

## COSTA RICA



Source: esri

### General

Costa Rica - officially the Republic of Costa Rica - is located in Central America. It borders Nicaragua in the North, the Caribbean Sea in the Northeast, Panama in the Southeast, and the Pacific Ocean in the Southwest, sharing a maritime border with Ecuador in the South of Cocos Island. The country has an area of 5.11 Mha (million hectares) with, in 2024, a population of 5.13 million, or 1.0 persons per ha (Wikipedia and United Nations, 2024).

### Climate and geography

Costa Rica has a tropical climate year-round. There are two seasons. The dry season from December to April, and the rainy season from May to November. However, there are rainy days in the dry season, as well as weeks without rain in the wet season. March and April are the hottest months, while December and January are the coldest. The country is highly vulnerable to extreme weather events, which can be exacerbated by climate change (source: Wikipedia).

The highest point in the country is Cerro Chirripó, at 3,819 metres+MSL (mean sea level). The highest volcano in the country is the Irazú Volcano (3,431m+MSL) and the largest lake is Lake Arenal.

The majority of the population and economic activity are concentrated in regions highly vulnerable to various natural hazards, such as floods, landslides, cyclones, storm surges, and rising sea levels. The country is facing increasing temperatures, rising sea levels on both coasts, and changing rainfall patterns resulting in increased risk of drought along the Pacific slope and flooding in all regions.

### Existing polders

Although he did not specifically mention polders, Murillo (1987) stated that in the Atlantic Region by private enterprises drainage and flood control measures have been taken for the development of plantations. At Google Earth it can be observed that there are indeed polders

General characteristics of the polders in Costa Rica are shown in Table I.

### Proposed polders

Murillo (1987) described that in the Atlantic Region 250,000 ha with high agricultural potential could be reclaimed.

### Drainage and flood protection

Murillo also gives design standards for subsurface drainage systems. These are:

- *groundwater table depth*. Decrease to 1.10 – 1.20 m-surface within 24 hours;
- *drain spacing*. According to Hooghoudt formula for homogeneous soils and according to Ernst formula for stratified soils;
- *drainage coefficient*. 60 – 70 mm/day.

Figure 1 shows the typical lay out of a subsurface drainage system in a banana plantation in the Atlantic Region (Murillo, 1987).

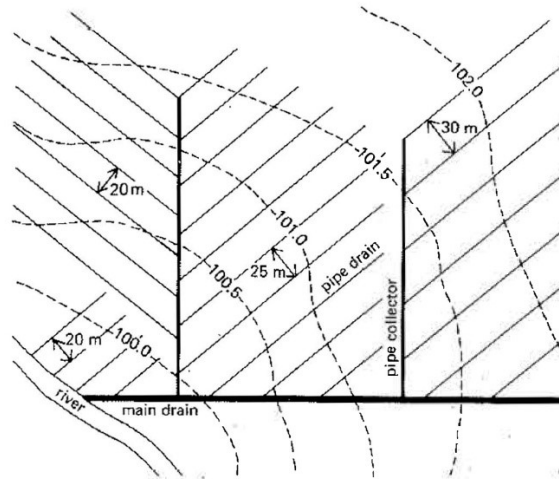


Figure 1 Typical lay out of a subsurface drainage system in a banana plantation in the Atlantic Region (Murillo, 1987)

### Location of the polders in Costa Rica as shown on the World polder map

The location of the polders in Costa Rica is shown in Figure 2.



Figure 2. Location of the polders in Costa Rica (source: esri – Batavialand)

### References

- Murillo, J.L., 1987. Land Drainage in the Atlantic region of Costa Rica. In: J. Vos (ed.). Twenty-five years of drainage experience. Proceedings, Symposium 25<sup>th</sup> International Course on Land Drainage, 24-28 November 1986. International Institute for Land Reclamation and Improvement (ILRI) and International Agricultural Centre (IAC). Wageningen, the Netherlands.
- United Nations, Department of Economic and Social Affairs, Population Division. 2022. *World Population Prospects, medium prognosis. The 2022 revision*. New York, USA.

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Table I. General characteristics of existing polders in Costa Rica

Name	Reclamation	Area in ha	Type *)	Latitudes	Longitudes	Elevation in m+MSL	Land use
Polders in the Atlantic Region			RLL				Agriculture
Total							

\*) RLL = reclaimed low-lying land; LGS = land gained on the sea; DL = drained lake