Documentos de Trabajo sobre Economía Regional y Urbana - Impact of demographic change on CO? emissions: the role of consumption

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This paper shows that changes in households' consumption preferences as the population ages lead to a redistribution of CO? emissions across sectors and territories. These findings provide valuable insights for designing climate and long-term development policies that are better aligned with population aging and the country's regional realities.

Publication Date: Friday, 28 of August 2026 **Approach**
This paper examines how Colombia's demographic transition, characterized by declining fertility rates and rising life expectancy, may reshape household consumption patterns and, consequently, affect CO? emissions in the long term. The analysis is based on the premise that population aging alters expenditure patterns, shifting demand away from goods and services typically associated with younger households toward activities more closely linked to the needs and preferences of an older population.

Using data from the National Household Budget Survey and official demographic projections for the 2020-2050 period, the study estimates how the consumption structure across different expenditure categories is expected to evolve and assesses how these changes will be reflected in household consumption-related emissions. In addition, the paper adopts a regional perspective to identify territorial differences in the effects of population aging, recognizing that the interaction between demographics, consumption, and productive structures may generate heterogeneous impacts across the country's regions and departments.

Contribution
The main contribution of this study is to provide evidence for Colombia on the relationship between population aging, consumption, and climate change, a topic that has received limited attention in the country. The findings show that demographic dynamics influence not only the size of aggregate demand but also its sectoral and territorial composition. Moreover, the analysis offers a regional perspective, making it possible to identify significant differences across departments and regions in the way demographic change is expected to affect emissions.

In this way, the paper incorporates the demographic dimension into the analysis of environmental sustainability and provides insights for the design of climate and long-term development policies that are better aligned with the country's regional realities.

Results

The results suggest that population aging will reduce the share of expenditure allocated to categories such as food, alcoholic beverages and tobacco, clothing and footwear, education, and restaurants, while increasing the relative importance of sectors such as health, information and communications, recreation, transport, and other services.

As a result of these changes in the consumption structure, emissions associated with household demand are expected to decline at the national level by 2050. However, this aggregate outcome masks significant regional differences. While regions such as the Caribbean, Pacific, South Central, and New Departments are projected to experience reductions in emissions, Bogotá and the Central Eastern region could see increases.

Overall, the evidence suggests that population aging does not automatically reduce emissions; rather, it redistributes them across sectors and territories in line with changes in households' consumption preferences.

Fuente: https://www.banrep.gov.co/en/publications-research/working-papers-regional-urban-economics/impact-demographic-change-emissions