MIGRATION OUTFLOWS AND INFRASTRUCTURE IN NIGER

Project Description

The causes and patterns of regional migration in the Sahel are vastly understudied. This project explores how migration from a village of origin correlates with that village's access to markets, major roads and cell phone coverage. Understanding the linkages between migration and infrastructure can help inform policymakers of the effects of rural development on the scope and flow of migration in times of peace and war.

Research Questions

Do villages that are closer to major national roads have higher rates of outward migration?

Do villages that are closer to markets have higher rates of outward migration?

Do villages with better cell phone coverage

Methodology

To answer these questions, this project mapped survey data conducted in May 2011 on the migration rates of 96 villages in the Tahoua department of Niger (Map 1). Tahoua is a rural department within Niger's Tahoua region. Tahoua's village level migration rates were mapped and graphed in relation to survey data on cell phone coverage, the location of the nearest market and a map of the department's major roads (Map 2). Migration rates were calculated by dividing the total of reported migrated family members by the total household members surveyed in each village.

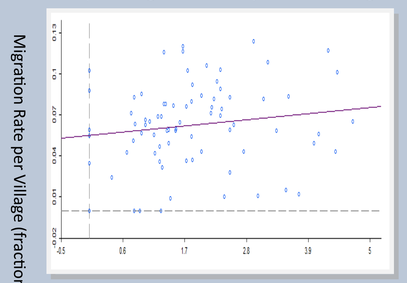
Map 1: Tahoua Department, Niger

Spatial analysis tools mapped accessibility to markets and roads by segmenting distances away from each infrastructure variable into gradients. The Major Road Accessibility map contains eight gradients, with intervals progressively expanding from two, to four, to eight to eleven kilometers (Map 3). The greater differentiation at earlier intervals highlights differences in reaching a major road by foot and then farther away, by vehicle. The Market Accessibility map consists of seven gradients of five kilometer intervals (Map 4).

A Market – Road Accessibility score was created and mapped (Map 5). This index gave intervals in both the Major Road and Market maps successive points. One point was added to each gradient away from the market or major road. Locations with the lowest points are closest to both markets and major roads.

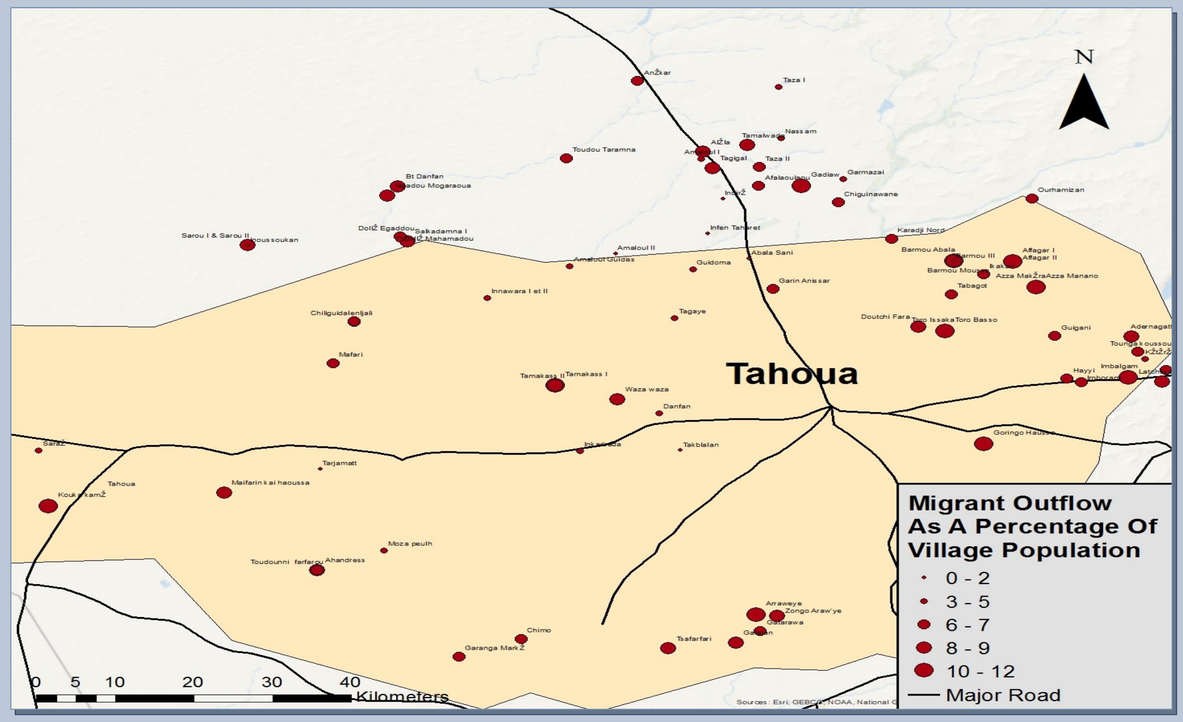
Because all data on the strength of cell phone coverage stemmed from surveys, correlation between migration rates per village and cell phone coverage was graphed in a scatter plot (Graph 1).

Graph 1: Migration Rate by Phone Coverage



Average Cell Phone Bars Coverage per Village

Map 2: Outward Migration Rate per Village in Tahoua, Niger



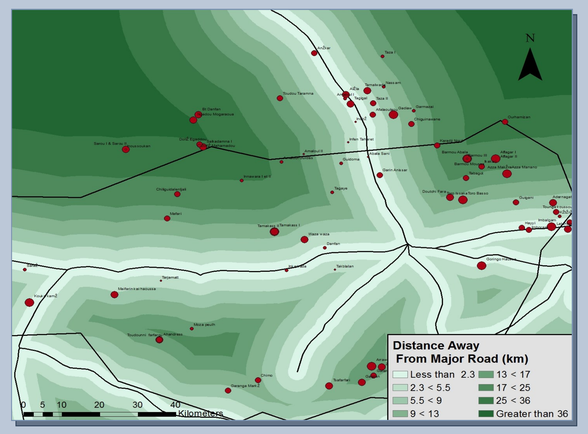
Findings

There appears to be little correlation between proximity to major roads or markets and outward migration rates. Maps 3 – 5 and graphs 2—3 validate this observation. There does seem to be a slight and positive correlation between cell phone coverage and migration rates.

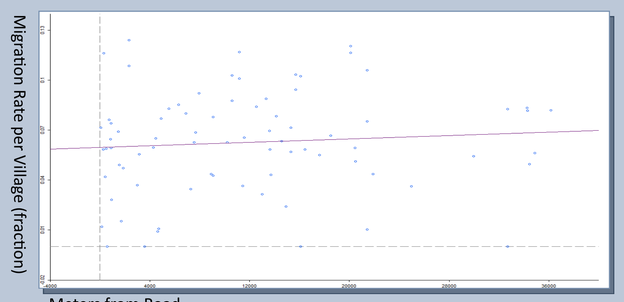
These findings suggest that infrastructure development may have countervailing effects on migration. While major roads, markets and cell phone coverage can discourage migration by providing and promoting local development, they can also facilitate the act of migrating (roads) and expand migrants' networks and information about opportunities elsewhere (markets, cell phone coverage).

There does appear to be some correlation between migration rates and villages in the North East of Tahoua. Future research should investigate why.

Map 3: Migration Rate by Distance from Major Road

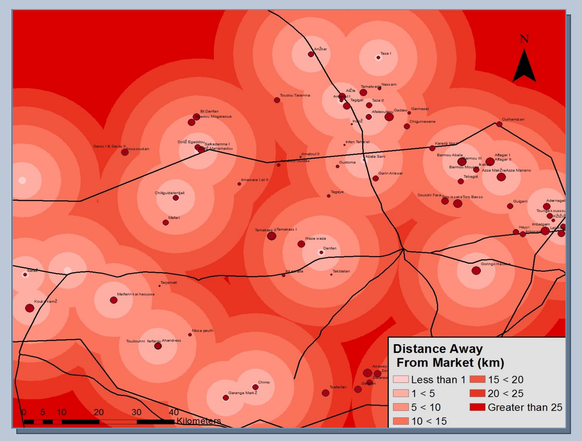


Graph 2: Migration Rate by Distance from Major Road

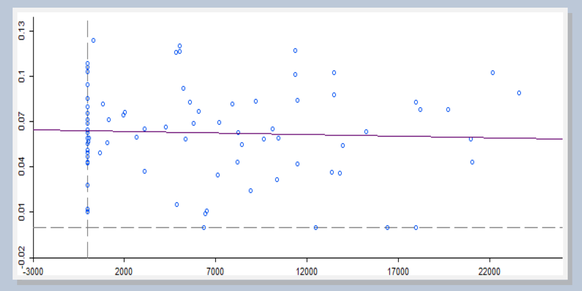


Meters from Road

Map 4: Migration Rate by Distance from Market

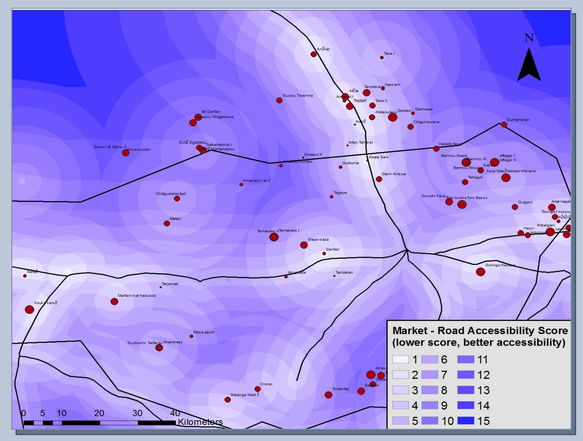


Graph 3: Migration Rate by Distance from Market



Meters from Market

Map 5: Market—Road Accessibility Index Map



Data Sources

Data on migration rates, cell phone coverage and market proximity were sourced from Dr. Jenny Aker's on-going research in Niger and her article "Zap it to Me: The Short-Term Impacts of a Mobile Cash Transfer Program," 2011. The Michael Bauer Research, Environmental Systems Research Institute (ESRI) provided Niger's major roads map, 2007. Basemap is Oceans from ArcGis. Department boundaries are from GfK Marktforschung, 1996. All layers were projected into the Projected Coordinate System: WGS 1984 UTM Zone 31N.

Cartographer: Steve Monroe, The Fletcher School of Law and Diplomacy, Tufts University, May 3rd 2012