

Research Note

CONFLICT IN LAND-USE IN THE PURISCAL AREA OF THE RÍO PARRITA WATERSHED IN SOUTHWESTERN COSTA RICA¹

The Río Parrita watershed has an area of 1342 sq km and is located some 40 km southwest of the metropolitan area of San José at an altitude of 1102 m above mean sea level. It lies between lat. 9°30' and 9°54' N. and between long. 84°00' and 84°26'W.² A program has been recently initiated to prepare integrated management plans for renewable resources of the area based on a multiple-use concept. To prepare the management plans basic data on climate, soils, slopes, land-use, infrastructure and others have been obtained for the Puriscal Area, which has been selected as representative of the area included in the initial study within the Río Parrita watershed.³

At Puriscal, mean annual rainfall is 2470 mm (36 years record). The rainy season extends from May through November with approximately 90% of the rain. A pronounced dry season prevails from December through April. Mean monthly temperature is around 21° C; mean monthly minimum, 14° C; mean monthly maximum, 27.7° C. Relative humidity is 82%.⁴

Relief is very steep over most of the area, ranging from 30 to more than 80% in over 88% of the area as shown in the following tabulation. Some 62% of the land is in slopes more than 45%; 35%, in slopes steeper than 60%.

<i>Slope</i> %	<i>Distribution of land</i>	
	<i>ha</i>	%
0-15	267	1
15-30	2937	11
30-45	6942	26
45-60	7209	27
60-80	7743	29
>80	1662	6

According to Alvarado et al.⁵ the soils are mostly Ustic Tropohumults;

¹ Submitted to Editorial Board March 29, 1984.

² Hueveldop, J. and L. Espinoza (Ed), 1983. El componente arbóreo en Acosta y Puriscal, Costa Rica, CATIE, Turrialba, Costa Rica.

³ Programa para la Conservación de Recursos Renovables, Ministerio de Agricultura y Ganadería, Costa Rica.

⁴ Von Platen, H., G. Rodríguez, and J. Lagemandor, 1982. Sistemas de Finca en Acosta-Puriscal, Costa Rica, CATIE, Turrialba, Costa Rica.

⁵ Alvarado, A., N. Glover, and O. Obando, 1982. Reconocimiento de los suelos de Puriscal-Salitrales y Tabarcia-San Ignacio de Acosta, Costa Rica, CATIE, Turrialba, Costa Rica.

clayey, isohyperthermic. Typical soils have a 30 cm deep A₁ horizon which is dark brown (7.5YR 4/2), clayey (42%). The 30–45 cm deep B_{21t} horizon is also dark brown (7.5YR 4/4), clayey (57%) with some clayskins. The 45–150 cm deep B_{22t} is strong brown (7.5YR 4/6), clayey (57%) and also shows clayskins. Throughout the profile, structural units consist of strong, coarse subangular blocks. CEC declines from 34 meq/100 g dry soil in the A₁ to 24.6 in the B_{22t}. Organic matter in the surface soil is around 5%; pH, 4.9. Percentage base saturation ranges from 26 in the A₁ to 20 in the B_{22t}; bulk density, from 1.02 to 0.97 g/cm³; porosity, from 59 to 64%. Main soil limitations are high P fixation, low K and acidity.

The following tabulation shows actual land-use in the Area:

<i>Land-Use</i>	<i>Extent, %</i>
Forest	21
Pasture	54
Coffee	10
Sugarcane	3
Annual crops	12

Forest includes “charral” which is a secondary growth following deforestation. Pasture includes both clean as well as weedy volunteer grasses. Jaraguá (*Hyparrhenia rufa*), a low-yielding, low protein pasture with a carrying capacity of 0.5 animal/ha is predominant. Beef production is an important enterprise raising Brahman and Criollo cattle. Principal annual crops are tobacco, corn, beans and upland rice. Forestry, livestock and crops are all produced under low levels of technology.

The following tabulation shows that there is a land-use conflict in nearly 60% of the area. This was assessed on the basis of actual land-use as compared to potential land use as indicated by land capability classes. The conflict involves land mostly in slopes above 30 to 45%, which is being used for annual crops and pasture and which should be under forest.

<i>Degree of conflict</i>	<i>Distribution</i>	
	<i>ha</i>	<i>%</i>
No conflict	11214	42
Conflictive	8544	32
Very conflictive	6942	26

It also includes lands in pastures, in slopes above 45%, which should be under permanent forest cover. Even in slopes greater than 80%, plantings of tobacco, corn, beans and other annual non-protective crops were observed during a recent tour of the area.

The land capability includes classes II, III and IV (32% of the area) and VI and VII (68% of the area).⁴ The magnitude of erosion is of great concern and can be mainly attributed to indiscriminate deforestation, intensive rainfall, steepness of slopes and inappropriate land-use.

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