

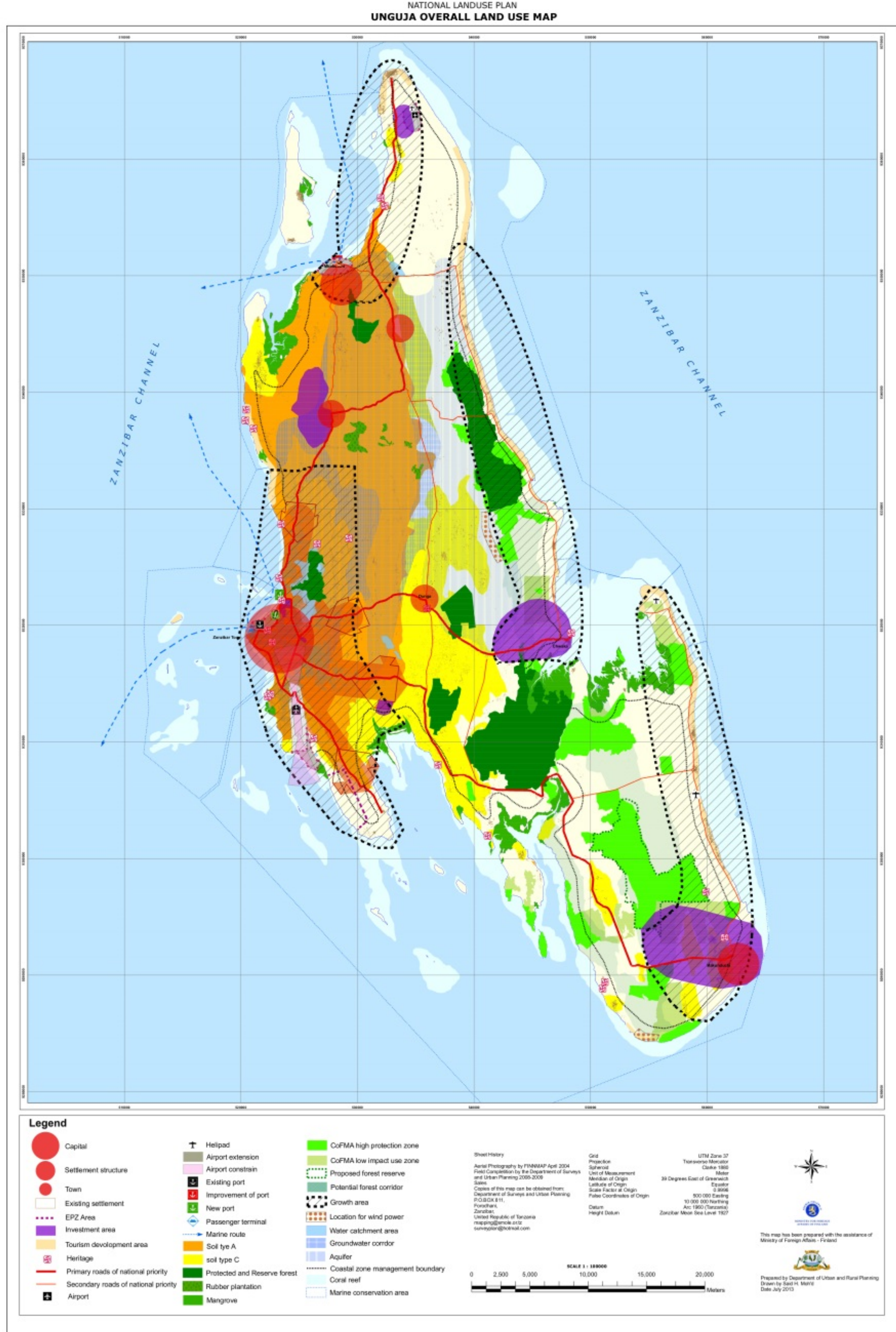
SPATIAL VARIATION IN ASSOCIATIONS BETWEEN FOOD CONSUMPTION AND OBESITY IN ZANZIBAR



C. Wiessner^{1,2}, M. Adam Nyangasa¹, S. Kelm², M. Sheikh³, A. Hebestreit¹, C. Buck¹

Background

Spatial variation is assumed in association of health behavior and health outcomes, due to spatial differences in land use, Infrastructure, economic clustering, income sources, and topographic differences.



Using **geographically weighted regression (GWR)** as a new method to consider the spatial location of observations within a regression model.

Method

Study sample and study design

- 80 randomly selected Shehias
- 1314 participants (0-95y) were included
- Examination: October to December

Outcome measures

- Obesity defined based on Body Mass Index (BMI) (Cole TJ, 2012)
- Food consumption score (FCS)

Exposure measures

- Wealth score comprised of
 - Number of household aids (electricity, mobilephone, refrigerator,...),
 - Number of animals (chicken, sheep, cows,...),
 - Number of vehicles (bike, motorbike, car, boat).
- Education (individual)
- Age (4 categories)

Statistical Analysis

A GWR was conducted as a linear or logistic regression for continuous or binary outcomes, respectively following

$$y_i = \beta_{0i}(u) + \beta_{1i}(u)x_{1i} + \varepsilon_i.$$

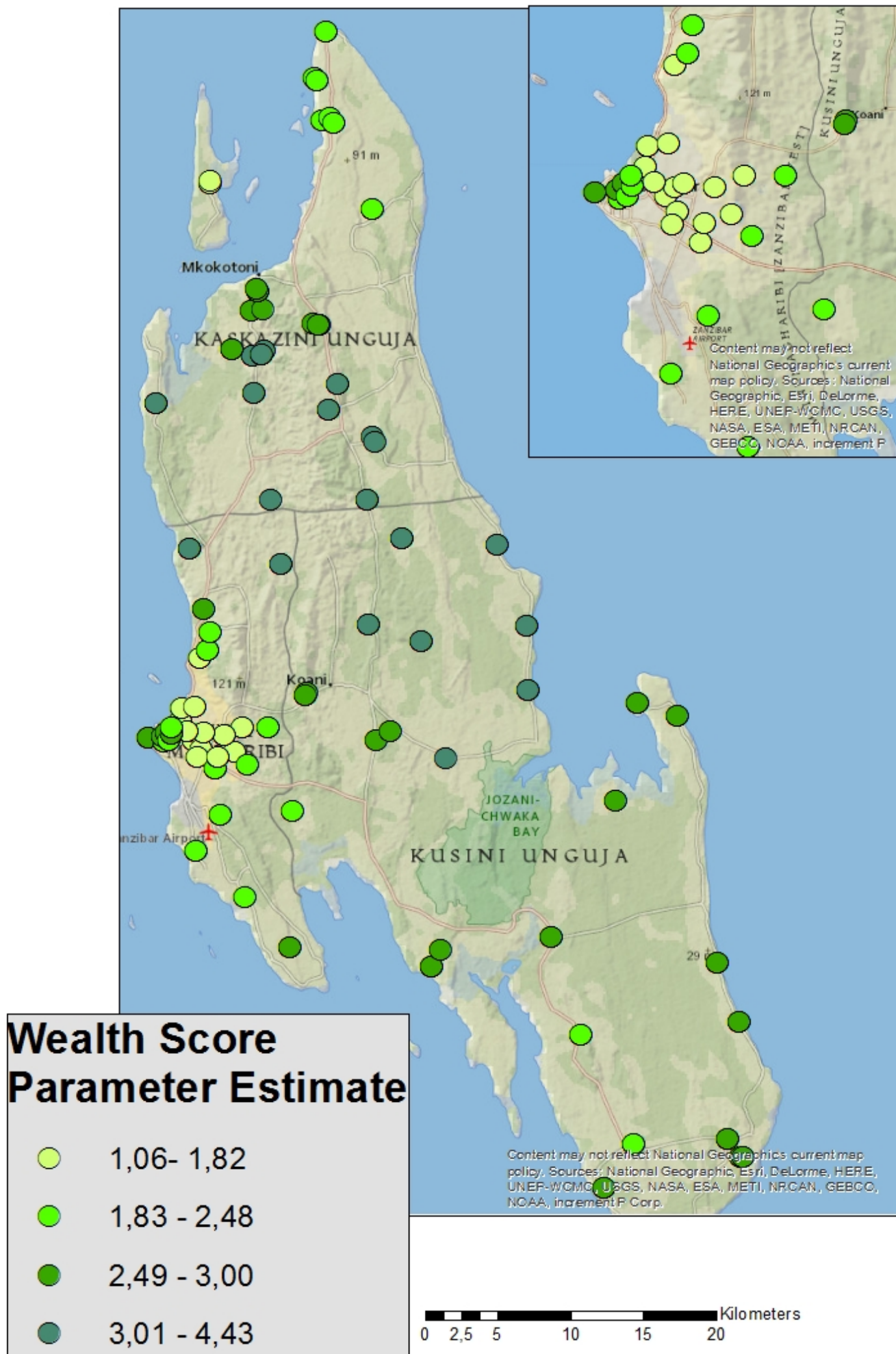
The GWR provides parameter estimates β_{1i} and t-values for each variable x_{1i} at each spatial location u of the corresponding shehia to account for spatial variation in the association of

1. Wealth and food consumption,
2. Wealth and obesity,
3. Food consumption, wealth and obesity.

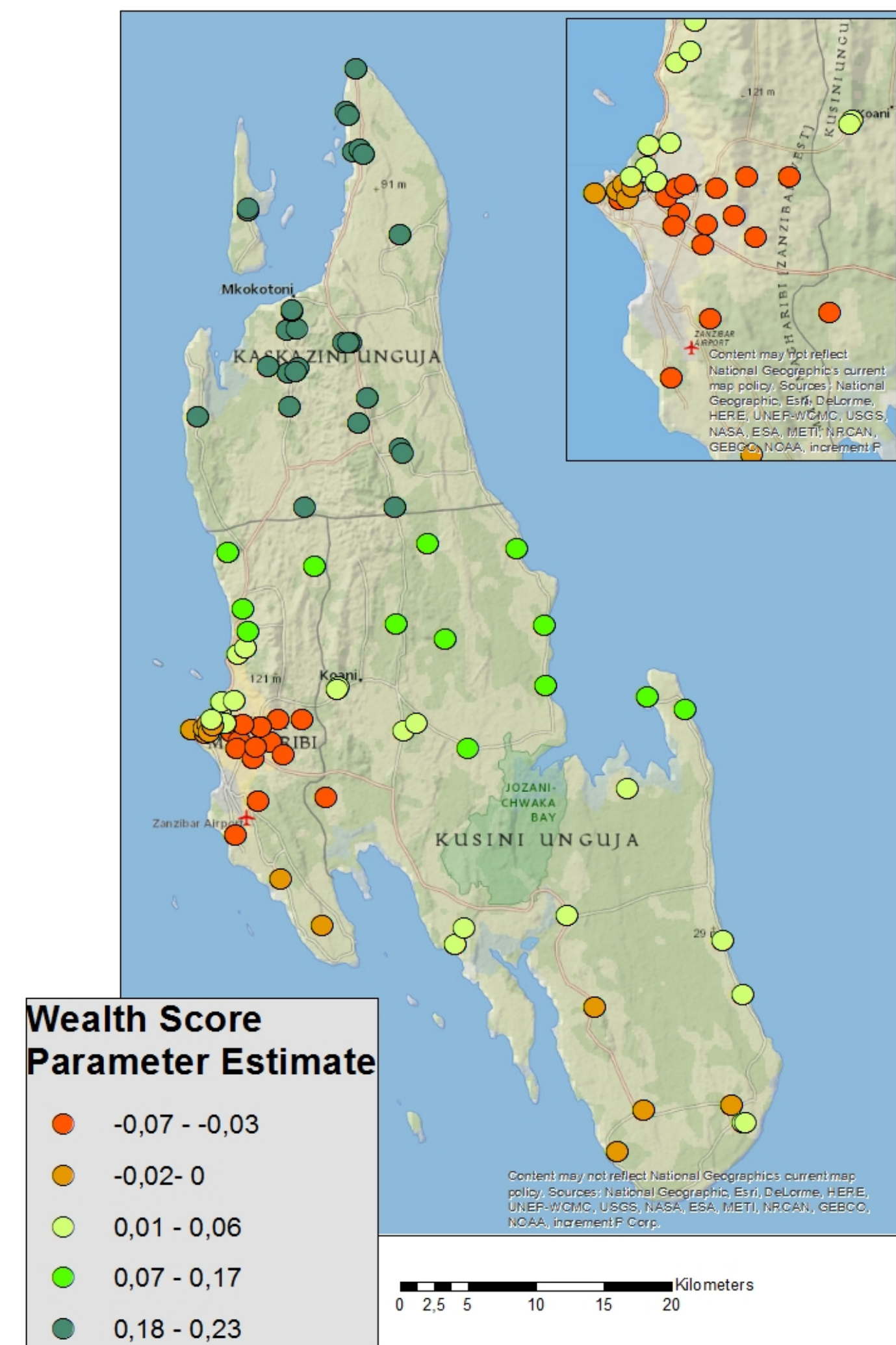
Regression models were all adjusted for age category and educational level

Results

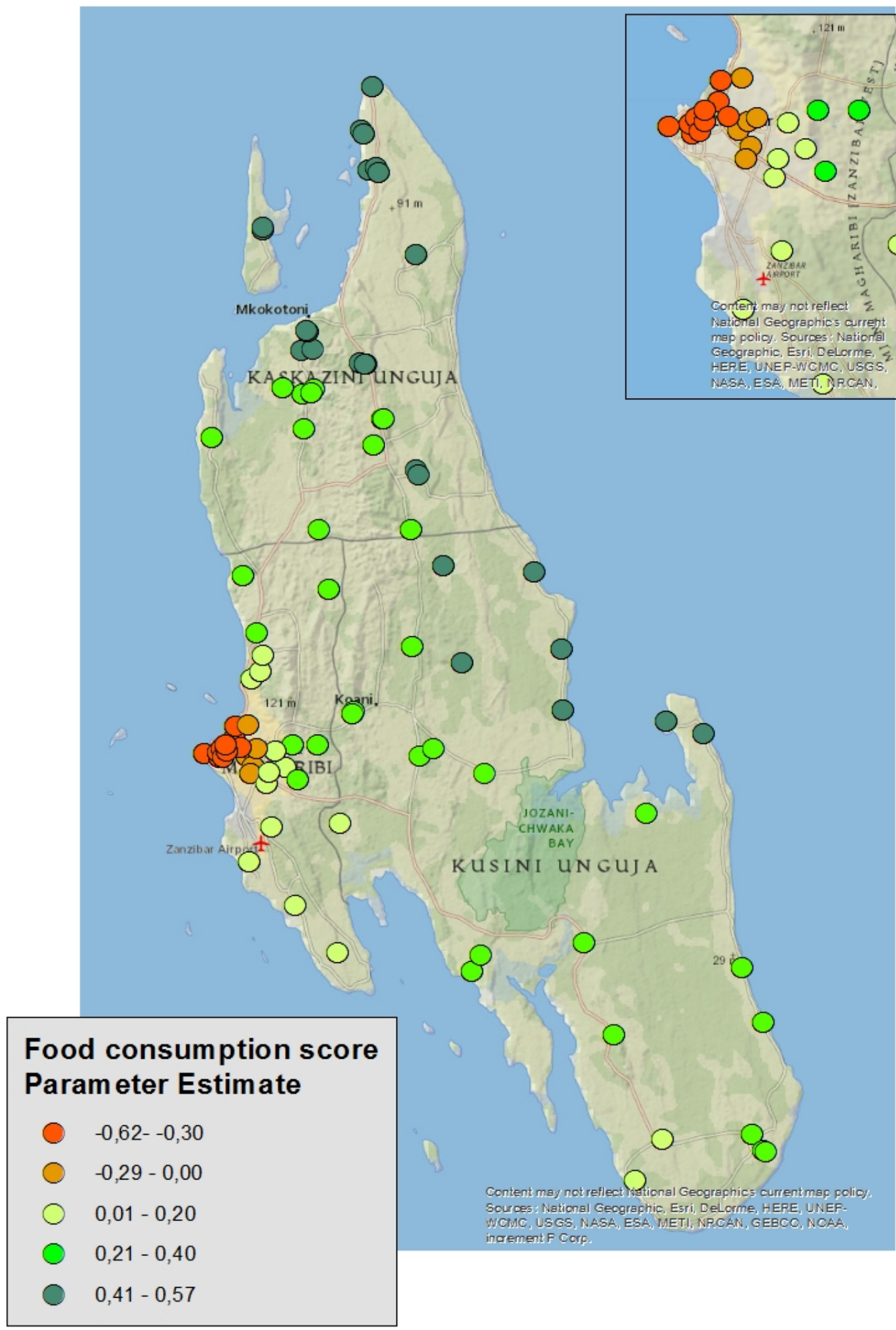
Association of wealth and food consumption



Association of wealth and obesity



Association of food consumption and obesity



Discussion

Spatial variation of investigated associations show larger positive effects of wealth on food consumption in the center and north part of Unguja. However, wealth was positively related to obesity in the northern part, i.e. higher wealth is associated with higher risk of obesity. In urban and touristic areas no effect was revealed. In particular within urban areas in the west of Unguja, food consumption shows a protective (negative) effect on obesity, while in the center and east higher food consumption was strongly related to higher risk for obesity.

Outlook

GWR is a useful technique to investigate spatial variation in the association of risk factors or behavior such as

- Socio economic status,
 - Accessibility to healthy food,
 - Or minerals in local water supplies,
- and health outcomes, e.g. cardiometabolic risk factors, to detect areas that are susceptible for intervention to reduce the risk of non-communicable diseases.

Affiliations

² University of Bremen, Germany; ³ SUZA, Tanzania

Contact

Christoph Buck

Leibniz Institute for Prevention Research and Epidemiology – BIPS
Achterstr. 30
28359 Bremen
Germany
Email: buck@leibniz-bips.de