Monsoon forecast proved correct

Since 1988, the India Meteorological Department (IMD) has been issuing its long range (seasonal) forecast of southwest monsoon (June to September) according to the technique developed by IMD scientists working with Vasant Gowariker. The basic technique has been described by Gowariker et al. in a paper in *Mausam* and it continues to be subjected to regular scrutiny and further refinement. While the forecast in 1988 was essentially in qualitative terms, that for 1989 gave a quantitative figure for the seasonal rainfall for the country as a whole. The technique was further refined so that in 1990, it was possible to issue a 'tentative' long-range forecast in qualitative terms as early as February 1990 and the same was confirmed (with quantitative details) in May 1990—the traditional time when the long-range forecast for the ensuing southwest monsoon is issued by IMD to the user agencies and the media.

It is a matter of considerable satisfaction to IMD that the seasonal forecasts of the southwest monsoon according to the new technique have turned out to be accurate for all the three years since the technique was introduced in 1988.

Earlier this year, there was scientific correspondence between Gopinathan


Figure 1. Cumulative rainfall for the period 1 June 1990 to 30 September 1990.

Figure 2. An example of the calcium K-line filtergram of the Sun, taken on 8 January 1990. The network pattern can be seen clearly. Also seen are other features associated with solar activity, like sunspots (dark spots) and bright emission areas surrounding sunspots, called plages.

LEGEND

- No Rain
- 10% to 19%
- 20% to 49%
- 50% or more
and Sastry and Goweriker and Thapliyal regarding IMD's long-range forecast for the 1990 southwest monsoon. The actual performance of the 1990 southwest monsoon closely follows the forecast issued by IMD and is indicated in Table 1.

Table 1.

<table>
<thead>
<tr>
<th>IMD forecast</th>
<th>Actual performance of monsoon 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total rainfall for the season (June to September 1990) for the country as a whole: 101% of the long period average value with model error within ±4%, that is, within 97% to 105% of the long period average value.</td>
<td>Season's total rainfall for the country as a whole: 106% of normal.</td>
</tr>
<tr>
<td>Over 80% of the 35 meteorological sub-divisions likely to receive normal or excess rainfall.</td>
<td>Meteorological sub-divisions with normal or excess rainfall 91% (32 out of 35).</td>
</tr>
<tr>
<td>The country would have another fine monsoon year.</td>
<td>Very good monsoon indeed.</td>
</tr>
</tbody>
</table>

Figure 1 shows the season's total rainfall distribution over the 35 meteorological sub-divisions. The week by week cumulative rainfall position for the country as a whole can be judged from Figure 2. In fact, these two figures are good indicators of the space and time distribution of rainfall during 1990 southwest monsoon season (June to September 1990).

The above presentation brings out the following special features of the 1990 southwest monsoon:

Over 95% of the Indian landmass received normal to excess rainfall.

Rainfall was very well distributed in time and space.

There were no major floods and there was no meteorological sub-division in the 'Scanty Rain' category.

The three meteorological sub-divisions with sub-normal rainfall (Kerala, Lakshadweep and Andaman and Nicobar Islands) were only marginally deficient.

In northwest India, monsoon rains commenced about two weeks ahead and the monsoon withdrew about 2 weeks later than the normal dates—resulting in a welcome prolonging of rainy season in the traditionally deficient areas, such as Rajasthan and Gujarat.

The 1990 monsoon ranks as the third best during this decade (after 1988 and 1983 monsoons).

The year 1990 so far

With above normal rainfall during the Winter (January and February 1990), pre-monsoon (March to May 1990), and southwest monsoon (June to September, 1990) for the country as a whole, and with no major floods, the year 1990 has been a very good rainfall year so far.

4. M. Kalbheetha, Director-General of Meteorology, India Meteorological Department, New Delhi.