

Senegal - Roads Rehabilitation 2012

Impaq International

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Sampling

Sampling Procedure

We use statistical power analysis to calculate the minimum sample size required to detect an effect of a given size. Identifying an appropriate sample size for our impact evaluation depends on various factors and assumptions, including a desired effect size, target power and significance level. For the desired effect size, we used information on the magnitude of benefits from the Beneficiary Analysis provided by MCC. The power of a statistical test is the probability of detecting a true effect when it truly exists. The significance level is the probability of falsely detecting an effect when it does not exist. We calculate the minimum sample sizes required to detect an effect of a given size for each of the combinations of the most commonly used power and significance levels. Using the present value of benefit stream as a share of annual income of about 10% and the per capita GNI of USD 820 in the ERR spreadsheet from MCC, we estimate that approximately of benefits are expected to be generated from the RRP per household for the first 5 years.

Using the least restrictive criteria for the power and test size (80% power and a 5% significance level), it was determined that we need at least 1,227 households in each of the treatment and comparison groups. Thus, the minimum total household sample size is 4,908 ($=1,227 \times 4$). As mentioned, this is the minimum required sample size for the least restrictive assumption for power and test size. For more robust results, we would need larger sample sizes. However, given the trade-off between the statistical rigor and the budgetary constraints faced by MCA-S, we have selected the smallest sample size consistent with a rigorous impact evaluation.

Regarding the sample size requirement for the enterprise survey, in discussion with MCC and MCA-S, we concluded not to use the power analysis due to lack of information about the number of enterprises along the treatment and comparison roads. Instead, we relied on the input of MCA-S staffers who know about business conditions for enterprises along RN2 and RN6. We then proposed a survey sample of approximately 600 enterprises.

Questionnaires

Overview

Baseline data have been collected using in-person interviews from households and enterprises located along the treatment and comparison areas. The baseline survey collected data on background characteristics and key outcomes of interest (income, use of the roads and various economic activities) for both household and enterprises. The survey instrument to collect household data was structured in several sections that collected the following information:

Demographic characteristics of household members

Employment and revenues of household members

Household food and non-food consumption (whether a household has consumed certain types of food and the frequency of purchase)

Salary and non-agricultural income of household members

Household assets (e.g., type of home, access to electricity, etc.)

Household members' use of the road, frequency of use, time and distance traveled to various destinations such as local market, communal market, school, health infrastructure and workplace

Agricultural/Livestock production and commercialization: amount of production realized and sold by crop

A separate questionnaire was developed to gather information on enterprises. This data collection effort is essential to gain a full picture of the impact of the RRP. The survey collected detailed information on the type of enterprise activities, the quantity of goods produced and sold, the costs related to the commercialization of goods and the purchase of raw materials, the size of the enterprises in terms of employees and capital equipment, revenues and use of the road in the same areas in which the heads of households were interviewed. In particular, the survey instrument to collect enterprise data was structured in several sections that collected the following information:

Information on the entrepreneur

Characteristics of the enterprise: e.g., primary activity, workers employed, mobile equipment and machinery (tractors, etc.)

Production and commercialization: e.g., the amount of sales from products and services, destination of products and services, use of the road to deliver the products/services, distance traveled on the road

Difficulties encountered in the entrepreneurial activity, including whether the enterprise has difficulties obtaining credit, recruiting personnel and difficulties related to the access of the road.

Data Collection

Data Collection Dates

Start	End	Cycle
2012-05-01	2012-06-30	RN2 treatment and comparison segment
2012-10-01	2012-11-30	RN6 treatment and comparison road segments

DATA COLLECTION NOTES

Data collection in the North (RN2 treatment and comparison segment) took place in May and June 2012.

Data collection in the South (RN6 treatment and comparison road segments) took place in October and November 2012.

Data Collectors

Name	Abbreviation	Affiliation
Agence Nationale de la Statistique et de la Dmographie	ANSD	

Data Processing

No content available

Data Appraisal

No content available

Related Materials

Questionnaires

RN2 Final Questionnaires

Title	RN2 Final Questionnaires
Author(s)	IPA
Date	2012-01-01
Country	Senegal
Language	French
Description	This folder contains the final household, community, and enterprise questionnaires used in the survey of the RN2 road segment.
Filename	RN2 Final Questionnaires.zip

RN6 Final Questionnaires

Title	RN6 Final Questionnaires
Author(s)	IPA
Date	2012-01-01
Country	Senegal
Language	French
Description	This folder contains the final household, community, and enterprise questionnaires used in the survey of the RN6 road segment.
Filename	RN6 Final Questionnaires.zip

Reports

Evaluation Design Report

Title	Evaluation Design Report
Author(s)	Impaq
Date	2012-03-01
Country	Senegal
Filename	Revised_Senegal_Roads_DesignReport_12.03.29.pdf

Baseline Report

Title	Baseline Report
Author(s)	Impaq
Date	2014-12-01
Country	Senegal
Filename	baselinereport-sen-roads-dec14.pdf
