

## Research Note

### OBSERVATIONS ON THE PHYSICAL GEOGRAPHY AND AGRICULTURE OF THE RÍO NOSARA WATERSHED IN THE NICOYA PENINSULA OF COSTA RICA<sup>1</sup>

The Río Nosara watershed, near the town of Hojancha in the Nicoya Peninsula in southwestern Costa Rica, has an area of 1882 ha. Altitude ranges from 325 to 885 m above mean sea level. Mean annual rainfall is 2269 mm (26 years record). The rainy season extends from May through November: May, 288 mm; June, 323; July, 262, August, 317; September, 404; October, 430; and November, 122. The dry season extends from December through April: December, 23 mm; January, 5; February, 10; March, 24; and April, 60. Maximum rainfall intensities in the area are 3.88 mm/min in 5 min.; 2.91 in 10 min.; 2.16 in 30 min.<sup>2</sup> Mean minimum annual temperature is 20.2° C and ranges from 18.9° C in December to 20.8 in April and July. Mean maximum annual temperature is 33.8° C and ranges from 36.3° C in April to 32.2° C in July.

Morphological examination of several profiles reveal that the soils are likely to be mostly Typic Haplustalfs and Typic Ustropepts, clayey, deep, and moderately well-drained. They are dark brown in the A horizon, and reddish brown throughout the rest of the profile.<sup>3</sup> Field observations indicate that rill and gully erosion reaches critical levels in many places of the watershed. This is more evident where natural drainageways are not protected and in overgrazed pastures. Trampling by cattle in marginal areas induces displacement of soil masses and the exposed soils are subject to the erosive impact of rainfall and runoff.

Relief varies from gently sloping to very steep. More than 40% of the land occurs in slopes smaller than 36%; 58%, on slopes greater than 36%; 46%, on slopes greater than 48%; and 24%, in slopes greater than 60%.

Some 6% of the land is in crops; 80%, in pastures; 8%, in forests, including secondary growth; the rest, in non-agricultural uses. Corn, beans, upland rice and sorghum are the most important annual crops. Other crops grown are sugarcane and coffee. Livestock is the most important enterprise and it is estimated that native pastures have a carrying capacity of one head/ha. The predominant grass is jaragua (*Hyparrhenia rufa*), but plantings of king grass (*Pennisetum purpureum* × *P. typhoides*)

<sup>1</sup> Manuscript submitted to Editorial Board March 29, 1984.

<sup>2</sup> Van Ginneken, P., 1977. Estudios básicos de la Cuenca Superior del Río Nosara, Hojancha, Guanacaste, Dirección General Forestal, Ministry of Agriculture and Livestock/Costa Rica.

<sup>3</sup> Ramirez, M. T., 1983. Estudio semidetallado de suelos, Cuenca Superior del Río Nošara, Hojancha-Guanacaste, Ministry of Agriculture and Livestock/Costa Rica.

and of sugarcane for fodder are increasing. Under traditional farming practices yields are very low: 90 kg/ha of corn; 45 of beans; and 45 of upland rice. Farmers who follow some improved practices usually obtain twice as much corn and rice; about 1 1/2 as much beans. With appropriate technology these yields could be increased at least three- or fourfold. On the basis of effective soil depth and slope, almost 1/2 of the land could be planted to annual and perennial crops if adequately protected against erosion; the rest should be under permanent cover, i.e.; fruit trees, pastures and forest.

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