

1. Title: Population Distribution on the Frontier: Changing Migration Patterns and Urbanization in the Ecuadorian Amazon in the 1990's

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6. Abstract:

Recent evidence from South American countries such as Brazil, Ecuador and Peru indicates profound changes in migration and urbanization patterns in frontier areas of the Amazon. Following the earlier large-scale migration fluxes into the Amazon from long-settled regions, the most dramatic forms of population redistribution under way are currently within the frontier, including rural-urban movements that have engendered a rapid urbanization in the middle of what is by far the world's largest tropical rainforest. Furthermore, previous work suggests that important gender differences exists between migrants, especially with young women being more likely to leave their parent's households and to choose urban destinations more than young men (Laurian, Bilsborrow and Murphy, 1998). This increasing urbanization on the Amazon frontier involves recent rapid growth of some long settled river towns, the formation of new pioneer urban areas, and the incipient transformation of many rural communities, which are acquiring urban characteristics through population growth and acquisition of basic infrastructure. Increasing economic and social articulation is also evolving between larger and smaller urban communities, constituting an incipient but increasing and complex network of urban places in the Amazon (see Browder and Godfrey, 1997, on Brazilian Amazon).

These changing migration and urbanization patterns can be explained by factors both endogenous and exogenous to individuals living on farm households in the frontier. Endogenous factors include aspects of individuals and farm households and their changing dynamics, including gender roles, education levels, family composition, income, household size and members in the labor force, farm size, main farm commodities produced and household members having off-farm employment. It is at this disaggregated level (individuals and households) that one can assess the consequences of population pressures on natural resources, which may reduce the sustainability of agricultural practices (e.g., through declining soil fertility), which in turn lead to lower incomes and labor surpluses and hence out-migration from rural areas, in search of off-farm employment. Exogenous factors include the characteristics of rural communities and municipalities that influence migration and urbanization patterns in the Amazon. They are higher-level analytical units above individuals, households or farms, and are not affected by the actions of an individual farmer. Examples of exogenous factors include the degree of economic integration of the community or town in the regional market, availability of educational and health services, road accessibility, distance to main towns, agricultural market prices, access to technical assistance, extent of in-migration and out-migration in the community and existence of off-farm employment opportunities (such as in the oil industry, in the case of Ecuador).

Traditional empirical research on the determinants of migration has grown out of human capital theory (Sjaastad, 1962) and focused on individual decision-making processes. Starting in the late 1970's the theoretical paradigm shifted to a focus on modeling the migration decision as a household decision (see, e.g., Mincer, 1976; DeJong and Gardner, 1981). Soon after various migration scholars came to recommend models that explicitly take into account the larger context within which migration decisions are made (e.g., Findley and Bilsborrow in 1981; Lee, 1985; Bilsborrow et al, 1987; Massey, 1990). It is now common to recognize the importance of the community or larger context on migration and other decisions of households, as well as the roles of factors and institutions at even higher levels (regional, national and international) on affecting the decisions of analytical units at lower levels, such as individuals, farms and households. However, theories regarding the effects of contextual factors on migration exist in only a rudimentary state, especially in terms of the frontier areas such as the Amazon. The temporal and spatial characteristics of migration and the resulting urbanization reflect a process engendered by the articulation, at the regional level (the contemporary Amazon frontier), of individual and farm household characteristics and changes occurring at the context where they are located (rural communities and municipalities).

This proposed research will use data from farms and households in the Ecuadorian Amazon collected from a longitudinal survey of farm plots in 1990 and 1999, and from a community survey carried out in 2000 (with retrospective information for 1990). The first includes a sample of 764 farm households based on questionnaires administered to both the head and spouse of the household, and the second includes a sample of 65 communities near the sample farm households (information collected from community leaders and other appropriate informants). The data were collected initially mainly to study linkages between demographic and other factors and land use on a scientifically representative sample of plots in the northern Ecuadorian Amazon. This area was selected due to its being the locus of dramatic colonization by spontaneous migrants settling along roads initially built by oil companies to extract oil for export. The data are useful to fulfill the objectives of investigating the effects of endogenous and exogenous changes in the 1990's on migration and urbanization patterns within the Amazon region. In this research we will also discuss the destinations and labor force status of out-migrants from farm households in 1990-1999, as well as differences in propensities to migrate of men and women and boys and girls.

The longitudinal data facilitate identifying recent migration flows and their characteristics with a high level of assurance, since household composition is available at both dates to provide a check on the accuracy of reports of who out-migrated, as reported in the 1999 survey. The data

sources available also allow the use of a multilevel model in which three analytical levels are considered: level 1, constituted by data on individual characteristics, level 2, constituted by data on farm households and level 3, constituted by information on communities and municipalities. The multilevel model with longitudinal information constitutes the empirical focus of the research and will be implemented using existing software such as SAS and MLwiN. It will be developed a discrete-time multilevel hazard model that associates migration status to endogenous and exogenous factors operating through the period 1990-1999 and at the three analytical levels described above. The model will test a dependent variable representing migration status referring to whether the person leaves the household to live elsewhere (in urban or rural areas) or not in the period 1990-1999. Each person living in the household in 1990 is considered at risk of out-migration until he or she moves or until 1999. The data also allows reconstructing the households at each year in the period 1990-1999, making available all the individuals at risk of migration at a given year. For example, an individual that lived in the household in 1990 but in 1999 was reported as dying in 1995 (censored in 1995) will be considered at risk of migration until 1994.

The combination of longitudinal data and multilevel models will permit developing a better understanding of the effects of endogenous and exogenous factors on migration and on an urbanization pattern that can be referred to as the “contemporary urban frontier” in the Amazon. We will show that this approach is more useful to explain the responsiveness of migration in the Amazon to changes in individual, farm and household characteristics and in their environment, the latter including the context where they are located (community and municipalities). Related to this, as rural plots have on average become much smaller in the 1990’s as a consequence of population growth and fragmentation, more and more rural households see off-farm employment of one or more family members as a way of getting more cash income and diversifying risk. However, we will show that the increasing absorption of rural population surpluses in Amazonian towns through not only employment but also permanent and temporary migration has not been sufficient to alleviate problems of poverty, environmental degradation and underemployment in the frontier. This paper will conclude by noting that the development of appropriate regional and urban policies for the frontier requires a better understanding of how endogenous and exogenous factors shape migration and urbanization patterns.