

Exploring attributes of urban food environments using a GIS approach and implications for public health



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INTRODUCTION

Tanzania (country in East Africa)
– 6th rapidly urbanizing country globally¹



↑ **Urbanization**

Heightened nutrition risk
(overweight and obesity) and
increasing urban poverty

Mapping spatial location of food
outlets and their healthiness ~
identifies high-risk locations and
guides specific interventions

Aim: Explore the spatial
distribution and healthiness of
food outlets in two low-income
urban wards in Dar es Salaam
using GIS mapping



METHODOLOGY

Food outlets census ~
800 m buffer

Study areas: (Dar es
Salaam)

- Vingunguti
- Buguruni

Outlet Healthiness
classification (CDC
mRFEI formula)²

Data collected:

- Geo-location
- Food environment
typology
- Food outlet
typology³
- Healthiness of
food outlets

Data analysis
software



- Spatial
distribution
- Hotspot
analysis

RESULTS

FOOD ENVIRONMENT TYPOLOGY

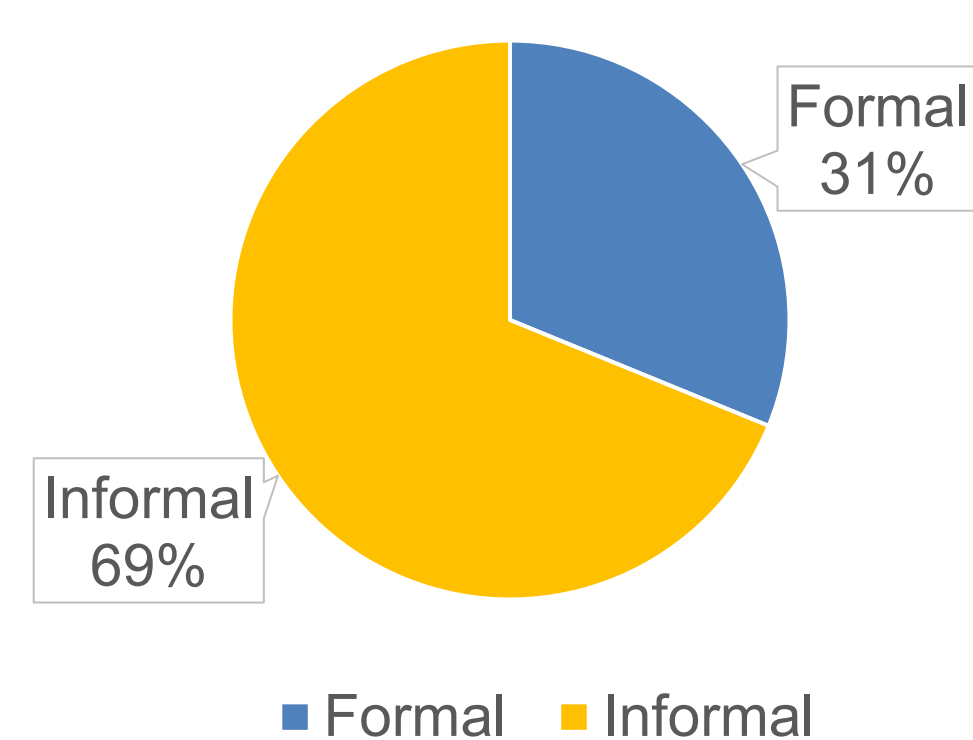


Fig.1: Food environment typology in Vingunguti and Buguruni wards

HEALTHINESS OF FOOD OUTLETS

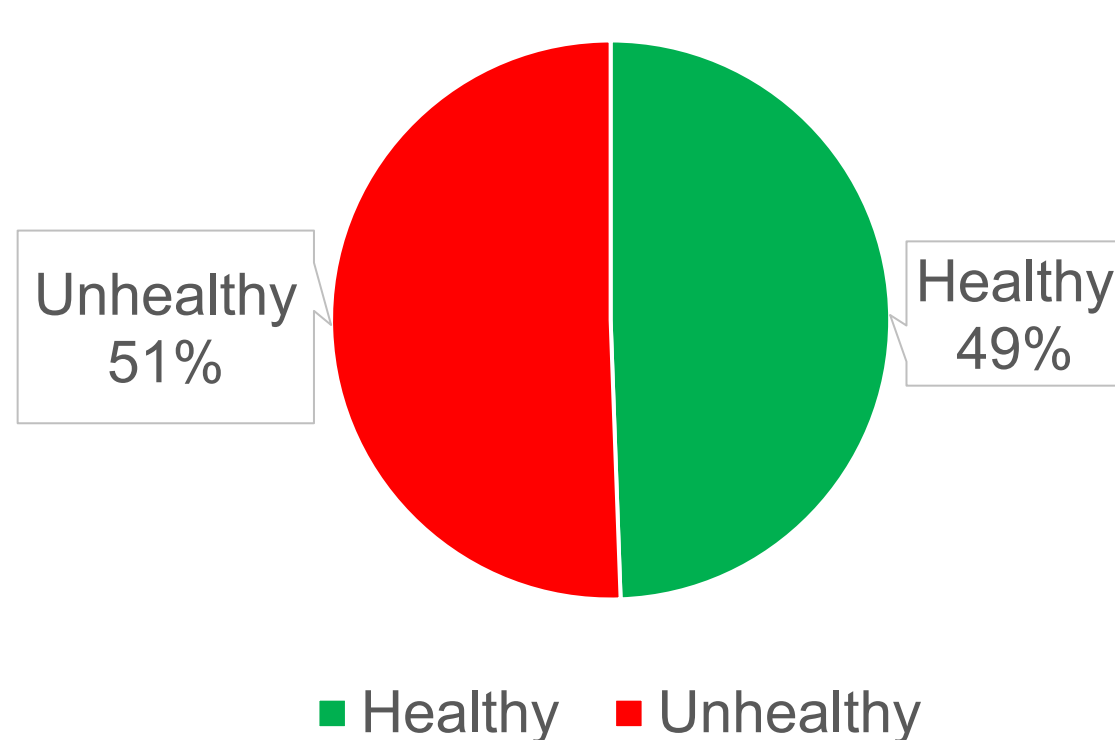


Fig. 2: Healthiness of food outlets in Vingunguti and Buguruni wards

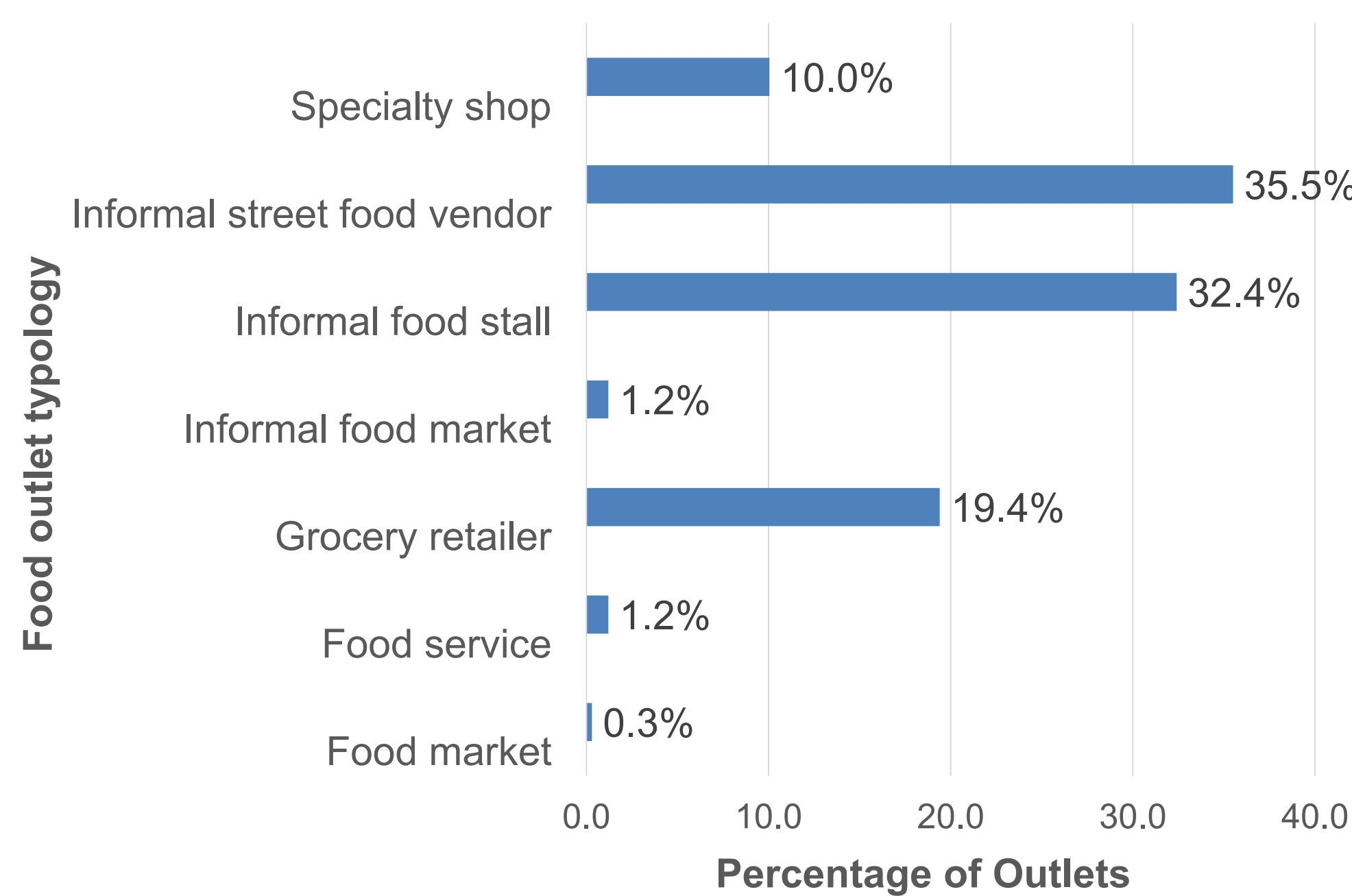


Fig. 3: Food outlet typologies in the low-income communities

- Predominance of informal food outlets (Figures 1 and 3) confirms the central role of informal vendors in Sub-Saharan Africa's poor urban food systems.

- There's a mix of healthy and unhealthy outlets (Figure 2, 4a and 4b).

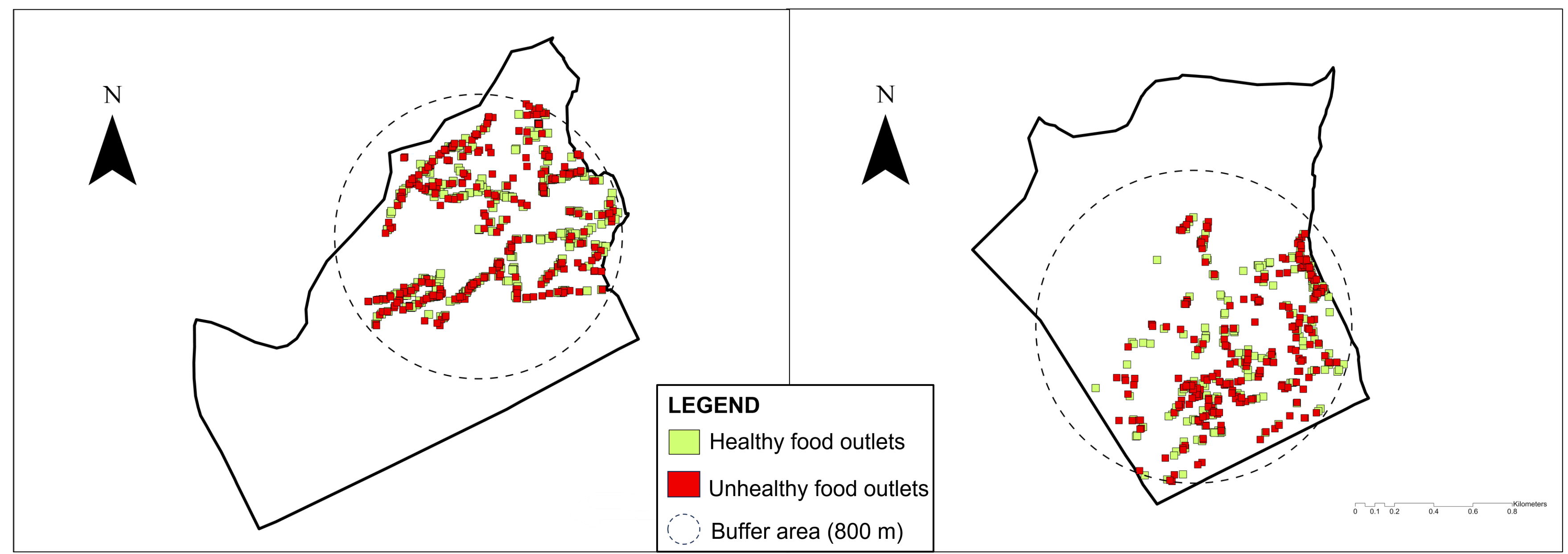


Fig.4.a: Map showing the spatial distribution of healthy and unhealthy food outlets for Vingunguti ward

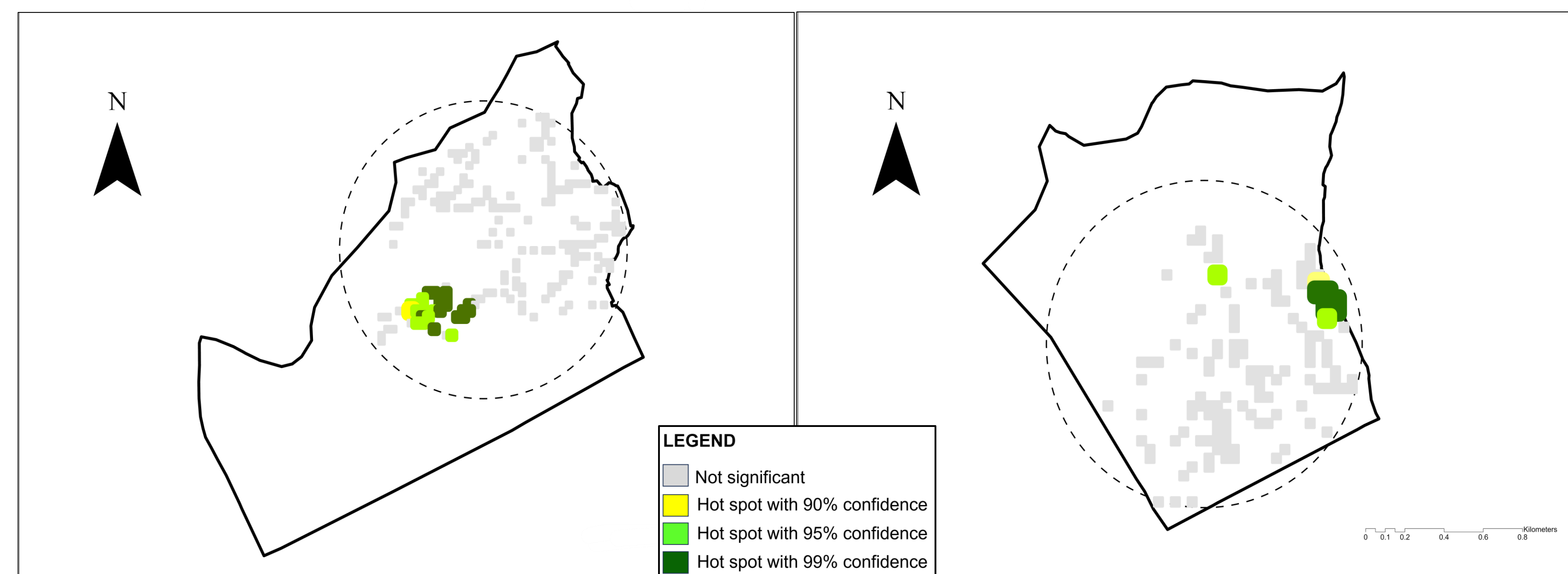


Fig.5.a: Map showing hot spots of healthy food outlets in Vingunguti ward

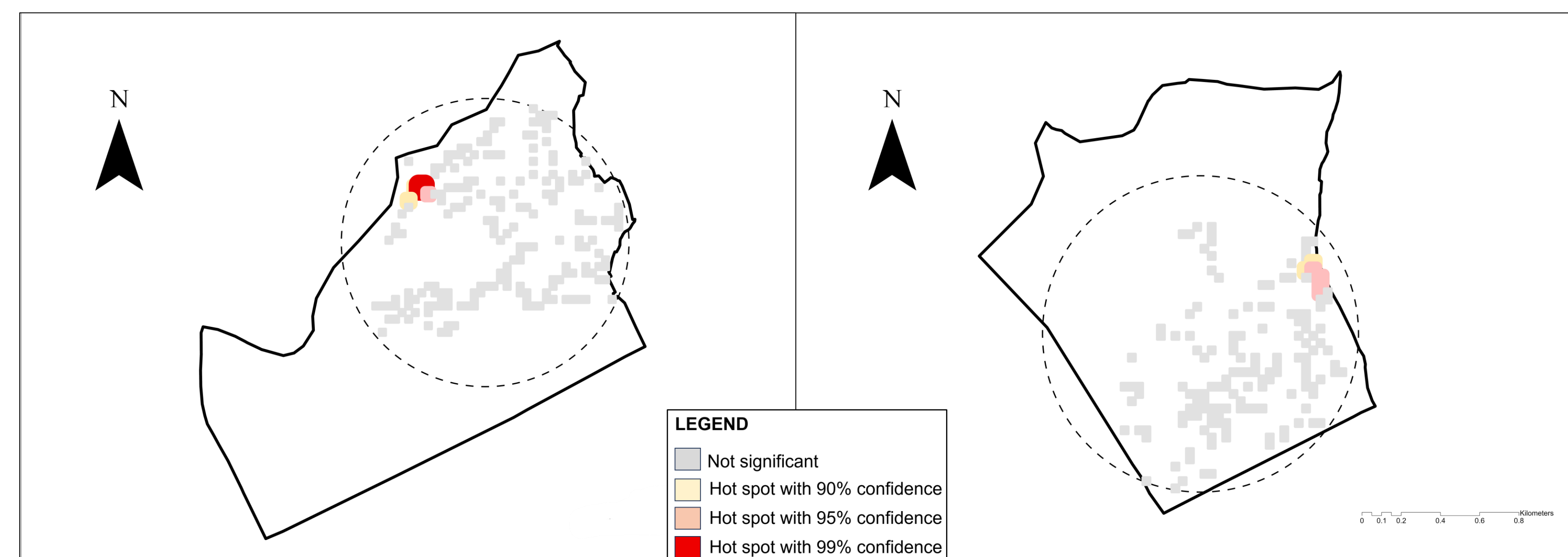


Fig.6.a: Map showing hot spots of unhealthy food outlets in Vingunguti ward

➤ Uneven clustering (hotspots) of healthy vs. unhealthy suggests an inequitable nutrition exposure (Figure 5a, 5b, 6a, and 6b).

- **Vingunguti:** Northwest residents may be disproportionately exposed to unhealthy food outlets.
- **Buguruni:** Eastern residents face overlapping healthy and unhealthy clusters → a competitive food environment

"...the where guides the why.."

CONCLUSION

- Informal food outlets dominate (69%)
- GIS reveals uneven distribution, highlighting potential nutritional risk zones.
- Need for localized interventions and by-laws to expand healthy food access
- Further research explaining unhealthy outlet clustering

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References

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² Center for Disease Control and Prevention (CDC). Census Tract Level State Maps of the Modified Retail Food Environment Index (mRFEI). Atlanta, GA: Division of Physical Activity, Nutrition and Obesity; 2011

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