Geographical
Set-Up
GEOGRAPHICAL SET-UP

Aligarh is one of the most important districts of Uttar Pradesh located in the north-western part of the State at a distance of about 130 kms. from Delhi. The district of Aligarh spreads from 27°29' to 28°11' north latitudes and 77°29' to 78°38' east longitudes. It lies in the central part of the Ganga – Yamuna doab. It is bounded by Bulandshahar district in the north, Mathura district in the south and southwest and Etah district in the east and southeast. The extreme north-eastern boundary is formed by the river Yamuna which separates Aligarh from Gurgaon district of Haryana State.

Physical features:

The topographic features of the Aligarh district are similar to those found in the other parts of the Ganga-Yamuna Doab. Physio-geographically, the district contains vast alluvial plains, having gentle slope from north to south and southeast, and is drained by rivers Ganga in the northeast and Yamuna in the northwest.

From the low khaddar of the Ganga river in the east, the level of the district rises sharply to the high uplands which crowns the old flood bank of the river Ganga and then descends inland gradually to a depression, drained by Nim and Chhoiya Nadis. Beyond which, it rises again to the bank of Kali nadi. Along the right bank of the Kali nadi, is another sandy to silty belt rising from the low and narrow khaddar belt of the stream. Adjoining it is a fertile belt of loam soil, which sinks gradually into the broad depression.
Through the centre of the district, a broad belt of low-lying land runs from northwest to southeast. This broad low-lying belt is in fact the continuation of the belt which begins from the district of Meerut, passing through the Ghaziabad and Bulandshahar districts, enters Aligarh district from Koil tehsil in the north. The depression is narrow in the north and gets wider towards the south and it eventually passes into the adjoining district of Etah. It is believed to be a part of a very extensive low-lying tract which runs through the centre of the doab, parallel to the rivers Ganga and Yamuna. This tract is characterized by imperfect drainage and numerous jhils in which the surface water collects.

Beyond this depression, the surface rises again into a level plain known as western uplands. In the northwest, the general characteristics of the doab are maintained, loam alternating with clay in the depressions and with lighter ground on the banks of the few drainage channels, till finally comes the high cliff of the Yamuna. From here, the level drops to the khaddar of Yamuna. In the southwest of the district, sandy tracts with practically no depressions are found.

Topographically, the district represents a shallow trough (sauce-pan shape) like appearance. On the basis of topography the district could be divided into three divisions:

(1) The khaddar plains found mainly along the river Ganga in the east and along the river Yamuna in the west.

(2) The eastern and western uplands.

(3) The central low-lying tract.

Geologically, Aligarh district forms a part of the Indo-Gangetic plain which came into existence in the Pleistocene period. This
land lying in front of the newly up heaved mountains (Himalayas) formed a depression, which was rapidly filled up by the waste of the high lands.

**Climate:**

Aligarh district experiences tropical monsoon climate characterized by two extreme conditions of severe cold in winters (January maximum temperature 21°C and minimum 4°C) and oppressive heat in summers (June maximum temperature 43°C to 47°C). The climate is in tune with that normally prevails in the western part of Uttar Pradesh. The rainfall is scanty ranging 60 to 75 centimetres per annum. The district is affected by the Northeast and Southwest monsoon in a year. Based on these two monsoon winds, the Indian meteorological department has divided the year into four seasons.

1. **The cold weather season** (Dec. – Feb.)
2. **The Hot weather season** (March – Mid June)
3. **The season of general rains** (Mid June – Mid Sept.)
4. **The season of retreating monsoon** (Mid Sept. – Nov.)

**1. Cold Weather Season:**

The cold weather season is characterized by cold and dry air which blows continuously during the three months of December, January and February. The sky is generally clear and cloud cover rarely exceeds two-tenth. During this season, the temperature falls and pressure rises as a result of which a high temperature belt develops over north India which influences this district.
The beginning of this season is marked by a considerable fall in temperature. The mean monthly temperature varies from 17.9°C to 18.8°C in November and it falls during December and varies from 13.0° to 14.3°C. The temperature experiences a further decrease in January when the average comes down to 10.7°C. As compared to January, temperature start rising from February and its mean vary 15.9°C to 17.3°C (Table-1). The direction of prevailing winds is normally from west and northwest to east and southeast. The winds are dry and light and generally blow at an average speed of about 3.2 kms. per hour.

The rainfall in winter months is very low and irregular. This rain is brought by the western depressions originating in the north of Atlantic and proceeding eastwards with the prevailing western lies. The average rainfall caused by these disturbances, is recorded 0.0 to 11.5 mm from December to February.

2. Hot Weather Season:

This season begins with a rise in temperature and decrease in pressure. In March, the temperature starts rising. The months of May and June record exceptionally high temperatures. The days are characterized by intensive heat, dry air and low relative humidity. A regular phenomenon of this seasons is the blowing of hot and dry winds locally called as ‘looo,’ which blow with great velocity (March 5.5 kms and in June 10.5 kms per hour). Another peculiar phenomenon of this season is the occurrence of dust and thunderstorm, which are locally known as ‘andhi’. During the period of May and early June they are more frequent and sometimes move at a speed of 48 to 64 km per hour. These storms are short lived and
sometimes they cause rains with winds, thunder and blinding dust. However, it brings an appreciable decrease in the temperature. The air becomes cold and one gets temporary relief from the oppressive heat. No rainfall, except for a small amount accompanied by the thunderstorms, makes drought situation severe during this seasons.

3. The Season of General Rains:

By the middle of June, changes occur in the weather phenomenon. This is called, over north India, as the burst of monsoons. The atmospheric temperature falls with the arrival of the humid oceanic currents and the air becomes cool and pleasing by the end of June. The average relative humidity is 71.35% in July and 51.15% in October. Generally, the rains set in by the end of June or by the first week of July and continue till the end of September or by the first week of October. July and August are the rainiest months and having average rainfall 269.5 mm in 2003, but in 2004, August and September are the rainiest months and having average rainfall 162.5.

4. The Season of Retreating Monsoon:

The southwest monsoon ends by September or from the beginning of October. It is characterized by the hot and sticky weather and rise in temperature which starts falling by the end of October. The skies are clear and relative humidity falls to 50.0%. Sunshine due to clear sky causes a slight increase in the day temperature but the temperature in the night decreases slightly because of the dryness of air. However, by the end of October the humid oceanic currents are replaced by the dry continental air. This period may be considered as the period of transition between the hot wet weather and cool dry
Table-1: Mean monthly temperature, rainfall and humidity during 2003 & 2004.

<table>
<thead>
<tr>
<th>Months</th>
<th>2003</th>
<th></th>
<th>2004</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temperature (°C)</td>
<td>Rainfall (mm)</td>
<td>Humidity (%)</td>
<td>Temperature (°C)</td>
</tr>
<tr>
<td>January</td>
<td>12.1</td>
<td>8.0</td>
<td>77.7</td>
<td>10.7</td>
</tr>
<tr>
<td>February</td>
<td>17.3</td>
<td>11.5</td>
<td>79.7</td>
<td>15.9</td>
</tr>
<tr>
<td>March</td>
<td>21.3</td>
<td>-</td>
<td>69.0</td>
<td>22.5</td>
</tr>
<tr>
<td>April</td>
<td>27.4</td>
<td>-</td>
<td>41.0</td>
<td>27.6</td>
</tr>
<tr>
<td>May</td>
<td>31.6</td>
<td>12.0</td>
<td>26.3</td>
<td>29.6</td>
</tr>
<tr>
<td>June</td>
<td>34.3</td>
<td>25.0</td>
<td>47.3</td>
<td>31.4</td>
</tr>
<tr>
<td>July</td>
<td>24.7</td>
<td>368.9</td>
<td>81.7</td>
<td>31.8</td>
</tr>
<tr>
<td>August</td>
<td>27.6</td>
<td>170.0</td>
<td>88.0</td>
<td>30.3</td>
</tr>
<tr>
<td>September</td>
<td>27.0</td>
<td>94.0</td>
<td>84.3</td>
<td>26.8</td>
</tr>
<tr>
<td>October</td>
<td>25.3</td>
<td>-</td>
<td>50.0</td>
<td>24.9</td>
</tr>
<tr>
<td>November</td>
<td>18.8</td>
<td>-</td>
<td>65.3</td>
<td>17.9</td>
</tr>
<tr>
<td>December</td>
<td>13.0</td>
<td>-</td>
<td>75.7</td>
<td>14.3</td>
</tr>
</tbody>
</table>
weather. The temperature during this season is uniformly high in the beginning of October but by November it begins to decrease more sharply and a cool weather sets in by December with temperature around 13.0°C.

**Vegetation:**

The Aligarh districts lies in the subtropical belt having deciduous type of vegetation. This district was once covered by dhak jungles which have been cleared for cultivation purpose. A certain amount of dhak jungles however are still found scattered in patches in the clayey and usar tracts. In the khaddar of Ganga, there is a considerable extent of tamarisk, an evergreen shrub on the more recent alluvium of the rivers. In the khaddar of Yamuna, there is a narrow belt of tamarisk which is followed by broad stretches of waste covered with that clung grass. The eastern, part of the district has more trees than the western part.

**Soil:**

The typical saucepan topography of Aligarh district has greatly helped in determining the character of soil. The soil of Aligarh district is alluvial (both old and new alluvium is found). The alluvium brought by the river Ganga spreads over about three fourth of the total area, while the alluvium brought by the river Yamuna spreads over about one fourth of the total area of the district. The new alluvium is confined to the flood plains of the rivers and their tributaries while the old alluvium is found in the level plain above the flood level of the main rivers and their tributaries. From the east of the river Ganga, the soil varies from sandy to sandy loam and clayey loam up to middle of the district. Further westwards there is again the
sandy loam tract which finally merges into the sandy bed of the river Yamuna.

**Geological Classification of Soil:**

The soils have been divided into two broad geological divisions.

1. Old alluvium or bhangar soil
2. New alluvium or khaddar soil

**1. Bhangar Soil:**

The Bhangar lands are found above the flood level of the main rivers and their tributaries. The most important material in bhangar lands is day, which at places becomes loam or sandy loam. In the clayey part of the alluvium, irregular kankar (nodules of calcium carbonate of various shapes and sizes) are formed due to transformation of calcareous materials of alluvial deposits into lumps or nodules. In areas where there is no proper surface drainage these salts keep on accumulating by leaching from the neighbouring regions. During the dry season, the soluble salts are sucked up in solution to the surface by capillary action and are deposited in the form of white efflorescence. In many parts of the district the slope of land is less than 20 cm to a kilometre and in some places there is complete lack of drainage, causing deposition of salts on the surface in the form of 'Reh'.

**2. Khaddar Soil:**

Khaddar lands are confined to the tracts and the flood plains of the rivers and their tributaries. They are formed by the main channels which are confined to well defined valley and the flood level of the water remains below the general level of the country side. The low level of the khaddar is in
conformity with the principal that as a river gets older, more and more of its deposits are found to be of a younger age and the bed of river sinks lower and so these younger deposits occupy lower levels than those occupied by earlier deposits. Khaddar lands are light coloured and poor in calcareous matter and are composed chiefly of sand, silt, mud and clay. They are generally free from kankar deposits.