

# INDIA WEATHER REVIEW, 1934.

## ANNUAL SUMMARY.

### PART B. SNOWFALL.

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This part contains a summary of the reports of snowfall in the mountain regions to the north and north-west of India. These reports are collected by the local officers from the local residents, headmen of villages or from travellers who have passed through the region and are then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground and such measurements are given in feet and inches. At places provided with raingauges the amount of snow collected in the gauge is melted and measured as rain and the amounts are given in inches and decimals of an inch.

#### Cold weather period, January and February.

##### I.—AFGHANISTAN.

*Kabul.*—February was comparatively warm and snow on the mountains near Kabul melted. The snowfall of the season has been much less than last year and the year before.

##### II.—BALUCHISTAN.

*Quetta.*—Snow fell on 4 days in January and on one day in February. The equivalent amounts of rain for these months were 0.84" and 0.12" respectively. Snowfall was markedly below normal during the period.

##### III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara.*—Snow fell on 16 days in January and on 4 days in February. The amounts were above normal in the former month and below it in the latter. Snow descended to an elevation of 4,000 ft. in January and 7,000 ft. in February. The following table gives the falls and accumulations recorded on the various hill tops at the end of each month :—

Locality.	JANUARY.		FEBRUARY.	
	Falls.	Accumulations.	Falls.	Accumulations.
	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Narang . . . . .	7 4	3 6	1 5	2 0
Phudran . . . . .	5 2	3 0	0 10	1 6
Kagan . . . . .	4 3	1 6	0 2	..
Jared . . . . .	2 5	0 6	0 2	..
Malakandi . . . . .	2 7	0 6	0 0	..
Sundigali . . . . .	5 9	1 0	0 7	..
Jachha . . . . .	5 2	..	0 6	..
Thandiani . . . . .	8 0	3 0	0 3½	1 0
Dungagali . . . . .	3 0	9 ½	0 3	0 9
Birangali . . . . .	8 0	1 6	0 0	..

The accumulations at the end of the season were below normal.

(b) *Dir, Swat and Chitral.*—At Drosh several falls were reported during the period under report. The heaviest fall which gave 13" of snow was recorded on the 27th January.

(c) *Khyber Agency.*—Light falls of snow were observed on the surrounding peaks during January and February. The snowfall was below normal.

(d) *Kohat.*—Fort Lockhart had about 7" of snow in January and none in February.

(e) *North Waziristan.*—At Razmak 7" of snow fell in January.

##### IV.—KASHMIR.

(a) *Skardu.*—Snow fell at the station and on the neighbouring peaks on 5 days in January and on 4 days in February. The total falls were below normal. The depths of the accumulations on the surrounding peaks and passes were about 5 ft. at the end of January and about 6 ft. at the end of February, and were about normal for the season.

(b) *Dras.*—Snowfalls and snowstorms were frequent during the period under report. The snowline descended as far as the populated villages. Accumulations on Zojila and Mushkoo passes were about 7 ft. in January and about 10 ft. in February and were about normal.

(c) *Srinagar.*—The first fall amounting to about ½" of equivalent rain was recorded on the 2nd January on the main valley and was followed by several moderate or light falls during the month, the total precipitation being normal. Accumulations at the end of January were also normal. In February three light falls of snow were recorded, the total precipitation being below normal. Accumulations on Pir Panjal and Harmukh ranges were moderate.

(d) *Kargil.*—Snow fell on 12 days in January and 9 days in February, the total amounts of equivalent rain being 1.05" and 0.59" respectively. The falls were less than normal.

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## V.—PUNJAB.

(a) *Rawalpindi*.—Nine falls of snow were reported from Murree and the surrounding peaks in January. The snow-line descended to a height of about 5,500 ft.

(b) *Kulu (Kangra District)*.—In the Kangra district no snow fell during the season except on the high ranges of the Himalayas. In the Kulu sub-division falls were confined to elevations above 4,000 ft. in January and above 5,000 ft. in February. The falls were normal in January and below it in February.

(c) *Kilba (Simla District)*.—There were four falls of snow in January at heights over 7,000 ft. In February snow fell on three days at elevations above 7,500 ft. Peaks and passes were heavily covered with snow and were inaccessible. The approximate depths of accumulations estimated at the various localities were as follows :—

Locality.	At the end of January.	At the end of February.
	Ft.	Ft.
Rupan Pass . . . . .	22	23
Buran Pass . . . . .	25	29
Charang Pass . . . . .	17	19
Shatul Pass . . . . .	20	21

The accumulations were above normal.

**The Hot Weather period, March to May.**

## I.—AFGHANISTAN.

*Kabul*.—During thunderstorms snow fell down to about the 9,000 ft. level in May, but passes over the Hindu-Kush are reported to be open and snow lay in small quantities on the lower levels.

## II.—BALUCHISTAN.

*Quetta*.—Slight snow fell on one day in March at Quetta and a few falls occurred in the first half of the month on the surrounding hills. Snow melted away very early in the season, there being hardly any snow left on the peaks at the end of March.

## III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—There were two moderate falls of snow in March. Accumulations of snow at the end of the period on the surrounding peaks and passes were below normal.

(b) *Dir, Swat and Chitral*.—From one to nine feet of snowfall was observed during May on the Lowari pass and its vicinity. Accumulations of snow on the higher regions near Drosh were about 2 to 5 feet.

## VI.—UNITED PROVINCES.

(a) *Almora*.—The following tables give the amounts of falls and accumulations at the end of each month :—

## ACTUAL FALLS.

Locality.	January.	February.
	Ft. in.	Ft. in.
Malla Johar . . . . .	1 2	3 0
Malla Darma . . . . .	0 11	8 0
Malla Danpur . . . . .	4 0	5 0
Chaudans . . . . .	..	3 0

## ACCUMULATIONS.

Locality.	January.	February.
	Ft.	Ft.
Milam . . . . .	12	..
Nuwe Pass . . . . .	21	21

The accumulations were about the average at the end of the period.

(b) *Garhwal*.—No reports were received.

## VII.—ASSAM.

(a) *Kamrup*.—Falls and accumulations during the period were normal.

(b) *Sadiya Frontier Tract*.—Heavy snow fell in February, the snowline descending to 6,000 ft.

(c) *Baliapara Frontier Tract*.—The falls of snow on the high passes were less than the normal.

(c) *Khyber Agency*.—Light snow fell on the surrounding peaks in March. There was less snow than usual on the Safed Koh range.

(d) *Kohat*.—On Fort Lockhart about an inch of snow fell in March. No falls occurred during the rest of the period.

(e) *Kurram*.—Parachinar had one fall during the period. Accumulations on the high peaks of Safed Koh were less than those of the previous year.

(f) *North Waziristan*.—A little snow fell at Razmak in March. No falls were reported during the remaining period. Snow melted away by the end of April.

(g) *South Waziristan*.—No snow fell at Wano. Accumulations of snow at the end of the period were less than normal.

(h) *Dera Ismail Khan*.—Snowfall was normal. Snow disappeared from the Takht-i-Suleman before the end of April.

## IV.—KASHMIR.

(a) *Skardu*.—On the neighbouring peaks and passes two falls occurred in each of the months March and April and

four in May. Accumulations at the end of the season were above normal. Snowline descended to a height of about 9,000 ft. in March and April and to 9,500 ft. in May.

(b) *Dras*.—Frequent snowstorms giving about 2" to 3" of snowfall occurred during March, April and May on the passes and neighbouring mountains. The snowfall was below normal in March and above it in April and May. Accumulations were about 6 ft. on the Zojila and Mushkoo passes throughout the period, and were below normal.

(c) *Srinagar*.—Several light to moderate falls were observed in all the three months on the neighbouring mountains, but no fresh fall occurred in the main valley. The falls were below normal in March and April and above it in May. Accumulations of snow were moderate in March and April. Snow accumulations on Harmukh and Pir Panjal mountain ranges were visible from Srinagar, and were reported to be a few feet deep.

(d) *Kargil*.—Snow fell on 4 days in March and on one day in May. Each time the snow reached the level of Kargil. The equivalent amount of rain was 0.30" in March and 0.03" in May. No information was received regarding April. Snowfall was on the whole below the average during the period. Accumulations at the end of the period on well-known passes were about 1 ft. and were below normal.

(e) *Sonamarg*.—Snow accumulations at the end of May on peaks and passes were less than those of the previous year.

(f) *Leh*.—Towards the end of May passes to the north were snowbound as usual, snow lying on the mountains down to about 14,000 ft. Accumulations at the end of the period were normal.

#### V.—PUNJAB.

(a) *Rawalpindi*.—Two light falls were reported from Murree and neighbouring peaks in March. Before the end of the month all the snow melted away.

(b) *Chamba*.—In May there were occasional falls of snow on elevations above 11,000 ft. and rain and hailstorms below that height. Accumulations of snow at the end of the period varied from 8 to 12 ft. on the well-known passes, and were above the average.

(c) *Kulu (Kangra District)*.—In the Kangra district there were no falls during the season except on the high ranges of the Himalayas. In the Kulu sub-division falls were confined to elevations above 9,000 ft. The accumulations

### South-West Monsoon Period, June-September.

#### JUNE AND JULY.

##### I.—AFGHANISTAN.

*Kabul*.—There was no snowfall during the season. There was no snow on the Paghman and Safed Koh mountains except in sheltered places. The snow on the Hindu-Kush was less than normal.

##### II.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—Elevations from 10,000 to 17,500 ft. had falls of snow ranging from  $\frac{1}{2}$ " to 6" during the season. The accumulations ranged from 1 to 5 ft. at the end of the season.

at the end of the season in Rohtang and Hampta passes were 3 ft. and 4 ft. respectively and were below normal.

(d) *Kilba (Simla District)*.—Snow mixed with rain fell on 3 days in March down to elevations of 8,000 ft. In each of the other two months of the period under report snow fell only on one day and came down to 8,000 ft. in April and to 10,000 ft. in May. Falls were below normal throughout the period. Accumulations of snow could not be ascertained as all the peaks and passes were covered with snow and hence closed for traffic.

#### VI.—UNITED PROVINCES.

(a) *Almorah*.—The following table gives the approximate amounts of falls at the end of each month as reported by the Patwaris :—

ACTUAL FALLS.

Locality.	March.	April.	May.
	Ft. in.	Ft. in.	Ft. in.
Malla Darma . . . .	9 0	4 0	..
Chaudans . . . .	6 8	1 6	2 9
Malla Danpur . . . .	4 0	10 0	3 0
Malla Johar . . . .	4 0	3 0	1 9

The accumulations in the Nuwe Pass at the end of March, April and May were respectively 21 ft., 15 ft. and 14 ft. and were slightly below the average.

(b) *Garhwal*.—Snowfall during the period and the accumulations at the end of May were reported to be far below normal.

#### VII.—ASSAM.

(a) *Kamrup*.—Falls and accumulations at the end of March were normal. Reports for April and May were not received.

(b) *Sadiya Frontier Tract*.—No snowfall occurred in March and April. Report for May was not received.

(c) *Baliapara Frontier Tract*.—In March and April the falls of snow on the higher passes were less than usual. No information was received for May. The accumulations at the end of April were about 1 ft. on the Piri La and Jhum La passes.

(b) *Dir, Swat and Chitral*.—No snowfall was reported in this locality during the period. There were, however, abnormal accumulations of snow in the mountain ranges and passes of Chitral.

(c) *Khyber Agency*.—In the neighbourhood of Tirah no snowfall was reported. As usual, snow existed on the tops of Gurdama, Adina and Malaka peaks.

(d) *Kurram*.—No falls were reported. The accumulations on the well-known peaks of Safed Koh at the end of July were less than those of the previous year.

(e) *South Waziristan*.—No snow fell in this locality during the period. There was no accumulation of snow on any of the mountain ranges or passes at the end of July.

III.—KASHMIR.

(a) *Skardu*.—Two fresh falls of snow were reported in July. These were confined to elevations above 11,000 ft. No snow existed on the peaks and passes at the end of the period.

(b) *Dras*.—Four falls occurred on the Zojila and Mushkoo passes in June and one fall in July. They were below normal. The depths of accumulations at the end of June and July on the Zojila and Mushkoo passes measured about 3½ ft. and 2½ ft. respectively and they were above normal.

(c) *Srinagar*.—Fresh light falls of snow occurred on the surrounding high mountain ranges during the first week of June, but none in July. Accumulations of snow were normal at the end of June and below normal at the end of July.

(d) *Gulmarg*.—Several fresh light falls of snow occurred in the surrounding mountains during the first half of June but none in July. The falls were reported to be below normal. Very thin accumulations of snow existed on some of the high peaks of the Afarwat range at the end of the period.

(e) *Sonamarg*.—No snow fell during the season. About one foot of snow existed on the Zojila and the Dachhinpora passes at the end of the period.

(f) *Gurez*.—No snow fell during the months. Accumulations on the Burzil pass were about 5 ft. at the end of July and were above normal due to unusual snowfalls during April and May.

(g) *Leh*.—No snowfall occurred during the season under report. All passes were open.

IV.—PUNJAB.

(a) *Chamba*.—Snow fell only on one day in the beginning of June and descended to an elevation of 12,000 ft. Accumulations of snow existed above 12,000 ft. and were below those of the previous year.

(b) *Kulu (Kangra District)*.—Slight falls occurred above 17,000 ft. in July. Accumulations at the end of the period were less than usual.

(c) *Kilba (Simla District)*.—No snow fell during the period. The estimated approximate accumulations on the well-known passes at the end of June and July are given in the following table :—

Locality.	DEPTH OF ACCUMULATION AT THE END OF	
	June.	July.
	Ft.	Ft.
Rupin Pass . . . . .	8	5
Buran Pass . . . . .	12	9
Shatul Pass . . . . .	8	7
Charang Pass . . . . .	7	5

The accumulations for each month were on the whole above normal.

V.—UNITED PROVINCES.

(a) *Almorah*.—The following tables give the amounts of falls and accumulations at the end of each month :—

ACTUALS FALLS.

Locality.	June.	July.
	Ft. in.	Ft. in.
Malla Johar . . . . .	1 3	0 3
Malla Danpur . . . . .	5 0	..
Chaudans . . . . .	..	3 0

ACCUMULATIONS.

Locality.	June.	July.
	Ft.	Ft.
Nuwe Pass . . . . .	21	..
Lipu Pass . . . . .	..	3
Binkura Pass . . . . .	..	4

The accumulation at the end of the season was about the average.

(b) *Garhwal*.—There was about 1½ ft. of snowfall on the lower valleys and about 3 ft. on the higher ones in both the months. Falls and accumulations were above normal.

VI.—ASSAM.

No reports were received.

AUGUST AND SEPTEMBER.

I.—AFGHANISTAN.

No reports were received.

II.—BALUCHISTAN.

No reports were received.

III.—NORTH-WEST FRONTIER PROVINCE.

*Drosh*.—Five light falls of snow were reported in September above 14,000 ft.

*Kurram*.—No snowfall occurred during the period, the precipitation being in the form of hail.

## IV.—KASHMIR.

(a) *Skardu*.—Four falls were reported in August and five in September at elevations above 10,000 ft. The falls were below the average in August and above it in September. Accumulations on the surrounding peaks at the end of the season were above normal.

(b) *Dras*.—Snow fell on 8 days in August and on 2 days in September on the Zojila and the Mushkoo passes. The accumulations were 2 ft. in August and one foot in September and were above normal.

(c) *Srinagar*.—There was one day of snowfall on the peaks of the Pir Panjal in each of the months August and September. No information is available except that snow is visible on peaks and gorges on the Pir Panjal mountain ranges at the end of the season.

(d) *Gulmarg*.—Snow fell on one day in each of the months August and September (*viz.*, 20th August and 26th September) on the Afarwat range. The fall was below normal in August and above it in September. Accumulations at the end of the season on the high peaks of the Afarwat range were normal.

## V.—PUNJAB.

*Kilba (Simla District)*.—The falls of the period were below normal.

*The retreating monsoon period, October to December.*

## I.—AFGHANISTAN.

*Kabul*.—A fresh light fall of snow occurred on the 27th October on the Hindu-Kush range and was followed by another fall on the 30th on the Paghman hills. Snow fell six times in November and once in December. The snowfall for the season was above normal.

## II.—BALUCHISTAN.

*Quetta*.—Light snow fell once in November and 5 times in December, on some of the higher peaks in the district. Two to four feet of accumulations existed on the higher peaks at the end of December. The snowfall of the season was about normal.

## III.—NORTH-WEST FRONTIER PROVINCE.

(a) *Hazara*.—Snow fell on 15 days in December and was above the average. The following table gives the falls and accumulations of snow at the end of December :—

Locality.	Falls.	Depth of accumulation.
	Ft. in.	Ft. in.
Narang . . . . .	6 10	3 8
Paludran . . . . .	5 9	3 0

## VI.—UNITED PROVINCES.

*Almorah*.—The following tables give the amounts of falls and accumulations at the end of each month :—

## ACTUAL FALLS.

Locality.	August.	September.
	Ft.	Ft.
Malla Darma . . . . .	9	..
Chaudans . . . . .	6	3
Malla Danpur . . . . .	8	3
Malla Johar . . . . .	7	3

The falls were above normal for the season.

## ACCUMULATIONS.

Locality.	August.	September.
	Ft.	Ft.
Nuwe Pass . . . . .	7	..
Binkura Pass . . . . .	5	7½
Milam . . . . .	..	½

The accumulation at the end of the season was below the average.

III.—NORTH-WEST FRONTIER PROVINCE—*contd.*

Locality.	Falls.	Depth of accumulation.
	Ft. in.	Ft. in.
Kagan . . . . .	4 0	2 2
Jared . . . . .	1 0	..
Malkandi . . . . .	1 9	..
Sundigali . . . . .	9 10	2 4
Jachha . . . . .	8 5	2 0
Thandiani . . . . .	7 5	4 6
Dungagali . . . . .	5 7	5 7
Birangali . . . . .	1 4	1 3

The accumulations at the end of the season were above normal.

(b) *Dir, Swat and Chitral*.—Drosh reported 4 falls of snow in October, 3 in November and 7 in December. The falls were confined to elevations generally above 8,000 ft.

(c) *Khyber*.—No snow fell in the months of November and December.

(d) *Kurram*.—Snow fell on 4 days in November and on several days in December. The accumulations on the peaks of the *Safed Koh* at the end of the period were above normal.

(e) *Kohat*.—No snow fell in November. Fort Lockhart had 8½" of snow in December.

(f) *South Waziristan*.—Towards the end of November snow fell to the north and northwest of Wana. There was again a light fall on the 13th December followed by a heavy one on the 16th on the hills above 7,000 ft.

IV.—KASHMIR.

(a) *Skardu*.—Snowfall was observed on the surrounding hills generally above 10,000 ft. on 2 days in October, on 7 days in November and on 5 days in December. The accumulations on the higher peaks at the end of the period were about normal.

(b) *Dras*.—No snow fell in October. December witnessed several falls of snow. Accumulations on the *Zojila* and *Mushkoo* passes amounted to 7 ft. at the end of December and were normal.

(c) *Srinagar*.—Three light falls of snow were reported in October, while several light to moderate falls occurred in November and December. The falls were normal during the season. Snow accumulations on the surrounding mountains were normal at the end of the period.

(d) *Kargil*.—Snow fell on one day in October and on 7 days in December, the total for the latter month being 8½".

V.—PUNJAB.

(a) *Kulu (Kangra District)*.—No snow fell during the period under report, the precipitation being in the form of rain. Snowline descended to 5,000 ft. on the ridges of *Kulu* and *Seraj*. Part of the snow, however, melted away on account of continuous heavy rainfall. The accumulations on the well-known passes of the sub-division are given in the following table :—

Locality.	Depth of accumulation.
	Ft.
Hampta Pass . . . . .	6
Rohtang Pass . . . . .	6
Bhabu Pass . . . . .	4
Bashleo Pass . . . . .	1½
Jalori Pass . . . . .	1½

The accumulations were normal at the end of the season.

(b) *Kilba (Simla District)*.—No snow fell in October and November at *Kilba* proper. It was confined to elevations

above 18,000 ft. in October and 9,000 ft. in November. There were 11 days of snowfall in December, snowfall commencing earlier than usual; the falls on the higher elevations were very heavy. Passes like *Harau*, *Rupin* and *Buran* were blocked at the end of December.

VI.—UNITED PROVINCES.

(a) *Almorah*.—The total falls for each of the months are indicated in the following table :—

Locality.	October.	November.	December.
	Ft. in.	Ft. in.	Ft. in.
Malla Darma . . . . .	..	0 0	6 6
Chaudans . . . . .	2 3	1 2	5 6
Malla Johar . . . . .	3 0	2 0	..
Malla Danpur . . . . .	4 0	12 0	2 0
Biyans . . . . .	..	..	5 6

Snowfall of the season was less than usual. The following table gives the estimated approximate accumulation at the end of each month during the period :—

Locality.	October.	November.	December.
	Ft. in.	Ft. in.	Ft. in.
Nuwe Pass . . . . .	22 0	20 0	23 0
Binkura Pass . . . . .	5 0	4 0	..
Milam . . . . .	..	1 0	..
Lipu Pass . . . . .	..	..	8 0

The accumulations at the end of the season were normal.

(b) *Garhwal*.—Snow fell on 6 days in December, the total amounting to 1½ ft.

VII.—ASSAM.

(a) *Kamrup*.—There was no snowfall during November and December, but thin layers of snow were seen here and there on the *Poonakha* route. Snowfall is reported to be slightly below the average.

(b) *Sadiya Frontier Tract*.—Snowfall was heavier than usual and reached down to a height of about 7,000—8,000 ft. The accumulations of snow made the crossing of the valleys precarious.

(c) *Baliapara Frontier Tract*.—Snowfall has been heavy during the season. About 2' of accumulation existed on the *Piri La* and *Jhum La* passes at the end of the season.

*Summary.*

*Cold weather period, January and February.*—Falls were generally below normal. Accumulations were normal in Kashmir, the Punjab, the United Provinces and Assam.

*Hot weather period, March to May.*—Falls and accumulations were generally below normal.

*The south-west monsoon period, June and July.*—Snow fall was generally below the average except in the United Provinces where it was above it. Accumulations were above normal in the North-West Frontier Province and the United Provinces and about normal in Kashmir and the Punjab.

*The south-west monsoon period, August and September.*—Falls were above normal in the United Provinces, normal in Kashmir and below it in the Punjab. The accumulations

were above normal in Kashmir and below it in the United Provinces.

*The retreating monsoon period, October to December.*—Snowfall was above normal in Afghanistan, the North-West Frontier Province and Assam, about normal in Baluchistan and Kashmir and below it in the United Provinces. Accumulations at the end of the period were above normal in the North-West Frontier Province and Assam and normal in the Punjab and the United Provinces.

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