EVALUATING THE IMPACT OF DRIVERS OF URBAN DENSIFICATION

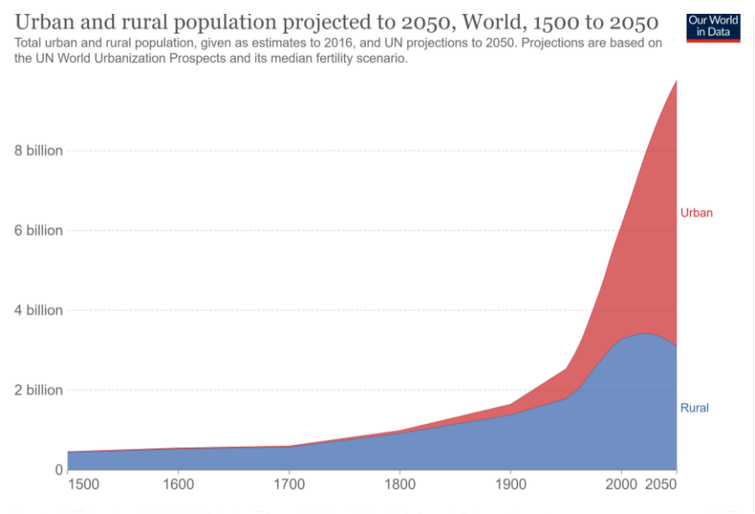
DS²BE
Doctoral Seminars on Sustainability Research in the Built Environment

Chakraborty Anasua*[a], Teller Jacques[a], Omrani Hichem[b], Mustafa Ahmed[c]
[a]LEMA research group, Urban & Environmental Engineering dept., University of Liège
[b]Urban Development and Mobility, Luxembourg Institute of Socio-Economic Research, Luxembourg
[c]Post-doctoral fellow, Urban Systems Lab, The New School, New York

LIÈGE université
LEMA
LUXEMBOURG INSTITUTE OF SOCIO-ECONOMIC RESEARCH

INTRODUCTION

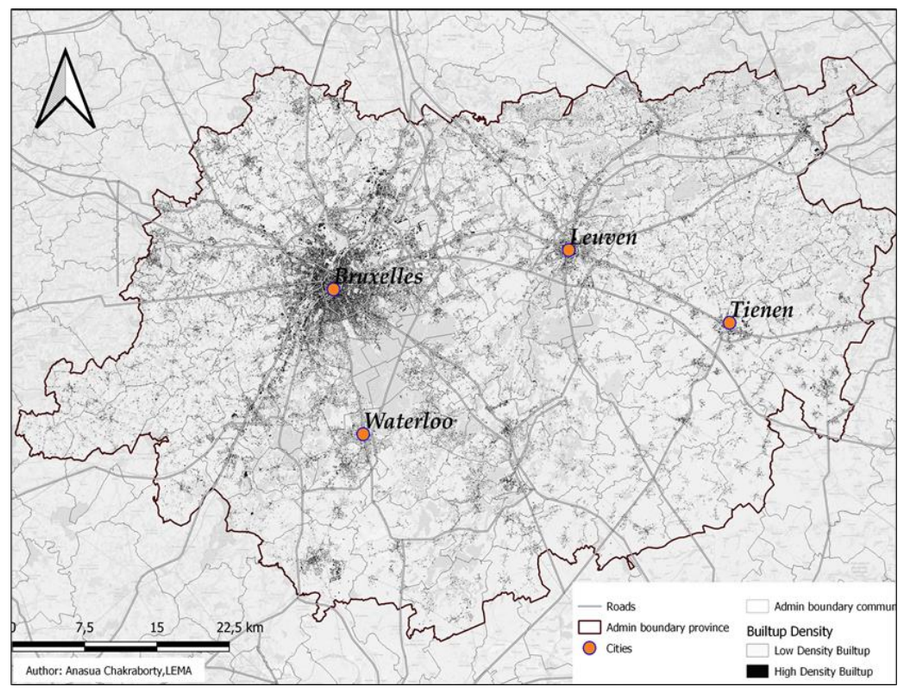
Multi logistic regression model (MLR model) has been used to analyze the different interdependent actors that impact the urban densification(in-fill development).This will facilitate the urban planners , policy makers and the stake holders to 'sense', 'design' and 're-think' planning for a sustainable future.



Source: OWID based on UN World Urbanization Prospects 2018 and historical sources

STUDY AREA

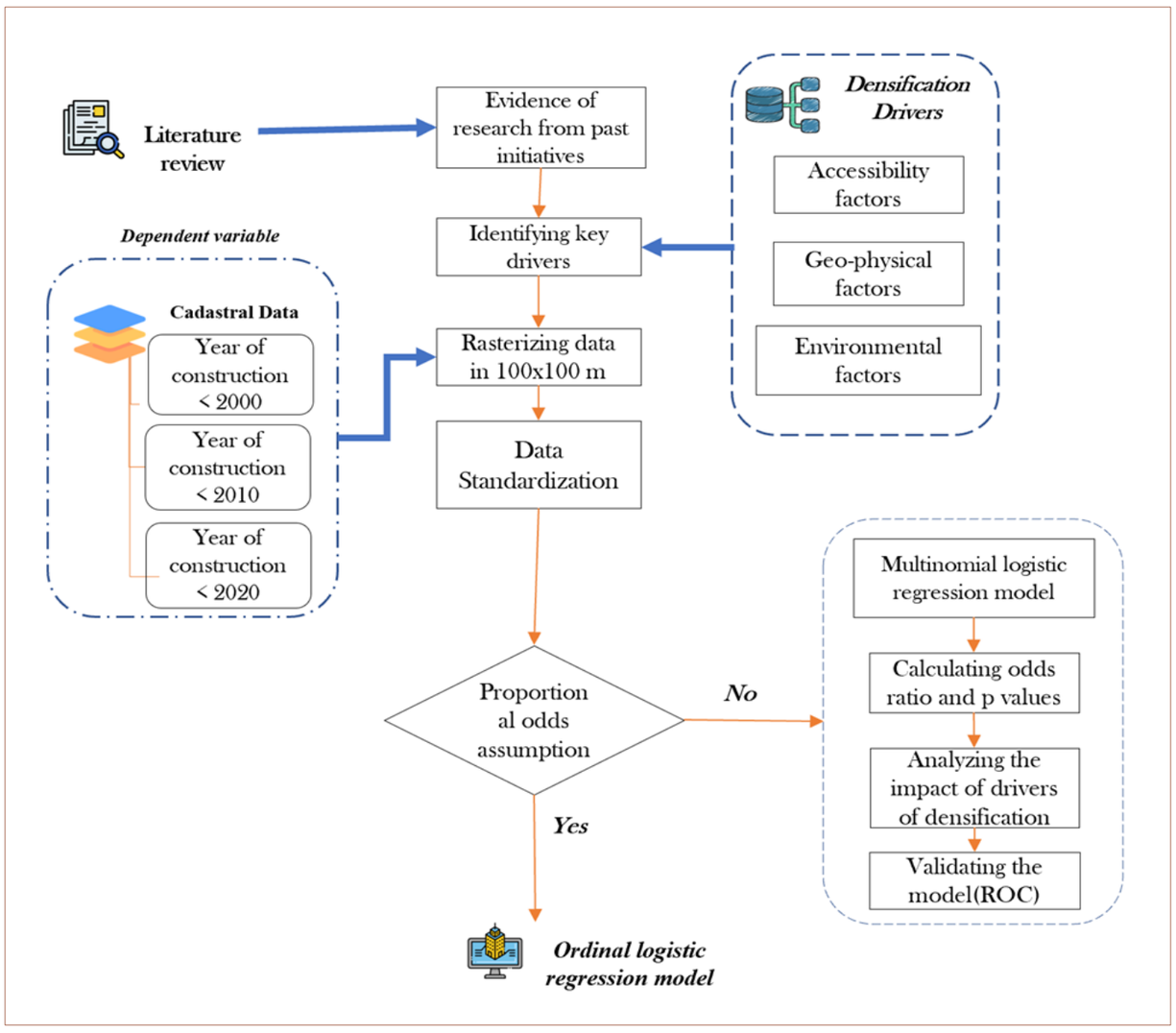
- Our study area comprises of Capital region of Brussels, Flemish Brabant and Walloon Brabant which represent a transitional scenario of both highly densified urban cores and peri urban areas.
- This area has been selected for it high geographical and political importance. It comprises of 3376 km2 of area which makes up almost 11% of total area of Belgium.



AIMS AND OBJECTIVES

- Studying the evolution of Urban densification across space and time.
- Understanding static and dynamic factors which includes environmental, socio economic, land use policies and accessibility indicators.
- Identifying the potential driving factors of urban densification.
- Analyzing the impact of these drivers on the process of densification.

MATERIALS AND METHODS



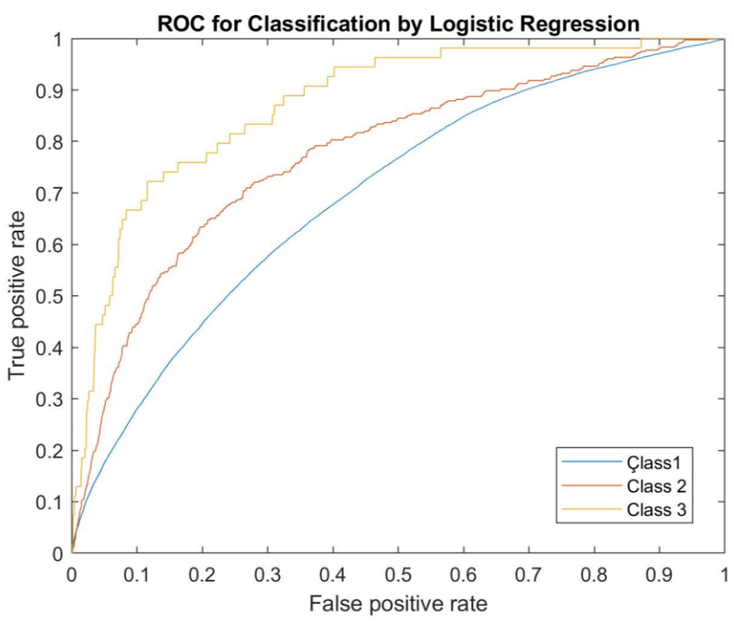
RESULTS AND DISCUSSSION

- The results derived from our model shows that zoning status plays a significant role in all density classes as also pointed in Poelmans and Van Rompaey (2010) work on Flanders.
- In 2000-2010, elevation is a negative determinant for low density classes, whereas slopes is insignificant in all the density class for both the periods signifying that development in existing built up tend to occur in flat terrain.
- Distance to residential roads have a positive contribution to densification. Similarly, distance to local roads has a positive impact on high density areas showing a tendency of having a well-connected neighborhood or a minimal work to home distance to be favorable.

	2000-2010		2010-2020	
	Coefficients β (Odds Ratio)		Coefficients β (Odds Ratio)	
	Reference : class 1 Sample Size: 22300	Reference: Class 2 Sample Size: 18000	Reference : class 1 Sample Size: 22300	Reference: Class 2 Sample Size: 18000
	Class 2	Class 3	Class 2	Class 3
DEM	-0.203*(0.816)	-0.068 (1.070)	-0.133 *(0.875)	-0.075(0.928)
Slope	-0.086*(0.917)	0.003(1.003)	-0.046*(0.955)	-0.065(0.937)
Dist. to highways	-0.016(0.537)	-0.107(0.898)	-0.059 *(0.943)	0.015(1.015)
Dist. To primary roads	-0.031(0.970)	-0.002(0.998)	0.002 (1.002)	-0.012(0.989)
Dist. To secondary roads	-0.109 *(0.897)	-0.040(0.960)	-0.013(0.987)	-0.408*(0.665)
Dist. To residential roads	0.074(1.077)	0.081(1.085)	-0.048(0.953)	0.327*(1.387)
Dist. To local roads	-0.041(0.960)	-0.120 (0.887)	0.008 (1.008)	-0.001(0.999)
Dist. To cities	-0.012(0.988)	-0.035(0.641)	-0.003 (1.003)	-0.065(0.937)
Dist. To parks	-0.055(0.947)	-0.106 (0.900)	-0.082*(0.922)	0.075(1.078)
Dist. To reserves	-0.129 *(1.138)	-0.050 (0.952)	0.124 *(1.132)	0.053(1.054)
Dist. To stations	-0.018(0.982)	-0.596 *(0.551)	0.003(1.003)	-0.198(0.821)*
Household	-0.070*(0.932)	-0.279 *(0.757)	-0.043**(0.958)	-0.169(0.845)
Income household	-0.172*(0.842)	0.225 *(1.252)	-0.233 *(0.792)	-0.333*(1,395)
Jobs	0.075*(1.078)	0.096 (1.101)	0.049*(1.050)	0.179*(1.196)
Mean Housing	-2.999*(0.050)	-0.333(0.717)	-0.899 *(0.407)	0.161(1.174)
Population Density	0.110*(1.116)	0.096(1.101)	0.064* (1.066)	-0.056(0.946)
Population	-0.029 (0.952)*	-0.175(0.840)	-0.004(1.004)	0.001(1.000)
Zoning	0.083(1.087)	-0.018 (0.982)	-0.038 (1.039)	-0.064(0.938)
ROC	**0.804**	**0.728**	0.828	**0.685**

** Indicate significance at P≤ 0.05 level*

CONCLUSION



- A MLR model, has been applied with an aim to study the dynamic of urban densification and the drivers impacting the densification process for the Brussels and its Brabant of Belgium.
- The results shows that there is a progressive increase of development in existing built-up area of metropolitan urban core due to the various resources and opportunities it provides.

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