AfricaGIS 2019
Innovations in Geospatial Technologies for Achieving Sustainable Development Goals in Africa
Kigali Conference and Exhibition Village, Rwanda
18 – 22 November 2019

UNIVERSITY of RWANDA

USING GEO-INFORMATION TECHNOLOGY FOR ASSESSMENT OF BASIC INFRASTRUCTURE SERVICE PROVISION:

CASE OF DRINKING WATER SUPPLY IN NYAMIRAMBO, KIGALI

By **BARIFASHE Theodomir** (Msc)

Department of Geography & Urban Planning

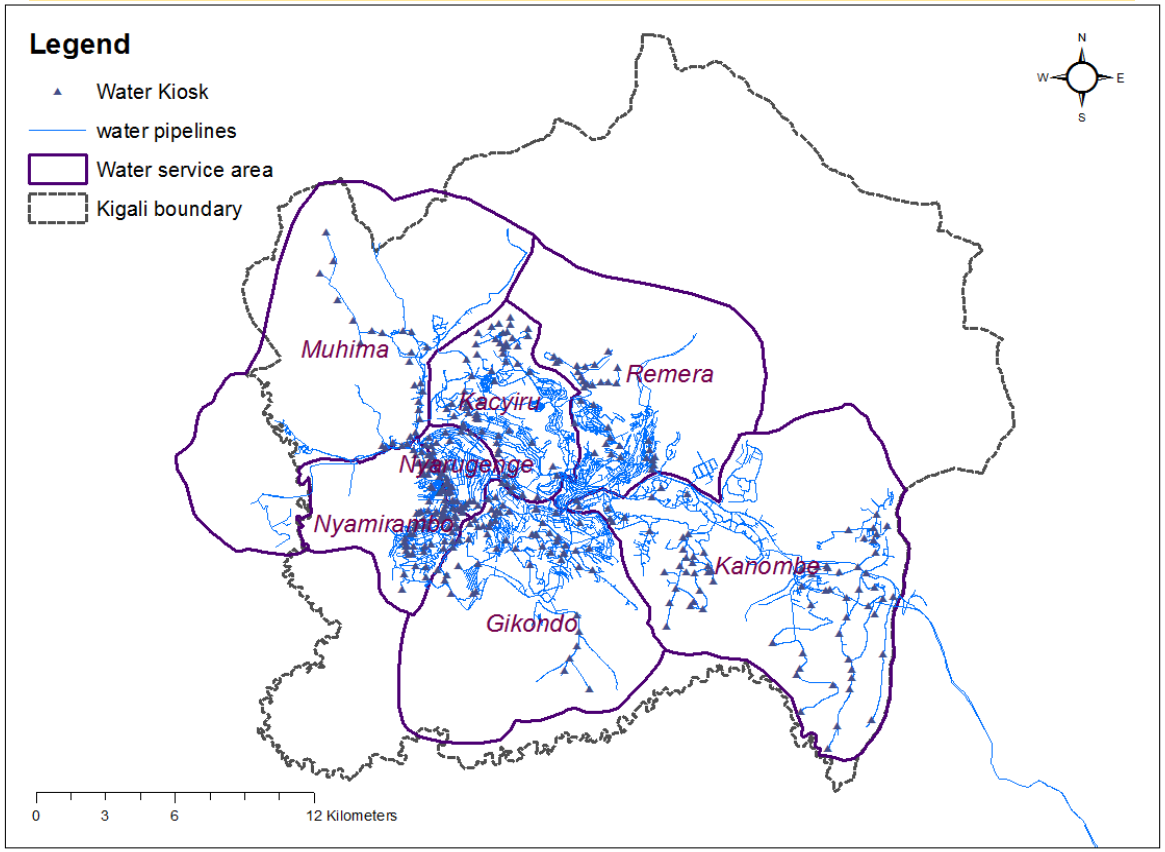
SABE/CST/UR

Challenge of infrastructure service provision

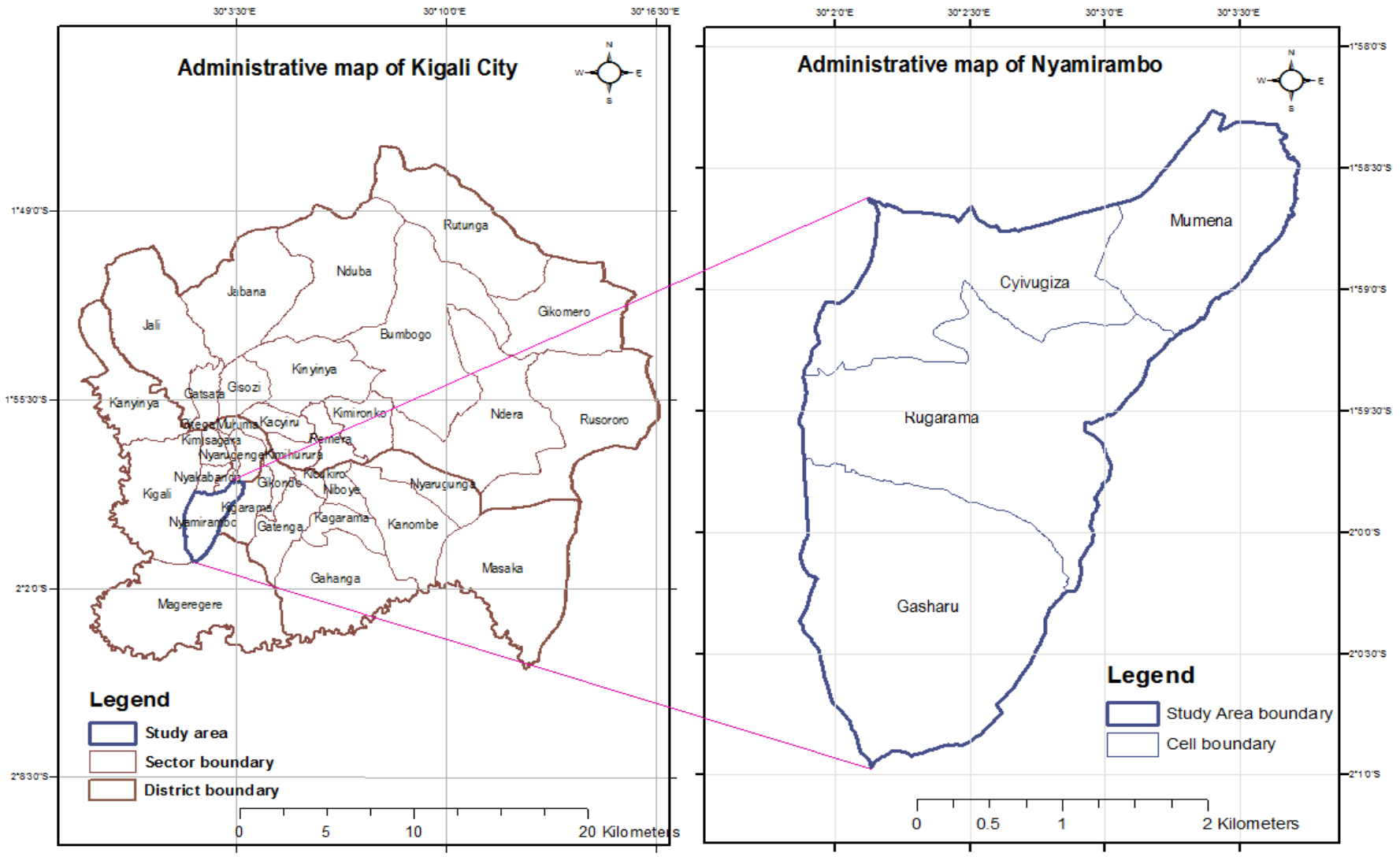
- Fast growing cities in developing countries
- Urban sprawl & population growth
- High rise of demand in urban services vs. slow development of urban infrastructure
- Decreased capacity of urban infrastructure service provision
- Spatial disparities in service provision
- Need of appropriate spatial decisions

DRINKING WATER SUPPLY IN KIGALI

Uneven pattern of water supply infrastructure!



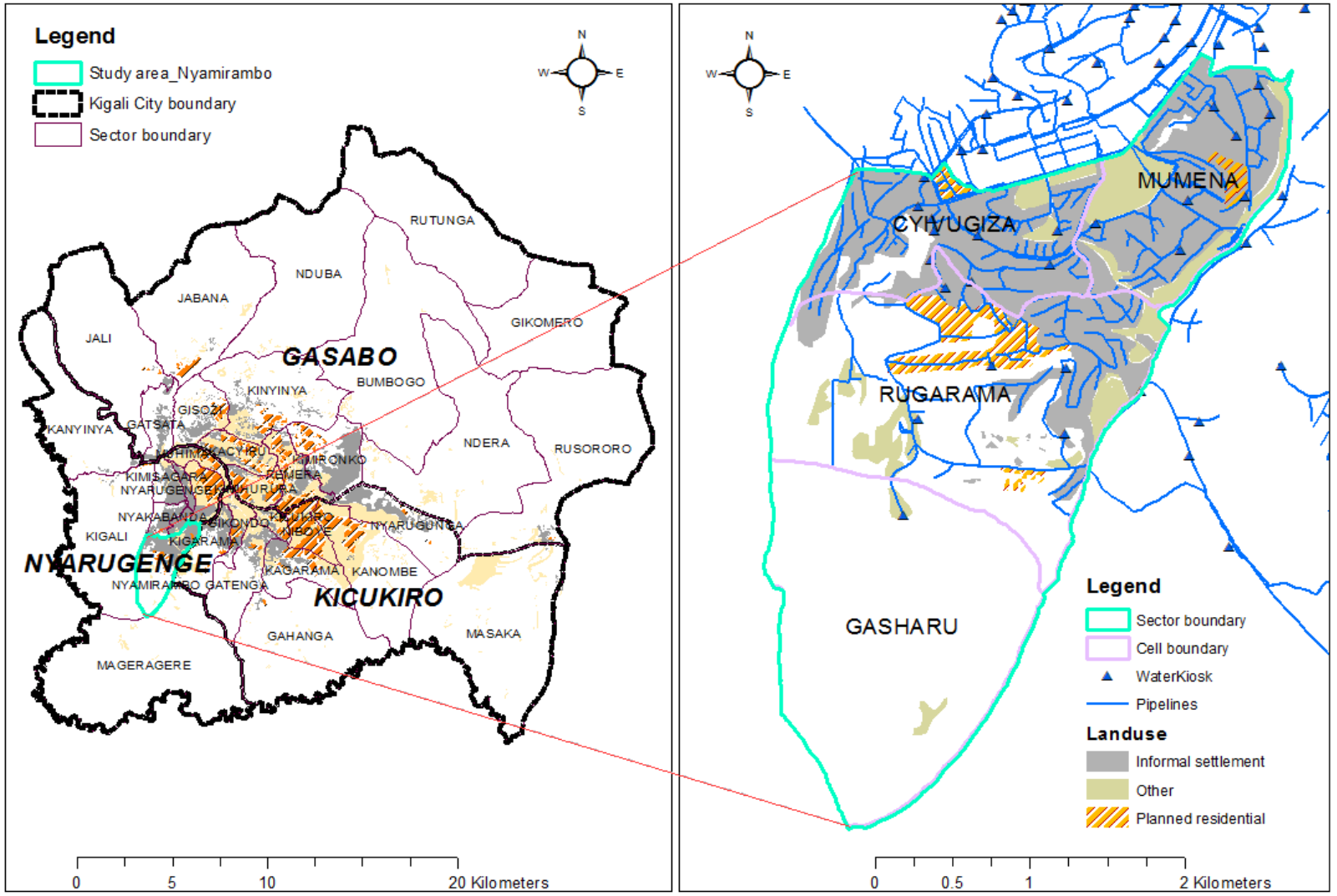
Where the intervention is needed?



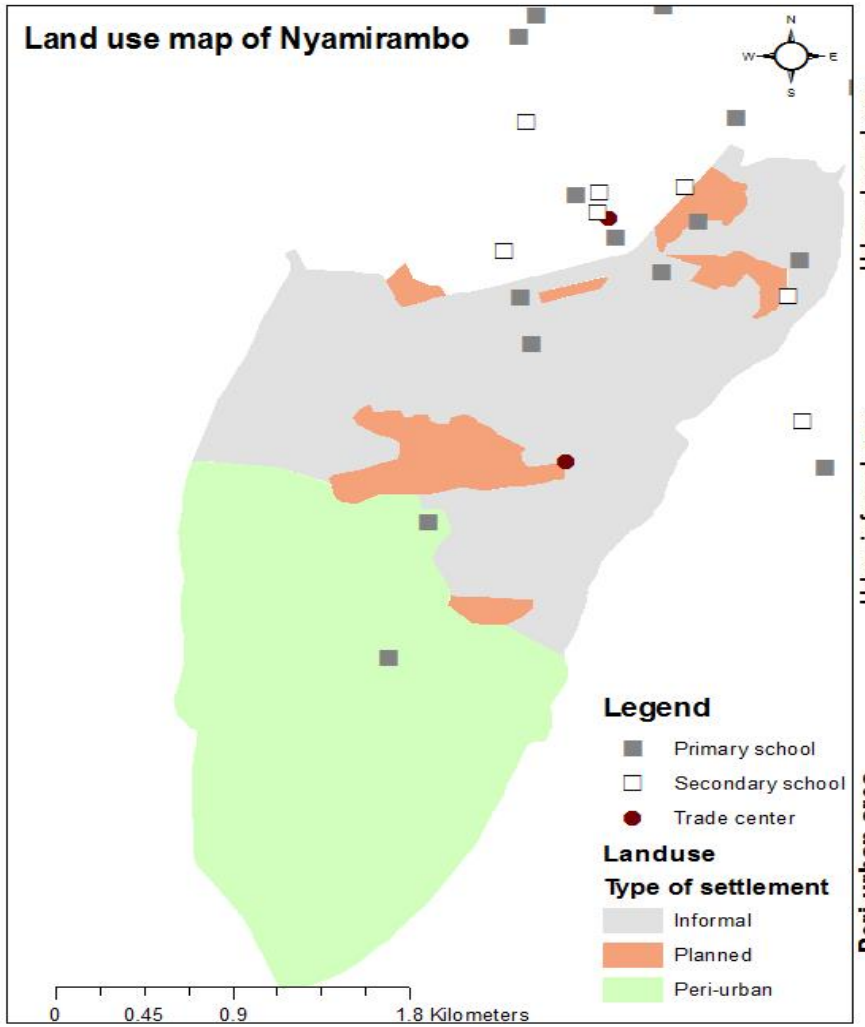
The study area

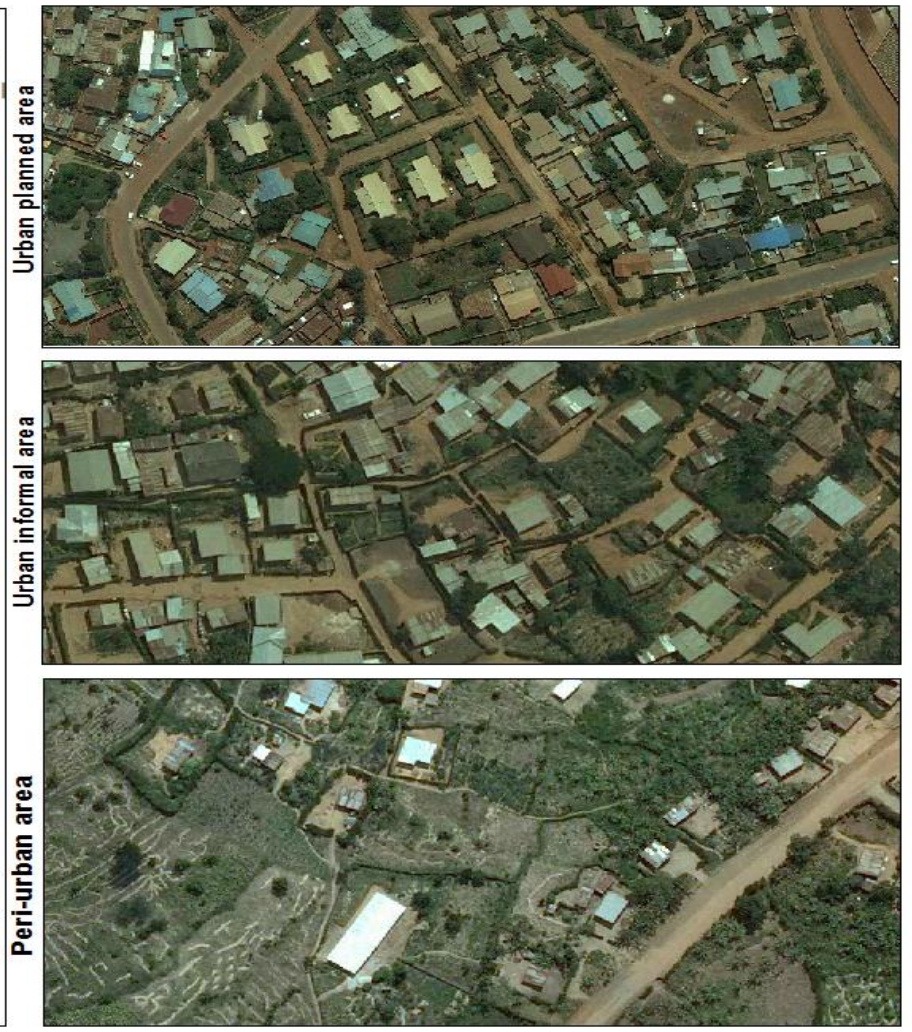
Geo-information technology and selection of the study area

- typical urban and rural area of Kigali city;
- illustration of the contrast of population density (700 to 17,000 inhabitants per square km) and life style of Kigali city;
- a diversity of human settlements (urban “planned, informal” vs. peri-urban/rural) of Kigali Kigali;
- a disparity of water supply infrastructure: spatial dissimilarity of concentration of water supply infrastructure

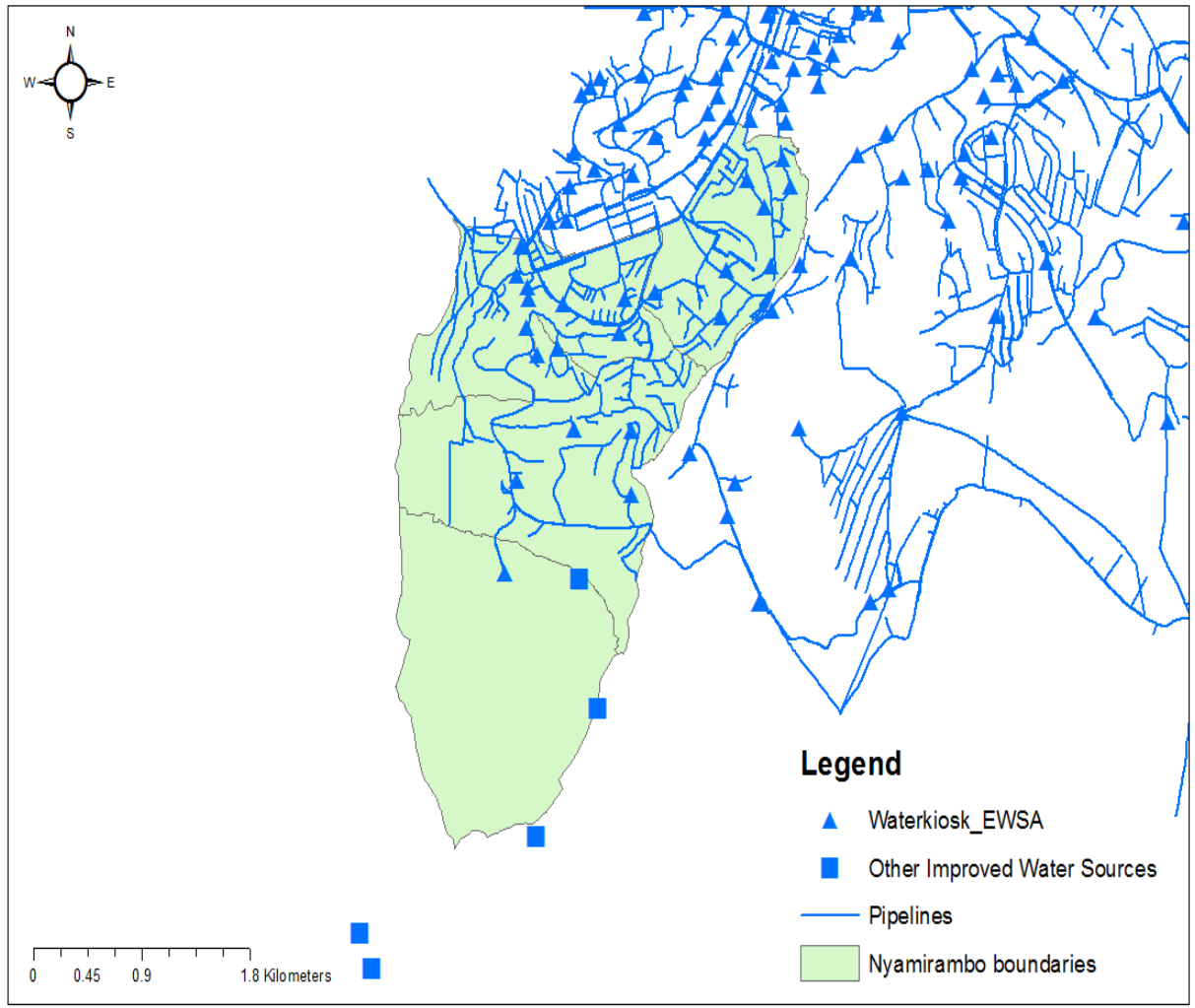


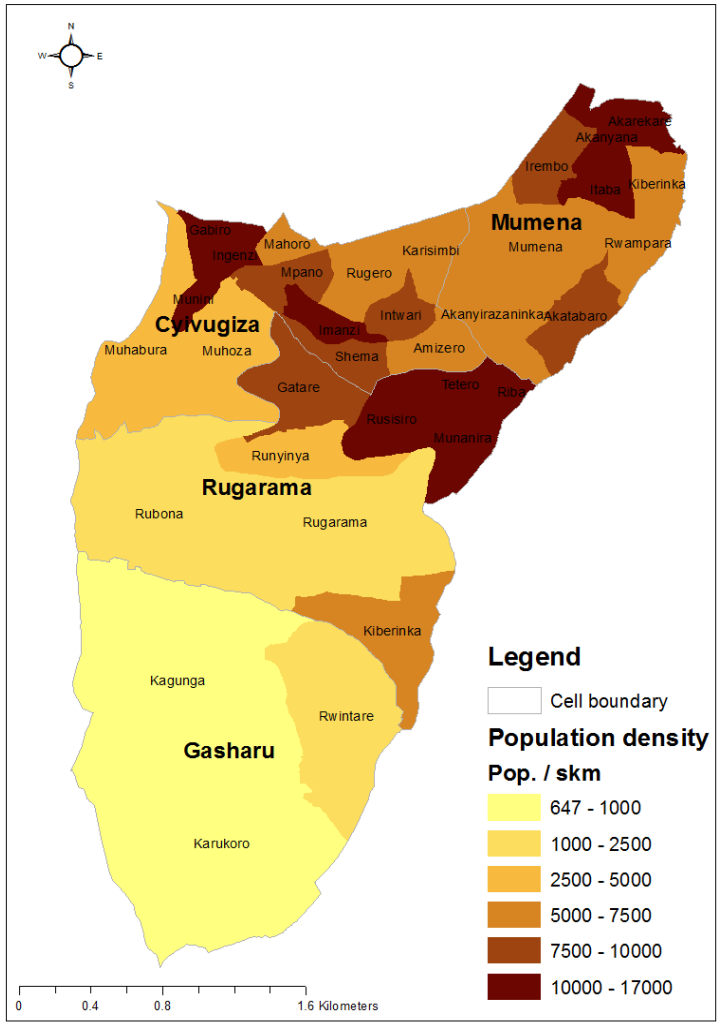
Nyamirambo sector is the sector whose characteristics reflect those of Kigali City





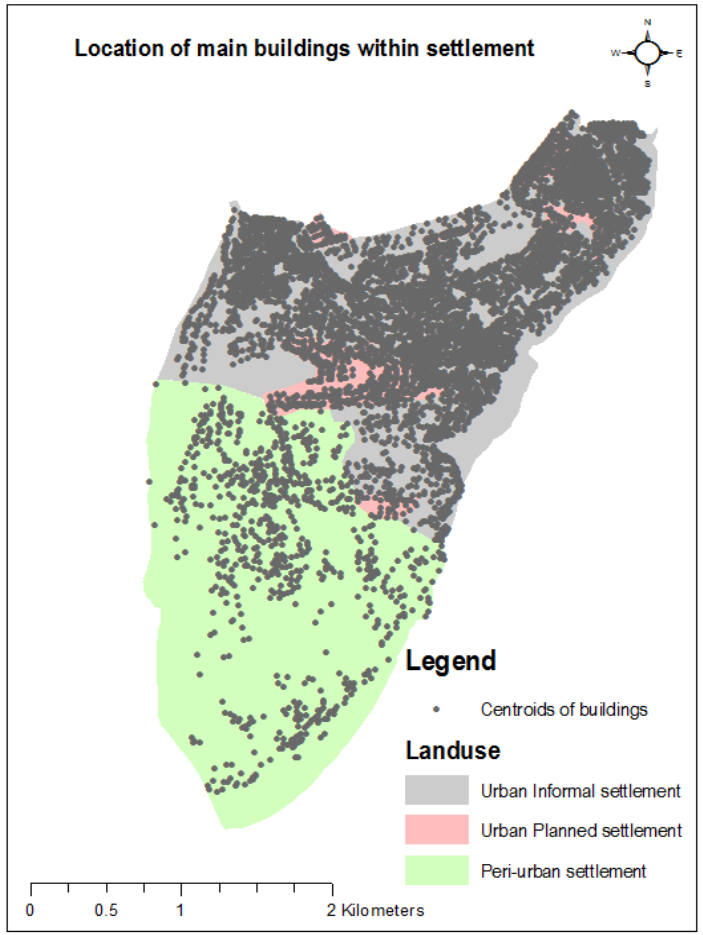
Nyamirambo sector is the sector whose characteristics reflect those of Kigali City

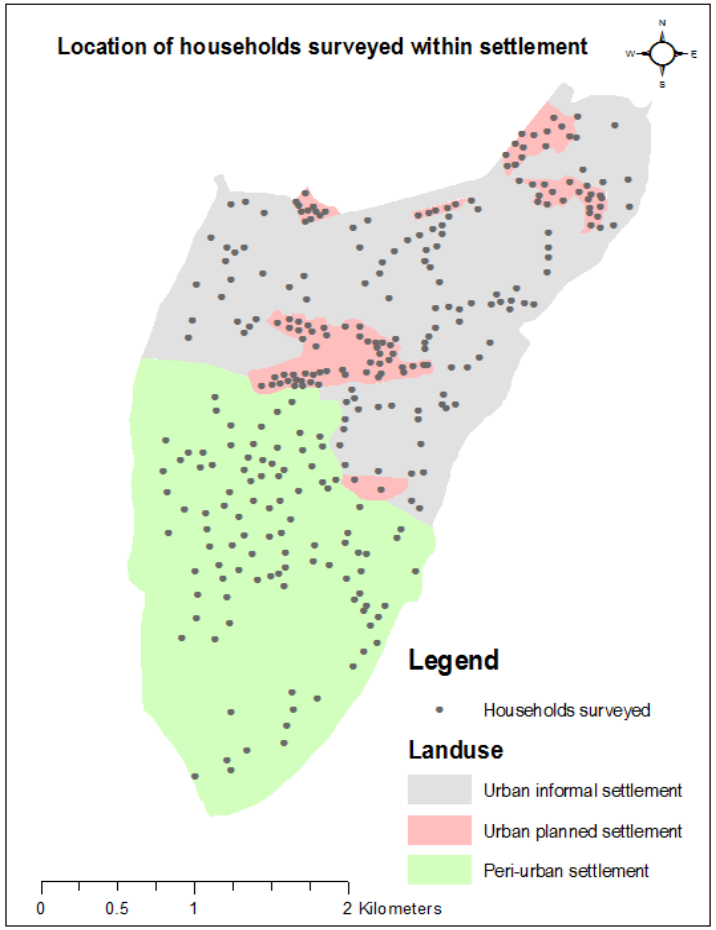




Nyamirambo sector is the sector whose characteristics reflect those of Kigali City

Geo-information Technology and sampling





- Within each type of settlement, 100 households were randomly selected
- Location of households were extracted from aerial photographs

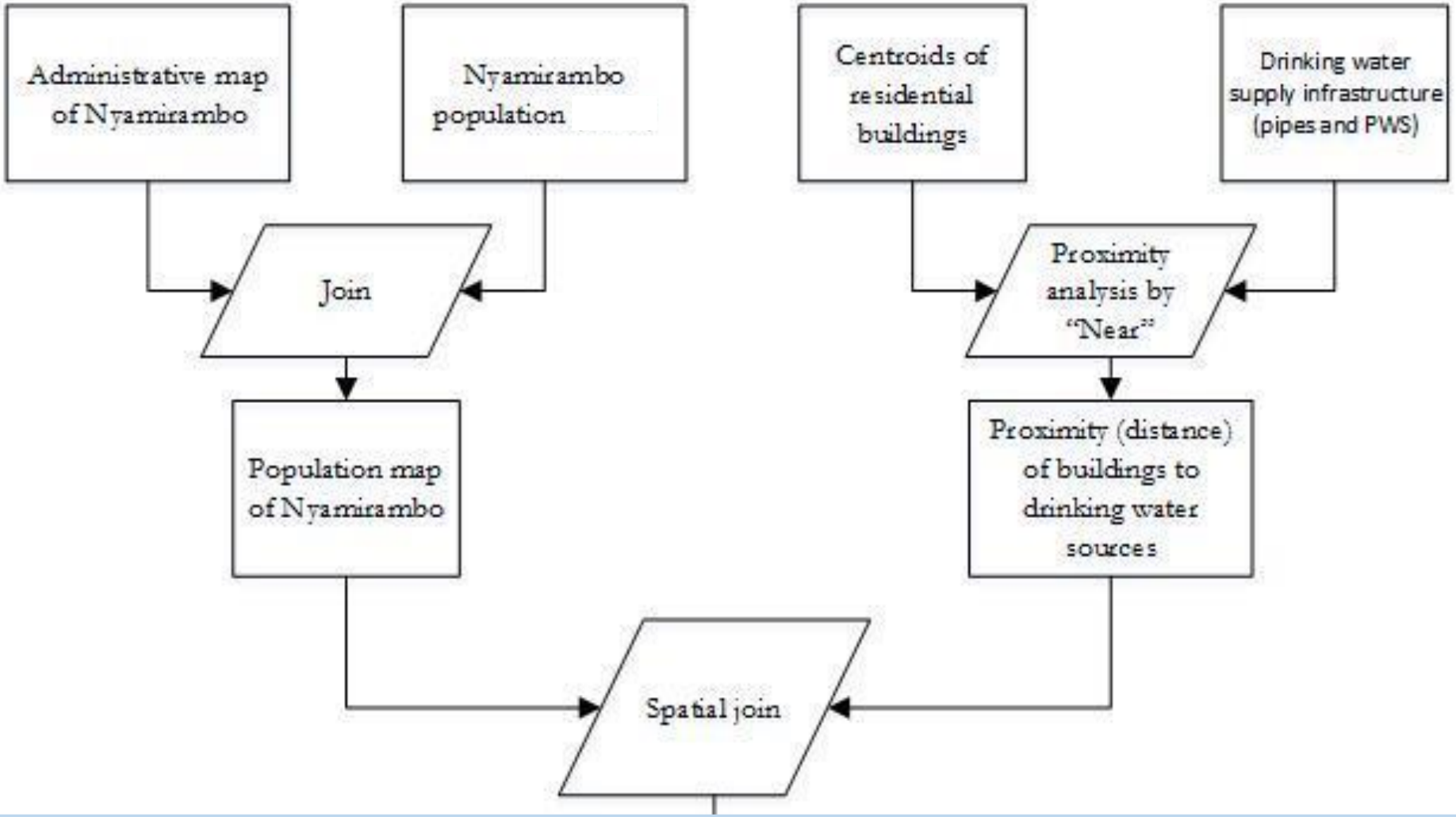
Geo-information and data collection

- Selected households were visualized on a map having an aerial photograph as background to ease their identification for the surveyors
- GPS receivers were used to locate:

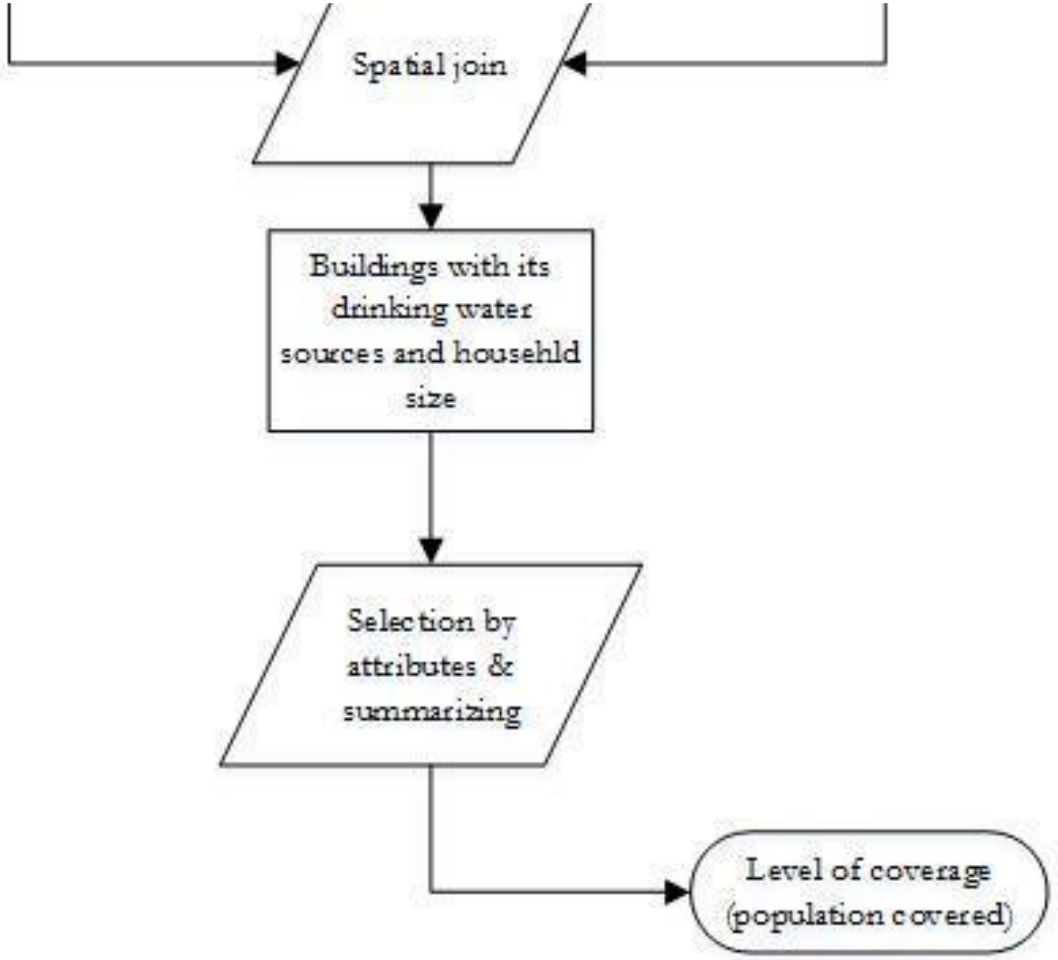
a) new improved water sources (not included in the existing geodatabase), and

b) households investigated.

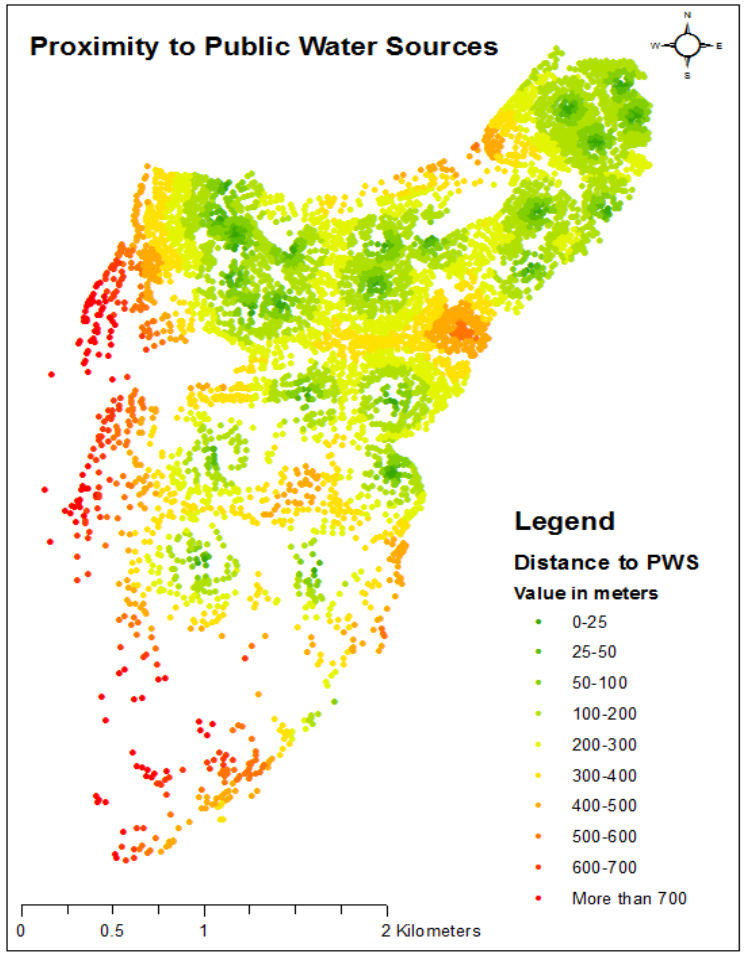
Steps for generating geographical coverage

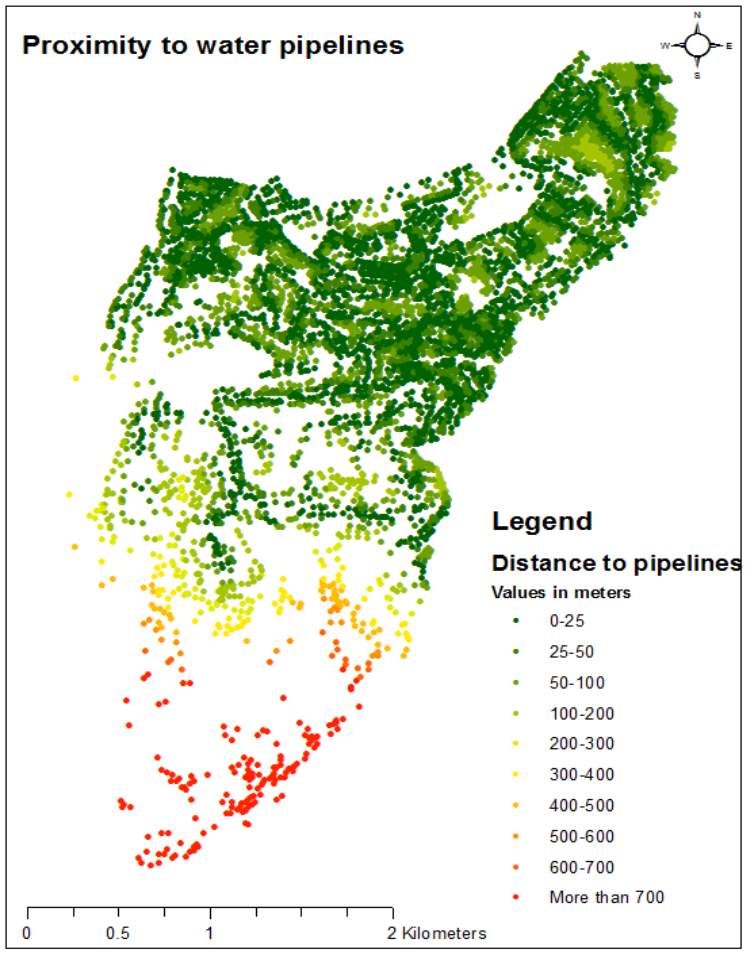


Steps for generating geographical coverage (cont'd)



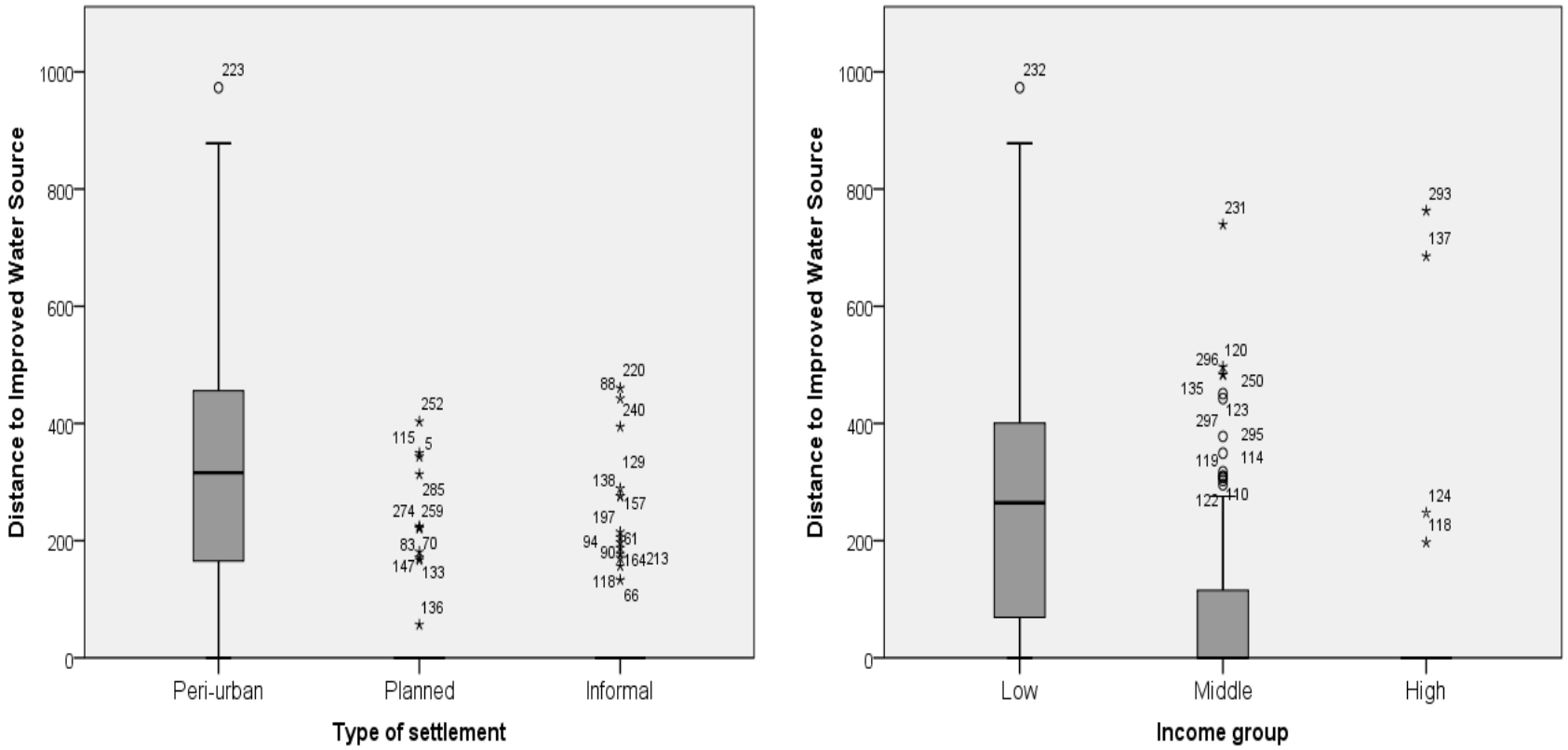
Proximity to drinking water supply infrastructure





- Only about the half (**48.3%**) of the population of are within 200 m from the improved public water,
- **73,2%** of the population are within 50m from the pipeline

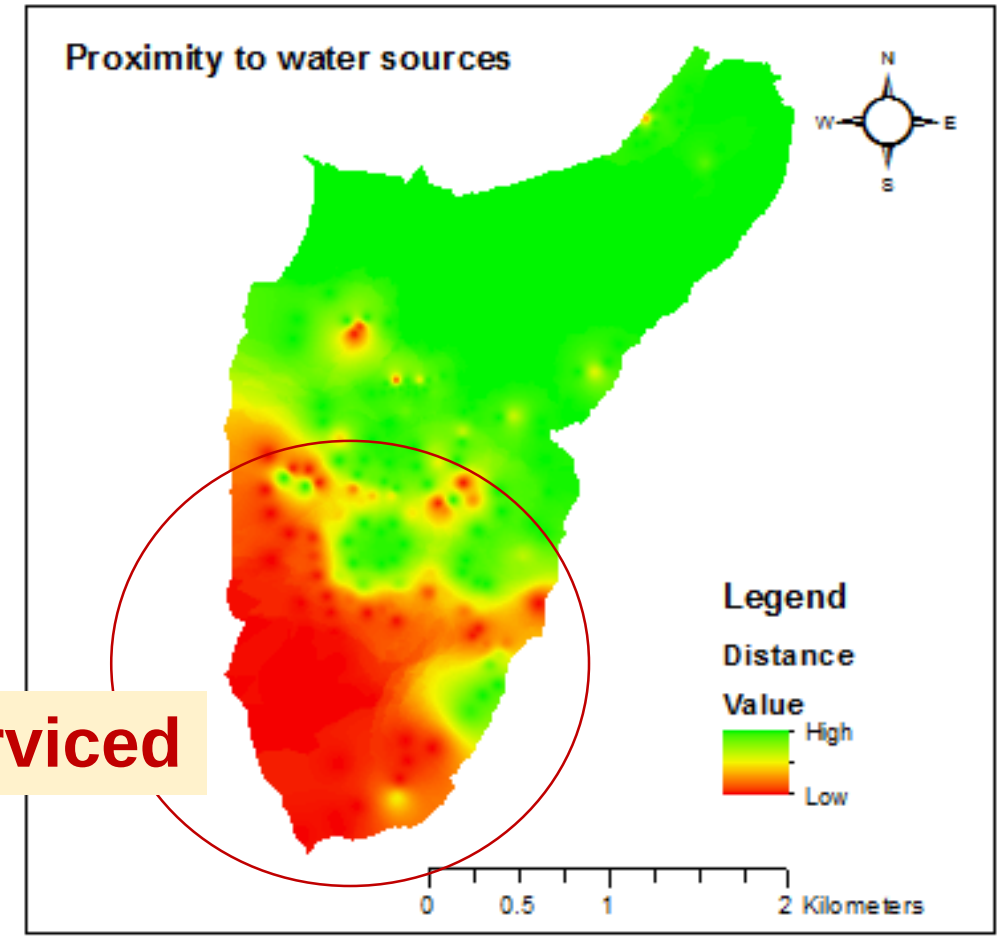
Pattern of proximity to improved drinking water sources



- ***Urban areas*** (planned and informal) are therefore better serviced than the peri-urban/scattered area;
- ***Low income group*** is poorly covered by drinking water supply infrastructure

Figure: Distance to drinking water sources within settlements and income groups

Proximity map: overall assessment



Poorly serviced

- Spatial dissimilarities inside the study area : **Urban (**Planned & informal**) well serviced.**
- Need of **Area-based interventions** to reduce the spatial disparities

Thank you!