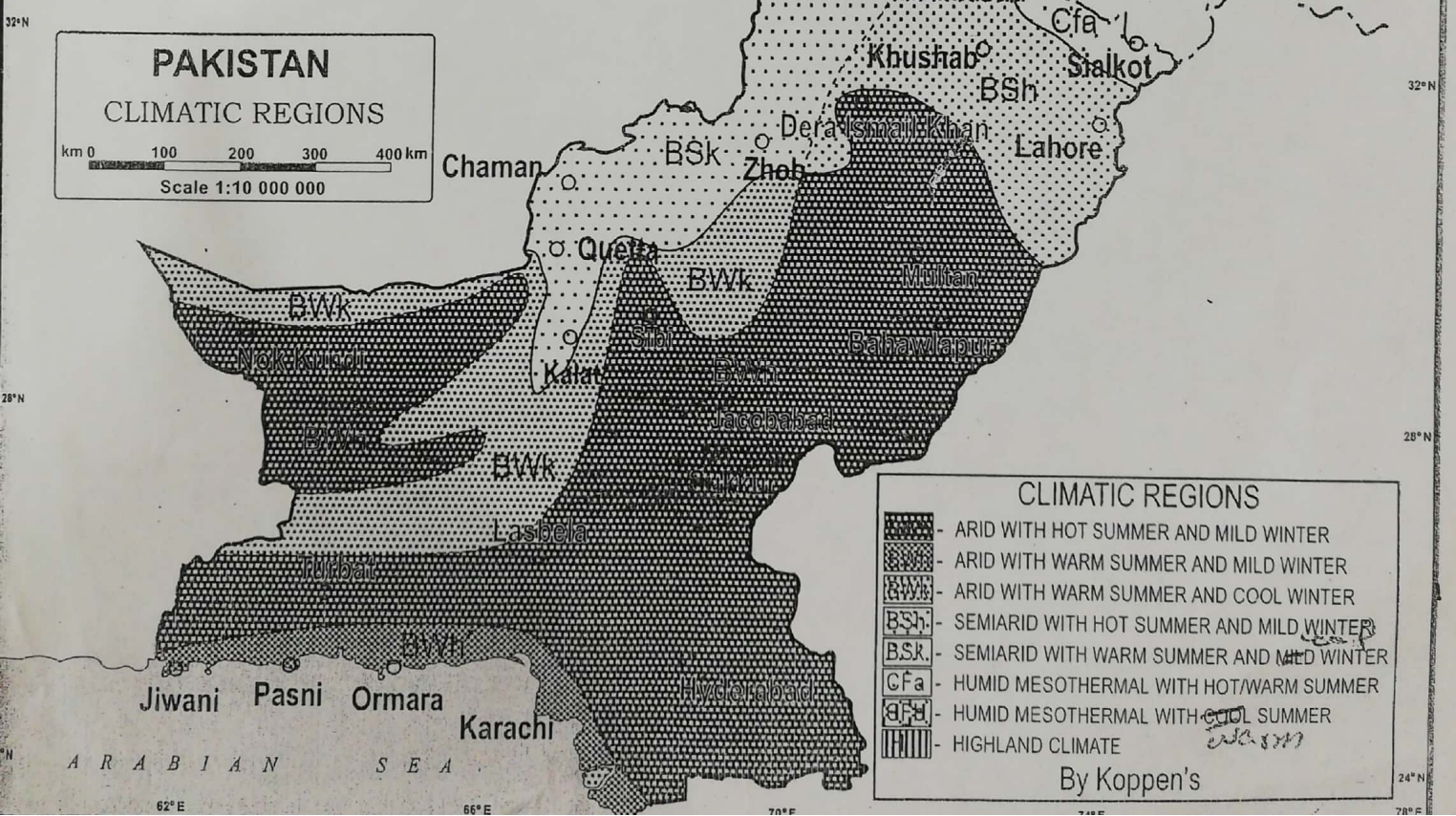


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By Koppen's

## CLIMATIC DIVISIONS OF PAKISTAN

The climate of a region is one of the most important physical factors controlling not only the evolutionary process of the living beings but also their character and mode of existence. Mental and physical capacities, cultural and social characteristics of men are all affected profoundly by the climate of their habitat. Climate has, therefore, been a subject of study from the very beginning of the human consciousness. Attempts at the classification of the climate have been made over a long period. The earliest classification has been made primarily based on temperature because of its great influence on plant and animal life.

The temperature control of climatic zones was recognised by the early Greek philosophers. **Aristotle** (384 B.C.) Divided the Earth into different zones (*Torrid, Tropics and Temperate*), which provided a framework for several latter classifications.

Latter on **Supan, Trewartha, Koppen, Thornthwaite, Blair, Kendrew and Millers** made climatic classifications of the world but their classifications have been overemphasised due to the quantitative presentation of climates and their symbolic expression. This may be justified for the study of the climates of the whole world or even those of a continent, but in the determination of climatic region of a country, all the important elements of climate- temperature, rainfall, humidity, winds and their controlling factors should be taken into consideration. From the geographical point of view any proper classification cannot ignore the human factor and relationship between the climate of a region and activities of its people. In short, homogeneity of a region based on any set of climatic factors, as reflected in social and economic life of the people or in the development of a particular culture or physical landscape, should be the primary basis for defining a climatic region.

Keeping in view all above-mentioned factors, **Ahmad Kazi. S.** (1951) has suggested the classification of Pakistan by considering the local physiography. He distributes the country into four major regions and six primary and sixteen secondary divisions. The major regions are:

- (1). **Tropical Coast Lands (Arid Marine)** Moderate temperature and low rainfall.
- (2). **Sub Tropical Continental Lowlands** High summer temperature and late summer monsoon rainfall, it includes whole plains of Pakistan except the coast lands.
- (3). **Sub Tropical Continental Highlands** With snowy winter, general winter and spring rains. It comprises of the mountainous areas to the north and west of the Indus Plain.
- (4). **Chaghai-Kharan** (very arid) or (Sub Tropical Continental Plateau).

## 1. Tropical Coast lands *(Moderate temperature, low rainfall desert. ARID MARINE)*

This major region includes the southern coastal areas. The most outstanding characteristic of area is a steady inflow of sea breeze throughout summer. Humidity is high and both the annual diurnal ranges of temperature are low. The annual rainfall is more than 7 inches (17.5cm) and annual temperature is over 32°C (90°F). The coast lands can be divided into three minor regions:

### i. Makran Coast

- (a). Rainfall is smaller, occur in three winter months December to February.
- (b). Total rainfall is 6 inches--4 inches in January.
- (c). The weather is generally fine except during three months- December- February.  
The mean minimum and maximum of hot & coldest month is 90°F and 55°F. (e). Due to low rainfall, the shore is entirely a desert.

### ii. Las bela

- (a) A triangular plain, moist along the coast remains intensely hot towards plateau for months.
- (b) Maximum rainfall occurs both in summer winter with frequent droughts.
- (c) The summer mean maximum temperature about 106°F while winter temperature moderate.

### iii. Lower Sindh Coast

- (a) Karachi-Sindh coast receives highly variable summer rainfall with mean annual of 7.7 inches for Karachi.
- (b) Occasional heavy downpour is associated with tropical cyclones.
- (c) High humidity is a common character at Karachi. Relative humidity exceeds 50% during day and 80 % at night throughout the year.
- (d) The mean maximum temperature oscillates between 82°F-89°F except months of winter cold wave days.
- (e) Central area of this region (**Hyderabad**) has low humidity and high temperature during summer and little cooler in winter, while **Tharparkar** region has desert climate with 10 inches of rainfall, which occur in summer.

## 2. Sub Tropical Continental Lowlands

*(High summer temperatures and late summer monsoon rains)*

This major region includes whole of the plain of Pakistan except the coastlands. Aridity and continentality are the main characteristic features of this region. Rainfall is less than 10 inches excluding the north-eastern part and is associated with 4 months of monsoon, while October, November are driest months.

The rainfall increases from south to north. Winter rainfall becomes increasingly prominent towards the north as well as towards the west.

The average annual range of temperature is higher over the whole region. May and June are the hottest months. These months have over 105°F all over the plains and daily maximum temperature attains 115°F and over on several days. January is the coldest month with mean minimum of about 40°F. Dust storms are frequent in summer over the whole lowland.

The landscape and amount of annual rainfall has considerable variation. So we can divide this lowland region into three **Minor Regions**.

- i. *The Sub-Montane West*
- ii. *The Central Part- irrigated plain.*
- iii. *The Eastern Part- un irrigated desert.*

### **i. The Sub-Montane West**

Along the eastern edge of the western dry highlands, from **Kohat Hills** to the north to the Arabian Sea in the south, there is an arid strip of land, which is inundated by *nullahs* or hill torrents. Its climate is dominated by the conditions of the hilly region in the rear.

High summer temperatures, low rainfall are the main characteristics of this area. In this region, **Kohistan** (west of Sindh) is the driest of the whole tract, while **Kachhi Desert Plain** is the hottest area of Pakistan. In summer (*June-July*) temperature rises to about 125°F at certain days with mean annual rainfall of 4.4 inches.

In this strip, **D.G. Khan** and **D.I. Khan (Derajat)** receive comparatively heavier rainfall. (D.I. Khan 9 inches) Rainfall occurs both in summer & winter season.

### **ii. The Central Irrigated Plain**

Whole of the south-west Punjab and middle and upper Sindh is included in this *minor region*. Annual rainfall is less than 10 inches (25cm). Summers are very hot and winters are cool/cold. Dust storms are frequent in summer and humidity is very low. Temperature in shade rises to 120°F-- 125°F and over. This region is well populated because of canal irrigation.

Most of the rainfall occurs in late summer months of July and August. In rainy season humidity rises very high, and dampness makes the climate disagreeable.

### **iii. Eastern Unirrigated Desert**

This region is known as **Cholistan**, which includes eastern part of **Bahawalpur** division. Like **Tharparkar**, it is a part of the Indian desert, which is very hot and dry with low rainfall. This region is extended upto eastern part of **Khairpur**, known as **Nara**, and the adjacent part of Sindh. In this region annual range of temperature is great and winters are cold.

The Potwar Plateau and the northern submontane areas are better than the rest of the Indus Plain and receive more summer and winter rain, while summer temperature is moderate and winters are cool/cold.

## **3. Sub-Tropical Continental Highlands**

*(Cold snowy winters, general winter and spring rain)*

This region includes humid Outer Himalayas, the Kashmir Valley and adjacent areas **Chitral**, **Swat**, **Kohat--Waziristan**, **Zhob--Loralai**, **Gilgit--Baltistan**, **Quetta--Sarawan** and **Makran--Balawan** high region. Apart from variations of temperature with altitude and differences in rainfall on exposed and protected slopes, the principal climatic characteristics of the whole area are cold snowy winters, general winter and spring rains.

Rainfall of this area depends more upon the frequency and intensity of western disturbances than monsoon. Slight fog is also common over the whole area.

Just as rainfall decreases southwards from the outer hills of the Himalayas, similarly it decreases towards the northern part of Kashmir. Snowfall is an important factor in the economic life of the people. This region is sub-divided into 4 *minor regions*.

- (i) Humid Outer Himalayas
- (ii) Sub-Humid & Semi arid region
- (iii) Arid North-East and North-West Highland.
- (iv) South-western Highlands

## i. Humid Outer-Himalayas

This region includes the **Murree Hills** and adjacent parts of **Hazara** district. Rainfall, both the monsoon and western disturbances, is higher than in any other region. At Murree the mean annual rainfall is 64 inches. Snowfalls at the end of December continues till the end of February. Summers are quite cool, while winters are cold. At Murree the mean maximum temperature is 80.7°F (26°C) and in winter it remains below 51.0°F.

## ii. Sub-Humid & Semi Arid

In the rain shadow of the outer Himalayas, the rainfall decreases towards the north. There is a variation in rainfall in this area, from over 25 inches in the Kashmir Valley to 10 inches in the north. Thunderstorms are common from February to October. This region is divided into the Kashmir and adjacent areas, the **Chitral-Swat Valley**, **Kohat-Waziristan**, **Zhob-Loralai** sub-regions. In the region towards north-west, west and south-west the rainfall decreases. Winters are very cold and summers are pleasant. July is the hottest month with mean minimum of 99.3°F.

## iii. Arid North-East & North-West Highland

Further of Kashmir and Gilgit mountain area becomes very dry, and a similar area also occurs in the central and south-western part of Baluchistan. Winter rains mark both these areas. Winters are cold and snowy while summers are cool. Northern part includes **Ladakh**, **Baltistan** and **Gilgit**. Ladakh is the most elevated part on the Earth with extremely slight snowfall with mean annual rainfall of 3.26 inches at **Leh**.

**Baltistan** is low-elevated and less severe, with more rainfall-- **Skardu** (4000 ft) has 6.3 inches annual rainfall. In winter snowfall is common and temperature frequently falls below zero and 26°C down. **Gilgit** towards west is drier and warmer than **Skardu**. Like rest of the region climate is arid and dry but healthy.

## iv. South Western Highlands

This region is also dry and arid. Mean annual rainfall is less than 10 inches. It decreases towards the south. January and February are rainiest months. Annual range of temperature is higher than in the north. Temperature falls below 0°C during winter.

This region is divided into (a) **Quetta-Sarawan** and (b) **Mekran-Jhalawan** sub-regions. **Quetta-Sarawan** is higher in elevation but climate is dry. Winters are rainier than spring. Humidity is low. Mean annual rainfall at **Quetta** is 9.5 inches which mostly occurs in winter.

In **Mekran-Jhalawan** area rainfall is still lower than 5 inches. **Panjgur** has an annual rainfall of 4.8 inches. Winters are cold and summers are hot. Extreme temperature ranges 113°F (Jan) to 100°F (July) with freezing in winter.

## 4. Sub-Tropical Continental Plateau

(*Chaghai - Kharan - very dry*)

This is one of the too hottest and at the same time the driest regions of Pakistan. It is subjected to numerous dust storms and blowing sand practically throughout the year.

In **Chaghai** dry wind blows steadily from the north-west day and night. Extremely hot winds also blow in **Kharan** in summer and continue into **Chaghai**.

Extreme aridity, heat and dust are the chief characteristics of this region. Sand dunes are widespread and prevail over the whole area.

**Nokhundi** has mean annual rainfall of less than two inches (1.95 inches) of which 1.37 inches fall in winter. Mean maximum for July is 103.3°F, while for January is 38.6°F. It is the hottest, driest and least populated area in Pakistan with only 2 person per square miles.