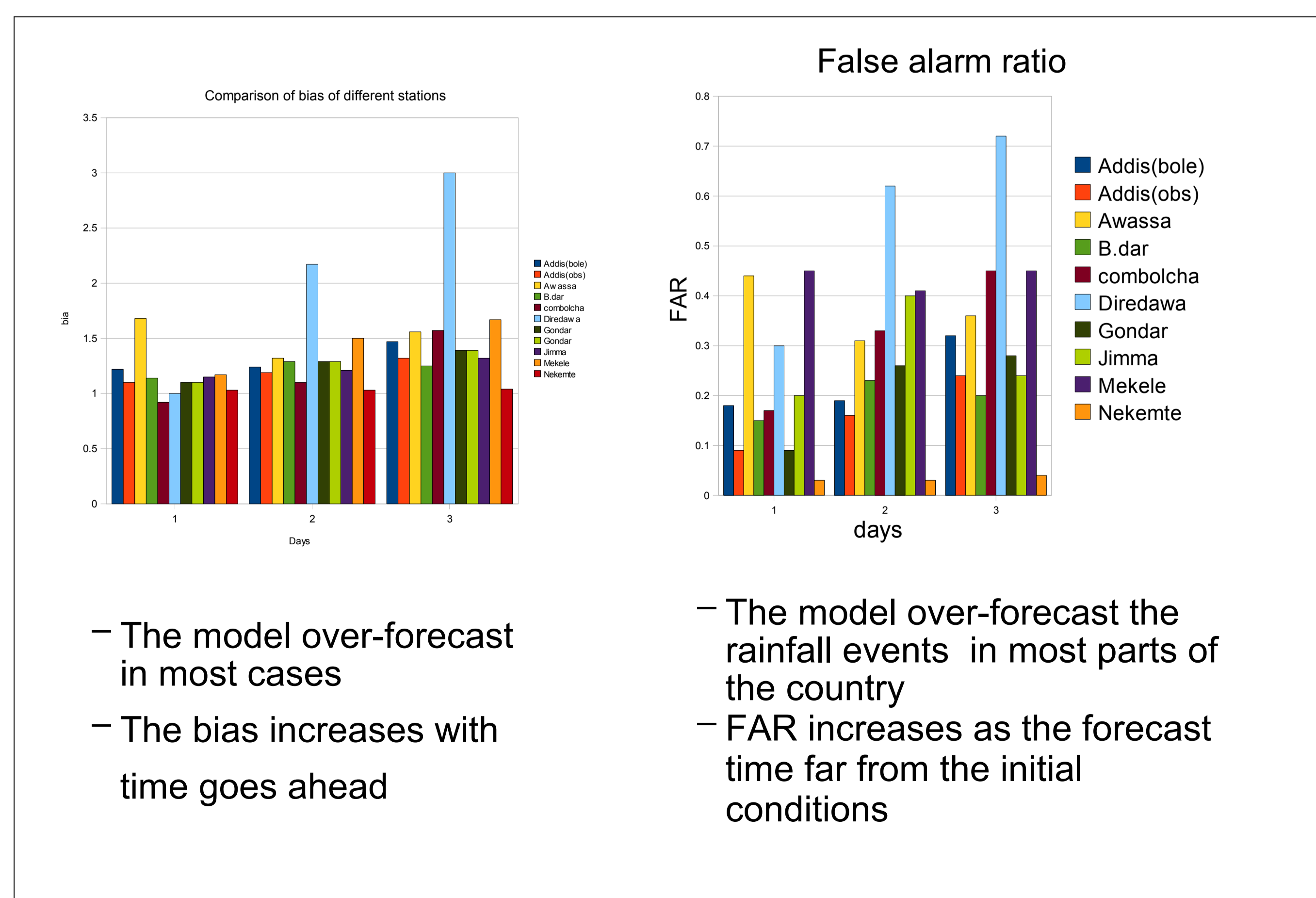
- Visualization or eyeball technique
- spatial analysis
- Time series analysis
- Dichotomous
- Contingency table
- Computing various statistics to compute the skill

Results.

- WRF model captured the rainfall distribution
- The model either underestimated or overestimated the rainfall amount in some parts of the country
- Difficulty of the model to capture heavy falls at exact location



- The accuracy is high in western, north-western and central parts of the country
 - The model performance is relatively poor over eastern, north-eastern and southern parts of the country.
 - The model performance is high for the first 24 hours
- POD of rainfall event is greater than 70% for the selected station
 - The model misses the rainfall events over north-eastern, eastern and southern parts of the country for some days



- The model over-forecast in most cases
- The bias increases with time goes ahead

- The model over-forecast the rainfall events in most parts of the country
- FAR increases as the forecast time far from the initial conditions

Summary.

- The model performance is very high over western, north-western and central parts of the country with accuracy greater than 70%
- Generally, the model over-forecast the rainfall events
- The model performance is relatively poor over north-eastern, eastern and southern parts of the country.
- Due to the representativeness error, the model sharpness is relatively poor over eastern half of the country.
- The models is missing the observed rainfall over stations located in complex terrain
- The model predicts the dry event almost perfectly over areas which are not receiving seasonal rainfall
- The model performance is generally high for the first 24 hours
- The model is able to capture the natural variability of the rainfall