

## A Quantitative Analysis of Rural to Urban Migration in Morocco

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**Abstract :** The ultimate goal of this study is to reinvigorate the philosophical underpinnings the study of urbanization with scientific data with the goal of circumventing what seems an inevitable future clash between rural and urban populations. To that end urban infrastructure must be sustainable economically, politically and ecologically over the course of several generations as cities continue to grow with the incorporation of climate refugees. Our research will provide data concerning the projected increase in population over the coming two decades in Morocco, and the population will shift from rural areas to urban centers during that period of time. As a result, urban infrastructure will need to be adapted, developed or built to fit the demand of future internal migrations from rural to urban centers in Morocco. This paper will also examine how past experiences of internally displaced people give insight into the challenges faced by future migrants and, beyond the gathering of data, how people react to internal migration. This study employs four different sets of research tools. First, a large part of this study is archival, which involves compiling the relevant literature on the topic and its complex history. This step also includes gathering data about migrations in Morocco from public data sources. Once the datasets are collected, the next part of the project involves populating the attribute fields and preprocessing the data to make it understandable and usable by machine learning algorithms. In tandem with the mathematical interpretation of data and projected migrations, this study benefits from a theoretical understanding of the critical apparatus existing around urban development of the 20th and 21st centuries that give us insight into past infrastructure development and the rationale behind it. Once the data is ready to be analyzed, different machine learning algorithms will be experimented (k-clustering, support vector regression, random forest analysis) and the results compared for visualization of the data. The final computational part of this study involves analyzing the data and determining what we can learn from it. This paper helps us to understand future trends of population movements within and between regions of North Africa, which will have an impact on various sectors such as urban development, food distribution and water purification, not to mention the creation of public policy in the countries of this region. One of the strengths of this project is the multi-pronged and cross-disciplinary methodology to the research question, which enables an interchange of knowledge and experiences to facilitate innovative solutions to this complex problem. Multiple and diverse intersecting viewpoints allow an exchange of methodological models that provide fresh and informed interpretations of otherwise objective data.

**Keywords :** climate change, machine learning, migration, Morocco, urban development

**Conference Title :** ICGUPD 2023 : International Conference on Geomatics for Urban Planning and Design

**Conference Location :** London, United Kingdom

**Conference Dates :** June 22-23, 2023