

ABSTRACT

EXPLORING OPEN SOURCES OF DATA FOR DETECTING AND MAPPING SLUMS

Ron Mahabir, Ph.D

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Dissertation Director: Dr. Peggy Agouris

Over one billion people currently live in slums with populations worldwide increasing, this number is only expected to grow in the coming decades. The vast majority of slums are located in and around urban centers in less developed countries, which are also experiencing greater rates of urbanization when compared to more developed countries. This rapid rate of urbanization is cause for serious concern given that many of these countries often lack the ability to provide the infrastructure and basic amenities needed to adequately provide for the increasing number of people.

While research on slums has been ongoing, such research has mainly studied slums from one of two different perspectives: socio-economic studies using census data, and physical studies using remote sensing data. On their own, each approach gives only a partial view of slums due to individual limitations with the types of data being used. For example, while census data contains a rich source of socio-economic data on cities and the people

that live in them, the coarse spatial and temporal resolution of this data may hide the presence of slums. Likewise, while remote sensing has the ability to overcome some of these issues, this data only captures the physical properties of slums. Moreover, although very high spatial and temporal resolution remote sensing data is available, this data may sometimes be too costly for some developing countries, especially those experiencing economic challenges. This research explores the use of open sources of data to overcome the previous issues. More specifically, open sources of remote sensing and socio-economic proxy data, which have the potential to identify and map slums at the settlement level were identified based on an extensive review of the literature. Following this, data mining approaches were applied to indicators to examine the combination of indicators and their influence in identifying and mapping slums. Results show that on its own, remote sensing may provide poor mapping accuracies for slums. However, mapping accuracies were greatly improved as the new socio-economic proxy indicators were added to this data. Furthermore, as this research shows, even with the use of one socio-economic indicator, mapping accuracies greatly improved (between 12% and 50%). The indicators and the approach developed in this research can be used to gain greater insights on slums and further be used to improve their mapping. It is only with such information that we can then address the specific social, economic, environmental and policy issues necessary for addressing the challenge of slums in different cities, countries and regions of the world.