Government of Nepal
Ministry of Energy, Water Resource and Irrigation
Department of Hydrology and Meteorology
Climate Division (Climate Analysis Section)
Babarmahal, Kathmandu

**18th June 2024**

# Preliminary Precipitation and Temperature Summary
## Pre-monsoon Season (March – May) 2024

### Highlights

Precipitation over the country as a whole during Pre-monsoon season (March - May 2024) was 80.9% of the normal indicating below normal precipitation. Moderate to Severe drought condition was observed in several part of the country. Both Maximum temperature and minimum temperature was above normal over most part of the country. Seven stations broke the previous record of ever-recorded extremes of maximum temperature.

### Precipitation

Central part of Gandaki Province and eastern part of Koshi Province recorded precipitation greater than 300 mm while isolated part of Lumbini Province, Karnali Province and Sudurpaschim Province recorded precipitation less than 50 mm (Figure 1). Below normal precipitation was recorded over most part of the country. However, southern part of Koshi Province and isolated part of Madhesh Province, Bagamati Province, Lumbini Province and Sudurpaschim Province recorded above normal precipitation (Figure 2). Syangja station recorded the highest seasonal precipitation of 444.5 mm and Dunai station recorded the lowest seasonal precipitation of 43.3 mm. The highest (166.9%) and the lowest (31.4 %) percentage of normal seasonal precipitation was recorded in Chisapani (Karnali) station and Chautara station respectively (Annex 1). Based on the average of 97 stations shown in figure 2, Nepal received 80.9% of the normal precipitation.

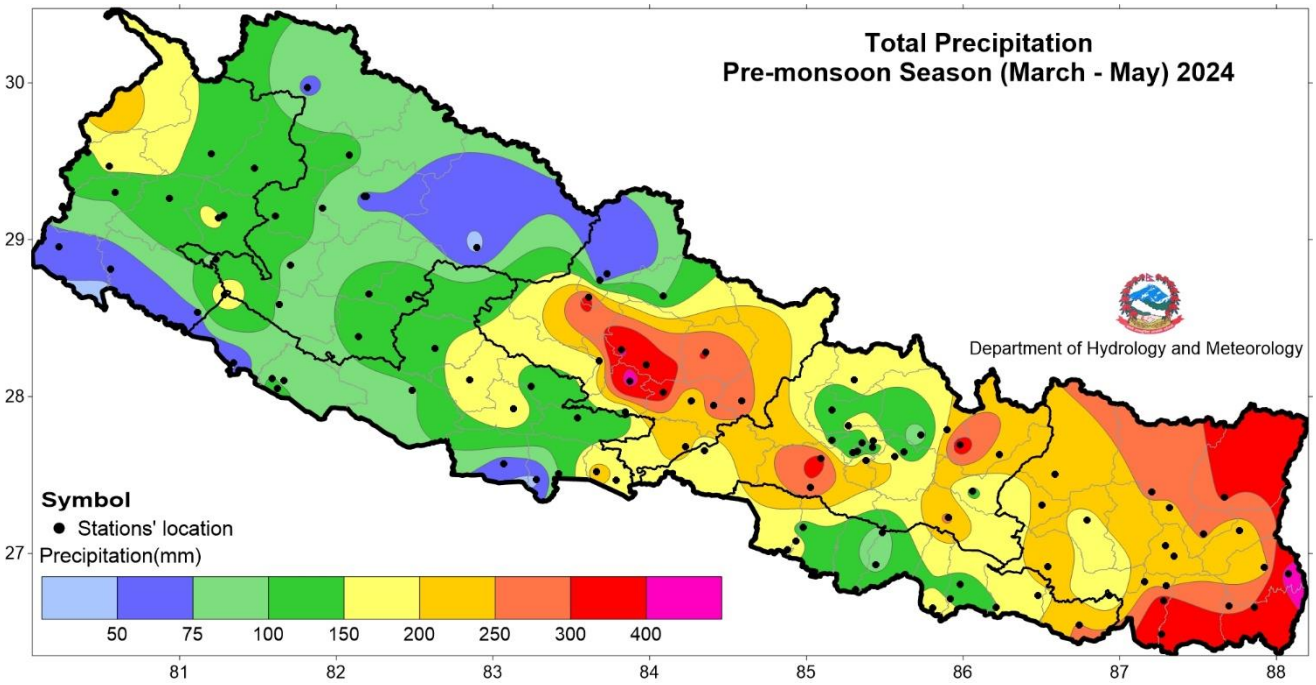


Figure 1: Total precipitation in Pre-monsoon 2024.

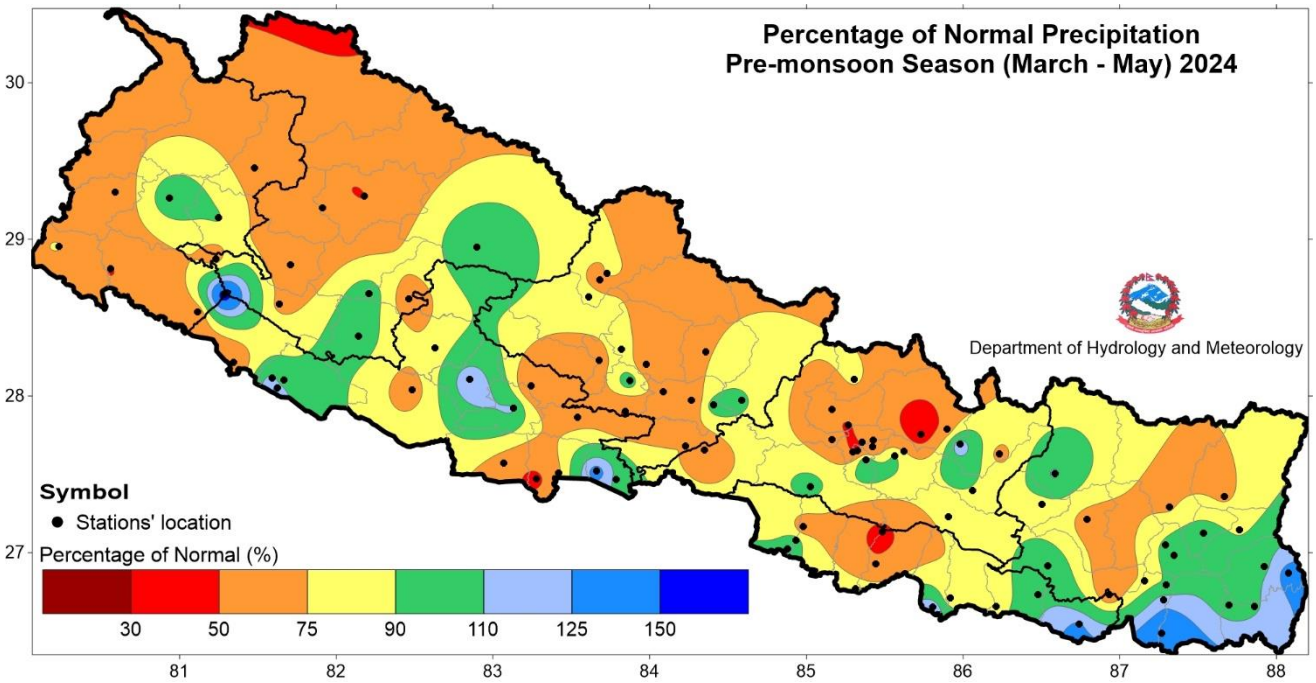


Figure 2: Percentage of normal precipitation in Pre-monsoon 2024.

The temporal distribution of the monthly cumulative average of daily precipitation shows that precipitation was near-normal until the third week of March. It then shifted to above normal until the second week of April, returned to near-normal until the end of the third week of April, and remained below normal for the rest of the period (Figure 3).

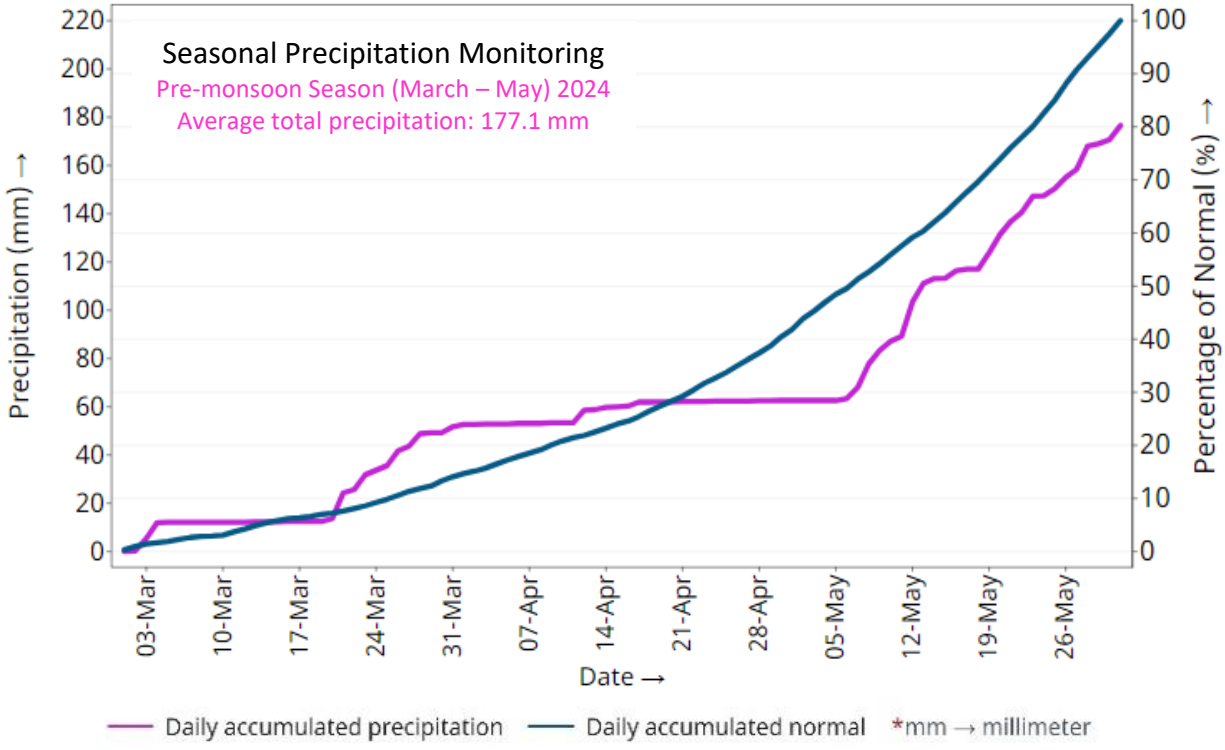


Figure 3: Cumulative average of daily normal and observed precipitation during Pre-monsoon season.

**Maximum Temperature**

Northern part of the country recorded seasonal maximum temperature less than 9°C while southern part recorded above 33°C (Figure 4). Maximum temperature was above normal over most part of the country. However, northern part of Gandaki Province and Bagamati Province experienced below normal maximum temperature (Figure 5). Nepalgunj (Reg. Office) station and Humde station recorded the highest and lowest seasonal maximum temperature of 36.1°C and 14.1°C respectively. Similarly, the highest seasonal anomaly of +3.4°C was recorded at Gaur station and the lowest of -0.6°C was recorded at Semari station (Annex 1). The highest daily maximum temperature of 45.2°C was recorded at Tikapur station on 30th May while the lowest daily maximum temperature of 1.9°C was recorded at Humde station on 3rd March.

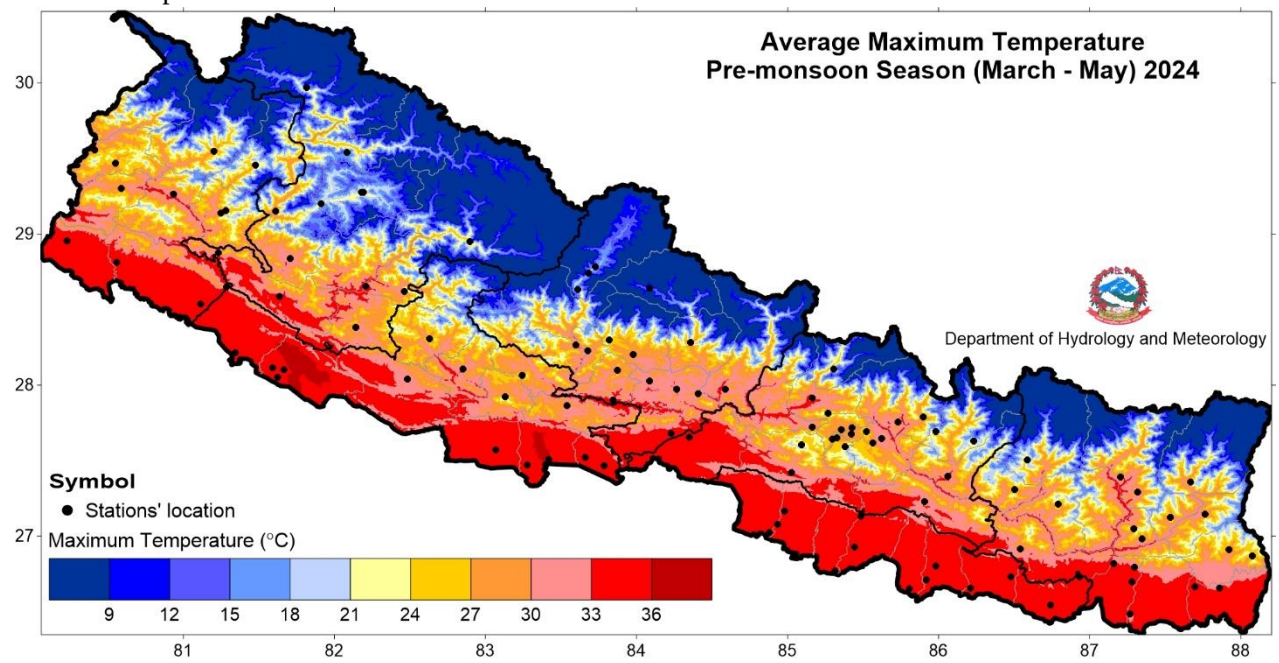


Figure 4: Maximum temperature in Pre-monsoon 2024.

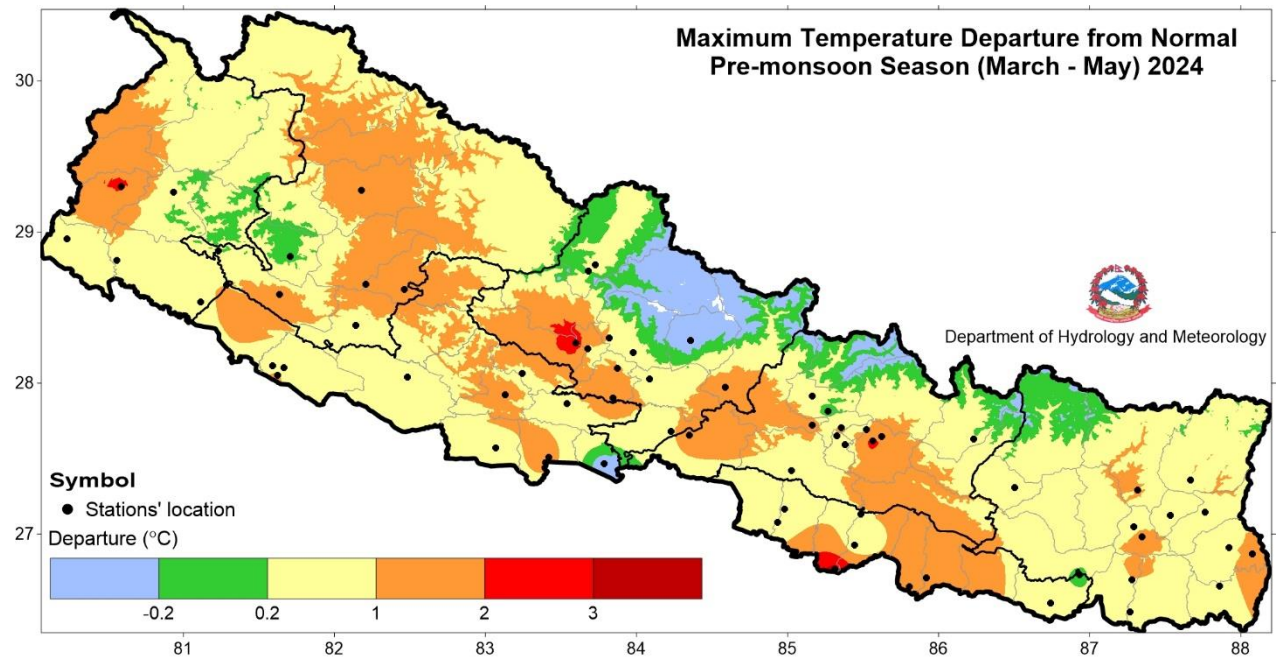


Figure 5: Departure from normal maximum temperature in Pre-monsoon 2024.

**Minimum Temperature**

Northern part of the country recorded seasonal minimum temperature less than 0°C while southern part recorded above 18°C (Figure 6). Minimum temperature was above normal over most part of the country (Figure 7). Chisapani (Karnali) station and Humde station recorded the highest and lowest seasonal minimum temperature of 21.8°C and 0.7°C respectively. Similarly, the highest seasonal anomaly of +2.7°C was recorded at Kanyam Tea Estate station and the lowest anomaly of -3.9°C was recorded at Gaur station (Annex 1). The highest daily minimum temperature of 33.0°C was recorded at Rampur station on 25th May while the lowest daily minimum temperature of -9.0°C was recorded at Humde station on 4th March.

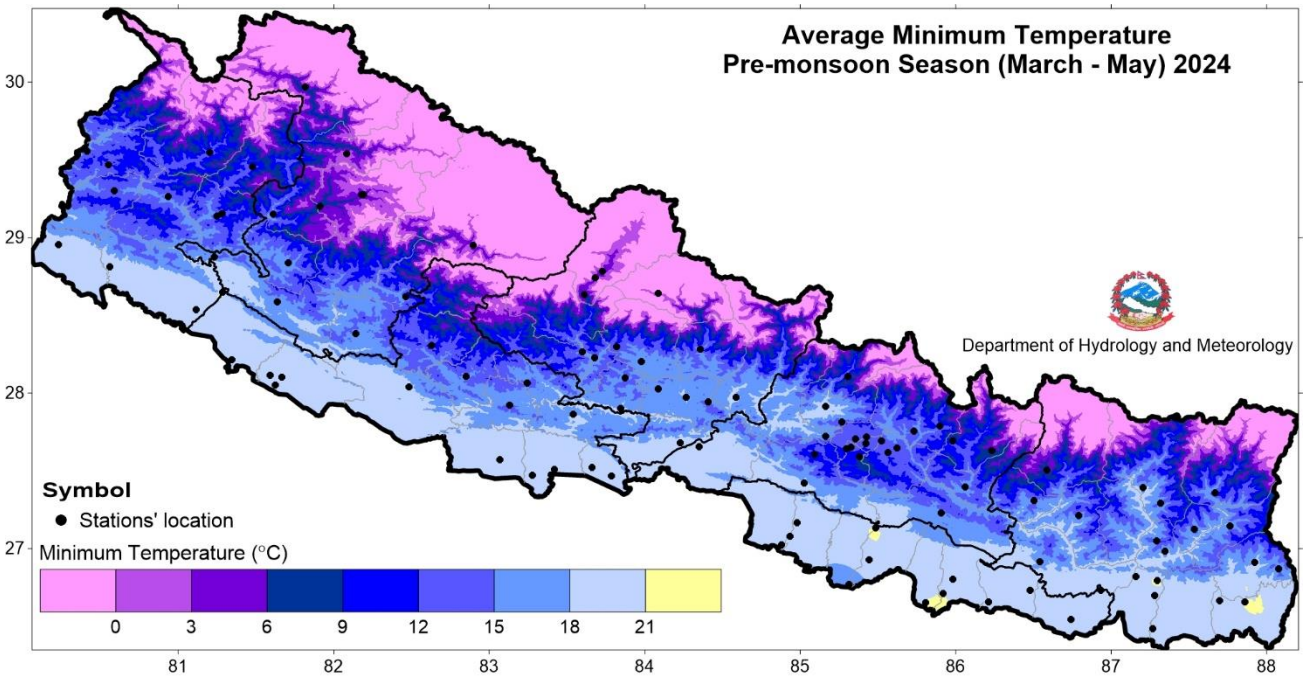


Figure 6: Minimum temperature in Pre-monsoon 2024.

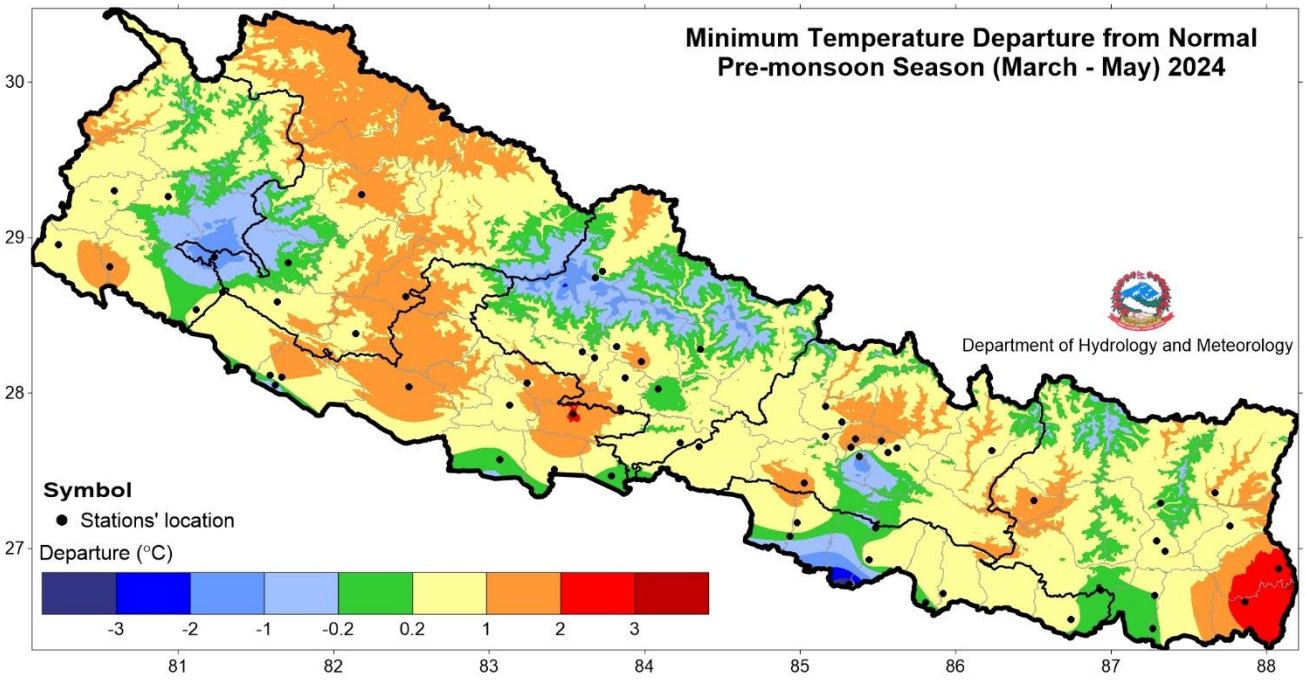


Figure 7: Departure from normal minimum temperature in Pre-monsoon 2024.

**Hot days and Heat wave**

Increase in maximum temperature by the end of the third week of April led to mild to severe heat wave conditions over the southern part of the country which continued till the end of the month. Hot days and heatwave conditions were observed on the first, third and last week of May at several part of the country (Figure 8). The temperature exceeded 40°C for few days in the southern part of the country specially in Banke, Kapilbastu, Rupandehi, Nawalparasi-West, Nawalparasi-East, Chitwan, Parsa, Bara, Rautahat, Sarlahi, Dhanusha, Mahottari, Siraha, Saptari, Sunsari and Morang districts.

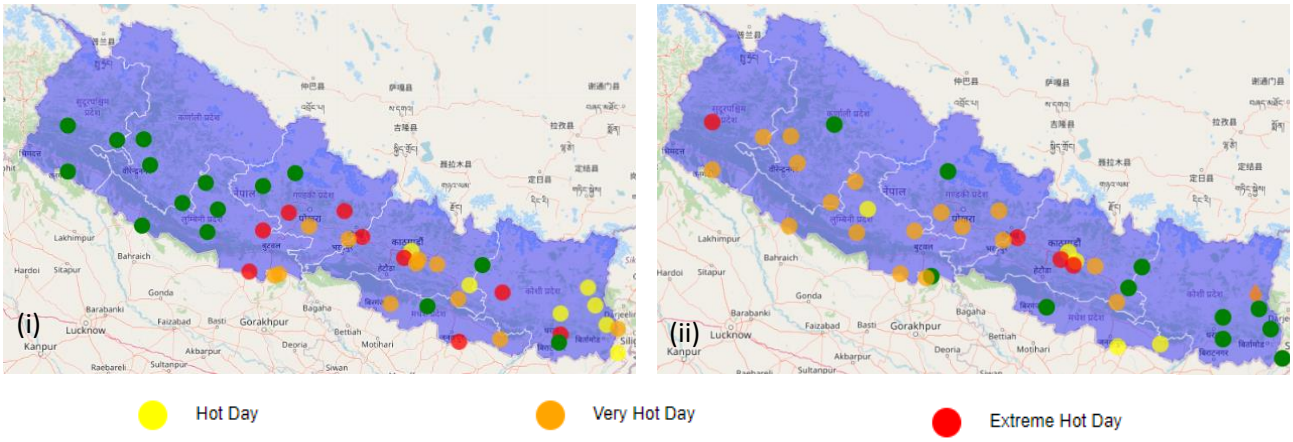


Figure 8: Observed hot days alert on (i) 2nd May and (ii) 19th May 2024.

**Drought**

Severe drought condition was seen over isolated part of Bagamati Province, Madhesh Province and Karnali Province while moderate drought was seen over central part of Koshi Province, Madhesh Province and Gandaki Province, north-western part of Bagamati Province and Karnali Province, isolated part of Lumbini Province and most part of Sudurpaschim Province in Pre-monsoon season (Figure 2). Monthly drought conditions during March, April and May are shown in figure 9, 10 and 11 respectively. A drought is defined as moderate, severe and extreme as given in the table 1.

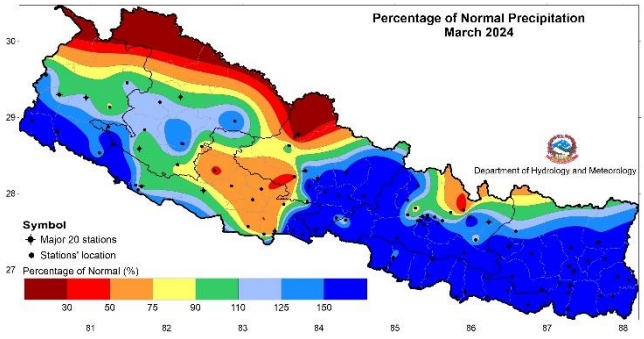


Figure 9: Percentage of normal precipitation in March 2024.

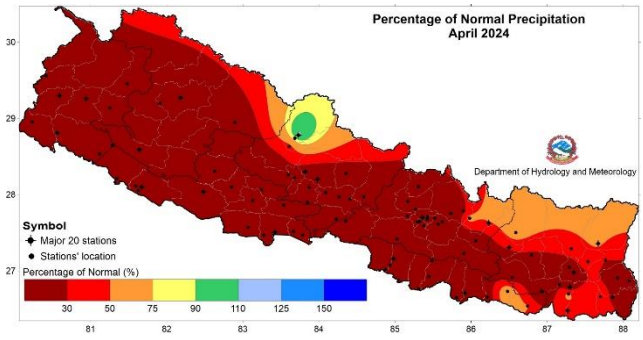


Figure 10: Percentage of normal precipitation in April 2024.

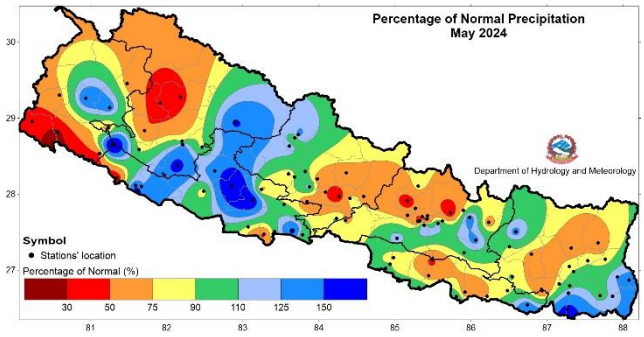


Figure 11: Percentage of normal precipitation in May 2024.

Table 1: Categorization of drought

| S.N. | Percentage of normal precipitation (%) | Drought category |
|---|---|---|
| 1 | 50 - 75 | Moderate drought |
| 2 | 30 - 50 | Severe drought |
| 3 | < 30 | Extreme drought |

**Historical record break**

Some of the stations broke the previous record of ever-recorded extremes of maximum temperature (Table 2).

Table 2: List of stations breaking ever-recorded highest daily maximum temperature in Pre-monsoon 2024.

| S.N. | Station Name | District | Record break maximum temperature (°C)/Date | Previous highest maximum temperature (°C)/Date |
|---|---|---|---|---|
| 1 | Changu Narayan | Bhaktapur | 34.4/2024-05-31 | 33.6/2015-06-06 |
| 2 | Chautara | Sindhupalchok | 39.9/2024-05-29 | 35.6/2023-06-23 |
| 3 | Dharan Bazar | Sunsari | 40.0/2024-04-28 | 39.3/2023-06-07 |
| 4 | Diktel | Khotang | 30.2/2024-04-30 | 30.0/2012-05-15 |
| 5 | Karmaiya | Sarlahi | 43.02024-04-30 | 42.5/1995-05-02 |
| 6 | Patan | Baitadi | 36.2/2024-05-18 | 35.5/2019-06-15 |
| 7 | Tikapur | Kailali | 45.2/2024-05-30 | 45.0/2012-06-13 |

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## Annex 1: Seasonal precipitation and temperature data of Pre-monsoon 2024.

| Station | Latitude | Longitude | Elevation | Precipitation | | Temperature | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Maximum | | Minimum | |
| | | | | Total (mm) | Percentage of Normal (%) | Average (°C) | Departure form normal (°C) | Average (°C) | Departure form normal (°C) |
| Baglung | 28.2636 | 83.6003 | 964 | - | - | 32.9 | 3.0 | 16.0 | 0.8 |
| Bahrabise | 27.7887 | 85.9000 | 884 | 204.0 | 59.9 | 31.6 | - | 15.1 | - |
| Baitadi (Gothalapani) | 29.5574 | 80.4132 | 1352 | 139.4 | 65.0 | 26.5 | - | 14.1 | - |
| Bajura (Martadi) | 29.4570 | 81.4804 | 1598 | 148.5 | 65.9 | 25.8 | - | 13.6 | - |
| Bandipur | 27.9418 | 84.4064 | 991 | 282.5 | 98.1 | 28.2 | - | 13.5 | - |
| Bhairahawa Airport | 27.5068 | 83.4204 | 108 | 96.5 | 70.6 | 36.1 | 1.4 | 20.2 | 0.6 |
| Bhaktapur | 27.6767 | 85.4240 | 1315 | 95.4 | 43.2 | 29.4 | - | 12.5 | - |
| Bijuwar Tar | 28.1035 | 82.8520 | 835 | 188.2 | 124.2 | 32.7 | - | 15.8 | - |
| Biratnagar Airport | 26.4840 | 87.2670 | 72 | 359.0 | 145.0 | 33.0 | 0.2 | 20.2 | 0.1 |
| Birganj | 27.0232 | 84.8782 | 67 | 154.7 | 90.6 | 35.6 | - | 21.2 | - |
| Chainpur (East) | 27.2921 | 87.3170 | 1277 | 239.4 | 72.4 | 27.9 | 1.0 | 13.9 | -0.1 |
| Chainpur Bajhang | 29.5459 | 81.2011 | 1405 | 130.6 | - | 28.3 | - | 13.2 | - |
| Changu Narayan | 27.7161 | 85.4268 | 1502 | 178.5 | 68.7 | 29.2 | - | 14.2 | - |
| Chapakot | 27.8999 | 83.8459 | 617 | 122.4 | 45.5 | 33.9 | 2.0 | 18.2 | 1.1 |
| Charikot | 27.6902 | 85.9802 | 2132 | 344.0 | 123.3 | 21.6 | - | 10.7 | - |
| Chatara | 26.8204 | 87.1592 | 105 | 228.9 | 79.0 | 34.6 | - | 20.4 | - |
| Chaurjhari Tar | 28.6540 | 82.2103 | 863 | 115.4 | 102.1 | 34.0 | 1.5 | - | - |
| Chautara | 27.7538 | 85.7321 | 1552 | 70.2 | 31.4 | 28.9 | - | 13.1 | - |
| Chisapani (Karnali) | 28.6472 | 81.2854 | 201 | 198.3 | 166.9 | 35.0 | 1.1 | 21.8 | 0.7 |
| Dadeldhura | 29.3014 | 80.5878 | 1879 | 105.6 | 60.1 | 25.7 | 2.1 | 12.2 | 0.4 |
| Dailekh | 28.8381 | 81.7085 | 1394 | 88.5 | 54.9 | 28.5 | -0.2 | 13.9 | -0.3 |
| Damak | 26.6623 | 87.6988 | 119 | 289.6 | 101.8 | 33.4 | - | 20.0 | - |
| Daman | 27.6044 | 85.0920 | 2265 | 326.4 | - | 20.5 | - | 9.6 | - |
| Damauli | 27.9737 | 84.2651 | 347 | 191.3 | 53.7 | 33.1 | - | 18.5 | - |
| Darchula New | 29.8429 | 80.5388 | 887 | 245.2 | - | 31.9 | - | 16.5 | - |
| Dhangadhi (Attariya) | 28.8127 | 80.5600 | 184 | 54.0 | 48.9 | 35.7 | 0.9 | 19.6 | 1.5 |
| Dhankuta | 26.9832 | 87.3460 | 1192 | 196.5 | 101.5 | 27.6 | 1.6 | 16.3 | 0.8 |
| Dharan Bazar | 26.7922 | 87.2978 | 310 | 243.9 | 92.5 | 33.2 | - | 21.7 | - |
| Dhulikhel | 27.6161 | 85.5655 | 1543 | 199.7 | 92.3 | 26.9 | 2.4 | 12.6 | 0.7 |
| Dhunche | 28.1053 | 85.3077 | 2005 | 159.6 | 78.7 | 22.1 | - | 11.5 | - |
| Dhunibesi | 27.7229 | 85.1643 | 991 | 123.0 | 60.8 | 31.3 | 1.5 | 17.4 | 0.5 |
| Diktel | 27.2125 | 86.7919 | 1612 | 191.6 | 67.6 | 24.7 | - | 14.8 | - |
| Dipayal (Doti) | 29.2621 | 80.9369 | 563 | 142.2 | 102.1 | 34.2 | 0.4 | 16.0 | 0.6 |
| Dumkauli | 27.6807 | 84.2285 | 183 | 222.5 | 74.9 | 35.2 | 0.9 | 20.2 | 0.8 |
| Dunai | 28.9507 | 82.8960 | 2098 | 43.3 | 111.2 | 25.9 | - | 5.4 | - |
| Gaida (Kankai) | 26.6569 | 87.8607 | 107 | 305.6 | 106.6 | 33.2 | 0.5 | 21.1 | 2.5 |
| Gaur | 26.7671 | 85.3130 | 77 | 137.4 | 87.4 | 35.6 | 3.4 | 15.4 | -3.9 |
| Ghorai (Dang) | 28.0372 | 82.4842 | 663 | 92.3 | 65.5 | 32.5 | 0.6 | 19.2 | 1.8 |
| Godavari | 27.5929 | 85.3788 | 1527 | 235.3 | 105.8 | 25.3 | 0.4 | 10.1 | -1.4 |
| Gorkha (Birenchowk) | 27.9714 | 84.5894 | 724 | 264.9 | 92.8 | 31.3 | 1.6 | 17.8 | - |
| Gulariya | 28.2128 | 81.3452 | 126 | 46.0 | 48.6 | 34.9 | - | 18.0 | - |
| Hardinath | 26.8000 | 85.9833 | 93 | 131.8 | - | 34.3 | - | 20.0 | - |
| Hetauda N.F.I. | 27.4202 | 85.0252 | 452 | 287.2 | 99.3 | 33.3 | 0.5 | 18.8 | 1.4 |
| Humde | 28.6399 | 84.0881 | 3401 | 99.3 | - | 14.1 | - | 0.7 | - |
| Ilam Tea Estate | 26.9096 | 87.9231 | 1208 | 221.9 | 104.7 | 25.1 | 0.3 | 17.0 | - |
| Jalesor | 26.6522 | 85.8073 | 68 | 168.2 | 126.4 | 34.9 | 1.0 | 21.0 | -0.1 |
| Janakpur Airport | 26.7097 | 85.9172 | 76 | 149.1 | 77.9 | 35.5 | 1.8 | 21.0 | 0.7 |
| Jiri | 27.6304 | 86.2321 | 1877 | 224.8 | 68.4 | 22.3 | 0.4 | 8.1 | 0.8 |
| Jomsom | 28.7840 | 83.7298 | 2741 | 53.7 | 76.3 | 18.8 | 0.7 | 5.6 | 0.9 |
| Jumla | 29.2747 | 82.1796 | 2363 | 70.9 | 49.6 | 23.7 | 1.9 | 5.8 | 1.5 |
| Jumla Airport | 29.2740 | 82.1942 | 2384 | 72.6 | - | 22.6 | - | 4.3 | - |
| Kakani | 27.8113 | 85.2674 | 2002 | 164.1 | 48.7 | 21.7 | -0.3 | 12.3 | 0.4 |
| Kanyam Tea Estate | 26.8681 | 88.0783 | 1570 | 443.6 | 133.5 | 23.6 | 1.8 | 14.6 | 2.7 |
| Karmaiya | 27.1330 | 85.4841 | 139 | 77.1 | 40.1 | 35.2 | 1.0 | 21.4 | -0.2 |
| Kathmandu Airport | 27.7038 | 85.3562 | 1337 | 119.2 | 51.8 | 29.0 | 1.1 | 14.1 | 1.7 |
| Khadbari | 27.3911 | 87.2044 | 1064 | 259.1 | - | 28.9 | - | 17.2 | - |

| Station | Latitude | Longitude | Elevation | Precipitation | | Temperature | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Maximum | | Minimum | |
| | | | | Total (mm) | Percentage of Normal (%) | Average (°C) | Departure form normal (°C) | Average (°C) | Departure form normal (°C) |
| Khairini Tar | 28.0270 | 84.0866 | 515 | 335.8 | 72.8 | 32.5 | 0.5 | 16.4 | -0.2 |
| Khajura (Nepalganj) | 28.1137 | 81.5903 | 129 | 102.9 | 116.4 | 35.8 | 0.7 | 18.8 | 0.4 |
| Khanchikot | 27.9221 | 83.1298 | 1801 | 202.5 | 113.0 | 23.7 | 1.2 | 14.0 | 0.3 |
| Khokana | 27.6438 | 85.2967 | 1309 | 111.6 | 52.0 | 28.1 | - | 11.5 | - |
| Khudi Bazar | 28.2822 | 84.3564 | 838 | 304.5 | 72.8 | 29.0 | -0.5 | 16.4 | 0.3 |
| Khumaltar | 27.6517 | 85.3257 | 1334 | 94.2 | 47.1 | 27.4 | 0.9 | 13.3 | 1.6 |
| Kushma | 28.2249 | 83.6769 | 900 | 177.7 | 64.4 | 31.4 | 0.8 | 16.2 | 0.5 |
| Lahan | 26.7327 | 86.4776 | 110 | 182.0 | 104.0 | 34.4 | - | 20.5 | - |
| Lete | 28.6327 | 83.6092 | 2490 | 323.1 | 88.1 | 19.3 | - | 7.1 | - |
| Libang Gaun | 28.3062 | 82.6323 | 1314 | 140.2 | 78.9 | 29.2 | - | 13.8 | - |
| Lumbini | 27.4703 | 83.2761 | 95 | 44.7 | 41.6 | 35.8 | - | 19.6 | - |
| Lumle | 28.2965 | 83.8179 | 1738 | 416.0 | 83.0 | 23.0 | 1.0 | 12.8 | 0.7 |
| Mahendra Nagar | 28.9548 | 80.2305 | 197 | 65.9 | 76.1 | 34.7 | 0.5 | 18.6 | 0.7 |
| Mangalsen | 29.1361 | 81.2501 | 1310 | 171.8 | 91.6 | 27.1 | - | 13.9 | - |
| Manma | 29.1488 | 81.6135 | 1729 | 150.6 | - | 25.4 | - | 13.3 | - |
| Manthali | 27.3947 | 86.0612 | 497 | 132.1 | 88.7 | 34.1 | - | 17.4 | - |
| Manusmara | 26.9280 | 85.4451 | 90 | 89.0 | 54.2 | 34.3 | 0.4 | 20.4 | 0.8 |
| Musikot (Rukumkot) | 28.6190 | 82.4625 | 1412 | 137.5 | 62.4 | 28.6 | 1.5 | 14.7 | 1.7 |
| Nagarkot | 27.6933 | 85.5209 | 2147 | - | - | 22.2 | 0.7 | 11.4 | 1.1 |
| Nagma | 29.2006 | 81.9106 | 2017 | 91.8 | 53.2 | 22.9 | - | 9.0 | - |
| Nepalgunj Airport | 28.1006 | 81.6682 | 165 | 89.9 | 94.2 | 35.8 | 0.6 | 19.8 | 1.2 |
| Nepalgunj (Reg.Off.) | 28.0520 | 81.6228 | 141 | 115.4 | 127.7 | 36.1 | 1.2 | 19.8 | -0.9 |
| Nuwakot | 27.9150 | 85.1646 | 966 | 108.0 | 51.5 | 30.6 | 0.5 | 18.2 | 0.8 |
| Okhaldhunga | 27.3081 | 86.5042 | 1731 | 206.3 | 83.9 | 24.6 | 0.7 | 14.3 | 1.2 |
| Oli Gaun (Patkani) | 29.1559 | 81.2831 | 989 | 123.8 | - | 24.8 | - | 12.0 | - |
| Pakhribas | 27.0463 | 87.2925 | 1720 | 235.2 | 94.1 | 23.4 | 0.4 | 13.3 | 0.5 |
| Panchkhal | 27.6451 | 85.6209 | 857 | 118.0 | 77.7 | 31.9 | 1.6 | 14.1 | 0.6 |
| Parasi | 27.5193 | 83.6622 | 112 | 224.2 | 136.4 | 34.6 | - | 18.7 | - |
| Parwanipur | 27.0789 | 84.9327 | 87 | 173.7 | 100.3 | 34.3 | 0.3 | 19.2 | -0.1 |
| Patan new | 29.4664 | 80.5506 | 1299 | 160.3 | - | 29.2 | - | 14.1 | - |
| Phattepur | 26.7305 | 86.9348 | 101 | 148.2 | 60.7 | 34.0 | 0.0 | 19.4 | -0.1 |
| Phidim (Panchther) | 27.1437 | 87.7656 | 1157 | 213.0 | 87.6 | 29.1 | 0.9 | 16.0 | 0.4 |
| Pokhara Airport | 28.2002 | 83.9795 | 827 | 323.5 | 57.9 | 29.6 | 0.4 | 17.4 | 1.4 |
| Pusma Camp | 28.8755 | 81.2327 | 953 | 89.3 | 66.5 | 29.7 | 0.2 | 15.9 | -2.0 |
| Rajbiraj | 26.5407 | 86.7425 | 68 | 255.6 | 128.8 | 34.2 | 0.7 | 20.9 | 0.3 |
| Rampur | 27.6540 | 84.3508 | 189 | 156.3 | 57.6 | 35.6 | 1.4 | 18.6 | 0.8 |
| Rara | 29.5401 | 82.0818 | 2989 | 109.5 | - | 17.0 | - | 2.5 | - |
| Salleri | 27.5051 | 86.5862 | 2383 | 206.2 | 113.8 | 23.4 | - | 7.8 | - |
| Salyan Bazar | 28.3821 | 82.1423 | 1557 | 105.4 | 101.4 | 28.2 | 0.7 | 15.5 | 0.7 |
| Semari | 27.4682 | 83.7861 | 110 | 190.3 | 105.8 | 35.2 | -0.6 | 19.6 | -0.1 |
| Simara Airport | 27.1642 | 84.9800 | 137 | 122.8 | 63.3 | 34.3 | 0.5 | 19.5 | 0.8 |
| Simikot | 29.9715 | 81.8161 | 2993 | 68.88 | - | 17.4 | - | 5.11 | - |
| Sindhuli Madhi | 27.2281 | 85.905 | 556 | 265.7 | 80.42 | 33 | - | 15.4 | - |
| Siraha | 26.6561 | 86.2117 | 63 | 147.8 | 78.78 | 34.8 | - | 20.8 | - |
| Surkhet Airport | 28.5879 | 81.6352 | 683 | 96.02 | 70.19 | 33.6 | 1.544 | 17.1 | 0.823 |
| Syangja | 28.0988 | 83.8722 | 871 | 444.45 | 103.1 | 30.6 | 1.198 | 15.4 | 0.767 |
| Tamghas | 28.0636 | 83.2435 | 1547 | 119.5 | 50.7 | 25.6 | 0.6 | 14.0 | 1.0 |
| Tansen | 27.8637 | 83.5387 | 1183 | 109.1 | 67.8 | 29.2 | 0.5 | 17.5 | 2.2 |
| Taplejung | 27.3586 | 87.6700 | 1744 | 305.3 | 72.1 | 23.2 | 0.7 | 12.9 | 0.8 |
| Tarahara | 26.6987 | 87.2786 | 120 | 333.1 | 120.1 | 33.2 | 1.0 | 19.1 | 0.2 |
| Taulihawa | 27.5711 | 83.0672 | 106 | 58.3 | 65.3 | 35.7 | 0.6 | 19.2 | -0.1 |
| Terhathum | 27.1230 | 87.5362 | 1525 | 255.6 | 102.3 | 24.6 | 0.2 | 14.4 | - |
| Thakmarpha | 28.7409 | 83.6816 | 2655 | 67.6 | 63.9 | 18.2 | 0.3 | 3.7 | -0.8 |
| Tikapur | 28.5366 | 81.1150 | 149 | 63.5 | 57.0 | 36.0 | 0.8 | 18.3 | 0.2 |
| Udayapur Gadhi | 26.9130 | 86.5397 | 469 | 230.2 | 107.0 | 32.3 | - | 18.4 | - |

*Note:*

- *"mm" = millimeter; "-" = Data Not Available.*
- *This summary is prepared based on the precipitation and temperature received at 111 meteorological stations during Pre-monsoon, 2024. Out of 104 stations, 84 stations have normal precipitation data, 68 stations have normal maximum temperature data and 65 stations have normal minimum temperature data.*
- *Normal precipitation/temperature is the average of the seasonal precipitation/temperature for period of 1991-2020.*
- *Less than 90% of normal precipitation is considered as below normal, 90 to 110% is considered as near normal, and more than 110% of normal precipitation is considered as above normal precipitation.*