Population distribution in Africa in 2010

Limitation:
Low intra-urban variations in densities


Urban population growth is fast in Africa

Growth rates are varying in space and time!

[Graph showing urban population growth rates]

Low intra-urban variations in population densities

GRUMP  LandScan  WorldPop

Challenges of Urban mapping in SSA

- Heterogeneity of the build-up structures, and corresponding human population density
- Similarity between the roof’s materials and the natural environment
- Lack of good quality training datasets
  → Using existing OpenStreetMap data, optical and SAR remote sensing data

How can intra-urban predictions of population densities be improved using remote sensing and data fusion?
Objectives

- Working at 2 scales:
  - Continental scale with HR remote sensing data (30m)
    - To map the built-up density from 1995 to 2015 each 5 years
    - To model/map the intra-urban population density from 1995 to 2015
  - City scale with VHR remote sensing data (0.5m)
    - To map the urban land cover and land use in 2015
    - To model/map the intra-urban population density

1. Mapping the urban extent from 1995 to 2015 at the continental scale

2. Estimate/model of the population density

Temporal probability of built-up

Ouagadougou change detection

Morphological zones in Ouagadougou
Population density model without built-up density

Population density model with built-up density

Roads as main predictor

3. Mapping the LULC in 2015 at the city scale

- 3 cities: Ouagadougou, Dakar, and Saint-Louis
- These detailed maps will be used to refine our models of the population density
Data fusion is essential for a more accurate mapping of African urban areas.

Including the map of the built-up density improves the WorldPop population model.

Will include the fine-scale LC to further improve the WorldPop population model.

Intermediate products can be interesting for land management and planning in an urban SSA context.

Urban extension from 1995 to 2015

Land-cover and land-use maps
Questions?

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