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P 4

CLIMATE AND METEOROLOGY

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# THE CLIMATE AND METEOROLOGY OF NAIROBI.

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Nairobi is located at longitude  $36^{\circ} 50'E$  and  $1^{\circ} 18'S$ . The mean altitude is around 1700 metres above the mean sea level (msl) but as the urban areas has a highly variable topography, this height ranges from 1600 metres (to the east) to over 1800 metres (to the west and Northwest).

Nairobi being close to the equator its climate is greatly influenced by the movement of the over head sun. However, its altitude above the mean sea level has important influence on many of the prevailing meteorological factors. The Indian Ocean is the main water body that plays the influencing role in the meteorology and climate of Nairobi as in many other areas of East Africa.

There are two meteorological stations in Nairobi which make hourly surface observations. They are Jomo Kenyatta International Airport (162m) and the National Headquarters of Meteorological Services Dagoretti (1798m). The meteorological data used in this paper were obtained from observations at the two stations, (Kenya Meteorological Department 1984). On the basis of these data, various aspects of the climatology of Nairobi will be presented in the sections that follow.

## WIND

Figures 1-7 show the two way frequency winds roses for Nairobi based on surface wind observations. They give the most frequent wind speeds and directions. It is observed in figure 1 that, the winds at Nairobi have a strong Easterly component throughout the year. The speeds are fairly high also throughout the year with very few cases of calm conditions.

Figure 2 shows the wind conditions during January. This month represents the dry season when the winds are mainly northerly flowing into the heat low to the south. The air is dry having flown over mainly continental regions to the North. Figure 3 show the conditions in April which month represents the long rains period. The winds are mainly easterly flowing from the Indian Ocean onto the highlands They are therefore moisture laden resulting in heavy showers over the city as in most other areas of the country.

Figure 4 shows the conditions during July representing the cold season in the country. The winds have generally lower speeds and are more variable in direction. The situation is associated with the high pressure ridge that has extended into Eastern Africa from Southern Indian Ocean and forms part of the Indian monsoon system. The pressure prevailing over Nairobi during this season results in high frequency of stable atmosphere and calm wind conditions. Many instances of westerly surface flow is observed during this period due to the influence of drainage winds associated with cold air over the highlands to the west (Ramsey, 1966).

Figures 6 & 7 show the wind field during the afternoon and late night. It is seen that the daytime surface winds are highly constant in direction and have generally high speeds. On the other hand the night-time winds have low speeds with many calm conditions and are highly variable in direction. Westerly flow associated with drainage winds is also evident. As a whole the winds at Nairobi are highly constant in direction and this has been shown to be generally the case with the regions within the Trade Wind Belt (Riehl 1954).

## **RAINFALL**

The Inter-Tropical Convergence Zone (ITCZ) is the main