

the Egyptian border). The flow becomes weaker as it spreads north. In September, the dry northeasterlies begin to strengthen and to push south; by the end of December, they cover the entire country. In general, the rainy season extends from April to November.

In some years, the arrival of the southwesterly winds and their rain in central Sudan can be delayed, or they may not come at all. When that happens, drought and famine follow. In the 1970s and 1980s, the southwesterly winds failed frequently, with disastrous results for the Sudanese people and the economy.

Temperatures are highest at the end of the dry season. However, the far south, with only a short dry season, has uniformly high temperatures throughout the year. In Khartoum, the warmest months are May and June, when the average temperature is 41 °C and can reach 48 °C. Northern Sudan, with its short rainy season, has hot daytime temperatures all year round, except for winter months in the northwest where there is precipitation from the Mediterranean Sea in January and February. Conditions in highland areas are generally cooler, and the hot daytime temperatures during the dry season throughout central and northern Sudan fall rapidly after sunset. In general, May is considered to be the hottest month in most areas of Sudan whereas December and January are the coldest. Low temperatures in Khartoum average 15 °C in January and have dropped as low as 6 °C after the passing of a cool front.

The *haboob*, a violent duststorm, can occur in central Sudan when the moist southwesterly flow first arrives (May–July).

Most of the Sudan is exposed to a northeasterly cold dry front that carries some rain that falls on the Red Sea coast. The rain may fall also in the inland parts of the country that remain dry in winter. In summer the front moves northward accompanied by rain clouds from the south. Therefore, the rainfall occurs in autumn and the length of the rainy period is linked with the length of the continental front in the north of the country.

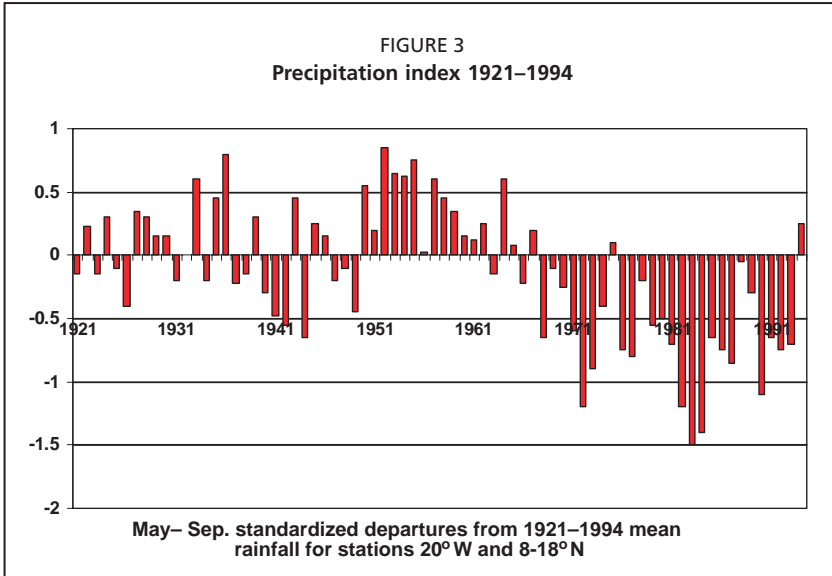
Studies indicate that areas receiving lower average rainfall are tending to increase. Figure 3 shows the precipitation index for 1921–1994.

SOILS

The soils of the Sudan are broadly divided into six main categories with respect to their location and manner of formation:

- desert,
- semi-desert,
- sand,
- alkaline catena,
- alluvial,
- ironstone plateau.

There are many local variations within these soil categories. The main groups are: alluvial clay deposits in the central and eastern parts of the



Note: The index is based on the probability of precipitation; > 2 indicates very wet, and < -2 indicates extremely dry.
Source: Climate Analysis Center.

country; stabilized sand dunes in the west and north; and red ironstone soils in the south.

TABLE 1
Main geomorphologic units in the Sudan

	%
Desert	26.7
Semi-desert	15.5
Semi-desert Red Sea area	2.7
Qoz	9.6
Central Clay Plains	8.5
Alluvial plains and channels	4.2
Eroded Darfur plains	3.7
Southern Clay Plains	9.9
Marshes	1.6
New Jahar areas	9.5
Plateaus and east and southeast plains	4.2

Source: Sudanese Technical Committee, 2004.

The soil types in the Sudan include: Alfisols, Aridisols, Entisols, Inceptisols, Ultisols and Vertisols (Figure 4).

Table 1 shows the main soils in the Sudan according to the American Soil Classification System.

On a geographical basis, the country’s soils consist of three categories: the Arenosols and Regosols of the north and west central areas; the Vertisols of the