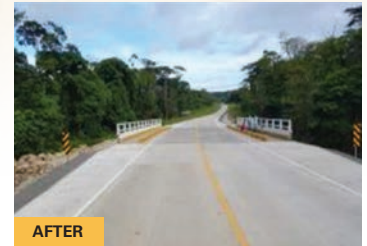


# ENHANCING THE ECONOMIC IMPACT OF RURAL ROADS ON FEMALE FARMERS IN NICARAGUA

*First rigorous and holistic evidence on the effects of rural road infrastructure on women's empowerment*

## Intervention

Road improvement works (such as cobblestone surfacing) for about 100 km of rural roads in productive zones of the country which have unreliable road infrastructure inaccessible during the rainy season. Prior to these projects financed by the World Bank and other multilateral institutions, it was estimated that less than one-third of the population had access to a paved road. Moreover, it was estimated that 30 percent of the total road network were not transitable during the rainy season (May to October), resulting in high costs and loss of income for rural producers and restricting their access to local and regional markets due to longer travel times, spoilage, and losses of perishable goods, harm to live animals during travel, and increased vehicle-operating.



## Context

Nicaragua is the poorest country in Central America and the second poorest in the Western Hemisphere, with widespread underemployment and poverty. Poverty is a significant problem for Nicaragua's rural population, 58.8 percent of whom were poor in 2015. Furthermore, a recent survey of 5,866 rural women in Nicaragua found that 89 percent of them were food-insecure.

Besides eradicating poverty, one important objective of the World Bank's engagement in Nicaragua is to contribute to significant progress in terms of reducing gender disparities. The estimated gross national income per capita of women was almost half of that of men in 2017 (USD 3,434 versus USD 6,930). Nicaraguan women are also more likely to face poverty than men, and rates of violence against them remain high.

Own Income

Favorable Gender Attitudes



Improved decision-making power and control over household resources

Consumption of female oriented durables

Investments in women's...

- education
- health
- businesses

Respectful behavior of family members...

- fertility
- well-being

## Theory of Change

Low mobility makes it difficult for women to access labor and product markets, characterized by relatively large employment opportunities, high wages, and favorable prices of commodities. Moreover, lack of adequate transportation infrastructure hinders growth of the local economy through scarcity of input goods and low product demand. This might prove particularly important for rural women because they often depend on income generation opportunities in their villages that allow them to comply with their family responsibilities compliant with traditional gender norms.

## Impact Evaluation Research

Using quasi-experimental regression techniques, this impact evaluation aims to present causal estimates for a series of important economic and social outcomes of women. This includes actual and potential mobility, income generation activities (e.g., agricultural and non-agricultural production, wage labor and self-employment), incomes, and intra-household decision-making power defined as the ability to exert control over decisions related to women's mobility, household spending, and investments. The latter is measured by women's autonomy of travel decisions, participation in household spending decisions on education and health, participation in household productive investment decisions, and consumption of female-oriented durables.

The effect is measured by the difference in the change of outcomes before and after the road improvements between (i) a group of women that is located near an upgraded road (the treatment group), and (ii) a group that is not located near an upgraded road (the control group).

In the analysis, women living near control roads that are prioritized to receive upgrades in subsequent road infrastructure projects are

given greater importance relative to women located near control roads ranked lower in the national infrastructure development plan.

## Policy Relevance

The impact evaluation will influence policy and institutional capacity in several ways. First, it will provide evidence to the ministry of transport of Nicaragua and the World Bank regarding specific outcomes of improved rural roads on women with respect to their employment opportunities, productivity, and wellbeing outcomes. The generated will guide decisions in relation to future interventions. Related to this, the impact evaluation is expected to inform policymakers and development practitioners about distributional impacts of improved rural roads on subgroups of the rural female population characterized by various individual characteristics, including the number of their children and socio-economic status. As such, results from this impact evaluation could play a role in shaping road infrastructure interventions to target particular groups of women and to improve gender-sensitive design and implementation of the related projects.

Second, the study's objective is strongly aligned with the IDA-18 Special Themes Gender and Development, as well as Jobs and Economic Transformation. Third, the impact evaluation is designed to realize capacity building potential in Nicaragua. It provides an opportunity to foster evidence-based policymaking at the country level, given that the ministry of transport of Nicaragua has composed a multidisciplinary impact evaluation committee within the Ministry, following the initiative of the World Bank's Poverty GP.

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The ieConnect for Impact program links project teams with researchers to develop rigorous and innovative impact evaluations that both substantially improve the evidence-base for policy making and induce global shifts in transport policy. The ieConnect program is a collaboration between the World Bank's Development Impact Evaluation (DIME) group and the Transport Global Practice. This program is part of the Impact Evaluation to Development Impact (i2i) multi-donor trust fund and is funded with UK aid from the UK government and by the European Union.