

SECTION 3

The Vulnerability of Indigenous Farming Systems to Climatic Variations

3.1. Introduction

In this section we consider the significant environmental constraints and opportunities for highland farmers and characterize the technical options that farmers may use to reduce risk. Our aims are to assess the sensitivity of agriculture to climate, and to identify points of vulnerability, so as to begin to identify appropriate policies. The focus of attention is on the results of a survey of indigenous farmers in the Galte-Chauzan area.

3.2. The Chauzan-Galte Area

3.2.1. Environment and land use

The areas of Chauzan and Galte contain several hundred farm families concentrated in six peasant organizations (*Figure 3.1*). Most of the area is above 3200 meters elevation (*Figure 3.2*). Soils, vegetation and crops are largely determined by elevation and topographic position (*Figure 3.3*). According to the Holdridge (1967) classification of life zones, most of the region is Montane Moist Forest, varying from 3000 to 4000 meters in elevation and with 500 to 1000 millimeters of rainfall per year. The valley bottom, however, is in the drier Montane Steppe life zone.

Soils are sandy (Vitrandepts and Psamments). Some areas, such as around Palmira, are wind-blown dunes and are thus unsuitable for cultivation. There are also less sandy soils, such as the Eutrandepts (fertile volcanic soils) around Galte and high-elevation Dystrandeps. Of the county of Guamote about 20% of the surface is eroded and another 20% in process of erosion (SEDRI, 1983). The vegetation of the area has been extensively modified by human activity. High elevations exhibit a paramo grassland (*Stipa ichu*, etc.). Shrubs and thorny

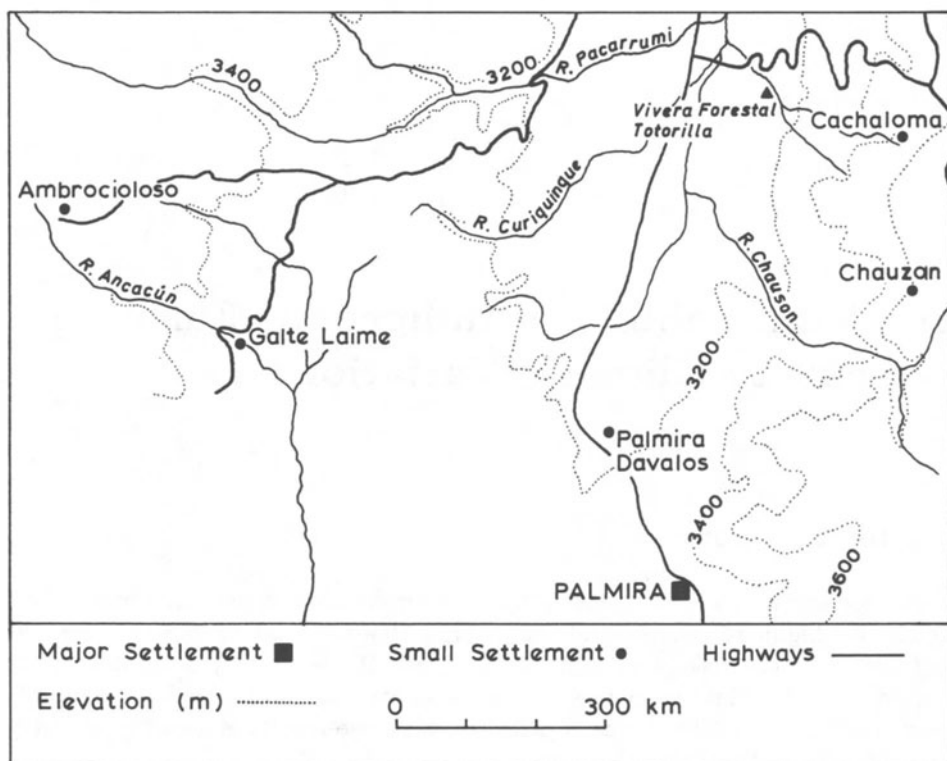


Figure 3.1. Galte and Chauzan: location and topography.

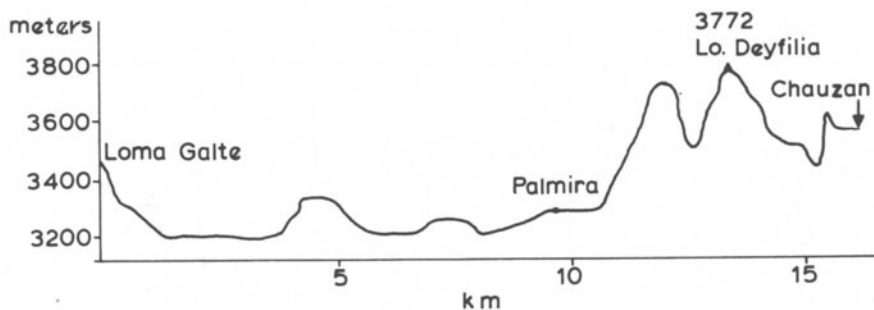


Figure 3.2. Topographical transect from Galte to Chauzan.

vegetation (*chilca*, *agave*, *tuna*, etc.) are common at lower elevations, especially in hedgerows.

In the county of Guamote, 65% of land is owned communally and 35% individually (SEDRI, 1983). The communally owned land is mostly in natural pasture. Some 81% of the individually owned land is cultivated, the remainder being pasture or unproductive land. Most of the cultivation is for broad beans,