AREA OF STUDY
Chapter – 2

AREA OF STUDY

Perched securely among the Himalayas at an average height of about 1600 m, between the coordinates 33.20° to 34.54° N and 73.55° to 75.35° E, lies the Valley of Kashmir, approximately 135 km in length and 32-40 km in breadth. Wedged between Afghanistan and North West Frontier Province of Pakistan in the west and the north-west, Turkmenistan and China in the north and Tibet in the east, as it is, Kashmir is strategically located from the phytogeographical point of view representing the floristic gateway to the West Asian, Mediterranean and Central Asian elements in the Flora of India.

PHYSIOGRAPHY

Kashmir (Map-I) consists of three huge mountain masses- the Karakoram Range in the far north, the Himalaya, north of the Valley and the Pir Panjal in the south, the last two flanking the Valley of Kashmir.

Mountains, Lakes and Karewas:

Kashmir is a combination of the mighty splendour of mountains, of lovely glades and forests. North, east and west, range after range of mountains guard the Valley from the outside world, while on the south it is cut off from the rest of India by rocky barriers 80-120 km in width. The mountain ranges rising to a height of 5500 m on the north-east, dip down to something over 2750 m in the south, where the Banihal Pass (2440 m) affords an exit from the Valley. The whole sweep of towering ranges opens up through the Pir Panjal with peaks rising over 4570 m in the south-west of the Country. The natural surroundings of Kashmir unfold themselves on the journey through both the Banihal and the Jhelum Valley Roads.
The River Jhelum meanders its steady course into the heart of Srinagar City, and onwards, until it rushes headlong through the frowning gorges and dashing against boulders joins the Arabian Sea through the Plains of Punjab.

On the Panjal Range, there are a few remarkable peaks, viz. the three peaks round the Kaunsar Nag (3900 m), Tratakoti (4730 m), the highest on this range, and Romesh Thong also called as Sunset Peak. Banihal (3000 m) lies at the south-eastern extremity of the Pir Panjal Range above Verinag. East of Banihal lie the snowy peaks of Vishnupad (4400 m).

From Pir Panjal Range further north, between Kashmir and Poonch, lie the open grassy highlands of Tosa Maidan (3500 m). Further north-west is the Kazi Nag Range. It stands 3695 m high and is snow-covered with slopes coated with dense forests. The towering peak of Nanga Parbat (8126 m) stands as a sentinel, guarding, as it were, the Valley on this side. Far away from here are seen the Karakoram Ranges also known as Mustagh, with some of its peaks rising over 7620 m and among them the world-famous K-2 (8611 m), the second highest in the world, stands out boldly in its mountain glory. Between Kashmir Valley and Ladakh, there is a lofty range of mountains, i.e. between Sonamarg and Dras lies Zoji La (3430 m), in Suru Valley lies Nun Kun (7010 m) and north of Pahalgam lies Lidderwatt (3500 m). On the south of the Valley, the peaks of Amarnath (east of Pahalgam) and Kolahoi (Gwash Brari) (west of Lidderwatt) springing from the same massif are found prominent. Amarnath stands 4500 m and Kolahoi 4300 m high.

To the east of the Valley stands the noble, snow-clad peak of Harmukh (5150 m) with the famous Gangabal Lake in its lap. The eastern region of Srinagar City is bound by Himalayan ranges, the important peaks of which are Zabarwan and Shankaracharya. At the foot of these peaks are situated the famous Mughal Gardens- Cheshma-Shahi (2000 m), Nishat (1900 m), Shalimar (1900 m) and Harwan (2000 m). Another remarkable peak in the east seen all over the City is Mahadev (4500 m), which lies above Dachigam.

For its fresh-water lakes and tarns, Kashmir is known the world over. Those lying in the Valley against the charming mountain background are the Wular Lake, the Dal Lake and the Manasbal Lake. The Wular is the largest fresh-water lake in
India and according to some, perhaps in Asia too. It is 195 km long and 8 km broad. It lies to the north-east of the Valley with mountains overlooking it. The Dal Lake lies on the suburbs of Srinagar in the east. It is at the foot of the mountain range. The lake is 18 km long and 6 km broad. The Lake Manasbal, with its greenish-blue waters, is the deepest lake in the Country.

Besides these lakes, which are fed by the melting snows from the mountains, there are hosts of mountain tarns formed by glacial action and other phenomenal activities of range nature. There are several glaciers on Harmukh. On the south side, they only descend to about 4115 m, but alter the north 460 m lower. They are fed by the large snowfields on the summit, which are of great thickness. The snow cliffs on the middle peak show a vertical thickness of nearly 60 m. In the surrounding valleys, there are lakelets varying in size from mere ponds to sheets of water a mile or so in length and quarter a mile broad; most of these occur at a height of 3500 m. There can be no doubt that they are all in some way due to glacial action, and that they are not of very remote age.

The lakes and lake-lets found in upper valleys around Harmukh Mountain are Gangabal, Lool-Gool and Sarbal. They are at an elevation of nearly 3655 m above sea level. The shimmering waters lend glory to the Gangabal Lake, which stands at an elevation of 3595 m. To the south-east of the Pir Panjal Range lies the Lake Kaunsar Nag (3900 m) surrounded by three peaks. It is fed by glaciers and is said to be a source of the Jhelum. In the spring and summer, the water is some 12 m higher than in winter. In the spring, its surface is covered with icebergs, which are driven about by the wind. In the Lidder Valley, large glaciers are observed. On the mountain range of this Valley, the glaciers are found in Kolahoi. From here to the east on the way to Amarnath Cave, lies the famous Sheesh Nag at an elevation of 4267 m. Glaciers are prominent in this area. In the Valley proper, we find the frozen lake of Alapatar, well over Khillanmarg. The mountain tarn stands at the height of about 3810 m and is 457 m long and 137 m wide. The nearest tarn to the City is that of Harwan on the slopes of Mahadev Mountain about a mile and a half further away from the Mughal Garden- Shalimar. The source of its fresh water is Tarsar, a lake on the Amarnath Mountain. Tarsar and Marsar are the two high altitude lakes situated near Lidderwatt.
Besides the above enumerated lakes and lake-lets, there are scores of tarns and glaciers found in the mountain ranges around the Gurez Valley, Ladakh and Karakorams.

Another remarkable aspect of the physiography of Kashmir is the presence of Karewas, which are extensive elevated, flat-topped plateaus of alluvial or lacustrine material, occupying a great portion of the Valley (Lawrence, 1895). The Karewas are divided from each other, sometimes cut into stripes by ravines generally connecting on to some of the mountains that bound the Valley. Karewas, and their dividing ravines, occupy a width varying from 8-16 miles, along the south-western side of the Valley. The north-western end of the Valley is mostly Karewa ground. On the north-east side of the Valley across the River Jhelum on its right bank, are the spaces of Karewas; in some cases these are in recesses made by retiring hills, in others they project out from spurs. The Karewas adjoining the mountains have their surfaces inclined from the latter with decreasing slopes. On the south-eastern side of the Valley, the Karewas reach upwards to an elevation of about 2000 m (Drew, 1875).

GEOLOGY

The geology of Kashmir displays a chronological record of the great alpine orogeny, including the sedimentations, tectonics and volcanicity that followed the Himalayan orogeny. In addition to exhibiting on its surface the rock specimens belonging to all ages, beginning from Achaean complexes which formed the floor of the Himalayan geosyncline right up to the recent alluvium, the region also displays remnants of glacial deposits at lower altitudes as an evidence to climatic changes in the past. Evidences of dynamic structural deformations like folds, faults, thrusts, nappes and huge igneous intrusions are also discernible (Pithawala, 1953; Wakhaloo, 1964; Raza et al., 1978).

The Valley of Kashmir was formed by folding and faulting as the Himalayan mountain chain was thrust between the Indian Subcontinent and the rest of Asia. The Valley runs north-west to south-east along the strike of the mountain chain and is drained by the River Jhelum, which cuts through the Pir Panjal at the Baramulla gap. The Pir Panjal Ranges south of the Valley comprise mainly the
basaltic lava flows of the Panjal Volcanic (Lower Permian) and also sporadic sediments of agglomeratic slates, Gondwana Beds and Zewan Formation of Permo-Carboniferous Age.

Karewas form conspicuous feature of the geology of Kashmir (Sahni, 1936). The Karewa formations of Kashmir Valley belong to the Pleistocene Ice Age. During the Pleistocene Epoch, the Valley was occupied at times by a lake, known as the Karewa Lake which got filled by the lacustrine sediments and the alluvium deposited by the River Jhelum. Thus, the Valley is now an alluvium-filled basin, a large part of this alluvium being of recent formation by the River Jhelum.

DRAINAGE

The Hindukush Range in the north-west, the Karakoram in the north-east and the Pir Panjal in the south-west, with perpetual snow cover and a large number of glaciers, springs and tarn-lakes form the watershed of the Valley of Kashmir. The major rivers that flow through the Valley of Kashmir are:

Jhelum:

Known as Vyeth in Kashmiri, Vitasta in Sanskrit and Hydaspes in Greek, the River Jhelum originates from a spring (Verinag), near Anantnag at the bottom of a spur of Pir Panjal Range. With its canals and lakes, Jhelum forms the main arterial system of the Valley of Kashmir. The basin of Jhelum in the Valley is like an oval trough between the Great Himalayan and Pir Panjal Ranges. The alluvium, that filled the Valley, has a depth of over 1800 m and has thus resulted in a unique geomorphological feature of the Valley of Kashmir- the lacustrine and fluviatile Karewas.

The river flows north-west through the middle of the Valley and after a winding course, it forms the Wular Lake. It leaves the lake at south-western side near Sopore and flows slowly south-west to the gorge at Baramulla. From this point, the river is more rapid and flows westward to Muzaffarabad, where it sharply turns southward and is joined by the River Kishenganga near Domel.

Vishav:

It is an important tributary of River Jhelum that joins it below Bijbehara. Originating from the Kaunsar Nag Lake, it drains the Kulgam area.
**Lidder:**

It is an important tributary of the River Jhelum with its source in the Sheesh Nag Lake.

**Sukhnag:**

It drains the Gulmarg area of Kashmir Valley.

**Dudganga:**

It flows from Ludurmarg in the Central Pir Panjal, and near Tratakoti Mountains, it divides into two streams, the Sang-Safed and the Yachera. It flows to the south of Srinagar and in the western mountain of Baramulla-Gulmarg area with a number of springs below the Alapatar, Aparwat, Khillanmarg, Gagrimarg, Banilanag and Kantarnag.

**Sind:**

It is an important tributary of Jhelum. Its traditional source is the Gangabal Lake in the Harmukh Mountains. The headwater emerges at Zoji La and the Amarnath Peak in a limestone cave. In its about 96 km course, the Sind drains the loftiest mountains until it joins the Jhelum at Shadipur. Sind feeds the Anchar Lake near Ganderbal.

**Kishenganga:**

The River Kishenganga originates in the Valley of Tilel and Gurez in the mountains of Dras. It passes through Keran, Karnah, Tectwal, Ghor and empties into Jhelum at Domel near Muzaffarabad.

**Indus:**

The River Indus drains the territories of Ladakh, Baltistan and Gilgit. It enters Ladakh from the south-east and flows in the north-westerly direction through a barren land of granites, granulites, gneisses, phyllites and schists. It is joined by the River Zanskar below Leh and others like Shyok, Shigar etc. before it enters the North West Frontier Province of Pakistan after circling the Nanga Parbat at the western-most end of the Great Himalayan Range.

Numerous perennial streams and **Nallahs** (general Kashmiri term for fast moving streams dashing against boulders and making some noise in the process) also traverse through the mountains and plains of Kashmir that add to its glory. Amongst these, the prominent ones are Ningal, Ferozepur, Buniyar etc.
Besides, there are numerous natural lakes, the prominent among them being the Dal, Nigeen, Aanchar, Hokersar, Manasbal, Wular, Kaunsar Nag, Gangabal, Tarsar-Marsar, Sheeshnag, Anantnag etc. (Kashmir); and Pangong, Tso Morari etc. (Ladakh).

**CLIMATE**

The shielded Valley of Kashmir is an exception to its surrounding regions. Characterised by distinct orographic features and snow clad peaks, it resembles the mountainous and continental parts of the temperate latitudes. Thus, the Valley has Continental climate marked by well-defined seasonality. However, there is conspicuous change in the climate with altitude. There is also some yearly change in the climate, making some workers believe that Kashmir has not one but a combination of climates. Meher-Homji (1971) classified the climate of Kashmir as of the Mediterranean type, portending that Srinagar may have several types of climate, viz. uni-, bi-, tri- and quadri-xeric conditions in a year.

**Temperature:**

The mean annual temperature in Kashmir averages 13.3° C. The mean maximum and minimum temperatures between June-September average 30° C and 14.7° C respectively, whereas during December-February it is 6.9° C and -2.1° C respectively. In between, there are two transitional temperature regimes between October-November and March-May, with the mean maximum and minimum temperature averaging 20° C and 2.5° C respectively.

**Rainfall:**

The Valley of Kashmir, receives an average annual rainfall of 650 mm largely as winter (snow) and spring (rain) precipitation. The Valley forms a separate climatic region because of its peculiarities in the variation of temperature, precipitation and humidity. During winters, the cyclonic disturbances from the Mediterranean cross over Iran and Afghanistan, and bring heavy precipitation into the Valley and the surrounding mountains in the form of snow (390.7 mm). January is the coldest month with the temperatures much below the freezing point, but humidity is maximum (88%). The spring period, which lasts from March-May, is
the rainiest season. Summer rains are generally absent, as the Pir Panjal Range in
the south-west of the Valley obstructs the South-Western Monsoon.

The regions of Ladakh, Gilgit and Baltistan receive a very meagre rainfall
averaging about 100 mm annually. July-August and December-March are the two
rainiest seasons in these territories.

SOIL

In Kashmir Valley, the soils are texturally clay-loam to loam and their
nitrogen content is usually high. The soil under deodar forests is brown (Dhir,
1980).

Larger expanses of Alluvial Soils occur in the plains of the Valley of
Kashmir, which are medium to heavy in texture, moderate to high in fertility and
often saline in its composition.

The Brown Hill Soils composed of sandstones, grey micaceous sandstones
and shells are encountered in the northern valleys of Kashmir.

The Podsolic Soils are found in the temperate regions of Kashmir. This soil
is largely derived from soft and hard sandstones and shells, is medium to heavy in
texture with poor moisture retention capacity.

The Mountain Meadow Soils are encountered in the temperate zone of
some inner Himalayan valleys like Gulmarg, Khillanmarg, Apharwat, Pahalgam
etc. These are of moderate or shallow depth and vary in texture from light to simple
mixed weathered rock fragments, gravels and pebbles, with sandstone and shells
being the chief parent material.

PTERIDOPHYTIC FLORISTIC REGIONS

The overall distribution of plants is determined by a complex interplay of
many factors, of which the most obvious are historic, topographic, edaphic and
climatic ones. It is very probable that each of these factors can be broken into many
separate components, and these components combine in different ways to have an
overall influence on the distribution of different species. Although pteridophytes are
probably influenced by many of the same general environmental factors as are
flowering plants, there are probably components of these factors which ferns and fem-allies are especially susceptible to.

At higher elevations (1200-3600 m), where the conditions are more favourable for fern growth because of the thick humus layer covering the soil surface, presence of sufficient moisture and optimum density of shade, the ferns grow gregariously. However, their intensity, both in number of species and individuals, goes on decreasing westwards. The fern flora of Kashmir Valley is of particular interest in that it differs from the rest of the Himalayas and shows some resemblance with the European elements (Dhir, 1980).

Kashmir on the basis of characteristic pteridophytic vegetation can be divided into the following floristic regions:

**The Plains:**

The abundance of perennial streams and Nallahs throughout the plains of Kashmir, lends moisture to the adjacent soil, and consequently these places are the hotspots of ferns and fem-allies. *Dryopteris spp.*, *Adiantum capillus-veneris*, *Pseudophegopteris levingei* etc. are found in abundance near these watercourses.

**The Mountainous Region:**

The fern flora of mountains is luxuriant due to greater atmospheric moisture, frequent fog and clouds than in the lowlands. Also the streams and rivulets are numerous, affording ideal sites along their banks for growth (Dhir, 1980). The mountains of Kashmir with their tarns and glaciers constitute the habitat of many fern species, which do not thrive in the lowland areas. Majority of the species of such habitats belong to the genera *Pteris*, *Dryopteris*, *Athyrium*, *Polystichum* etc.

**The Lakes:**

Species of *Azolla* and *Salvinia* have assumed greater dimensions in recent years in the lakes and ponds of Kashmir, which have immensely contributed to their eutrophication, including the world famous Dal and Nigeen Lakes. *Marsilea sp.* thrives throughout stagnant waters of paddy fields and ponds in the plains.

**The Forest Floors:**

Because of the shade loving nature of most ferns, the forest floors afford an ideal habitat for taxa like *Ophioglossum sp.*, *Adiantum spp.*, *Athyrium spp.* etc.
The Mountain Meadows:

Kashmir is a land of meadows. Mountain meadows like Gulmarg, Khillanmarg, Sonamarg, Yusmarg, Tosa Maidan etc. harbour ferns like Osmunda claytoniana, Polystichum spp., Athyrium spp. etc. At higher elevations near Khillanmarg (3300 m), Osmunda claytoniana forms bright green patches among stones. The shining but interrupted green colour, due to the presence of fertile brown pinnae in the centre, makes it quite attractive. Again these meadows border some high altitude lakes or springs (e.g. Alapatar), which harbour taxa like Botrychium lunaria etc.

River Valleys and Nallahs:

The banks of river valleys and Nallahs harbour rich variety of ferns. Species of Athyrium form beautiful baskets along the Lidder Valley of Pahalgam. Polystichum spp. have also been reported in the same locality. Pseudophegopteris levingei forms dense beds in between big boulders under the shade of conifers in Ferozepur Nallah, Tangmarg.

The Karewas and the Ridge:

The alkaline nature of the Karewa soils provide shelter to ferns like Adiantum capillus-veneris, Asplenium trichomanes, Dryopteris spp., Pteris sp. etc.

Fossil Pteridophytes: Spores representing pteridophytic groups have been described from Middle and Upper Cambrian of Kashmir (Ghosh and Bose, 1950).

In case of lycopods, mega fossils are rare in occurrence and the oldest record is from the Lower Permian Beds of Zewan Spur, Kashmir (Kapoor 1969; Srivastava and Kapoor, 1969). These are poorly preserved, fragmentary specimens of leaves, stems (Lepidodendron?) and cones (Lepidostrobus kashmirensis Sriv. et Kapoor).
### Table 2 (I): Meteorological Data for Gulmarg (Year: 2003-2004)

**Station:** Gulmarg  
**District:** Baramulla

<table>
<thead>
<tr>
<th>Month</th>
<th>Mean Max. Temperature (°C)</th>
<th>Mean Min. Temperature (°C)</th>
<th>Mean R. H.* at 0830 Hrs. I. S. T. (%)</th>
<th>Mean R. H.* at 1730 Hrs. I. S. T. (%)</th>
<th>Total Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year: 2003</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>-0.7</td>
<td>-5.4</td>
<td>56</td>
<td>53</td>
<td>37.3</td>
</tr>
<tr>
<td>February</td>
<td>-1.4</td>
<td>-5.3</td>
<td>77</td>
<td>74</td>
<td>190.4</td>
</tr>
<tr>
<td>March</td>
<td>2.7</td>
<td>-2.7</td>
<td>78</td>
<td>71</td>
<td>230.8</td>
</tr>
<tr>
<td>April</td>
<td>7.6</td>
<td>1.7</td>
<td>76</td>
<td>64</td>
<td>226.0</td>
</tr>
<tr>
<td>May</td>
<td>13.7</td>
<td>3.8</td>
<td>67</td>
<td>62</td>
<td>207.1</td>
</tr>
<tr>
<td>June</td>
<td>21.4</td>
<td>10.0</td>
<td>66</td>
<td>57</td>
<td>37.6</td>
</tr>
<tr>
<td>July</td>
<td>22.6</td>
<td>12.5</td>
<td>82</td>
<td>73</td>
<td>24.5</td>
</tr>
<tr>
<td>August</td>
<td>21.1</td>
<td>11.5</td>
<td>81</td>
<td>71</td>
<td>34.1</td>
</tr>
<tr>
<td>September</td>
<td>18.9</td>
<td>8.7</td>
<td>80</td>
<td>72</td>
<td>113.1</td>
</tr>
<tr>
<td>October</td>
<td>16.4</td>
<td>3.9</td>
<td>62</td>
<td>58</td>
<td>13.9</td>
</tr>
<tr>
<td>November</td>
<td>9.3</td>
<td>-1.5</td>
<td>62</td>
<td>61</td>
<td>20.7</td>
</tr>
<tr>
<td>December</td>
<td>3.6</td>
<td>-4.9</td>
<td>81</td>
<td>77</td>
<td>78.1</td>
</tr>
<tr>
<td><strong>Year: 2004</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>1.0</td>
<td>-6.9</td>
<td>89</td>
<td>84</td>
<td>162.3</td>
</tr>
<tr>
<td>February</td>
<td>3.7</td>
<td>-5.2</td>
<td>75</td>
<td>68</td>
<td>82.6</td>
</tr>
<tr>
<td>March</td>
<td>11.8</td>
<td>1.5</td>
<td>63</td>
<td>50</td>
<td>27.7</td>
</tr>
<tr>
<td>April</td>
<td>12.0</td>
<td>3.8</td>
<td>79</td>
<td>76</td>
<td>206.8</td>
</tr>
<tr>
<td>May</td>
<td>16.4</td>
<td>6.5</td>
<td>68</td>
<td>61</td>
<td>154.3</td>
</tr>
<tr>
<td>June</td>
<td>18.8</td>
<td>8.7</td>
<td>75</td>
<td>72</td>
<td>96.6</td>
</tr>
<tr>
<td>July</td>
<td>20.5</td>
<td>10.6</td>
<td>75</td>
<td>69</td>
<td>57.7</td>
</tr>
<tr>
<td>August</td>
<td>21.1</td>
<td>10.5</td>
<td>76</td>
<td>70</td>
<td>51.6</td>
</tr>
<tr>
<td>September</td>
<td>20.6</td>
<td>8.9</td>
<td>68</td>
<td>54</td>
<td>22.2</td>
</tr>
<tr>
<td>October</td>
<td>12.0</td>
<td>2.3</td>
<td>73</td>
<td>67</td>
<td>89.4</td>
</tr>
<tr>
<td>November</td>
<td>10.2</td>
<td>-0.6</td>
<td>60</td>
<td>55</td>
<td>46.0</td>
</tr>
<tr>
<td>December</td>
<td>4.9</td>
<td>-4.8</td>
<td>74</td>
<td>72</td>
<td>60.4</td>
</tr>
</tbody>
</table>

*Source:* Indian Meteorological Department, Centre Srinagar.

R. H. = Relative Humidity.
Table - 2 (II): Meteorological Data for Srinagar (Year: 2005).

**Station:** Srinagar

<table>
<thead>
<tr>
<th>Month</th>
<th>Mean Max. Temperature (° C)</th>
<th>Mean Min. Temperature (° C)</th>
<th>Mean R. H.* at 0830 Hrs. I. S. T. (%)</th>
<th>Mean R. H.* at 1730 Hrs. I. S. T. (%)</th>
<th>Total Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>7.5</td>
<td>-0.3</td>
<td>89</td>
<td>67</td>
<td>85.6</td>
</tr>
<tr>
<td>February</td>
<td>6.5</td>
<td>0.7</td>
<td>91</td>
<td>78</td>
<td>188.5</td>
</tr>
<tr>
<td>March</td>
<td>14.7</td>
<td>5.3</td>
<td>81</td>
<td>61</td>
<td>104.8</td>
</tr>
<tr>
<td>April</td>
<td>20.7</td>
<td>7.1</td>
<td>62</td>
<td>41</td>
<td>48.1</td>
</tr>
<tr>
<td>May</td>
<td>21.8</td>
<td>9.9</td>
<td>75</td>
<td>58</td>
<td>63.6</td>
</tr>
<tr>
<td>June</td>
<td>29.3</td>
<td>14.4</td>
<td>64</td>
<td>44</td>
<td>8.3</td>
</tr>
<tr>
<td>July</td>
<td>28.9</td>
<td>18.0</td>
<td>77</td>
<td>60</td>
<td>115.5</td>
</tr>
<tr>
<td>August</td>
<td>30.4</td>
<td>16.9</td>
<td>72</td>
<td>50</td>
<td>15.6</td>
</tr>
<tr>
<td>September</td>
<td>29.3</td>
<td>13.7</td>
<td>74</td>
<td>50</td>
<td>16.8</td>
</tr>
<tr>
<td>October</td>
<td>22.7</td>
<td>5.8</td>
<td>80</td>
<td>56</td>
<td>18.6</td>
</tr>
<tr>
<td>November</td>
<td>15.8</td>
<td>-0.2</td>
<td>82</td>
<td>56</td>
<td>14.4</td>
</tr>
<tr>
<td>December</td>
<td>9.9</td>
<td>-3.3</td>
<td>89</td>
<td>64</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Source:** Indian Meteorological Department, Centre Srinagar.

R. H. = Relative Humidity.
PLATES
(Landscape)
PLATE - 1

I. Sunset view of Apharwat.

II. Khillanmarg Alpine Meadows.
PLATE – 2

I. Nallah Ningal descending from the Alapatar Lake.

II. Alama Iqbal Library, University of Kashmir, Srinagar.
PLATE – 3

I. A view of Kishenganga Valley, Gurez.

II. Rajdhan Alpine Meadows, enroute Gurez.
PLATE – 4

I. A retreating glacier, enroute Zanskar, Ladakh.

II. A view of Zanskar Valley, Ladakh.