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The Political Ecology of Land Conversion in the Tri-National Border of Southwest Amazon

The tri-national borders of Peru, Brazil and Bolivia converge on an area known as the MAP deep within the Amazon. The MAP refers to the departments of Madre de Dios, Acre and Pando in the countries Peru, Brazil and Bolivia, respectively. This area has undergone several major shifts in demographic and ethnic composition, related to policies and social movements operating at different spatial and temporal scales. This area had been territory of several indigenous groups that were killed off or were forced to move when the Rubber Boom reached this area during the late 1800s, leaving large areas open for rubber extraction and colonization. Following that Boom, we may differentiate three periods according to the degree of incorporation of forest areas into the national or state economy: (1) Rubber Bust, 1913-1960s: In Acre, rubber tapping continued to service the Brazilian automobile tire industry and then the increased demand during World War II, but in Madre de Dios and Pando rubber tappers migrated out or remained and began practicing subsistence agriculture. (2) Big Projects, 1960s-1980s: In Acre Brazil's "Operation Amazonia" led to market-oriented land use but also to the creation of Extractive Reserves. In Madre de Dios Peru's Banco Agrario provided credits for crop and cattle production. (3) Establishment of Land Tenure systems and Infrastructure Development, 1990s - present: Within Madre de Dios and outside Extractive Reserves in Acre small areas of land were given to peasants to develop agriculture and cattle ranching. Within Pando and Extractives Reserves in Acre, large areas of land were given to peasants to encourage extractive activities. Brazil's "Advance Brazil" led to the pavement of the major road in Acre in 2002. Madre de Dios followed suit and made its major road passable year round. Recently the Peruvian and Bolivian governments announced the paving of the major road in Madre de Dios, already underway, and a secondary road in Pando, to start in 2007, as part of the Interoceanic Highway initiative.

The primary research question in this study is: *What is the role of development policies as primary forces ("drivers") that influence land use and land cover change in the tri-national border area of Peru-Brazil-Bolivia?* There are two major hypotheses in this research:

H₁: National differences in land use and land cover among small producers in the study area are primarily the result of federal and state development policies that have differentially:

- a) encouraged forest based or extractive activities (e.g., tenure of large areas of forest);
- b) favored (or disfavored) particular products and crops (e.g., cattle, timber, rubber, brazil nuts);
- c) facilitated incorporation into the market economy (e.g., road paving, credits); and
- d) encouraged (or discouraged) settlement and population growth in the area.

H₂: Development policies do not have a linear influence on households, and land use systems; instead, much depends on their timing with respect to cycles of household demography and resource extraction as well as on the land management practices:

- a) households with more dependent members show more intensive land use patterns than those with fewer dependent members,
- b) households with greater knowledge of soil management practices are able to intensify their agriculture without degrading the soil,

c) households that practice more traditional swidden agriculture are able to intensify production without depleting their resources.

330 families (110 in each country) distributed in 26 villages (10 in Madre de Dios, 8 in Pando, and 8 in Acre) are currently participating in this research. Villages were selected according to their distance to the main road, the main activity and the willingness of the village members in being involved in a one year study. The families were randomly selected from a list of village members and at least half of the families in each village were included. Work in Acre is being carried out in collaboration with PhD Candidate Amy Duchelle from University of Florida.

Quantitative data is being collected quarterly from the 330 families during five visits that cover a one year period, September 2006 to September 2007. The methodology builds on that established by the Poverty and Environment Network (CIFOR-PEN 2006). GPS points will be collected of all households and their farming plots. Qualitative data will be gathered through participatory observation and in depth interviews with representative households. Ten representative households in each of the three sides of the border (30 in total) will be selected according to the analysis of data gathered between September 2006 and March 2007. Also GPS points and soil samples will be collected of all land use units for these 30 households.