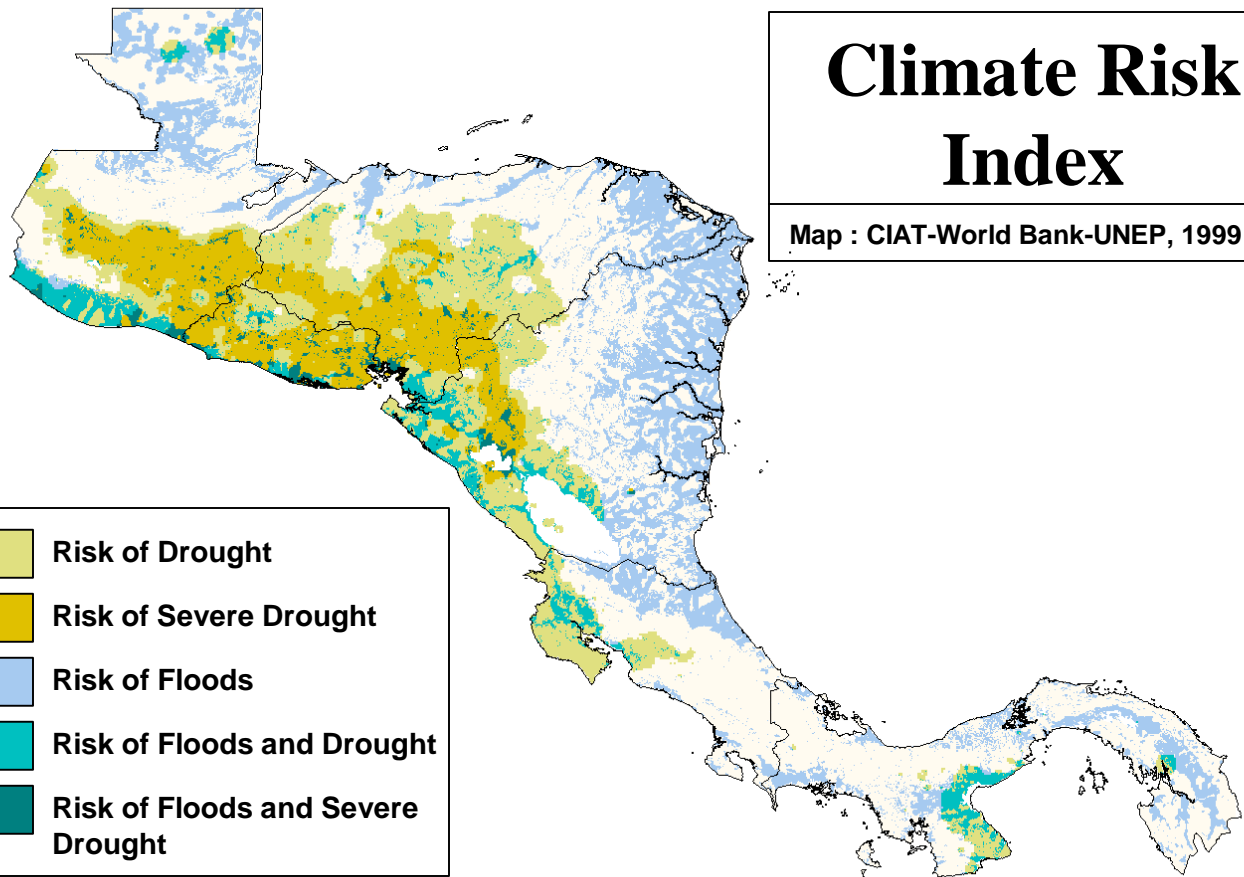


# Climate Risk Index

Map : CIAT-World Bank-UNEP, 1999



## Analysis of the Index

Besides the catastrophic effects of Hurricane Mitch and other individual natural events in Central America, the risk of flooding and drought are permanent biophysical traits in the region that need to be taken into account. In total just over a quarter of the land (27%) is at risk due to flooding and over a third of Central America is at risk from drought. A significant proportion of the region (40%) is at risk from either flooding or severe drought.

## Explanation of the Index

This index is a combination of risk of drought and risk of flooding in Central America, it is intended to give a broad picture of the two major climatic risk factors in the region.

The risk of drought is indicated by the greatest number of consecutive dry months. This figure was calculated by analysing the monthly precipitation figures for various climate stations in the region. A precipitation surface was created for each month with two classes: those areas with less than 60mm; and those areas with more than 60mm. These surfaces were created using an inverse distance squared weighted interpolation method with a radius of 12 cells.

When the twelve precipitation surfaces were completed they were analysed on a cell-by-cell basis to calculate the greatest number of consecutive dry months. This analysis took into account the comparison of data in December to that of January so that dry seasons that traversed the start and finish of the calendar year were not overlooked.

The index shows the number of consecutive dry months in three categories of which two are shown on the map:

- 0-3 months (no risk of drought);
- 4-5 months (risk of drought); and
- 6 months and above (risk of severe drought).

The risk of flooding is very simplistic, and shows those areas that are "flat" and within 2 miles of rivers. Flat is defined as those areas less than 1 degree of slope. There is only one class for flood risk areas.

## **Assumptions**

The assumptions for this index are that 60mm of precipitation constitutes a "dry" month (Peter Jones, CIAT, 1999, *Pers. Comm.*). An implicit assumption (in the choice of classes) is that the greater the number of consecutive dry months the greater the pressures on the natural environment. What is lacking in this index is either an indication of the water balance (i.e. the difference between precipitation and evapotranspiration) or of the soil water holding capacity.

The assumptions in the flood risk areas are that the linear distance to a river is the important factor and that flat areas are more prone to flooding (these are fairly valid assumptions). More important are the omissions. The most important omission is probably the size of the upstream area and potential of the soil (and vegetation) to store water. These will determine the actual discharge at a certain point (under certain rain conditions).

However to include all of these factors would complicate the index, besides the fact that the data are currently unavailable for the region.

## **Sources**

Precipitation Figures: CIAT, 1999.

Rivers: Digital Chart of the World, 1975.

Slope: derived from GTOPO 30 Digital Terrain Model, USGS, 1996.