Descripción del proyecto
"*The past, present, and future of urban footprint growth of Latin American cities*"
para el desarrollo de potenciales tesis doctorales dentro del grupo RiSE.

RiSE-group
Departamento de Ciencias Matemáticas
Escuela de Ciencias
Universidad EAFIT
Abril 2019

Habilidades mínimas requeridas para cualquier candidato interesado:
- Excelente manejo de bases de datos
- Manejo de lenguaje Python y STATA
- Buen nivel de Inglés
- Manejo básico de Sistemas de Información Geográfica
- Buen nivel de escritura académica (excelente nivel de redacción)
- Excelentes notas en cursos cuantitativos a nivel de pregrado y maestría (estadística, econometría, optimización, etc.)

Project approval – Stage 2: template

> **Project title:** The past, present, and future of urban footprint growth of Latin American cities.
> **Timeline:** October 2018 - December 2021 (3 years and 2 months).
> **Project Leader:** Jairo Alejandro Gómez.
> **Researcher(s):** Jairo Alejandro Gómez, Jorge Eduardo Patiño, Mauricio Quiñones, Eduardo Lora, Juan Carlos Duque.
> **PEAK dynamic:** *prediction and projection (P)* by characterizing and modeling urban footprint growth, identifying urban footprint growth types and assessing their impact on economic performance, and *knowledge exchange (K)* by sharing lessons from Latin American cities that could be useful for other developing regions.

Introduction (300 words maximum)

The world is experiencing an unprecedented urban growth (United Nations, 2017). Today 55% of the world's population resides in urban areas, and it is expected to grow to 68% by 2050, with most of it occurring in Asia and Africa (United Nations, 2018). It is also expected that just three countries will account for 35% of that growing: India is projected to add 416 million urban dwellers, China 255 million and Nigeria 189 million. Rapid urbanization challenges sustainable development, especially in developing countries, where local governments often fail to cope with rapid urban growth and are unable to provide suitable services and infrastructure, leading to urban poverty traps and larger inequalities (Duque et al., 2013). The recent rapid urban growth worldwide has led to growing numbers of slum dwellers, increased air pollution, inadequate basic services and infrastructure, and unplanned urban sprawl (United Nations, 2017). Moreover, the expansion of urban land has outpaced the growth of urban populations, leading to less dense cities and sustainable patterns of urban development (United Nations, 2017).

As the management of urban growth is a key element to the fulfilment of the Sustainable Development Goals (SDG), the study of the urban footprint growing types in cities of developing countries also becomes essential to better inform policy makers (United Nations, 2018). Unfortunately, there are not enough studies trying to understand the way in which Latin American Cities (LAC) grow using systemic and standardized methods, yet there are important lessons to learn. The understanding of urban footprint growth can help to maximize the benefits of agglomeration while minimizing the adverse impacts of urban growth itself (United Nations, 2018). Some of these lessons might be useful for Africa and Asia, as their current challenge is to build sustainable urban settlements for the future.

Aims and research questions (100 words maximum)

We will focus on two dimensions of urban footprint growth: the expansion of the urban extent and the dynamics of growth within the city. Table 1 summarizes the research questions to tackle in this project.

Table 1. Research questions.

Question	SDG Target
1. Is it possible to implement a parsimonious model of urban footprint growth using only freely available data?	11.A, 11.B
2. Which urban footprint growing types have been observed and which kinds of lands have been consumed by LAC cities?	11.3-11.4
3. Have urban footprint growth types made an impact on the economic performance of LAC cities?	1.5, 11.4