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PART B
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CONTENTS

Cold Weather Period	Pages	Post Monsoon Period	Pages
Hot Weather Period	B-1	Summary	B-16
South-West Monsoon Period	B-7		B-20
	B-12		

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I N D I A W E A T H E R R E V I E W 1963

ANNUAL SUMMARY - PART B

S N O W F A L L

This part contains a summary of the reports of snowfall in the mountain regions to the north of India based on (a) records of snowfall observations made at the observatories and (b) reports collected by local officers from the local residents, headmen of villages or from travellers who have passed through the region, and then transmitted to this office.

The amount of snowfall is usually measured by finding the depth of undisturbed snow lying on the ground. The measurements are given in metres or centimetres. At places provided with raingauges the snow, collected in the gauge, is melted and measured as rain. The heights of well-known peaks are reported in the nearest metres, wherever available, while the heights of mountain ranges etc. are reported in tens of metres. In the description the figures given for depths for a month indicate the total amount of snowfall which occurred during that month.

Cold Weather/Winter Period - January and February

I - JAMMU AND KASHMIR

SOUTH ANANTNAG DISTRICT

Srinagar (1585 m.) - No snowfalls occurred in the town proper or in the valley during January, but all the surrounding peaks experienced snowfall on a few occasions. Four snowfalls were observed on the peaks and passages and also in the valley during February. The falls were of light to moderate intensity in the valley, but were much heavier on the surrounding mountains. A thick layer of snow was visible on all the surrounding peaks, especially on Zojila and Pir Panjal ranges during February.

The snowfall was below normal in both January and February.

LADAKH DISTRICT

Sonamarg (2515 m.) - There was no occurrence of snowfall in January. The station witnessed nine snowfalls in February. Slight to moderate snowfalls were recorded on six days in the first fortnight, while moderate to heavy falls occurred in a spell of three days in the third week of the month.

The snowfall was below normal in January and normal in February.

Dras (3066 m.) - Though the weather was extremely cold during the period, only slight snowfall amounting to 2 cm. was recorded during February.

The snowfall was much below normal during the period.

Leh (3514 m.) - The station experienced snowfall once in January and twice in February viz. 16th January, 12th and 22nd February. The depth of snowfall recorded in February was 5 cm. Accumulation of snow amounting to 30 cm. in depth was present during both months at heights of 5490 m. to 6100 m. The passes were reported to be closed during February.

The snowfall was below normal in January and normal in February.

II - PUNJAB (I) AND HIMACHAL PRADESHCHAMBA DISTRICTChurah

Tissa (1570 m.) - No snowfall occurred at the station proper during the period.

Chamba

Chamba (924 m.) - There were no snowfalls at the station proper or on the surrounding peaks in January. In February the surrounding peaks only experienced snowfall, the depth being about 60 cm. The amounts of snow accumulation on the well-known passes of the region were reported as under :-

Name of pass	Accumulation	
	January	February
Sach (4410 m.)	4.3 m.	3.0 m.
Padhri (3600 m.)	3.7 m.	60 cm.
Basodhan (2740 m.)	60 cm.	-
Kalichho (5000 m.)	-	3.0 m.

The snowfall was below normal during the period.

Ludrera (924 m.) - No snow fell during the period.

Bhanota (914 m.) - The report for January was not received. No snow fell during February.

Upper Chamba Range

Chhattrari (1793 m.) - No snowfalls were experienced at the station proper during both the months, but regions above 2000 m. reported snowfalls on the 14th and 15th February. The depths of snow on Dhola Dhar and Belaz Dhar were about 45 cm. each. The amounts of snow accumulation on Dhola Dhar and Baliani pass were about 1.2 m. each at the end of the period.

The snowfall was below normal in both the months.

Bhattiyat

Kalatop (Dalhousie Range) (2414 m.) - No snowfalls were experienced throughout the range nor was there any accumulation of snow on the passes.

The snowfall was below normal during the period.

Chowari (1021 m.) - No snow fell during the period.

Bathree (1372 m.) - No snow fell during the period.

Trehta Range - Snowstorms occurred at high elevations on the ranges on the 14th-15th January, 7th-8th and 14th-15th February. The depths of snowfall and the accumulations on the two well-known passes of the range were reported as under :-

Name of pass	Depth of snowfall		Accumulation	
	January	February	January	February
Jalsu (3810 m.)	1.2 m.	1.5 m.	2.4 m.	2.7 m.
Kwarsi (4420 m.)	1.8 m.	2.4 m.	3.0 m.	3.7 m.

The snowfall was below normal during the period.

Bharmaur

Bharmaur (2155 m.) - Light snowfalls occurred on three days in the third week of January, the total depth being about 2 cm. Heavier falls were experienced on the 8th, 12th, 16th and 17th February, the total depth amounting to 30 cm. The snowfalls descended to heights of 2100 m. in January and 1800 m. in February.

The snowfall was below normal in both the months.

MAHASU DISTRICT

Chopal (2342 m.) - Snowfalls were experienced on the 15th January and 16th February. The corresponding depths in these months were 13 cm. and 15 cm. at the station proper. The depths of snowfall on the highest peak of Chur Dhar was about 1.1 m. in January and 60 cm. in February. Other peaks in the region received about 30 cm. of snowfall. The amount of snow accumulation on the well-known and higher passes was about 30 cm. at the end of the period.

The snowfall was below normal during the period.

Shilaroo (2591 m.) - The station recorded a total of 20 cm. of snowfall on the 15th and 16th January and 19 cm. in spells of two days each in the second and third weeks of February. There were no accumulations of snowfall at the ends of these months.

The snowfall was below normal in both the months.

Phancha (Pandra Bis Range) (2271 m.) - Snowfall occurred on the 15th and 16th January, the depth being 33 cm. In February five snowfalls were reported, two of which were in the first fortnight. The depth was 34 cm. The accumulations at the ends of the respective months were about 30 cm.

The snowfall was below normal during the period.

Junga (1989 m.) - Snowfall occurred once during the period on the 15th January, the depth being 5 cm.

The snowfall was below normal during the period.

Rampur (1067 m.) - Snowstorms, extending throughout the area of the tehsil, occurred on the 15th-16th of each of the months. The snowfalls descended to elevations of 1500 m. The amount of snow accumulation on Daran Ghati was 75 cm. during the period.

The snowfall was below normal in both the months.

Kumarsain (1388 m.) - The report for January was not received. No snow fell during February.

Theog (2286 m.) - The total depth of snowfall recorded in January was 5 cm. No snow fell during February. The amounts of snow accumulations on the well-known peaks of Fagu, Tir Mahasu and Kanagi in January and February were 15 cm. each.

The snowfall was below normal during the period.

Kotgarh (1829 m.) - Snowfall occurred on the 13th and 14th January, the depth amounting to 20 cm. No snow fell during February. The amounts of snow accumulation on Sidhpur were 60 cm. in January and 25 cm. in February.

The snowfall was below normal during the period.

Kotkhai (1676 m.) - The station proper did not receive any snowfall during the period, but the surrounding peaks experienced snowfall on the 15th January and 16th February. The depths of snowfall were estimated to be of the order of 60 cm. in January and 30 cm. in February on each of the following peaks :- Naira (2290 m.), Joshla (2440 m.), Mundroo (2440 m.), Khara Pathar (2590 m.) and Bagi (2740 m.).

The snowfall was below normal in each of the months.

Suni (510 m.) - Snowfalls were reported in the surrounding regions on the 14th January and 15th-16th February, the depths in these months being 45 cm. and 15 cm. respectively. The snowfalls were experienced above heights of 1100 m. in January and above 2000 m. in February. The amounts of snow accumulation on Shali peak (2740 m.) was about 25 cm. in January and 5 cm. in February.

The snowfall was below normal during the period.

Lower Pabar Range

(i) Bashla (2286 m.) - Snowfalls were recorded on the 15th January, 12th and 16th February, the corresponding total depths in these months amounting to 30 cm., and 40 cm.

The snowfall was below normal in January and above normal in February.

(ii) Khadrala (2957 m.) - Two snowfalls occurred on the 14th and 15th January, the total depth amounting to about 55 cm. February witnessed six snowfalls half of which were in the first fortnight. The total depth recorded was about 90 cm., of which 48 cm. fell on the 16th February.

The snowfall was below normal in January and above normal in February.

Rohru (1524 m.) - Snowfalls were experienced on the 15th-16th January and on the 16th February. The respective depths of snow in these months were 57 cm. and 13 cm. The amounts of snow accumulation on Chansal peak were 1.8 m. in January and 1.2 m. in February.

The snowfall was normal in January and below normal in February.

Solan (1530 m.) - No snow fell during the period.

Jubbal (1891 m.) - Snowfalls occurred on two days in the middle of January and on three days about the middle of February, the total depths being 25 cm. and 18 cm. respectively at the station proper. The depths of snow on Chambi Kupar were 1.7 m. in January and 1.1 m. in February. The total

depths of snow were reported as the accumulations at the ends of the corresponding months.

The snowfall was below normal during the period.

JUBBAL FOREST DIVISION

Snowfall was experienced throughout the division on the 15th January. The depths of snow at some well-known places, viz. Banah (2130 m.), Reoshti (2290 m.), Manalag (2530 m.), Mandha Ghati (2500 m.) and Chur Dhar (3660 m.) varied from 15 cm. to 30 cm. The snowfall did not accumulate. The report for February was not received.

The snowfall was below normal in January.

Kasumpti (1989 m.) - Snowfall was reported in January, the total depth being 13 cm. No snow fell in February.

The snowfall was below normal during the period.

KINNAUR DISTRICT

Kilba - Kailash Range

(i) Kilba (1829 m.) - The station experienced snowfalls on the 16th January, 16th and 23rd February. The depths in these months were 11 cm. and 10 cm. respectively.

The snowfall was below normal in both the months.

(ii) Sangla (2591 m.) - Snowfalls occurred on two days in the middle of January and on seven days in February, in which there was a spell from the 14th to 16th of the month. The corresponding depths of snow in these months were 15 cm. and 60 cm. The heaviest fall of 30 cm. during the period occurred on the 15th February.

The snowfall was below normal in January and above normal in February.

(iii) Purbani (2286 m.) - The total depths of snowfall recorded at the station were 20 cm. in January and 40 cm. in February.

The snowfall was below normal during the period.

Chini (2774 m.) - The depth of snowfall in January was reported as 18 cm. No snow fell during February.

The snowfall was below normal in both the months.

Kalpa - Snowfall was experienced in both January and February. The total depths were 13 cm. and 43 cm. in the respective months.

KANGRA DISTRICT

Banjar (Inner Seraj Sub-Tehsil) (640 m.) - The station proper experienced snowfall on the 15th January during the period, the depth being 13 cm. The total depths of snowfall and the accumulations at the ends of the months were reported as under :-

Name of Peak	Depth of snowfall		Accumulation	
	January	February	January	February
Raghopur	60 cm.	1.2 m.	60 cm.	60 cm.
Jalori	60 cm.	90 cm.	60 cm.	90 cm.
Sakirn	60 cm.	30 cm.	60 cm.	45 cm.
Lambri	1.2 m.	30 cm.	90 cm.	30 cm.
Shepakaru	1.2 m.	2.1 m.	1.5 m.	1.8 m.
Gargarasan	1.5 m.	1.5 m.	1.2 m.	90 cm.
Bashelu	1.2 m.	75 cm.	60 cm.	90 cm.
Pallach	60 cm.	90 cm.	30 cm.	60 cm.
Tirth	1.2 m.	60 cm.	90 cm.	60 cm.

The snowfall was below normal in both the months.

MANDI DISTRICT

Mandi Forest Division - Snowfalls occurred on the peaks and passes in the region during both months. The total depths were 15 cm. in each of the months. The well-known peaks which received snowfall were Tunga Devi (3050 m.), Prasar Dhar (2740 m.) and Shikari (3350 m.). The total depths of the falls were reported as the accumulations at the end of the respective months.

The snowfall was below normal during the period.

SIRMUR DISTRICT - The tehsils Nahan, Paonta and Pachhad did not experience any snowfall during the period. Snowfalls occurred in Renuka tehsil on two days in February at heights ranging from 2130 m. to 2740 m. The total depths varied from 45 cm. to 1.5 m. The same amounts of snowfall were reported as the accumulations at the end of the period.

III - UTTAR PRADESH

TEHRI-GARHWAL DISTRICT - After a spell of widespread rainfall in the first fortnight, snowfall was experienced on the 15th January at heights above 1200 m. The depths of snow were reported as about 10 cm. at heights ranging from 1200 m. to 1800 m. and about 55 cm. at heights ranging from 1800 m. to 2400 m. In February, light snowfall amounting to about 5 cm. occurred on the 16th at heights above 1800 m. In both the months, the peaks of Surkanda, Dhanolti, Nagtiba and Taru-ka-Danda were covered with snow.

The snowfall was normal in January and below normal in February.

GARHWAL DISTRICT - No snowfalls were reported during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation at the ends of the months on the well-known peaks of Malla Danpur were reported as under :-

Name of peak	Depth of snowfall		Accumulation	
	January	February	January	February
Kautela	0	90 cm.	0	60 cm.
Kafini	60 cm.	90 cm.	2.1 m.	1.5 m.
Bankatia	1.8 m.	1.5 m.	4.6 m.	6.1 m.
Pindar	1.2 m.	1.2 m.	4.0 m.	5.5 m.
Nanda Devi	2.1 m.	1.8 m.	5.3 m.	9.1 m.
Sundardhunga	1.8 m.	1.5 m.	4.6 m.	7.6 m.

The snowfall was normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - Light to moderate snowfalls occurred on the 15th January and again on the 16th February. The total depths in these months were 20 cm. and 13 cm. respectively. The snowfalls were experienced on all the surrounding hills such as Nainital, Ramgarh etc.

The snowfall was normal during the period.

Hot Weather / Pre-Monsoon Period - March to May.

I - JAMMU AND KASHMIR

NORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - The reports for March and April were not received. The station reported the occurrences of snowfall, occasionally accompanied by rain, during May. There was heavy accumulation of snow on the well-known passes and peaks at the end of May.

SOUTH ANANTNAG DISTRICT

Srinagar (1585 m.) - Four moderate to heavy snowfalls occurred at the station proper and on the surrounding peaks and passes on the 9th, 15th, 16th and 23rd March. No snowfalls were experienced in the valley during April and May, but the adjoining peaks and passes, such as Agharwat, Pir Panjal and Zojila received heavy snowfall on several occasions during these months. The peaks and passes were covered with thick layers of snow throughout the period.

The snowfall was above normal in March and April and normal in May.

LADAKH DISTRICT

Sonamarg (2515 m.) - The station witnessed snowfall on fifteen days in March. Some of these snowfalls were moderate to heavy and occurred mainly in two periods. In the first, there were eight falls from the 2nd to 10th and the remaining seven occurred from the 16th to the end of the month. In April nine snowfalls were recorded, of which five were in the earlier part of the month. There was only one heavy snowfall on the 13th May. During these months the depths of snowfall were not recorded.

The snowfall was above normal during the period.

Dras (3066 m.) - Heavy snowfalls occurred in the region during March, the depth of snow at the station proper being 3 cm. No snow fell during April and May, but it was reported that communications were disrupted as the roads and peaks remained covered with snow throughout the period.

Leh (3514 m.) - The station experienced snowfall on six days in March in which there was a spell of three days in the first fortnight. In April, five snowfalls were recorded, of which two were in the earlier part of the month. The total falls in these months were 65 cm. and 5 cm. respectively. No snow fell in May. The amounts of accumulation of snow at heights ranging from 5500 m. to 6000 m. were 1.5 m. in each of the months.

The snowfall was much above normal in March and below normal in April and May.

II - PUNJAB (I) AND HIMACHAL PRADESHCHAMBA DISTRICTPangi

Kilar (Pangi Range) (2564 m.) - The reports for March and April were not received. No snowfall occurred at the station proper in May, but snowfalls were reported to have been experienced at high altitudes. The snow accumulations on the well-known passes varied from 90 cm. to 3.7 m.

The snowfall was normal in May.

Churah

Tissa (1570 m.) - The report for March was not received. No snow fell during April and May.

Bhandal (1730 m.) - The report for March was not received. No snow fell during April and May.

Tikri (1618 m.) - The reports for March and April were not received. Snowfall was experienced at heights above 2740 m. on the ranges during May. The amounts of snow accumulation on Drati and Sach passes varied from 1.5 m. to 1.8 m.

Chamba

Chamba (924 m.) - The report for March was not received. There was no occurrence of snowfall at the station proper during April and May. The amounts of snow accumulation on some well-known passes at the ends of April and May were reported as under :-

Name of Pass	Accumulation	
	April	May
Sach	2.1 m.	1.5 m.
Padhri	60 cm.	30 cm.
Kalichho	2.1 m.	1.5 m.

The snowfall was below normal in April and May.

Ludrera (924 m.) - The report for March was not received. No snow fell during April and May.

Bhanota (914 m.) - The report for March was not received. No snow fell during April and May.

Upper Chamba Range

Chhattrari (1793 m.) - Snowfall occurred on the 9th March at heights above 910 m. The depth of snowfall at Baliani was 10 cm. while on the higher passes and ranges upto 3050 m. the depths were about 1.5 m. Snowfalls were observed on the 18th April on the high altitudes above 3050 m. In May two snowfalls were reported on the 8th and 15th but these snowfalls were confined to the higher peaks only. The total depths were 25 cm. on Kanikote, 23 cm. on Baliani and 18 cm. on Belaz. The amounts of snow accumulations on the well-known higher passes and peaks, such as Baliani, Kanikote and Belaz were 2.4 m. to 3.7 m. in March, 1.8 m. to 2.4 m. in April and 1.2 m. to 1.8 m. in May.

The snowfall was reported to be above normal during the period.

Bhattiyat

Kalatop (Dalhousie Range) (2414 m.) - The report for March was not received. In April, snowfall occurred on the 18th, the depth at the station proper being 10 cm. In May snowfalls were observed at heights above 3660 m. The accumulation of snow on well-known peaks at the end of the season varied from 1.5 m. to 1.8 m.

The accumulation was reported to be above normal.

Trehta Range - The region experienced heavy snowfalls in three spells in March. The first spell was from the 5th to 11th March and was reported to have extended over the whole of the Western Himalayas. The second and third spells occurred on the 15th-16th and 22nd to 23rd March. In April, snowfalls were observed on four occasions, the maximum falls on each occasion being about 25 cm. Lighter falls were experienced in May on three occasions, the maximum falls each time being about 10 cm. The total depths of snowfall and the amounts of accumulation at the end of each month were reported as under :-

Name of Pass	March	April	May
<u>SNOWFALL</u>			
Jalsu	3.0 m.	45 cm.	15 cm.
Kwarsi	4.5 m.	60 cm.	25 cm.
<u>ACCUMULATION</u>			
Jalsu	3.0 m.	*	2.7 m.
Kwarsi	4.9 m.	*	3.4 m.

* Not reported.

The snowfall was above normal during the period.

Bharmaur

Bharmaur (2155 m.) - Snowfalls were experienced on the 5th, 6th and 10th March, the total depth being 75 cm. The heaviest fall of 60 cm. was recorded on the 10th March. The snowfalls occurred at elevations above 1680 m. No snow fell in April and May.

The snowfall was normal in March and below normal in April and May.

MAHASU DISTRICT

Chopal (2342 m.) - There was no occurrence of snowfall during the period.

Shilaroo (2591 m.) - The station experienced snowfall on four days in the first fortnight of March. The total snowfall amounted to 24 cm. The reports for April and May were not received.

The snowfall was reported to be below normal.

Phancha (Pandra Bis Range) (2271 m.) - The station witnessed seven days of snowfall in March. The snowfall mostly occurred in two spells, the first from the 9th to 11th and the second from the 15th to 17th. The total snowfall recorded was about 85 cm. The reports for April and May were not received.

The snowfall was much above normal in March.

Junga (1989 m.) - No snow fell during the period.

Rampur (1067 m.) - A snowstorm occurred on the 9th-10th March at elevations above 1520 m. in the tehsil. The amount of snow accumulation on the high peaks of Daran Ghati was about 45 cm. No snow fell during April and May.

The snowfall was below normal in March and April and normal in May.

Kumarsain (1388 m.) - No snow fell during the period.

Theog (2286 m.) - No snow fell during the period.

Kotgarh (1829 m.) - There was no occurrence of snowfall in March. The reports for April and May were not received.

Kotkhai (1676 m.) - No snowfalls were experienced at the station proper during the period, but snowfalls were observed on the surrounding peaks on the 5th, 10th and 15th March. The depths of snow were reported as about 50 cm. on each of the following peaks - Naira (2290 m.), Joshla (2440 m.), Mundroo (2440 m.), Khara Pathar (2590 m.) and Bagi (2740 m.).

The snowfall on these peaks was reported to be above normal.

Suni (510 m.) - Snowfall occurred in the tehsil on five days in March. The first two falls on the 4th and 6th descended to heights of 2440 m., the total depths varying from 13 cm. to 18 cm. The remaining three falls on the 10th, 15th and 25th March were experienced at heights above 2130 m., the total depth being about 58 cm. There was no accumulation of snow at the end of March. No snow fell during April and May.

The snowfall was above normal in March and normal in April and May.

Lower Pabar Range

(i) Bashla (2286 m.) - Snowfall occurred on the 5th and 10th March, the total depth being 20 cm. No snow fell during April and May.

The snowfall was above normal in March and normal in April and May.

(ii) Khadrala (2957 m.) - The station witnessed thirteen days of snowfall in March. There were continuous falls from the 5th to 11th and 24th to 26th, the remaining falls occurring about the middle of the month. The total depth amounted to 2.2 m., and the heaviest fall of 48 cm. was recorded on the 10th March. In April there was only one fall on the 4th, the depth being 5 cm. No snowfall was experienced during May.

The snowfall was much above normal in March and normal in April and May.

Rohru (1524 m.) - No snow fell during the period.

Solan (1530 m.) - No snow fell during the period.

Jubbal (1891 m.) - There was only one snowfall during the period on the 10th March. The depth of snowfall was 3 cm. at the station proper, 30 cm. to 45 cm. on Khara Pathar pass and 45 cm. to 60 cm. on Chambi Kupar.

The snowfall was below normal in March.

Kasumpti (1989 m.) - Snowfall was experienced during March, the total depth being 10 cm. There were no snowfalls during April and May.

KINNAUR DISTRICT

Kilba - Kailash Range

(i) Kilba (1829 m.) - There were three snowfalls during March viz. 10th, 15th and 26th, the total depth amounting to 14 cm. No snowfalls occurred during April and May.

The snowfall was below normal during the period.

(ii) SANGLA (2591 m.) - The station experienced snowfall on twelve days in March. The snowfall mostly occurred in three spells of which the last one of five days occurred in the fourth week of the month. The total depth amounted to 1.9 m. of which the heaviest fall of 46 cm. was recorded on the 14th. There were no snowfalls during April and May.

The snowfall was much above normal in March and below normal in April and May.

(iii) Purbani (2286 m.) - Heavy snowfall occurred during March, the depth amounting to 3.3 m. No snow fell during April and May.

The snowfall was much above normal in March and below normal in April and May.

Kalpa - Snowfall was experienced during March, the total depth being 19 cm. No snow fell during April and May.

The snowfall was below normal during the period.

KANGRA DISTRICT

Banjar (Inner Seraj Sub-Tehsil) (640 m.) - There were no snowfalls during March and April at the station proper. The depths of snowfall and the amounts of snow accumulation on the well-known peaks at the ends of March and April are given below. The report for May was not received.

Name of Peak	Depth of snowfall		Accumulation	
	March	April	March	April
Raghopur	2.1 m.	60 cm.	1.5 m.	60 cm.
Jalori	1.2 m.	60 cm.	1.2 m.	60 cm.
Sakirn	1.5 m.	90 cm.	1.1 m.	60 cm.
Lambri	1.8 m.	90 cm.	1.2 m.	90 cm.
Shepakaru	2.1 m.	1.5 m.	2.0 m.	1.2 m.
Gargarasan	3.4 m.	1.5 m.	2.1 m.	1.5 m.
Bashelu	2.1 m.	90 cm.	1.8 m.	1.2 m.
Pallach	2.1 m.	90 cm.	1.5 m.	1.2 m.
Tirth	1.5 m.	1.2 m.	1.2 m.	1.2 m.

The snowfall was above normal in March and April.

MANDI DISTRICT

Mandi Forest Division - The amounts of snow accumulation on the peaks of Tunga Devi (3050 m.), Prasar Dhar (2740 m.) and Shikari (3350 m.) were

observed to be about 15 cm. each at the end of March. The report for April was not received. Snowfall was reported during May, the total depth amounting to about 75 cm. The amount of snow accumulation on Nargu peak (3960 m.) was 1.2 m.

The snowfall was below normal in March and above normal in May.

SIRMUR DISTRICT

There was no occurrence of snowfall during the period throughout the district.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfalls occurred during the period.

GARHWAL DISTRICT - No snowfalls occurred during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation at the end of each month on the well-known peaks of MallaDanpur were as under :-

<u>Name of Peak</u>	<u>March</u>	<u>April</u>	<u>May</u>
<u>SNOWFALL</u>			
Kautela	90 cm.	30 cm.	0
Kafini	1.5 m.	60 cm.	1.5 m.
Bankatia	2.7 m.	1.8 m.	1.2 m.
Pindar	2.1 m.	1.5 m.	1.8 m.
Nanda Devi	3.0 m.	2.1 m.	2.4 m.
Sundardhunga	2.7 m.	1.8 m.	1.5 m.
<u>ACCUMULATION</u>			
Kautela	-	60 cm.	0
Kafini	60 cm.	90 cm.	2.1 m.
Bankatia	1.8 m.	2.1 m.	4.9 m.
Pindar	1.2 m.	1.5 m.	4.3 m.
Nanda Devi	2.1 m.	2.4 m.	5.2 m.
Sundardhunga	1.8 m.	1.8 m.	4.6 m.

The snowfall was above normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snow fell during the period.

Southwest Monsoon Period - June to September

June - July

I - JAMMU AND KASHMIR

NORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - Six snowfalls were observed on Handibal and Aparhat mountains during June. No snow fell in July. Accumulation of snow was present on both these mountains during the period, but it was less than usual towards the end of July.

SOUTH ANANTNAG DISTRICT

Srinagar (1585 m.) - No snowfalls were experienced in the region during June and July. However, snow accumulation was present on the surrounding passes and peaks during the entire period.

LADAKH DISTRICT

Dras (3066 m.) - No snow fell in June. The report for July was not received.

Leh (3514 m.) - No snowfall was experienced during the period. Accumulation of snow was present on the higher altitudes during the period.

II - PUNJAB (I) AND HIMACHAL PRADESHCHAMBA DISTRICTUpper Chamba Range

Chhattrari (1793 m.) - Snowfalls were observed on the higher peaks of the range on the 14th and 22nd June and again on the 22nd July. The total depths of snowfall were 10 cm. in June and 15 cm. in July. The amounts of snow accumulation at the ends of these months on some well-known locations were as under :-

Name of location	Accumulation	
	June	July
Baliani pass	30 cm.	90 cm.
Kanikote peak	60 cm.	1.5 m.
Belaz peak	30 cm.	90 cm.
Gaz Gote	-	1.2 m.

Bhattiyat

Trehta Range - No snowfalls were experienced during June and July.

MAHASU DISTRICT

No snowfalls were experienced at the stations Chopal (2342 m.), Junga (1989 m.), Rampur (1067 m.), Kumarsain (1388 m.), Theog (2286 m.), Kotkhai (1676 m.), Suni (510 m.), Bashla (2286 m.) and Khadralla (2957 m.) in Lower Pabar Range, Rohru (1524 m.), Solan (1530 m.) and Jubbal (1891 m.) during the period.

KINNAUR DISTRICT - No snowfalls were reported during the period by the stations Kilba (1829 m.), Sangla (2591 m.) and Purbani (2286 m.) in Kilba-Kailash Range and the station Kalpa.

MANDI DISTRICT

Mandi Forest Division - No snowfall was experienced and no accumulation was present during June. The report for July was not received.

SIRMUR DISTRICT - No snow fell in the district during the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfalls were experienced during the period.

GARHWAL DISTRICT - No snowfalls were experienced during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of accumulation at the ends of the months on some well-known peaks of Malla Danpur were as under :-

Name of Peak	Depth of snowfall		Accumulation	
	June	July	June	July
Kautela	0	0	0	0
Kafini	15 cm.	0	90 cm.	15 cm.
Bankatia	30 cm.	15 cm.	1.5 m.	60 cm.
Pindar	60 cm.	15 cm.	1.8 m.	45 cm.
Nanda Devi	90 cm.	30 cm.	2.4 m.	90 cm.
Sundardhunga	30 cm.	10 cm.	1.5 m.	30 cm.

The snowfall was above normal in June and normal in July.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snowfall occurred during the period.

August - SeptemberI - JAMMU AND KASHMIRNORTH BARAMULLAH DISTRICT

Gulmarg (2652 m.) - Snowfall was observed on the Apharwat peaks on 20th August. In September, the Apharwat and Handibal mountains experienced snowfalls on five occasions, of which two were in the first fortnight. Snow accumulation was present on these mountains in both the months.

The snowfall was normal in August and above normal in September.

SOUTH ANANTNAG DISTRICT

Srinagar (1585 m.) - No snowfalls were experienced in the valley and on the surrounding mountain ranges in August. Several light snowfalls were observed during September on all the surrounding peaks and ranges of Pir Panjal and Zojila mountains above 4000 m. The snowfalls were reported to have occurred earlier than usual.

LADAKH DISTRICT

Leh (3514 m.) - The report for August was not received. The station proper did not receive any snowfall in September, but the higher elevations ranging from 4270 m. to 4570 m. experienced slight snowfall on the 2nd.

The snowfall was normal in September.

II - PUNJAB (I) AND HIMACHAL PRADESHCHAMBA DISTRICTUpper Chamba Range

Chhattrari (1793 m.) - The higher peaks of the range experienced snowfall on the 11th and 30th August and again on the 26th and 27th September. The total depths in these months were 10 cm. and 15 cm. The amounts of the accumulation of snow on some well-known locations at the ends of August and September were reported as under :-

Name of location	Accumulation	
	August	September
Baliani pass	23 cm.	20 cm.
Kanikote peak	45 cm.	30 cm.
Belaz peak	15 cm.	10 cm.

Bhattiyat

Trehta Range - The report for August was not received. Snowfalls were observed on three occasions on Jalsu and Kwarsi peaks during September, the respective total depths of snowfall being 10 cm. and 15 cm. These amounts were reported as the accumulations at the end of the period. The snowline was above 3650 m. during September.

MAHASU DISTRICT - No snow fell during the period at Chopal (2342 m.), Junga (1989 m.), Rampur (1067 m.), Kumarsain (1388 m.), Theog (2286 m.), Kotkhai (1676 m.), Suni (510 m.), Bashla (2286 m.) and Khadralla (2957 m.) in Lower Pabar Range, Rohru (1524 m.), Solan (1530 m.), Jubbal (1891 m.) and Kasumpti (1989 m.).

KINNAUR DISTRICT - No snowfalls were experienced during the period at the stations Kilba (1829 m.), Sangla (2591 m.) and Purbani (2286 m.) in Kilba-Kailash Range and also at Kalpa.

SIRMUR DISTRICT - There was no occurrence of snowfall in the district during August and September.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfall was reported during the period.

GARHWAL DISTRICT - No snowfall was reported during the period.

ALMORA DISTRICT - The total depths of snowfall and the amounts of snow accumulation on some well-known peaks of Malla Danpur were reported as under :-

Name of peak	Depth of snowfall		Accumulation	
	August	September	August	September
Kautela	0	0	0	0
Kafini	0	8 cm.	15 cm.	15 cm.
Bankatia	8 cm.	75 cm.	90 cm.	1.5 m.
Pindar	15 cm.	75 cm.	1.5 m.	2.1 m.
Nanda Devi	30 cm.	90 cm.	2.1 m.	3.0 m.
Sundardhunga	8 cm.	60 cm.	60 cm.	1.2 m.

The snowfall was normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snowfall was experienced during August and September.

Post Monsoon Period - October to December

I - JAMMU AND KASHMIR

SOUTH ANANTNAG DISTRICT

Srinagar (1585 m.) - The region experienced snowfalls throughout the period but in the first two months, the snowfalls were confined to the surrounding peaks. On 31st October, light snowfalls occurred at heights above 3000 m. while in November seven to nine snowfalls were observed on all the surrounding peaks. In December slight to moderate snowfalls were observed on the surrounding hills and in the valley on the 12th, 13th and 28th to 30th. Accumulation of snow was present on the surrounding peaks at the end of each month.

The snowfall was below normal during the period.

LADAKH DISTRICT

Sonamarg (2515 m.) - The station experienced the first spell of snowfall of the season from the 30th October to 2nd November. The snowfall was accompanied by rain. Frequent snowfalls of moderate intensity continued to occur in November. There were five falls in the first half of the month and eight in the latter part of the month of which there was a spell from the 26th to 30th. In December there was a spell of light snowfall from the 12th to 15th of the month. The total depths of snowfall at the station in November and December were 21 cm. and 4 cm. respectively. The accumulations on the higher regions were 61 cm. and 76 cm. at the ends of November and December respectively.

The snowfall was below normal during the period.

Leh (3514 m.) - No snowfall was experienced at the station proper in October but there was slight snowfall on the passes and ranges on the last two days of the month. From the 27th to 29th November the station proper as well as the surrounding regions received snowfall, the corresponding depths being 30 cm. and 60 cm. The station received about 2 cm. snowfall on the 31st December while there was slight snowfall on the passes on the 14th, 16th and 23rd of the month, the total depth amounting to about 46 cm. at heights of 5490 m. to 6100 m. The amounts of snow accumulation at the ends of the months of October, November and December were 2 cm., 15 cm. to 20 cm. and about 60 cm. respectively.

The snowfall was below normal in October and December and above normal in November:

II - PUNJAB (I) AND HIMACHAL PRADESH

CHAMBA DISTRICT

Upper Chamba Range

Chhattrari (1793 m.) - Snowfall occurred on the highest peaks of the range on the 23rd and 24th October, the depths being about 8 cm. each on the peaks of Sebrev, Raisal, Kanikote and Baliani. In November and December the snowfalls descended to the lower levels of Gaz Dhar upto heights of 1830 m. The corres-

ponding total depths in these months were 10 cm. to 15 cm. and 30 cm. to 45 cm. The amounts of snow accumulation at the end of October were 5 cm. each on Sebrev and Raisal peaks, 45 cm. on Kanikote peak and 30 cm. on Baliani peak. The snow accumulations on Gaz Dhar at the ends of November and December were 10 cm. to 15 cm. and 30 cm. to 45 cm. respectively.

The snowfall was normal in October and below normal in November and December.

MAHASU DISTRICT

Chopal (2342 m.) - No snowfalls were reported during October and November. The region experienced snowfalls on the 13th, 14th and 30th December. The depths of snowfall were 10 cm. at the station proper and about 60 cm. on Chur Dhar.

The snowfall was below normal during the period.

Shilaroo (2591 m.) - The reports for October and November were not received. The station received snowfalls on the 13th and 14th December, the total depth being 28 cm. There was no accumulation of snow at the end of the month.

The snowfall was normal in December.

Phancha (Pandra Bis Range) (2271 m.) - The reports for October and November were not received. Snowfall occurred on the 14th December at the station proper, the depth being 38 cm. The same amount was reported as the accumulation at the end of the month.

The snowfall was normal in December.

Junga (1989 m.) - No snow fell during the period.

Rampur (1067 m.) - There were no snowfalls during October and November. A snowstorm occurred on the night of the 13th-14th December. The snowfall descended to heights 1520 m. throughout the area of the tehsil. No loss due to the storm was reported. The amount of snow accumulation at the end of December on Daran Ghati peak was about 60 cm.

The snowfall was below normal during the period.

Kumarsain (1388 m.) - No snow fell during October and November. A snowstorm was experienced on the 12th-13th December at heights above 1520 m. The depth of snowfall at Narkanda (2740 m.) was 60 cm. Accumulation of snow was present at the end of December at heights of 1520 m. and above. The amount of snow accumulation at Narkanda was 60 cm.

The snowfall was below normal during the period.

Theog (2286 m.) - No snowfalls were experienced during October and November. Sleet occurred on the 13th December, the depth of snow being 2 cm. The amount of snow accumulation on Tir Mahasu at the end of December was 30 cm.

The snowfall was below normal during the period.

Kotgarh (1829 m.) - The reports for October and November were not received. Snowfall occurred on 13th December, the depth being 17 cm.

Kotkhai (1676 m.) - No snowfalls were reported during October and November.

The region experienced snowfall on the 13th December. The depths of snowfall were 4 cm. at the station proper and 60 cm. to 90 cm. each on the surrounding peaks such as Naira, Joshla, Mundroo, Bagi and Khara Pathar.

The snowfall was below normal during the period.

Suni (510 m.) - There was no occurrence of snowfall in October and November. Snowfall was reported on the 13th December at heights above 1220 m., the depths being about 90 cm. The amount of snow accumulation on Shali peak (2743 m.) at the end of December was 30 cm.

The snowfall was normal in October and November and above normal in December.

Lower Pabar Range

(i) Bashla (2286 m.) - There was only one snowfall during the period on the 13th December, the depth being 12 cm.

The snowfall was below normal in December.

(ii) Khadrala (2957 m.) - Snowfall was experienced on the 12th and 13th December during the period, the total depth being 61 cm. The heaviest fall was 43 cm. on the 13th December.

The snowfall was above normal in December.

Rohru (1524 m.) - The station proper did not experience any snowfall during the entire period. Regions above 1680 m. received snowfall in December. The amount of snow accumulation at the end of December on Chansal peak was 1.2 m.

The snowfall was below normal during the period.

Arki (1219 m.) - The reports for October and November were not received. No snow fell during December.

The snowfall was below normal during December.

Solan (1530 m.) - No snow fell during the period.

Jubbal (1891 m.) - There was no snowfall during October and November. Snowfall was experienced on the 14th December. The depths of snowfall were 10 cm. at the station proper and 45 cm. to 60 cm. at Chambi Kupar. The same amounts were reported as the accumulations at the end of December.

The snowfall was below normal during the period.

Kasumpti (1989 m.) - No snow fell during October and November. Slight snowfall amounting to about 1 cm. was reported during December.

KINNAUR DISTRICT

Kilba-Kailash Range

(i) Kilba (1829 m.) - No snowfall occurred in October and November, while snowfall amounting to 8 cm. in total depth was reported on the 14th December.

The snowfall was below normal in October and November and about normal in December.

(ii) Sangla (2591 m.) - There were no snowfalls during October and November. The station recorded two snowfalls on the 12th and 13th December, the total depth being 37 cm.

The snowfall was below normal in October and November and above normal in December.

(iii) Purbani (2286 m.) - No snow fell during October. The total depths of snowfall recorded during November and December were 1 cm. and 60 cm. respectively.

The snowfall was below normal in October and November and above normal in December.

Kalpa - No snow fell in October. Snowfall was experienced during November and December and the corresponding total depths were 5 cm. and 45 cm.

KANGRA DISTRICT

Banjar (Inner Seraj Sub-Tehsil) (640 m.) - No snowfalls were experienced at the station proper in October and November. The available information on the snowfall on the peaks is given below :-

Name of Peak	Depth of snowfall		Accumulation	
	October	November	October	November
Sakirn	0	60 cm.	0	15 cm.
Lambri	0	75 cm.	0	15 cm.
Shepakaru	0	90 cm.	0	30 cm.
Gargarasan	0	60 cm.	0	45 cm.
Bashelu	0	45 cm.	0	0
Pallach	0	60 cm.	0	15 cm.
Tirth	0	90 cm.	0	30 cm.

The report for December was not received.

The snowfall was below normal in October and about normal in November.

SIRMUR DISTRICT

Nahan - No snow fell in the tehsil during the period.

Paonta - No snow fell in the tehsil during the period.

Renuka - There were no snowfalls in the tehsil during the period.

Pachhad - No snow fell during October and November. The tehsil experienced snowfall on the 12th-13th December at heights above 1220 m. The depths of snow varied from 5 cm. to 15 cm. at heights of 1220 m. to 1830 m., 15 cm. to 60 cm. at heights of 1830 m. to 2290 m. and 60 cm. to 90 cm. at heights of 2290 m. to 2740 m.

The snowfall was reported to be below normal during the period.

III - UTTAR PRADESH

TEHRI GARHWAL DISTRICT - No snowfall was experienced in the district throughout the period.

GARHWAL DISTRICT - No snowfall occurred in the district during the period.

ALMORA DISTRICT - The depths of snowfall and the amounts of snow accumulation at the end of each month on the well-known peaks of Malla Danpur were reported as under :-

Name of peak	October	November	December
<u>SNOWFALL</u>			
Kautela	8 cm.	60 cm.	30 cm.
Kafini	15 cm.	90 cm.	45 cm.
Bankatia	90 cm.	1.5 m.	90 cm.
Pindar	90 cm.	1.4 m.	90 cm.
Nanda Devi	90 cm.	1.4 m.	1.2 m.
Sundardhunga	60 cm.	1.1 m.	1.1 m.
<u>ACCUMULATION</u>			
Kautela	15 cm.	8 cm.	76 cm.
Kafini	45 cm.	15 cm.	90 cm.
Bankatia	2.0 m.	90 cm.	1.2 m.
Pindar	1.8 m.	90 cm.	1.2 m.
Nanda Devi	3.4 m.	90 cm.	1.5 m.
Sundardhunga	1.5 m.	60 cm.	60 cm.

The snowfall was about normal during the period.

NAINITAL DISTRICT

Mukteswar (2310 m.) - No snow fell during the period.

DEHRA DUN DISTRICT

Mussoorie (2042 m.) - No snow fell during the period.

S U M M A R Y

Winter Period - January and February

Snowfall during the period was below normal in Jammu and Kashmir, Punjab (I) and Himachal Pradesh and normal in Uttar Pradesh.

Pre-Monsoon Period - March to May

Snowfall during the period was slightly above normal in Jammu and Kashmir, normal in Punjab (I) and Himachal Pradesh and above normal in Uttar Pradesh.

Monsoon Period - June and July

As usual practically no snow fell in Jammu and Kashmir, Punjab (I), and Himachal Pradesh, but snowfall was slightly above normal in Uttar Pradesh.

Monsoon Period - August and September

The snowfalls were mostly confined to the high altitudes. The snowfall was slightly above normal in Jammu and Kashmir, and normal in Uttar Pradesh.

Post Monsoon Period - October to December

Snowfall during the period was below normal in Jammu and Kashmir, Punjab (I) and Himachal Pradesh and normal in Uttar Pradesh.

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N. B :- It is not possible to adopt a single classification of seasons which will be satisfactory for the whole of India. The classification adopted in this publication, is devised from the point of view of rainfall in the country.

SG./Rotaprint, Poona.