

## Using Night-time Light to Detect Economic Development and Map Regional Poverty in the Philippines

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**Abstract:** The relationship between the spatial distribution of night-time lights and economic activity has been observed and utilized in several studies but most of which deal with global and national scale. In this study, the applicability of night-time lights to serve as proxy for assessing the economic growth and poverty distribution in the country at a regional level was explored. Night-time lights data from 1994-2013 was used along with LandScan 2013 population grid, census population data, and regional accounts of the gross domestic product to detect economic development, map regional poverty, and understand inequalities among regions in terms of the distribution of night-time light. Visualizing the change in economic activity through night-time light data revealed the dynamic nature of the country's economy as well as the development undergone by the economy of each region. Mapping poor areas, on the other hand, proved how strongly related per capita night-time light and per capita GRDP is at the regional scale, and likewise demonstrated that in areas where majority of the population have little to no access to night-time light, poverty becomes evident. The results of the study provided further insight into the consideration of using DMSP-OLS night-time lights data as an economic indicator in the Philippines at a regional scale, and how this could be an effective tool for monitoring spatial and temporal economic parameters especially in cases where resources, regional capacities, and consistent data collection methods are not available at the local level.

**Keywords:** night-time light, remote sensing, DMSP-OLS, socio-economic development, poverty