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**Multidimensional poverty in Colombia: identifying regional  
disparities using GIS and population census data (2005)**

Prepared by the National Administrative Department of Statistics (DANE)

**Abstract**

## **Multidimensional Poverty in Colombia: Identifying Regional Disparities using GIS and Population Census Data (2005)**

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According to the results of the Multidimensional Poverty Index<sup>1</sup> based on Quality Life Surveys, one can infer that poverty rates in Colombia have decreased significantly at the national, urban, and rural levels since 1997. However, information provided by surveys does not allow for a more disaggregated poverty assessment. Alternative methods and data sources are therefore needed to understand the spatial dimension of poverty and to identify regional disparities.

The 2005 Population Census Data and ESRI's ArcGIS 10.1 Geographic Information Systems (GIS) software were used to analyze these issues. Spatial analysis methods facilitate the identification of spatial patterns of multidimensional poverty, of spatial outliers, and of clusters of high and low poverty rates at the municipal, urban, and rural levels. Our methodology includes GIS-based poverty mapping, exploratory spatial data analysis, trend analysis, and global and local autocorrelation tests (Moran's I and Anselin Local Moran's I).

The findings suggest that multidimensional poverty demonstrates positive spatial autocorrelation, meaning poorer municipalities tend to cluster around each other. Furthermore, "Welfare Hubs and Paths" of low poverty rates can be found in the Andean Region. At the total and rural levels, "Welfare Hubs" can be found in the main capital cities and surrounding municipalities. "Welfare Paths" can be found at an urban level related to the main capital cities which enclose the municipalities between them.

High poverty rate clusters can be found in the south of the country and along the Pacific and Caribbean coasts. These clusters are characterized by being discontinuous and showing a notable difference in poverty rates between total municipal, urban, and rural levels. Spatial outliers - municipalities with low poverty rates relative to surrounding municipalities and vice versa - are identified especially in the Caribbean coast and the south of the country.

Further research should address the evolution of multidimensional poverty spatial patterns, outliers, and clusters using data from the next Population Census, as well as other explanatory variables such as road infrastructure, ethnic groups, natural resources, etc.

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<sup>1</sup> The multidimensional poverty index measured by DANE identifies poor peoples' experiences of deprivation along five dimensions: education of household members; childhood and youth conditions; health; employment; and access to household utilities and living conditions. This index has a nested weighting structure where each dimension is equally weighted (0.2). The statistical unit for measuring poverty rate is the individual person.