

Spatial variations of urban development drivers:

Comparing logit approach with a geographically weighted regression.

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Introduction

- The goal of this ongoing work is to explore urbanization drivers at both global and local levels.
- Logistic regression model (logit) is employed to measure the behavior of drivers at a global level.
- Geographically weighted regression model is proposed to analyze the behavior of drivers at a local level.
- R^2 and Pseudo R^2 are used to evaluate models performance.

Methodology

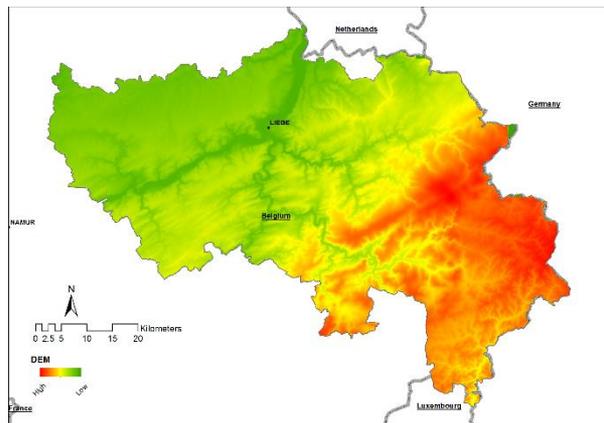
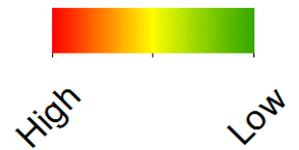
Study area



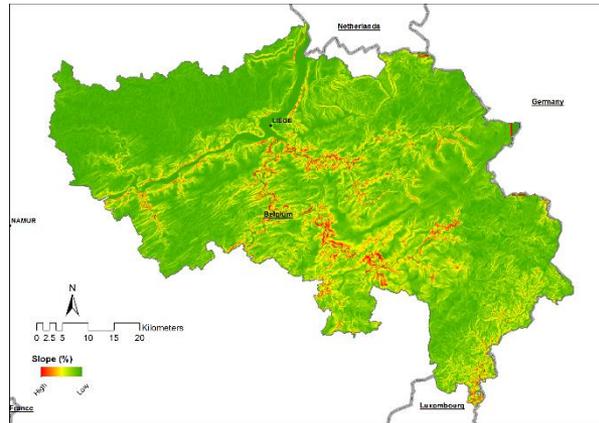
Methodology

Selected urbanization drivers (independent variables)

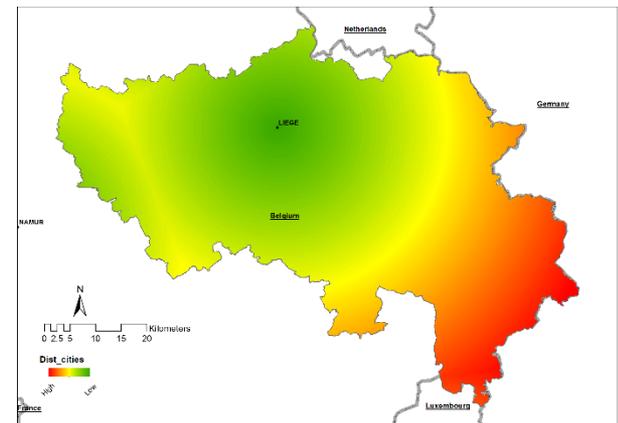
- Ten drivers are selected (Elevation, slope, distance to major cities, distance to different road classes, distance to rail stations, job potential and zoning).



DEM



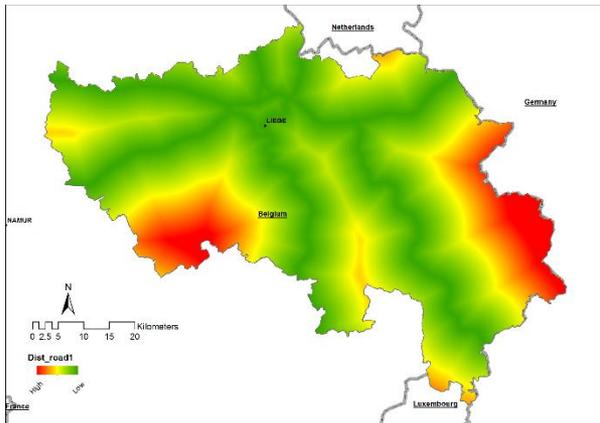
Slope



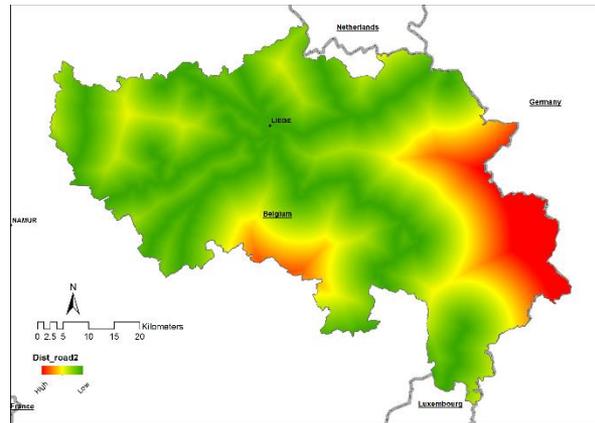
Dist. to cities

Methodology

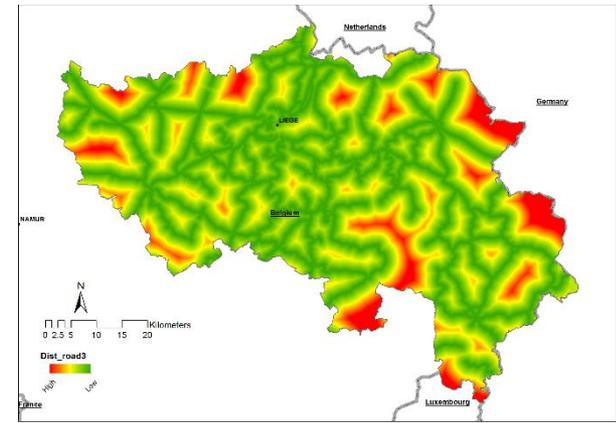
Selected urbanization drivers (independent variables)



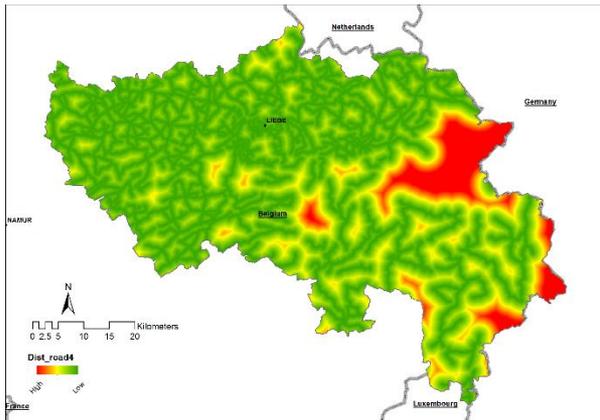
Dist. to road1



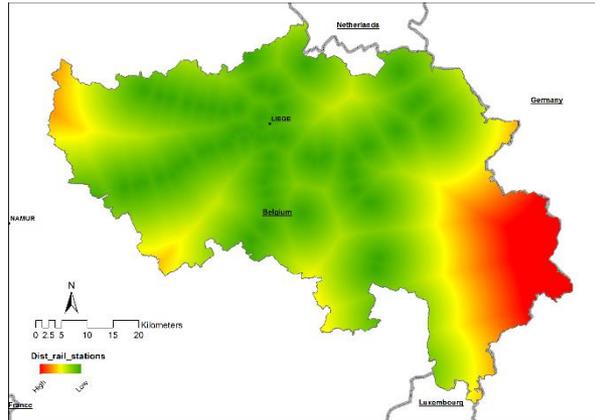
Dist. to road2



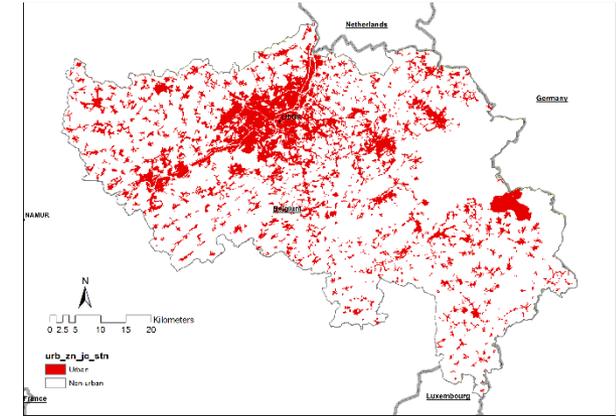
Dist. to road3



Dist. to road4



Dist. to rail stations

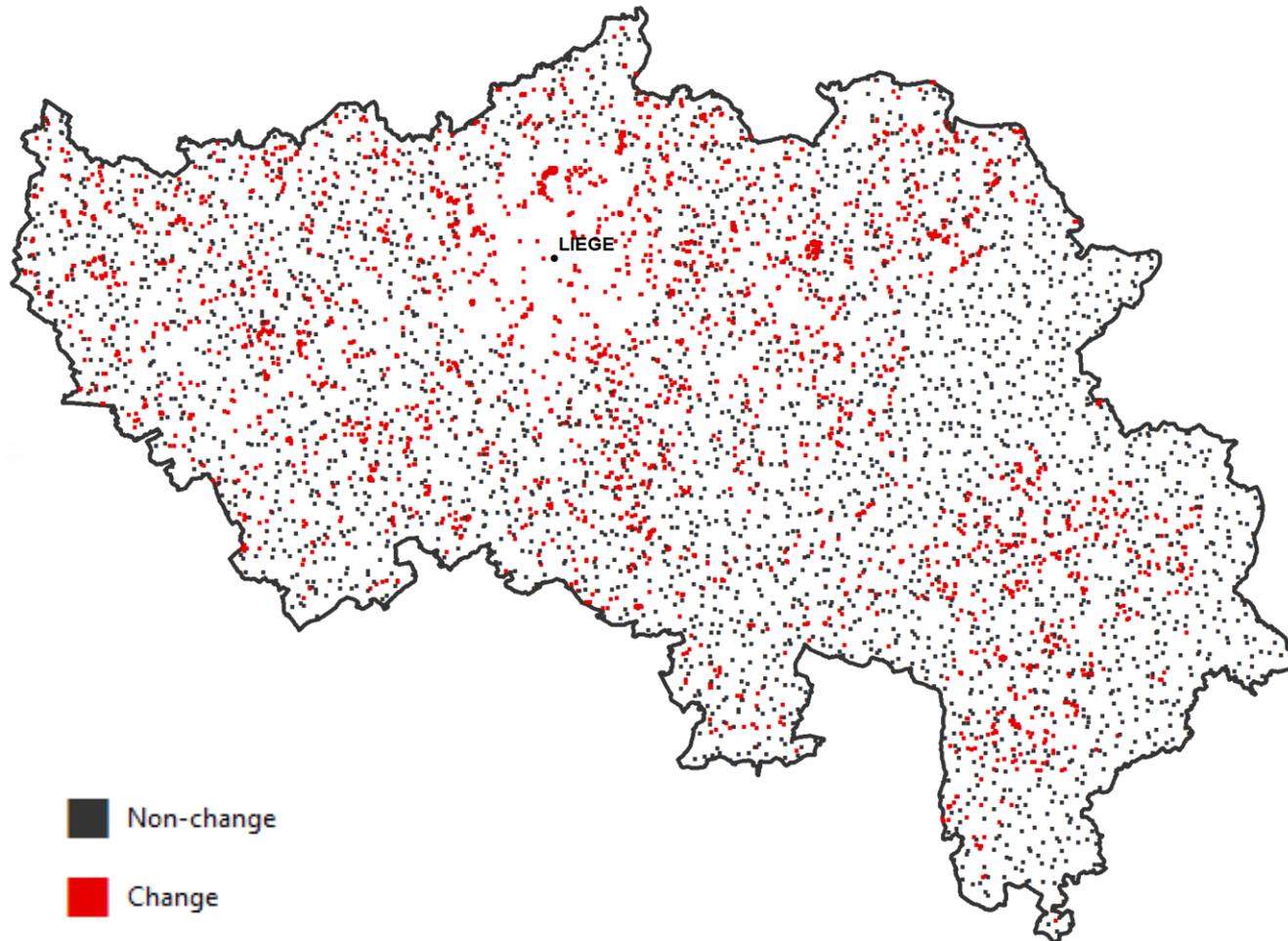


Zoning plan

Methodology

Dependent variable

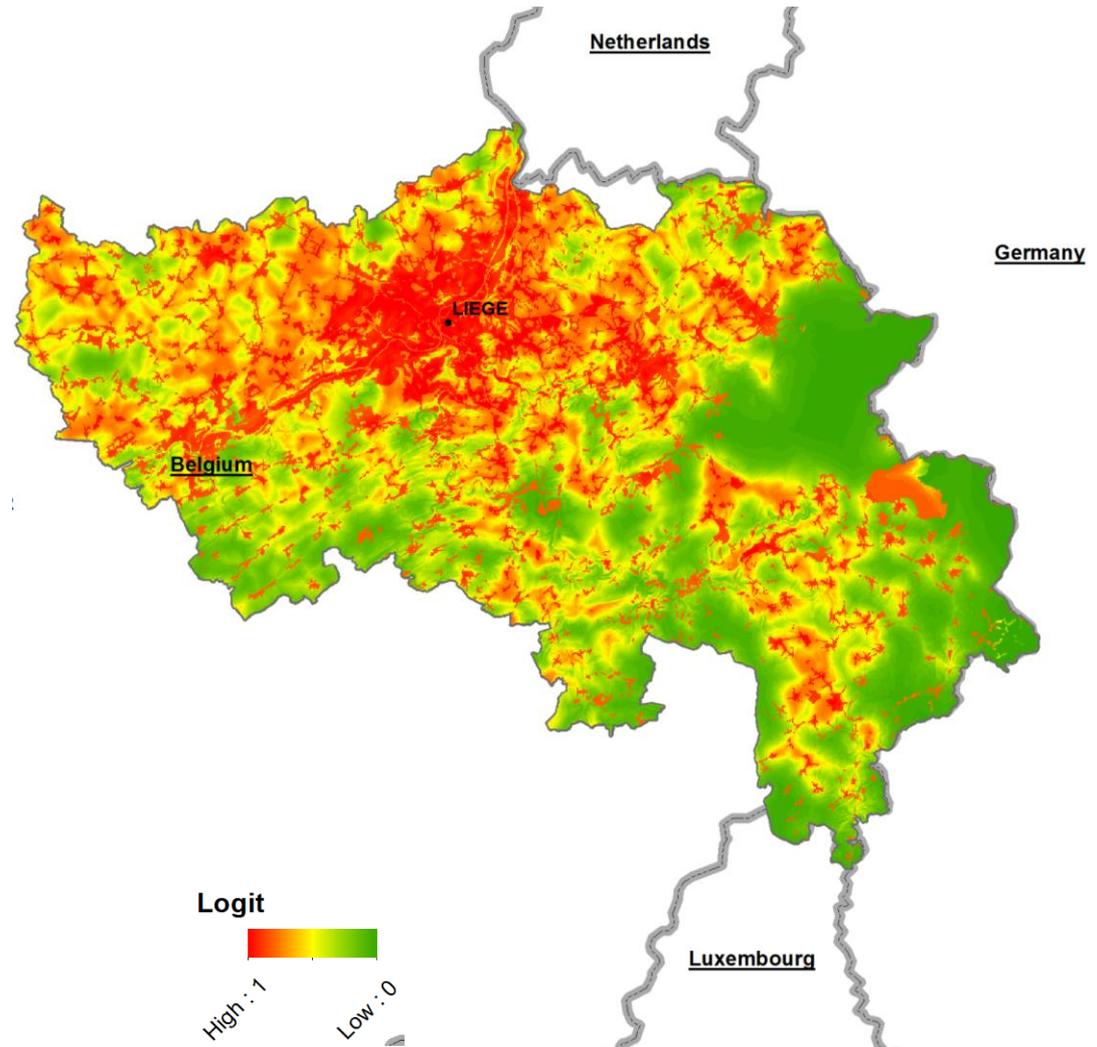
2000-2010



Results

Logit

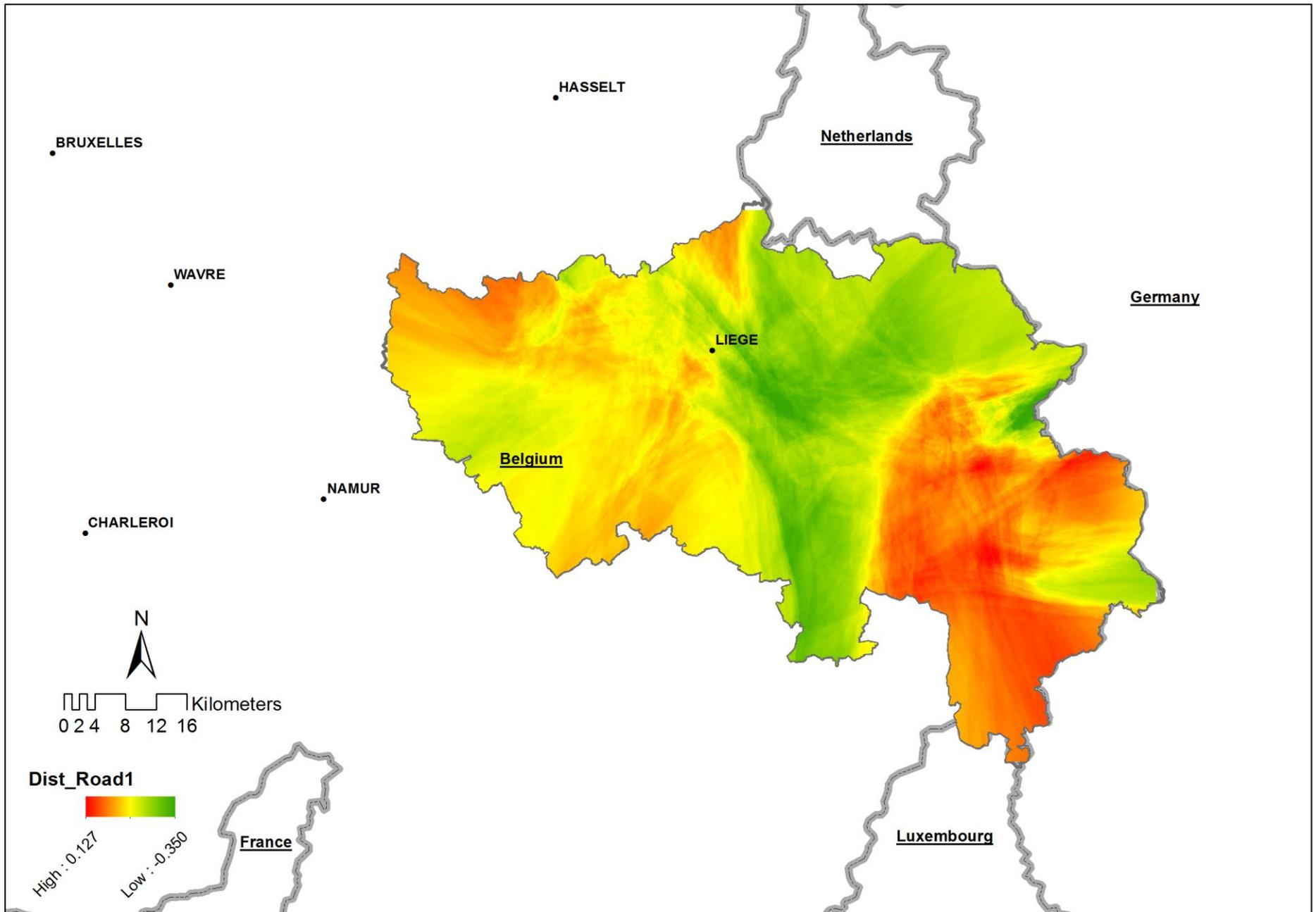
	Coefficient	OR
Intercept	-1.051	
DEM	0.178	1.195
Slope	-0.133	0.876
Dist_Cities	-0.271	0.763
Dist_Rd1	-0.506	0.603
Dist_RD2	-0.095	0.910
Dist_Rd3	-0.387	0.679
Dist_Rd4	-0.504	0.604
Dist_Rail_St	0.086	1.089
Job potential	0.015	1.015
Zoning	3.178	24.001
Pseudo R2	0.32	

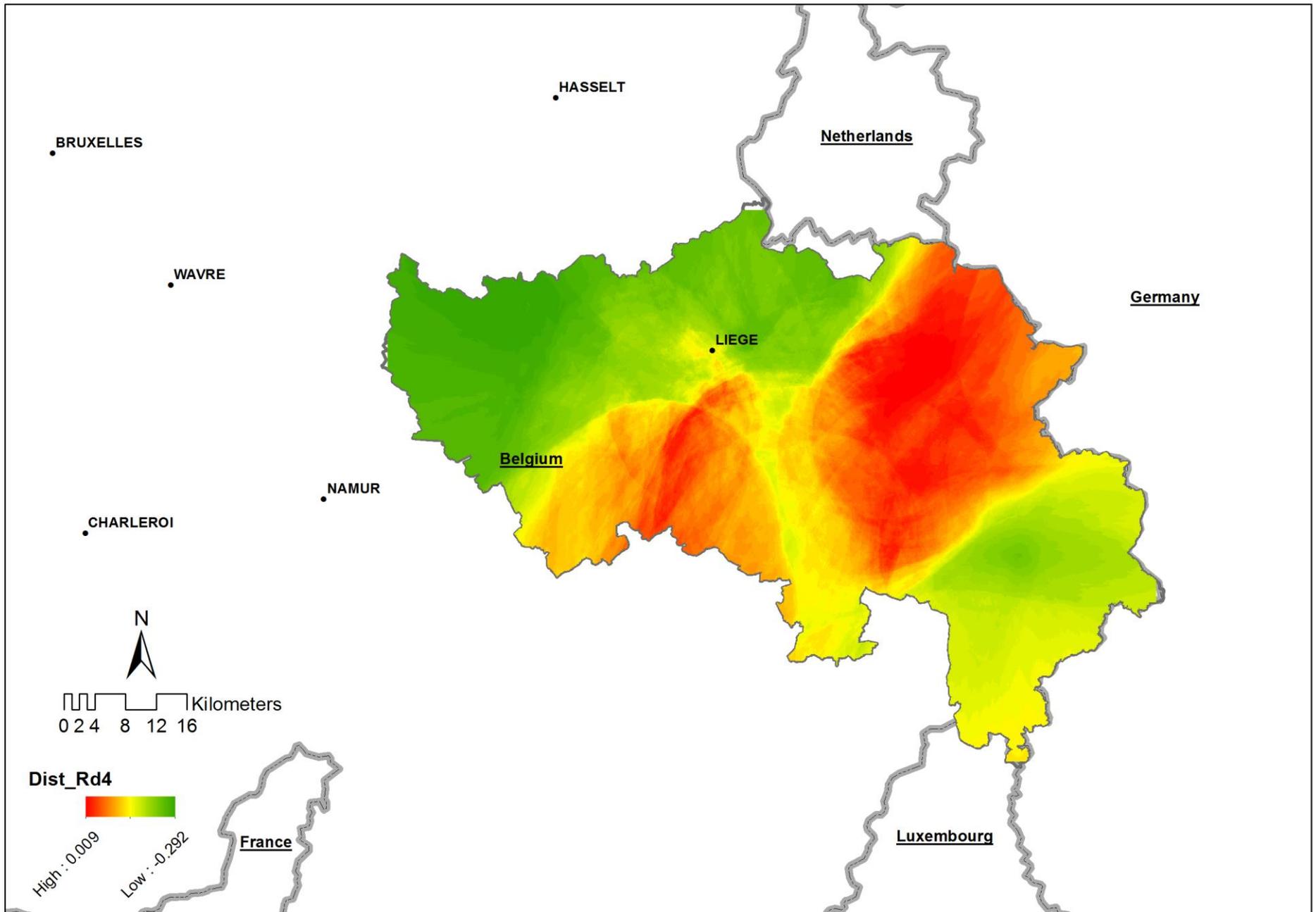


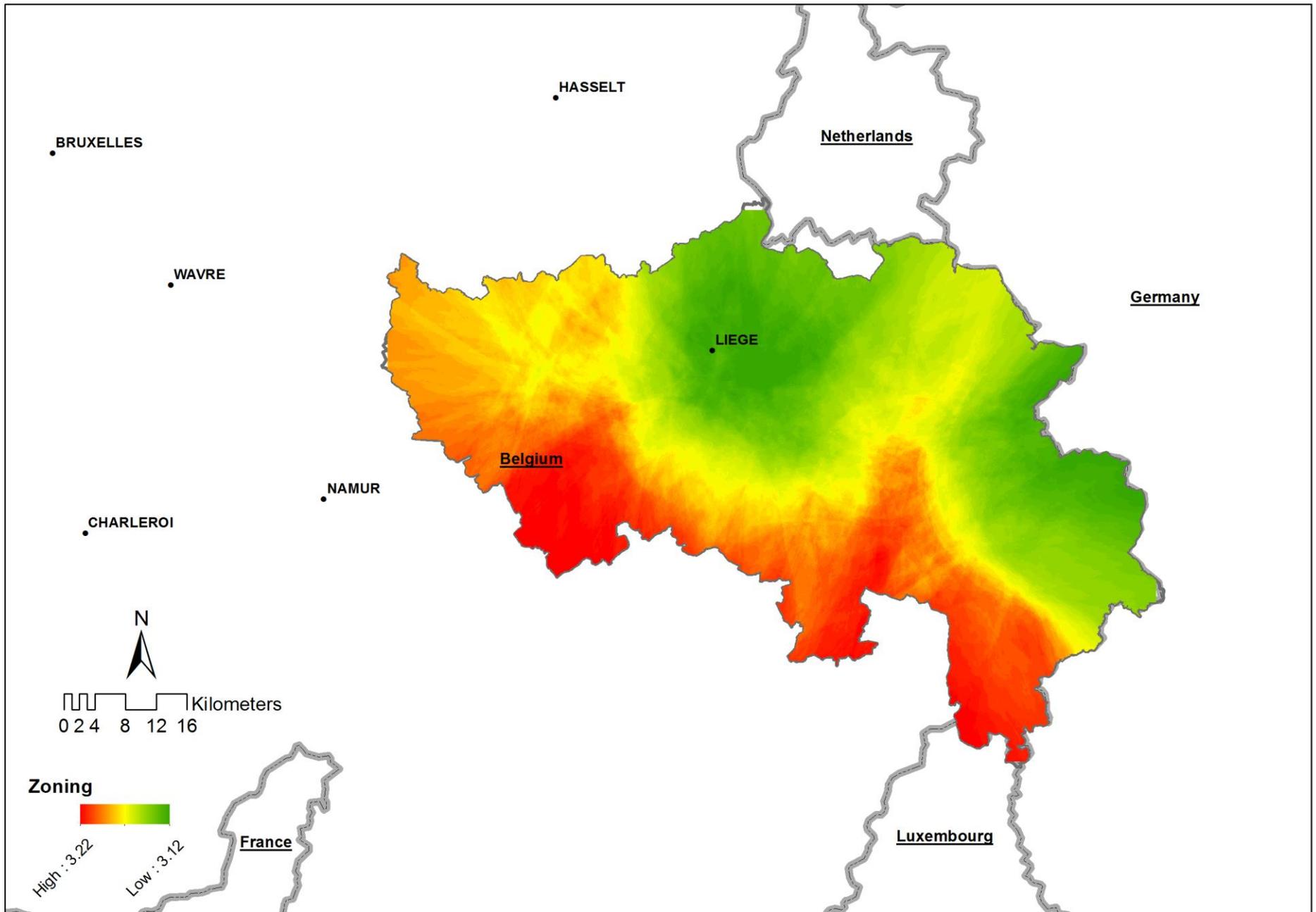
Results

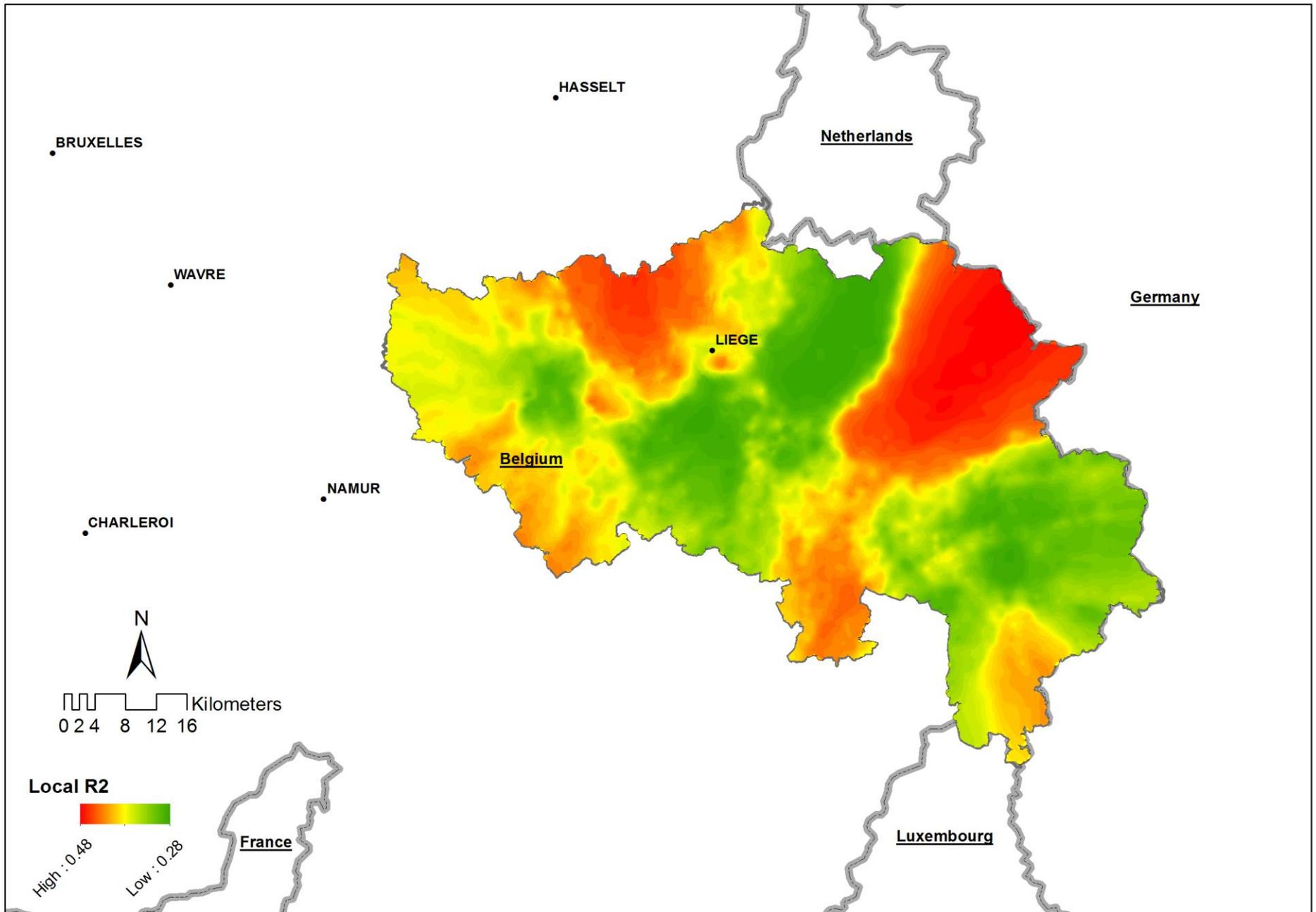
GWR

	Min	Max	Mean
Intercept	-0.031	0.740	0.390
DEM	-0.230	0.182	-0.014
Slope	-0.085	0.058	-0.028
Dist_Cities	-0.392	0.318	-0.024
Dist_Rd1	-0.318	0.119	-0.080
Dist_RD2	-0.120	0.043	-0.046
Dist_Rd3	-0.161	0.022	-0.057
Dist_Rd4	-0.288	0.007	-0.087
Dist_Rail_St	-0.155	0.167	0.005
Job potential	-0.002	0.012	0.005
Zoning	3.128	3.222	3.175
R2	0.40		









Conclusions

- We examined a number of urbanization driving forces in Liege, Belgium using logit and GWR.
- GWR appears to capture a variety of very local responses. It offers urban planners and modelers the potential for analyzing of urbanization process at the urban micro-level.
- Logit can capture responses at global scale. Therefore it can be considered as a more policy-oriented model.

Thank you for your attention

Questions