

Mid-season monsoon status within IMD's forecast range

This report was received 31 July. However, since this issue, dated 25 July, has been delayed and the report is of great relevance now, we are publishing it here.

— Editor

The four-month (June to September) southwest monsoon season of 1991 is now halfway through. As in the past, a mid-term status report on its performance vis-à-vis the long-range forecast has been prepared and is presented here.

A tentative indication of the 1991 monsoon was issued by the India Meteorological Department (IMD) on 2 April 1991, which stated that the overall monsoon performance for the country as a whole was likely to be on the lower side of the 'normal' range (defined as being within $\pm 10\%$ of the long-period average value).

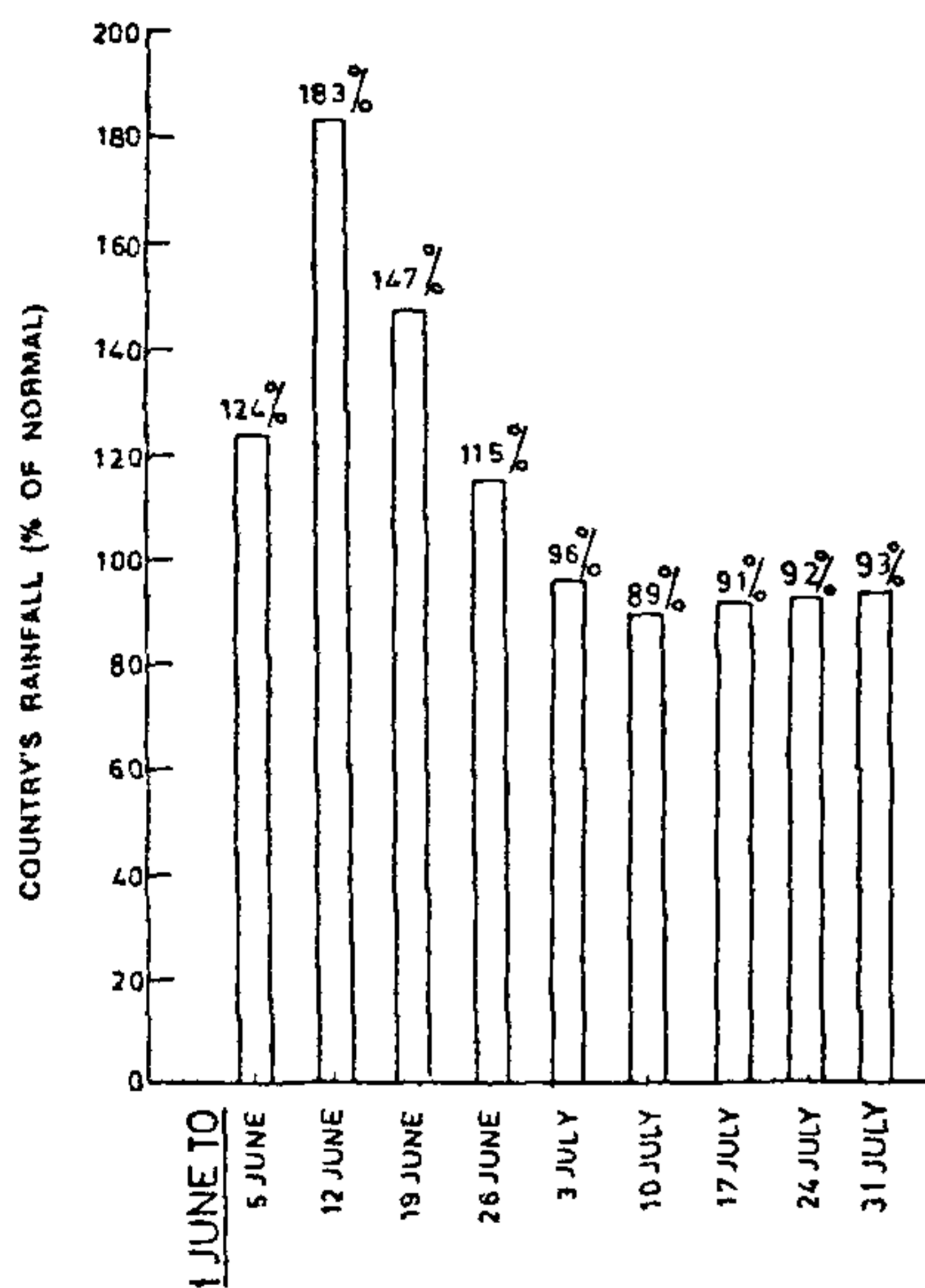
IMD's long-range forecast for the 1991 monsoon was issued on 27 May 1991, confirming what was stated earlier in the tentative indication issued in early April 1991. The main elements of IMD's long-range forecast were:

- Monsoon will set over Kerala in the first week of June 1991.
- Total rainfall for the country as a whole during the four-month monsoon season (June to September 1991) is likely to be $94\% \pm 4\%$, i.e. within 90% to 98%, of the long-period average value. It would thus be within the

definition of normal monsoon but on the lower side of the normal range.

— Based on climatological analysis, it is anticipated that about 75% of the 35 meteorological subdivisions of the country would, in all probability, get normal rains.

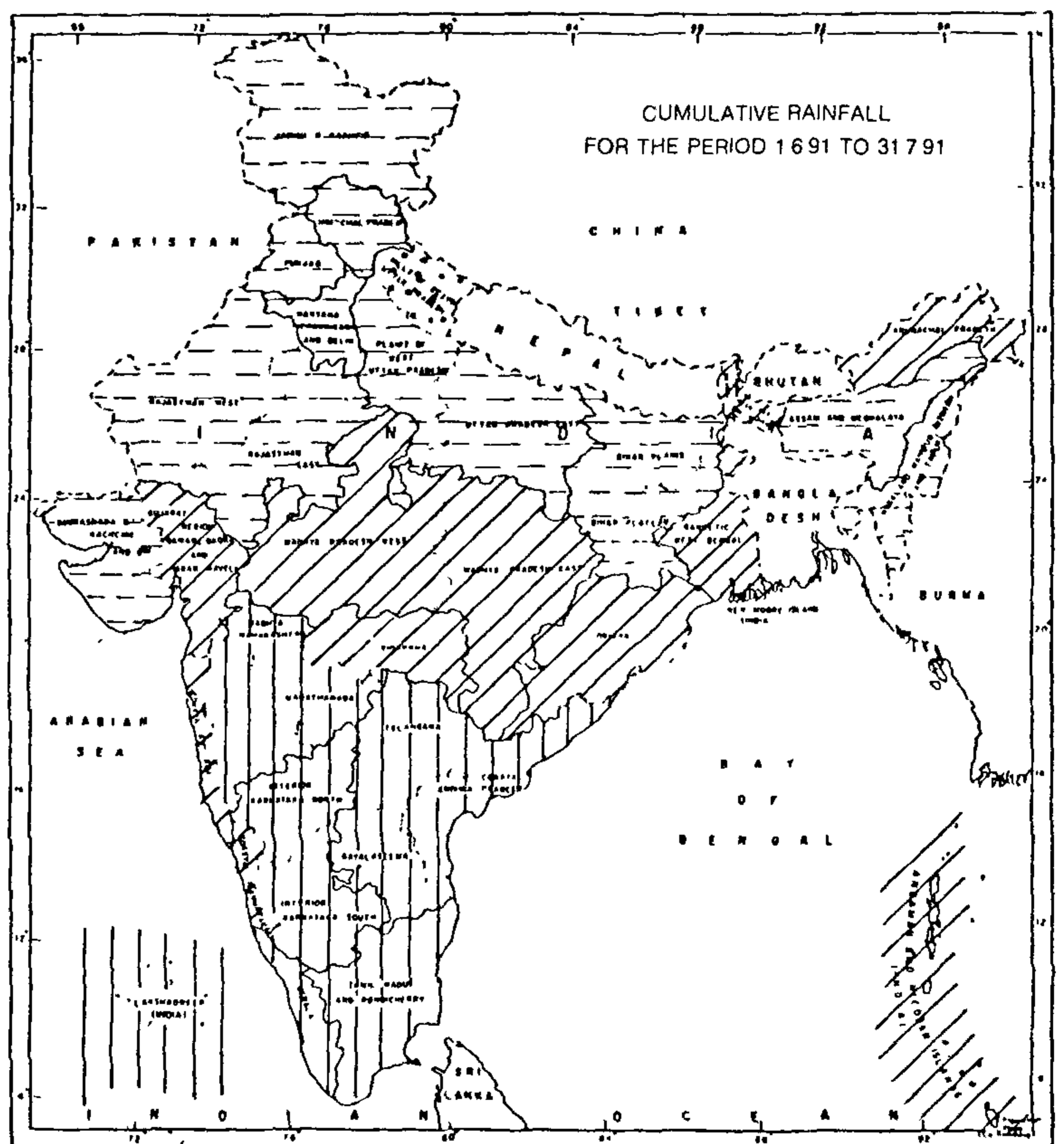
The monsoon actually set over Kerala on 2 June 1991. It progressed well, covering the peninsula, central India, east India, east UP, and parts of north India (hills of UP and HP) by the middle of June, i.e. a few days ahead of normal dates. Thereafter the monsoon



Week-by-week cumulative rainfall position from 1 June 1991 for the country as a whole.

Rainfall performance so far

From 1 June to	No. of met subdivisions with normal/excess rainfall
5 June	14
12 June	29
19 June	29
26 June	24
3 July	20
10 July	17
17 July	18
24 July	21
31 July	21



LEGEND

- Excess: 20% or more
- Normal: 19% to 19%
- Deficient: 20% to 59%
- Scanty: 60% to 99%
- No Rain: 100%

did not advance further for about 3 weeks although it continued to be active over the peninsula. It started advancing again on 11 July and reached Delhi and neighbouring areas on 16 July. By 19 July, the monsoon covered the entire country. (See figure for the week-by-week rainfall so far.)

As on 31 July, out of the 35 meteorological subdivisions, 21 have received normal or excess rainfall. On a districtwise count, 54% of the districts have received normal to excess rainfall. All through the season so far, the meteorological subdivisions comprising the Indian peninsula and the Lakshadweep islands have received normal or excess rainfall. Rayalaseema, Telangana, Madhya Maharashtra, Marathwada and Vidarbha, which are rain-fed and traditionally deficient, have received copious rainfall. Same is the case with Tamil Nadu, which is generally a rain-shadow area during the southwest monsoon. West Bengal has been in the 'normal' category all along. The map depicts the position as on 31 July.

The delay in advance of monsoon over northwest India was mainly due to the prevalence of unfavourable pressure

patterns. From the second week of July onwards, three low-pressure areas and one depression developed over north Bay of Bengal and moved over land, increasing the rainfall activity over Orissa and then over central and west India. This provided much-needed rainfall to Orissa, MP and Gujarat, all of which are now in 'normal' category. The position in Rajasthan and in Saurashtra and Kutch has also improved to a large extent. Bihar, UP, HP, Delhi, Haryana and adjoining parts of Rajasthan did not benefit much from the passage of these systems, although these regions also received rainfall.

To summarize: Rainfall has been very good over the peninsula, and good over northeast India, West Bengal, Orissa, MP, Gujarat and the island territories. Rainfall has also been by and large satisfactory in Punjab and East Rajasthan. Rainfall activity has been subdued over Bihar, Haryana, HP, Delhi, UP and adjoining parts of Rajasthan; the deficiency in rainfall is more marked in these areas. However, some rainfall activity has restarted over Bihar, UP, HP, and parts of Haryana and adjoining areas of Rajasthan during

the last few days.

In the long-range forecast issued in May, IMD had indicated that the behaviour of certain parameters, particularly El Niño, had been somewhat erratic, and the developments were being watched carefully. El Niño has continued to be erratic and IMD is monitoring the situation. However, at this point in time, IMD does not anticipate any further exceptionally adverse impact of El Niño on the performance of the monsoon in the remaining half of the season.

With the total rainfall for the country as a whole for the first half of the current monsoon season being 93% of the long-period average value, the overall performance of the monsoon so far has been within the range of the long-range forecast issued by IMD in May 1991. Half of the season is still available and it is anticipated that the total seasonal performance of the monsoon for the country as a whole will be on the lower side of the normal range, as forecast by IMD.

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Encyclopaedia of Mathematical Sciences, or mathematics with a human face

More than a hundred volumes of a new *Encyclopaedia of Mathematical Sciences* have been written by Soviet mathematicians in the last few years. About one half of these have appeared at present in Russian, and about twenty volumes have been translated into English by Springer-Verlag. About ten volumes are at present available in the English edition.

The idea of the project was to present a crucial, united treatment of the whole of mathematics, including the applications, from a modern point of view. The development of mathematics in the last century has produced a large amount of important new theories and a new insight into many classical domains. But the style of mathematical writing has become mostly incomprehensible to the potential users of these results (physi-

cists, engineers, etc.), to students, and even to experts in neighbouring domains.

The lucid style of F. Klein's 'History of the development of mathematics in the XIX century', so different from Bourbaki's incomprehensible 'Éléments des Mathématiques', was the inspiring example for the authors of the *Encyclopaedia*, among whom are most of the leading Soviet mathematicians (several articles have been written by Western authors).

The aim of the *Encyclopaedia* is to provide an easy way to the mathematical results and ideas for the potential user, who is interested in the mathematical tools for his problems rather than in the details of the complicated proofs of difficult theorems and in the study of the independence of the axioms and other problems of foundations.

One of the main obstacles to the understanding of modern mathematics by the scientist is its deductive-axiomatized style. According to Bertrand Russell, the axiomatic method has a lot of advantages, similar to the advantages of stealing compared to honest work. The main idea of this method is to replace the *theorems* by *definitions*. The Pythagoras theorem, one of the most important achievements of ancient mathematics, is reduced in the modern axiomatic treatment of geometry to an innocent-looking definition: a Euclidean space is a vector space equipped with a bilinear symmetric positive definite form.

Both presentations—the original one, where the Pythagoras theorem is a statement to be proven, and the axiomatic one, where there is nothing to prove—are in fact mathematically equi-