An evaluation of silvopastoral systems in pine plantations in the Central Highlands of Ecuador

M. GARRISON¹ and M. PITA²

¹ Returned Peace Corps Volunteer, United States; ² Agroforestry Coordinator for Chimborazo, Ministry of Agriculture and Livestock, Ecuador

Key words: Ecuador, silvopastoral systems, social forestry, plantation management, Pinus radiata

Abstract. One of the most serious problems facing Andean nations today is population growth and the resultant pressures placed on limited natural resources. Currently, thousands of hectares of pine plantations in the central highlands of Ecuador are left unmanaged and unutilized, while at the same time local agriculturalists lack grazing land, firewood and other basic necessities which could be provided by appropriate forest management. This paper evaluates ten pine plantations in central Ecuador for their potential as silvopastoral systems, and discusses the possibilities of integrating local farmers into the appropriate management and use of them.

Resumen. Uno de los problemas más graves afrontando a los países Andinos es el crecimiento de la población y las presiones que resultan sobre los recursos naturales. Al momento, miles de hectáreas de plantaciones de pino en la Sierra central del Ecuador se quedan sin que nadie les maneje ni les utilice; mientras tanto los agricultores cercanos sufren por falta de pastoreo, leña y otras necesidades que se podría conseguir a través del manejo forestal. Este documento examine diez rodales de pino en el Ecuador por su potencial como sistemas silvopastoriles, y discute las posibilidades de integrar agricultores pequeños dentro del manejo y uso apropiado de ellos.

General characteristics of the Central Sierra

Physical characteristics

Ecuador is a small country of about 270,699 square kilometers located on the Pacific coast of south America between the countries of Colombia and Peru (Fig. 1), with a population (1983) of 8.7 million.

The central highlands of Ecuador are delineated by two mountain ranges of North to South orientation and the intermountain valleys; elevations average between fifteen hundred and four thousand meters above sea level, with over a dozen peaks surpassing four thousand eight hundred meters. Climatic zones are principally a function of elevation, with the higher lands being more humid and prone to cold temperatures, frosts, high winds and fogs. Precipitation varies from 400 to 1500 millimeters annually, and temperatures range from less than ten degrees Celsius in the high paramos to over twenty degrees Celsius in the valley bottoms. The months of June
through November generally constitute the dry season, while December through May are normally rainy. The area is characterized by black Andean soils of volcanic origin with a clay loam or sandy loam texture; where severe erosion has occurred, a phosphorous-deficient, cement-like hardpan known locally as cangahua dominates, particularly along the eastern range.