

Rainfall Forecast for Gujarat for 2012

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There is large spatial and temporal variation in rainfall in Gujarat state in Western India. Anand Agricultural University (AAU), Anand, Gujarat has been publishing Monsoon Research Almanac every year since 2005 in Gujarati and English. Based on astrology, meteorological inputs were used to prepare the almanac (Varshneya *et al.*, 2009a, 2009b). As a team of Meteorologists and Astrometeorologists, we have developed this unique technology of rainfall prediction by blending our great ancient science of Astrometeorology and Modern Meteorology.

This group has been predicting daily rainfall (from 1st June to 31st October) since 2005 and 2006 (for 8 agroclimatic zones of Gujarat) and for every district (26 districts of Gujarat) since 2007 to 2012. The predictions are published every year by AAU as Monsoon Research Almanac both in Gujarati and English for agricultural scientists/officers and planners and finally for the farmers of Gujarat. This almanac is inaugurated on the auspicious day of *Akshaya Trutiya* (which is the starting day of a month-long *Krushī Mahotsav*, organized

by the Gujarat State Government). *Akshaya Trutiya* is in April/May depending upon *panchang tithi* of *Vaishakh Shudh Trutiya*. This year *Akshaya Trutiya* was on 24 April 2012. *Krushī Mahotsav* started from 6 May 2012. This is the 8th consecutive year of prediction of rainfall by this group (Tables 1–4). It is important to note that for the past two years, viz., 2010 and 2011 monsoon season, validation of our rainfall forecast based on Yes/No skill score was 72% and 70% accurate. The rainfall projection for the state as a whole was true to the tune of 97.4% accuracy (average from 2007 to 2011, i.e., 5 years).

Salient features of rainfall prediction for Gujarat 2012

1. Overall monsoon rainfall will be above normal by 30.3% in June to September and by 30.1% in June to October for the state as a whole, except for Kutch (–72%), Panchmahal (–10%), and Junagadh (–7%) districts.
2. There will be late onset of monsoon starting from 4th week of June in the

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state, i.e., after 27th June in all four regions of Gujarat.

3. One or two dry spells will occur in most of the districts during this monsoon which will affect the crops.
4. There may be pre-monsoon and post-monsoon rain at many places during May and November.
5. There will be less rainfall in June (–75% for state as a whole).
6. There will be highest rainfall in South Gujarat, i.e., +40.5%, followed by Saurashtra with +34.4%.
7. Between June and September, highest amount of rainfall will be in September

(+68.3%) followed by August (63.3%).

In October there is good possibility of rainfall which will be helpful for *rabi* (postrainy season) crops.

8. Sufficient drinking water will be available till next summer, i.e., till June 2013.

Rainfall prediction is an unique exercise that our group has been doing since the past 8 years for the benefit of the farming community of Gujarat. Feedback from scientists, farmers, or anyone interested will help to promote this endeavor of ancient science of rainfall prediction.

(For more details, please contact VB Vaidya – Eds.)

Table 1. Rainfall projection for four regions of Gujarat for 2012 (June–October).

| Region | Rainfall projection (June–October) (mm) | Normal rainfall (mm) | Rainfall projection (% departure from normal) |
|----------------|---|----------------------|---|
| Middle Gujarat | 894 | 796.6 | 12.2 |
| North Gujarat | 718 | 575.5 | 24.8 |
| South Gujarat | 2015 | 1433.7 | 40.5 |
| Saurashtra | 780 | 580.4 | 34.4 |
| State | 1101.5 | 846.5 | 30.1 |

Table 2. Quantitative rainfall (mm) prediction for Gujarat for 2012.

| Region/District | Jun | Jul | Aug | Sep | Oct | Season (Jun–Sep) | Season (Jun–Oct) |
|-----------------------|-----|-------|-------|-------|------|---------------------|---------------------|
| South Gujarat | | | | | | | |
| Bharuch | 87 | 874 | 608 | 460 | 18 | 2029 | 2047 |
| Dang | 87 | 969 | 585 | 536 | 24 | 2177 | 2201 |
| Narmada | 68 | 874 | 665 | 466 | 18 | 2073 | 2091 |
| Navasari | 68 | 680 | 585 | 440 | 24 | 1773 | 1797 |
| Surat | 68 | 680 | 585 | 440 | 24 | 1773 | 1797 |
| Tapi | 93 | 746 | 646 | 466 | 18 | 1951 | 1969 |
| Valsad | 87 | 969 | 585 | 536 | 24 | 2177 | 2201 |
| Middle Gujarat | | | | | | | |
| Ahmedabad | 14 | 230 | 403 | 122 | 36 | 769 | 805 |
| Anand | 34 | 388 | 290 | 212 | 6 | 924 | 930 |
| Dahod | 26 | 322 | 258 | 212 | 6 | 818 | 824 |
| Kheda | 24 | 445 | 282 | 252 | 8 | 1003 | 1011 |
| Panchmahal | 26 | 322 | 258 | 212 | 6 | 818 | 824 |
| Vadodara | 34 | 437 | 282 | 210 | 8 | 963 | 971 |
| North Gujarat | | | | | | | |
| Banashkantha | 4 | 270 | 378 | 114 | 36 | 766 | 802 |
| Gandhinagar | 6 | 278 | 378 | 112 | 36 | 774 | 810 |
| Kutch | 0 | 21 | 52 | 15 | 4 | 88 | 92 |
| Mehsana | 6 | 278 | 378 | 112 | 36 | 774 | 810 |
| Patan | 24 | 410 | 262 | 192 | 8 | 888 | 896 |
| Sabarkantha | 14 | 418 | 262 | 194 | 8 | 888 | 896 |
| Saurashtra | | | | | | | |
| Amreli | 6 | 278 | 378 | 112 | 36 | 774 | 810 |
| Bhavanagar | 6 | 278 | 354 | 112 | 36 | 750 | 786 |
| Jamnagar | 6 | 230 | 378 | 112 | 36 | 726 | 762 |
| Junagadh | 14 | 230 | 378 | 112 | 36 | 734 | 770 |
| Porbandar | 6 | 230 | 378 | 112 | 36 | 726 | 762 |
| Rajkot | 6 | 278 | 378 | 112 | 36 | 774 | 810 |
| Surendranagar | 16 | 230 | 370 | 110 | 36 | 726 | 762 |
| Mean | | | | | | | |
| South Gujarat | 80 | 827 | 608 | 478 | 21 | 1993 | 2015 |
| Middle Gujarat | 26 | 357 | 296 | 203 | 12 | 883 | 894 |
| North Gujarat | 9 | 279 | 285 | 123 | 21 | 696 | 718 |
| Saurashtra | 9 | 251 | 373 | 112 | 36 | 744 | 780 |
| State | 31 | 428.5 | 390.5 | 229.0 | 22.5 | 1079 | 1101.5 |

Table 3. Normal rainfall (mm) values of Gujarat.

| Region/District | Jun | Jul | Aug | Sep | Oct | Season (Jun–Sep) | Season (Jun–Oct) |
|-----------------------|-------|-------|-------|-------|------|---------------------|---------------------|
| South Gujarat | | | | | | | |
| Bharuch | 89 | 201 | 263.3 | 117.8 | 11.4 | 671.1 | 682.5 |
| Dang | 232 | 676.9 | 514.5 | 303.3 | 56.7 | 1726.7 | 1783.4 |
| Narmada | 267.2 | 723.5 | 433.2 | 296.7 | 34.2 | 1720.6 | 1754.8 |
| Navasari | 240.7 | 555.6 | 328.1 | 218.6 | 34.7 | 1343 | 1377.7 |
| Surat | 204 | 427.4 | 231.1 | 173.4 | 26.7 | 1035.9 | 1062.6 |
| Tapi | 216 | 583.2 | 430.4 | 260.7 | 22.5 | 1490.3 | 1512.8 |
| Valsad | 338.2 | 691.4 | 497.5 | 302.9 | 31.8 | 1830 | 1861.8 |
| Middle Gujarat | | | | | | | |
| Ahmedabad | 76.4 | 257.3 | 186.8 | 136.1 | 11 | 656.6 | 667.6 |
| Anand | 109.2 | 280.6 | 302.2 | 119.4 | 7.8 | 811.4 | 819.2 |
| Dahod | 106.3 | 240.4 | 247.8 | 153.2 | 26.6 | 747.7 | 774.3 |
| Kheda | 96.8 | 312.2 | 254.9 | 121 | 7.3 | 784.9 | 792.2 |
| Panchmahal | 120.8 | 350.1 | 266.3 | 160.1 | 20.4 | 897.3 | 917.7 |
| Vadodara | 117.1 | 307.4 | 223.2 | 133.2 | 27.8 | 780.9 | 808.7 |
| North Gujarat | | | | | | | |
| Banashkantha | 63.8 | 277.4 | 220 | 89 | 10.4 | 650.2 | 660.6 |
| Gandhinagar | 66.9 | 301.9 | 221.5 | 41.5 | 6.4 | 631.8 | 638.2 |
| Kutch | 31.6 | 144 | 97.5 | 49.1 | 9.4 | 322.2 | 331.6 |
| Mehsana | 59 | 228.5 | 176.6 | 109.1 | 5.7 | 573.2 | 578.9 |
| Patan | 63.9 | 230.7 | 168.8 | 95.5 | 8.1 | 558.9 | 567 |
| Sabarkantha | 78.9 | 230.7 | 230.6 | 125.6 | 10.6 | 665.8 | 676.4 |
| Saurashtra | | | | | | | |
| Amreli | 99 | 192.2 | 114.7 | 102.2 | 25.1 | 508.1 | 533.2 |
| Bhavanagar | 91.1 | 207.1 | 146.5 | 111.5 | 21.6 | 556.2 | 577.8 |
| Jamnagar | 106.5 | 202.1 | 185.8 | 40.6 | 10.8 | 535 | 545.8 |
| Junagadh | 162.8 | 351.5 | 175.5 | 112.8 | 28.1 | 802.6 | 830.7 |
| Porbandar | 111.8 | 248.7 | 115.8 | 64.5 | 8.4 | 540.8 | 549.2 |
| Rajkot | 93.1 | 248.2 | 135.8 | 80.5 | 17.6 | 557.6 | 575.2 |
| Surendranagar | 71.2 | 200.2 | 96.6 | 70.4 | 12.3 | 438.4 | 450.7 |
| Mean | | | | | | | |
| South Gujarat | 226.7 | 551.3 | 385.4 | 239.1 | 31.1 | 1402.5 | 1433.7 |
| Middle Gujarat | 104.4 | 291.3 | 246.9 | 137.2 | 16.8 | 779.8 | 796.6 |
| North Gujarat | 60.7 | 235.5 | 185.8 | 85.0 | 8.4 | 567.0 | 575.5 |
| Saurashtra | 105.1 | 235.7 | 138.7 | 83.2 | 17.7 | 562.7 | 580.4 |
| State | 124.2 | 328.5 | 239.2 | 136.1 | 18.5 | 828.0 | 846.5 |

Table 4. Rainfall prediction for Gujarat for 2012: % departure from normal.

| Region/District | Jun | Jul | Aug | Sep | Oct | Season (Jun–Sep) | Season (Jun–Oct) |
|-----------------------|-------|------|-------|------|-------|---------------------|---------------------|
| South Gujarat | | | | | | | |
| Bharuch | –2 | 335 | 131 | 290 | 58 | 202 | 200 |
| Dang | –63 | 43 | 14 | 77 | –58 | 26 | 23 |
| Narmada | –75 | 21 | 54 | 57 | –47 | 20 | 19 |
| Navasari | –72 | 22 | 78 | 101 | –31 | 32 | 30 |
| Surat | –67 | 59 | 153 | 154 | –10 | 71 | 69 |
| Tapi | –57 | 28 | 50 | 79 | –20 | 31 | 30 |
| Valsad | –74 | 40 | 18 | 77 | –25 | 19 | 18 |
| Middle Gujarat | | | | | | | |
| Ahmedabad | –82 | –11 | 116 | –10 | 227 | 17 | 21 |
| Anand | –69 | 38 | –4 | 78 | –23 | 14 | 14 |
| Dahod | –76 | 34 | 4 | 38 | –77 | 9 | 6 |
| Kheda | –75 | 43 | 11 | 108 | 10 | 28 | 28 |
| Panchmahal | –78 | –8 | –3 | 32 | –71 | –9 | –10 |
| Vadodara | –71 | 42 | 26 | 58 | –71 | 23 | 20 |
| North Gujarat | | | | | | | |
| Banashkantha | –94 | –3 | 72 | 28 | 246 | 18 | 21 |
| Gandhinagar | –91 | –8 | 71 | 170 | 463 | 23 | 27 |
| Kutch | –100 | –85 | –47 | –69 | –57 | –73 | –72 |
| Mehsana | –90 | 22 | 114 | 3 | 532 | 35 | 40 |
| Patan | –62 | 78 | 55 | 101 | –1 | 59 | 58 |
| Sabarkantha | –82 | 81 | 14 | 54 | –25 | 33 | 32 |
| Saurashtra | | | | | | | |
| Amreli | –94 | 45 | 230 | 10 | 43 | 52 | 52 |
| Bhavanagar | –93 | 34 | 142 | 0 | 67 | 35 | 36 |
| Jamnagar | –94 | 14 | 103 | 176 | 233 | 36 | 40 |
| Junagadh | –91 | –35 | 115 | –1 | 28 | –9 | –7 |
| Porbandar | –95 | –8 | 226 | 74 | 329 | 34 | 39 |
| Rajkot | –94 | 12 | 178 | 39 | 105 | 39 | 41 |
| Surendranagar | –78 | 15 | 283 | 56 | 193 | 66 | 69 |
| Mean | | | | | | | |
| South Gujarat | –64.7 | 50.0 | 57.8 | 99.9 | –32.5 | 42.1 | 40.5 |
| Middle Gujarat | –75.1 | 23.0 | 19.9 | 48.0 | 28.6 | 13.2 | 12.2 |
| North Gujarat | –85.2 | 18.5 | 53.4 | 44.7 | 150.0 | 22.8 | 24.8 |
| Saurashtra | –91.4 | 6.5 | 168.9 | 34.6 | 103.4 | 32.2 | 34.4 |
| State | –75.0 | 30.4 | 63.3 | 68.3 | 21.6 | 30.3 | 30.1 |

There will be late onset of monsoon starting from 4th week of June in the state, i.e., after 27th June in all four regions of Gujarat.

There will be highest rainfall in South Gujarat, i.e., +40.5%, followed by Saurashtra with +34.4%. ... highest amount of rainfall will be in September (+68.3%).

References

Varshneya MC, Vaidya VB, Vyas Pandey, Chimote LD, Damle KS, Shekh AM, and Karande BI. 2009a. Forecasting of rainfall for Gujarat based on astro-meteorology. *Asian Agri-History* 13(1):25–37.

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