

Assessment of rainfall and discharge data quality over a large southern Mediterranean catchment

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Motivations and objectives

**Medjerda waterway:
The only permanent
waterway with problems
related to data quality
and!!!**

**Quantifying the errors of
the gauges was never
assessed and explained
in the Medjerda**

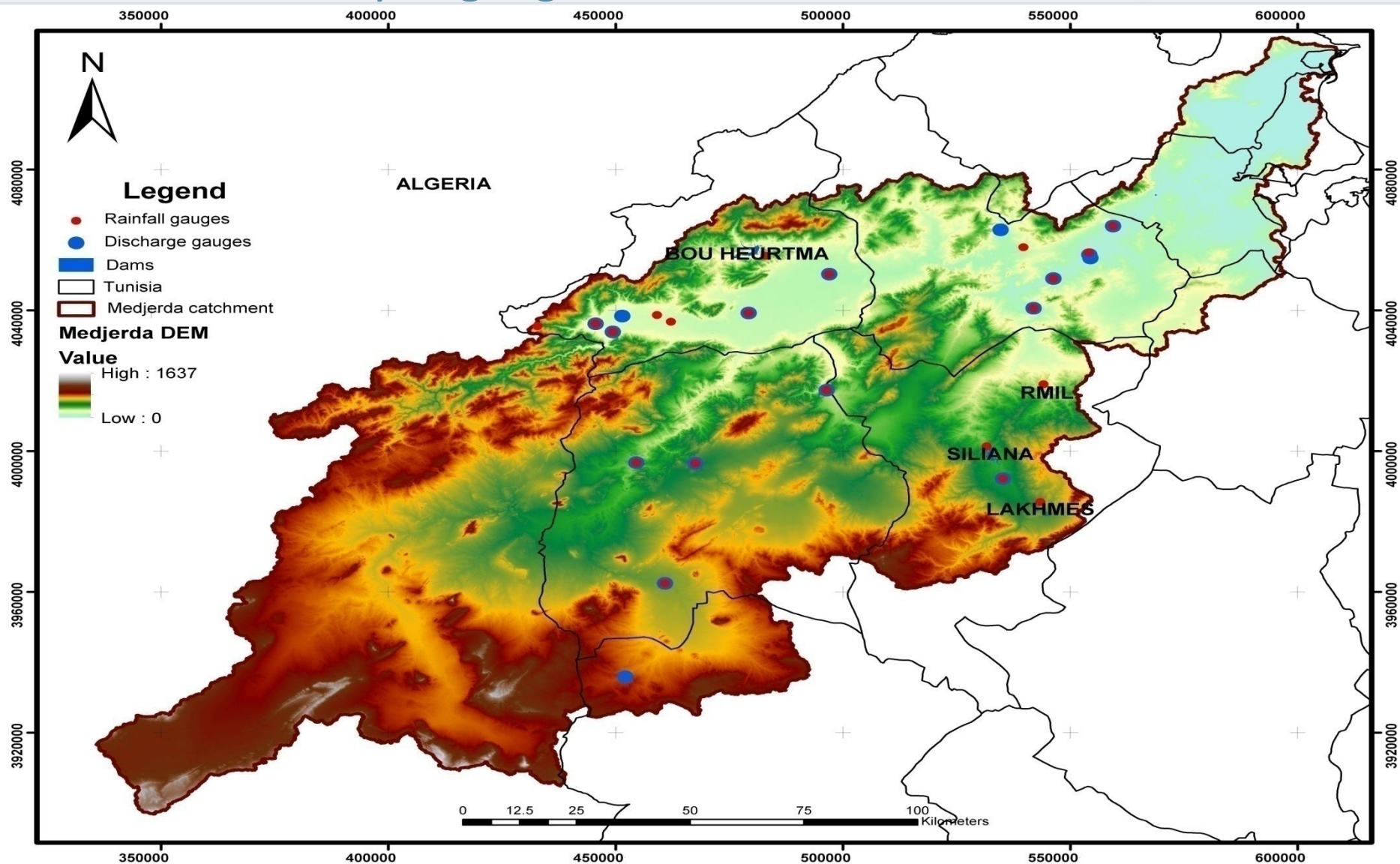
**Unable to explain
model results for
actual conditions and
affecting strategic
projections for Tunisia**

**Is it possible to identify
and to classify the causes
of poor data quality per
degree of influence ?**

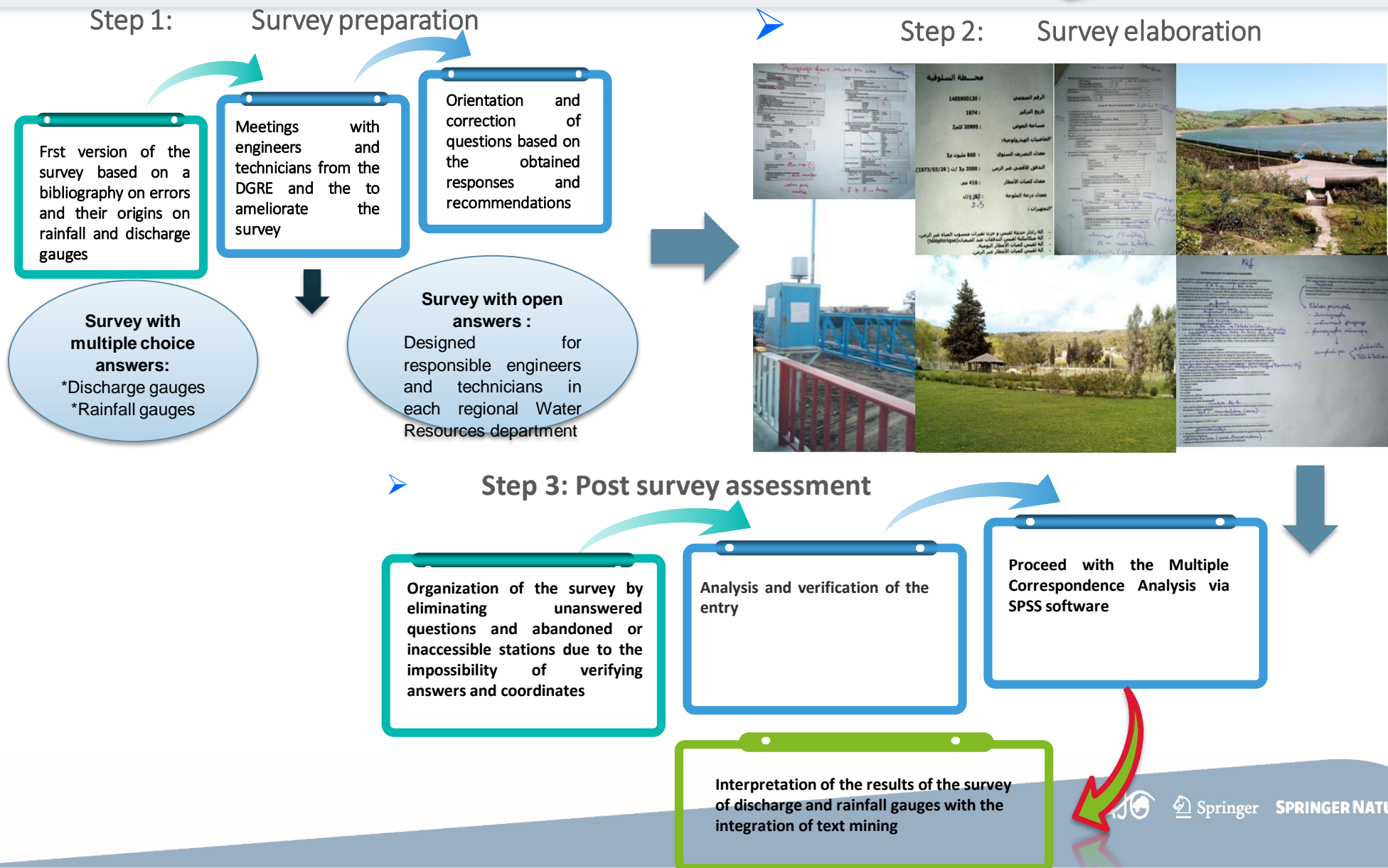


1. Study area and gauges location
2. Survey's methodology and used variables
3. Estimated errors' perception and origins for the rainfall and discharge gauges
4. MCA (Multiple Corresponding Analysis) assessment on the surveyed stations

1. Location of the study area and the surveyed gauges



2. Survey's methodology flowchart



Variables included in the survey of rainfall and discharge stations

01



Respondent identification

Active/retired, duty in station, professional experience related to station monitoring and data collection, age, instruction level, proximity of home to the observed station

02



Station identification

Station name and location, selection criteria for the implementation of rainfall/discharge station and used equipment

03



Rainfall station

time and frequency of rain measurement, methods and frequency calibration of pluviographic station, sources of errors' equipment and human that affect the rainfall data, percentage of errors of rainfall data, error calculation and correction of rainfall measurements

04

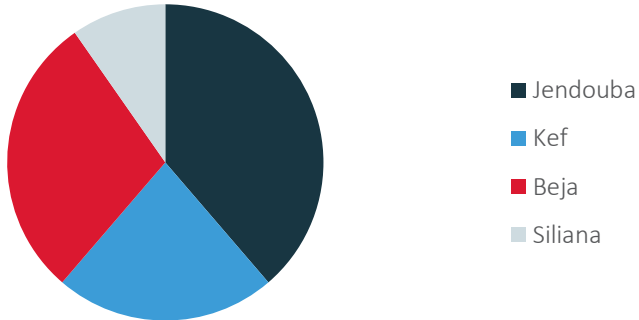


Discharge station

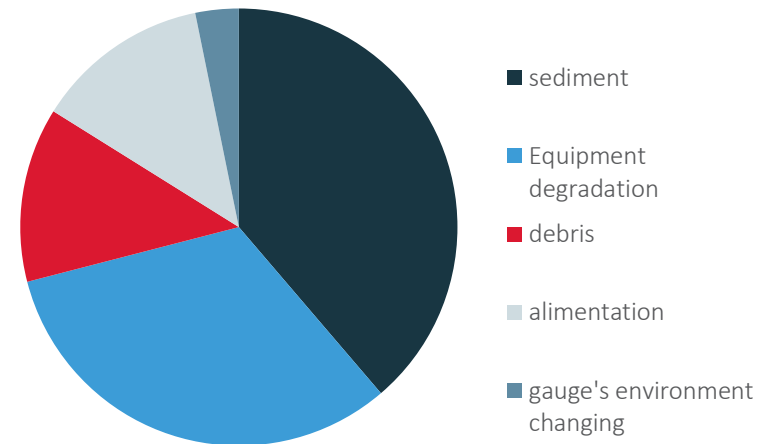
River section stability, calibrate for low discharge, calibration for high discharge, calibration frequency, water level conversion to discharge, sources of error (equipment and human) that affect conversion water level to discharge, percentage of errors of discharge data

3. Estimated errors and origins : (Rainfall gauges)

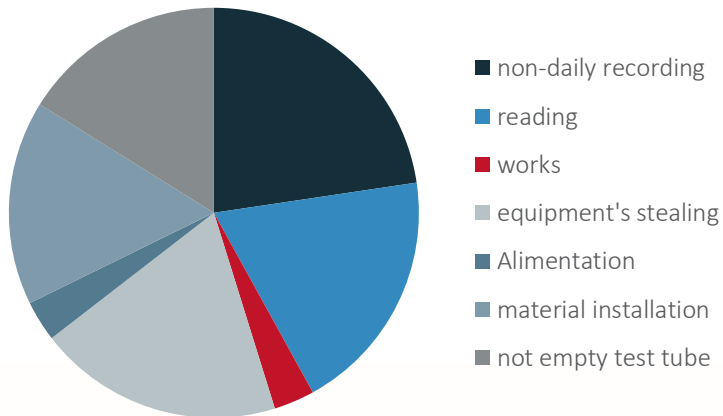
Percentage of the rain gauges per governorate



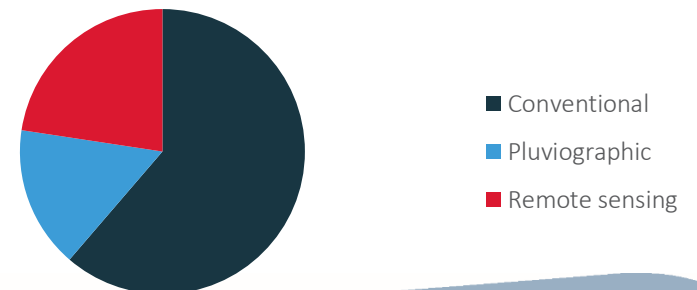
Percentage per Equipments' errors origin



Percentage of human errors' origins

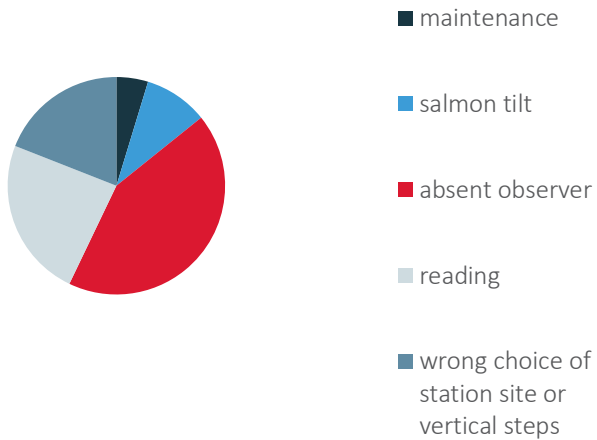


Percentage per nature of rain gauge

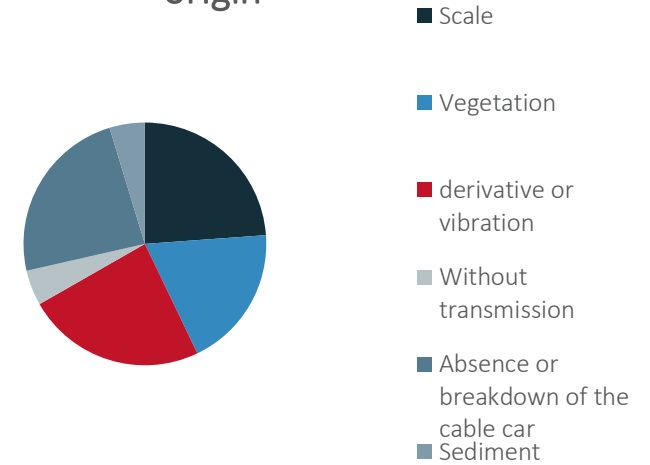


(Discharge gauges)

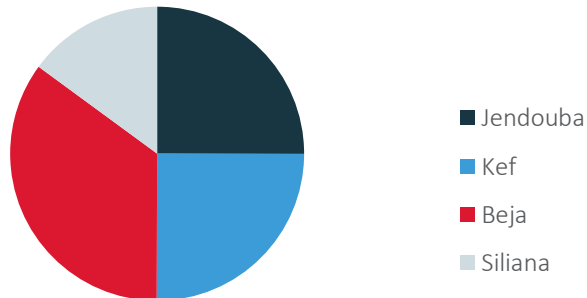
Percentage of human errors' origins



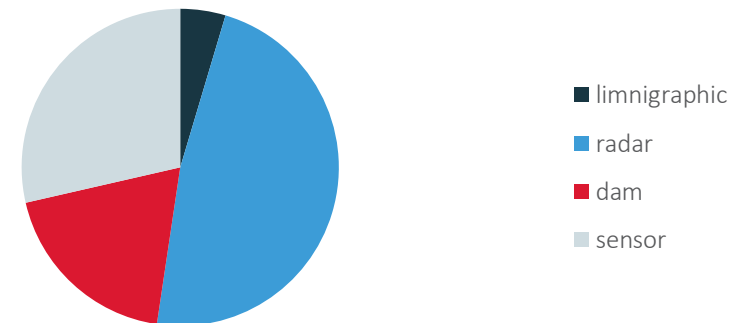
Percentage per Equipments' errors origin



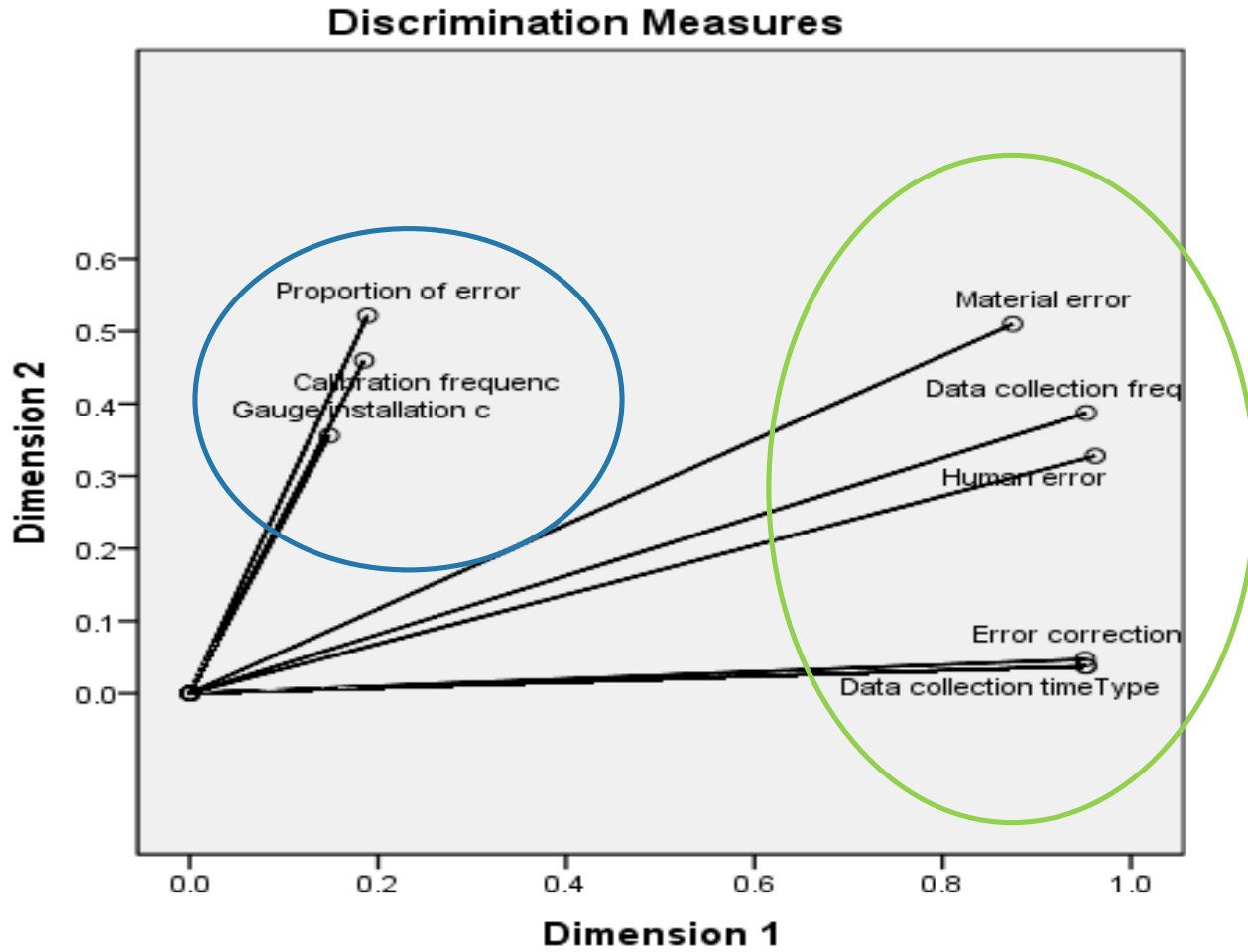
discharge gauges per governorate



Percentage per nature of discharge gauge

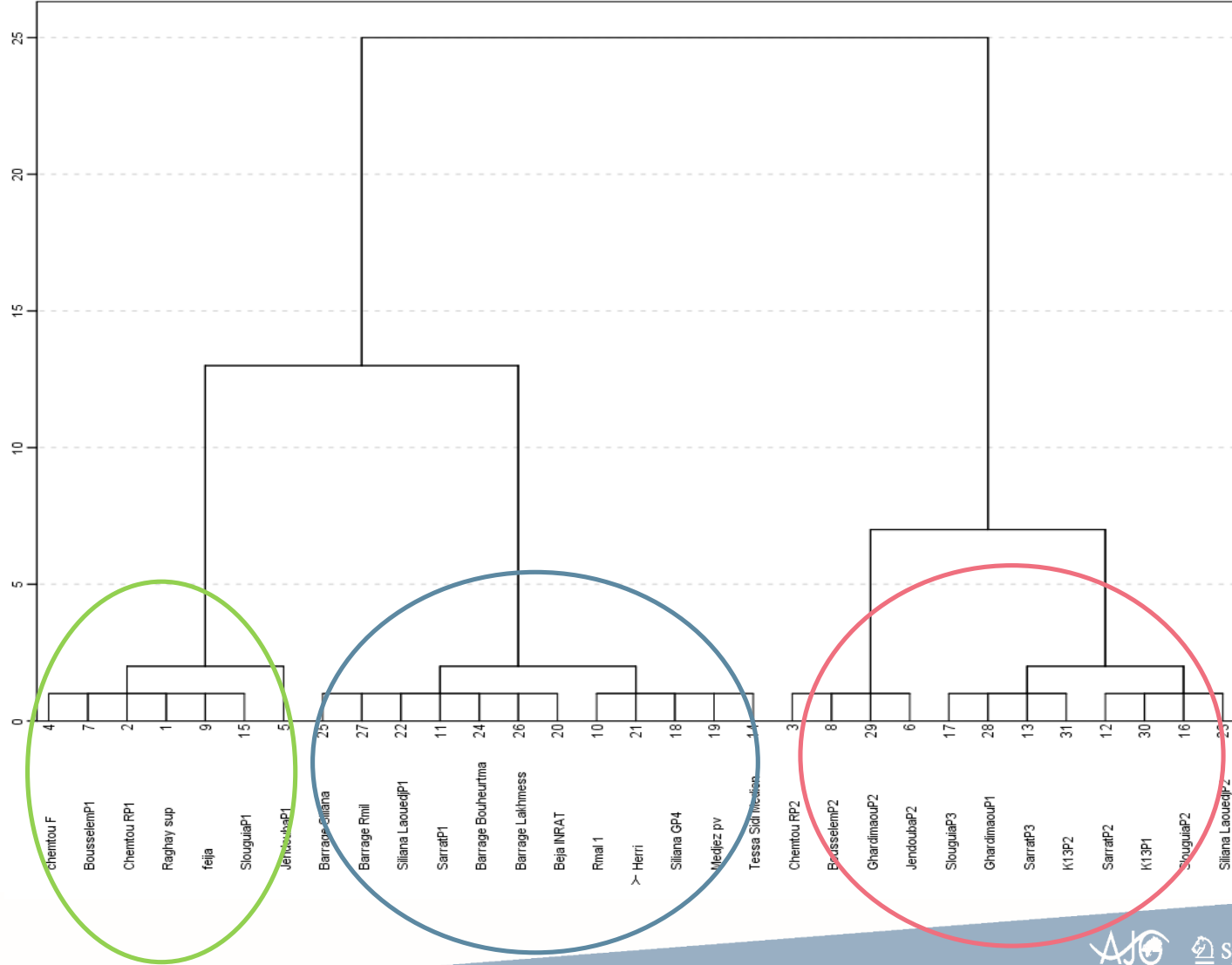


4. MCA assessment on the surveyed stations

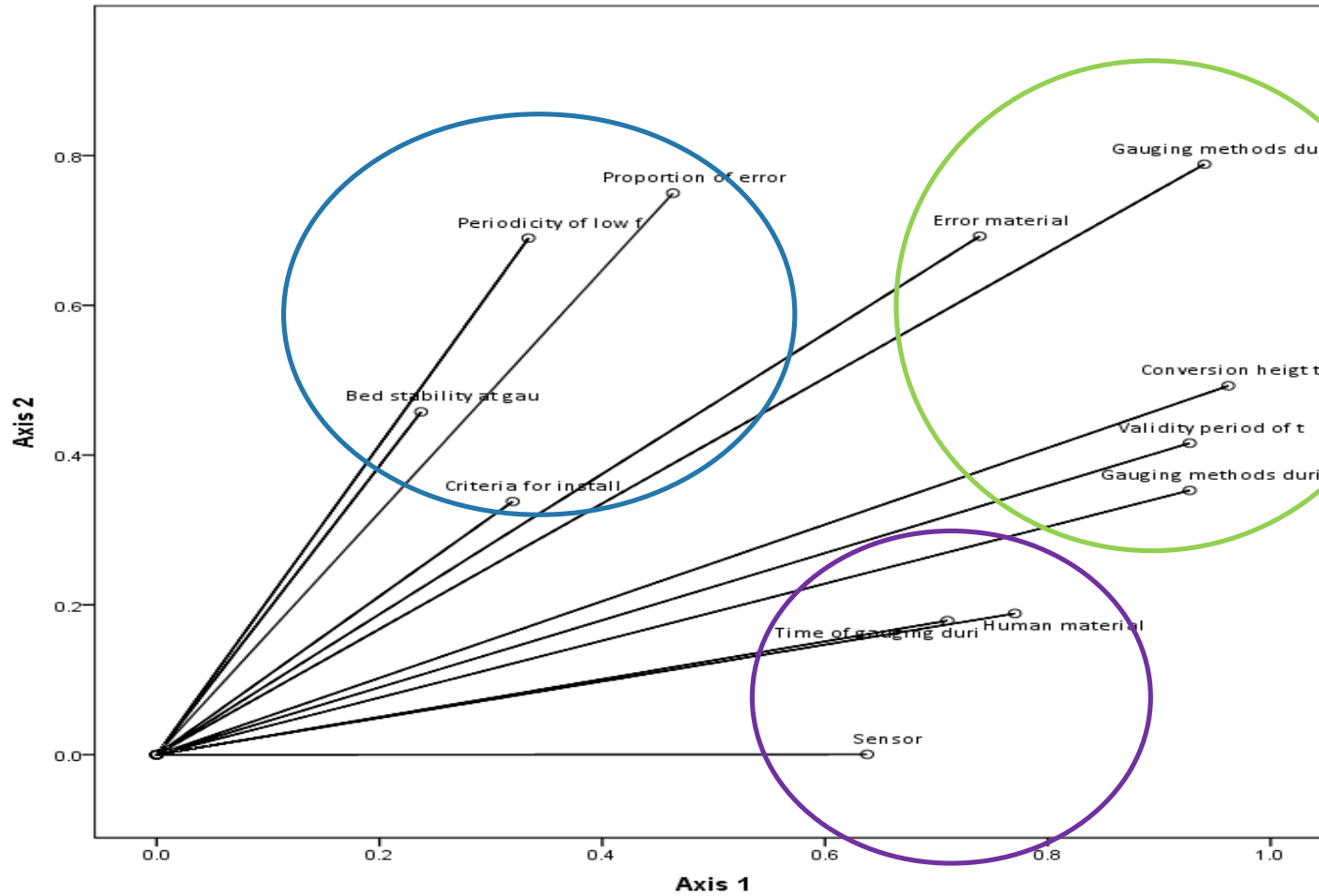


Variable Principal Normalization.

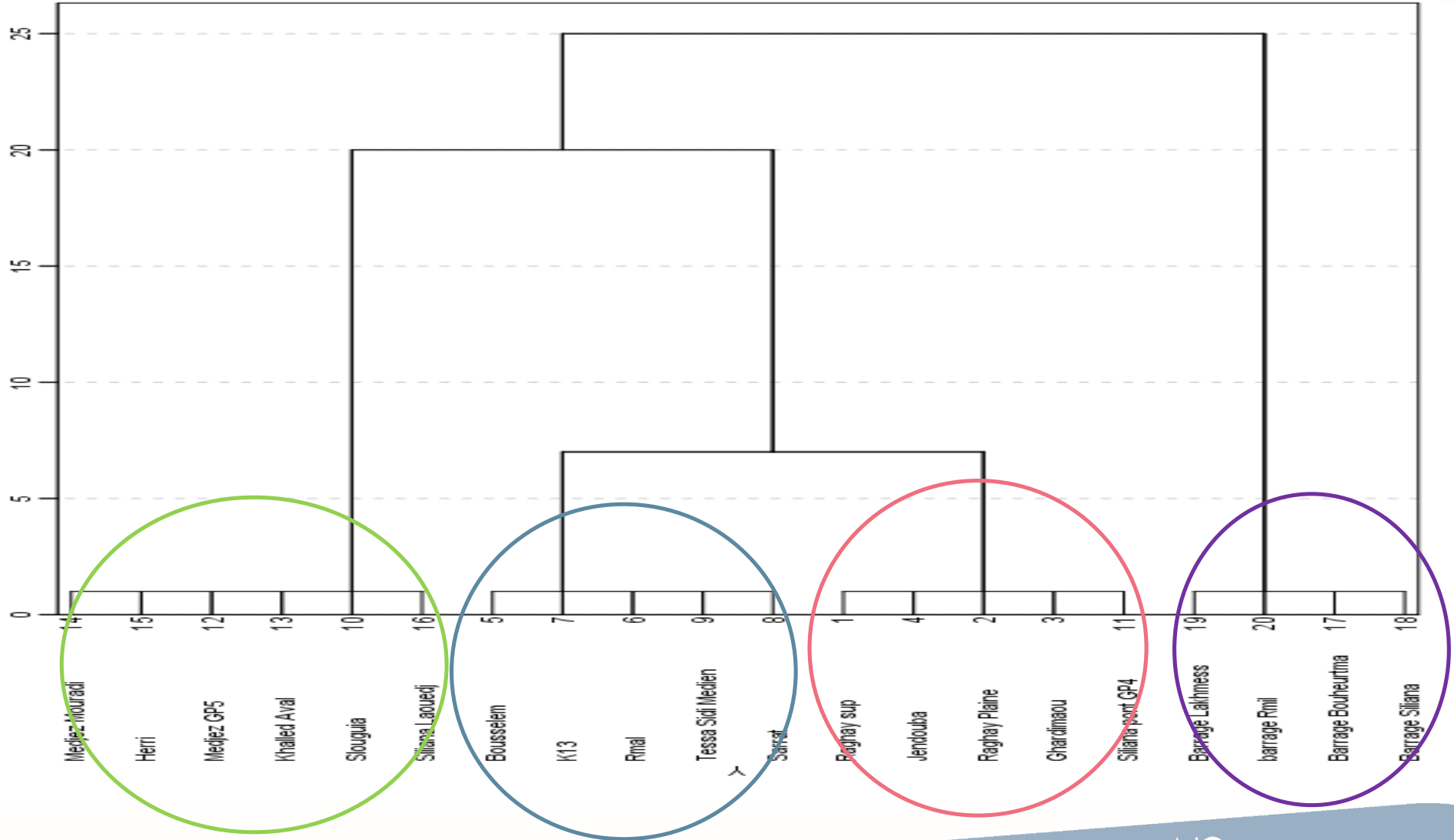
Rainfall gauges:
Cronbach's Alpha:
0.852



Discrimination Measures



Discharge gauges:
Cronbach's Alpha:
0.927



- This study aimed to quantify the errors and their origins for the rain and discharge data over the Medjerda catchment in Tunisia
- Results show that although its highly densed gauges network, the Medjerda has a serious problem with data quality that should be considered when used in modelling
- Based on MCA , we were able to estimate the percentage of uncertainty and the causes explaining the low data quality in the studied catchment
 - The data quality for rainfall gauges is better than the discharge gauges.
 - The rain gauges are influenced by the gauge's equipment and the correction method
 - The discharge data are mainly influenced by their geographic locations and altitude
- Our study helps to clearly define the causes of unexplained poor modelling results and emphasis the errors for ground data per type of gauge and per governorate

Thank you!

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