

Meteorological sub-divisions of India and their geopolitical evolution from 1875 to 2020

R. R. KELKAR and O. P. SREEJITH*

C-905 Mont Vert Grande, Pashan, Pune – 411 021, India

**India Meteorological Department, Ministry of Earth Sciences, Pune – 411 005, India*

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e mail : r.r.kelkar@gmail.com

सार – भारत के मौसम और जलवायु की मुख्य विविधता ने भारत मौसम विज्ञान विभाग (IMD) को 1875 में इसकी स्थापना के तुरंत बाद राजनीति से भिन्न उनके मौसम संबंधी प्रांतों को चित्रित करने के लिए प्रेरित किया। इन प्रांतों को जिन्हें अब मौसम उप-खंडों के रूप में जाना जाता है, 1875 से 2020 तक के वर्षों में इनकी संख्या, नामकरण और स्थानिक सीमा में बदलाव हुए हैं। इस शोध पत्र में इतिहास, भूगोल और राजनीतिक परिवर्तन के संबंध में भारत मौसम विज्ञान विभाग के 36 मौसम उप-खंडों की 2020 तक की विरासत के बारे में बताया गया है।

ABSTRACT. The great diversity of the weather and climate of India prompted the India Meteorological Department (IMD) soon after its establishment in 1875 to delineate its own meteorological provinces that were different from political ones. These provinces, now known as meteorological sub-divisions, changed in number, nomenclature and spatial extent, over the years from 1875 to 2020. The present paper traces the heritage of IMD's 36 meteorological sub-divisions as of 2020 to the past, in terms of history, geography and political changes.

Key words – Meteorological sub-divisions of India, Geopolitical evolution.

1. Introduction

The India Meteorological Department (IMD) was established in 1875 and Henry F. Blanford was appointed as its chief, with the title of Imperial Reporter to the Government of India. Not long thereafter, he wrote, almost poetically: “The connection between the meteorology of a country and the form and clothing of its surface is in all cases very intimate and nowhere more so than in India”. To this he added one long, explanatory sentence: “Nor is this influence one-sided only; not only do the physical condition and movements of the atmosphere depend on the distribution of land and water, on the directions of mountain chains, the elevation of the land above the sea level, the nature of the soil, the presence of sandy wastes or forest-clad uplands and the like; but the fertility of the land surface itself and, in certain cases, the very form of that surface, are in no small degree modified by the direct or indirect action of the atmosphere” (Blanford, 1877).

With such a great diversity of the weather and climate that had to be dealt with, IMD could not have used political maps of British India for analyzing the weather, particularly rainfall and so it delineated its own

meteorological provinces for its own purposes. To quote Blanford again, “The country is partitioned out in a number of rainfall provinces, partly conforming to administrative divisions, but with such modifications as to avoid bringing together parts of the country which differ very greatly in their average” (Blanford, 1889).

In 1875, IMD's area of responsibility extended across the entire south Asian subcontinent from what is presently Pakistan to what is now known as Myanmar. However, IMD was a scientific department and it goes to its credit that it could keep the science of meteorology from being influenced by its functioning as a government department. Since its very inception, IMD took the liberty of (i) dividing large presidencies, provinces and states into smaller divisions or sub-divisions of its own on meteorological grounds (ii) combining small territories, agencies and states that were meteorologically homogeneous into larger divisions or sub-divisions. In addition and (iii) IMD also exercised the freedom to give names to its divisions or sub-divisions which it delineated that did not necessarily conform to prevailing political maps. However, weather and climate have not been the only consideration in the design of IMD's meteorological sub-divisions. For reasons of practical convenience,

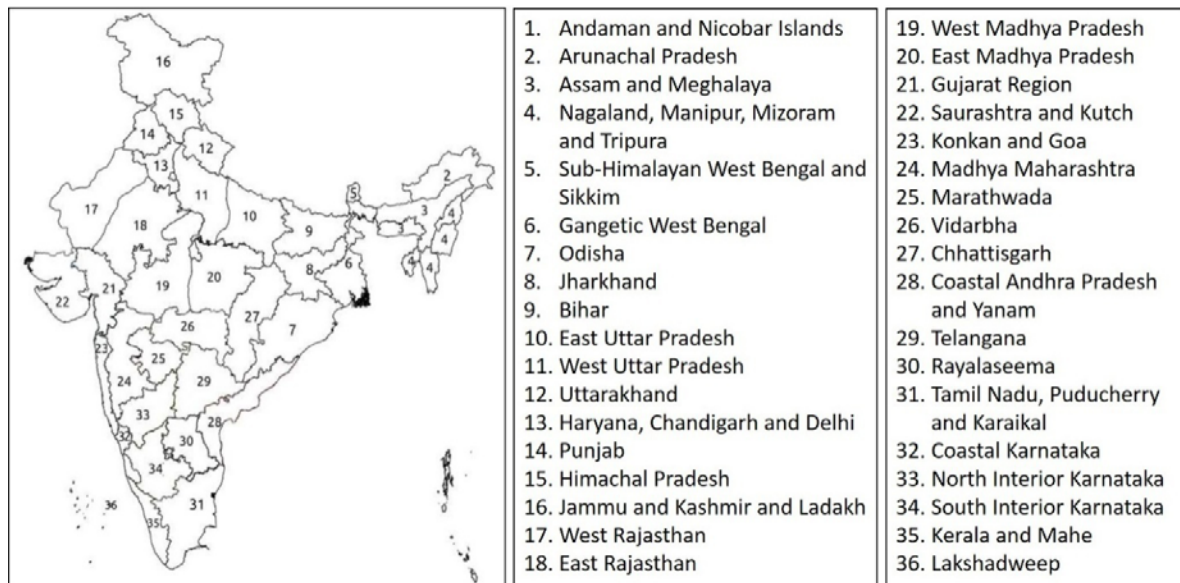


Fig. 1. Meteorological sub-divisions of India (2020) (Source : IMD web site <https://mausam.imd.gov.in>)

compilation of statistics, issue of weather warnings to government functionaries and informing the general public, the sub-divisional boundaries were always made to conform at least to the jurisdiction of basic revenue districts.

As IMD's observatory network expanded and methods of data analysis improved, IMD kept on redefining its meteorological provinces from time to time. The term meteorological sub-division came into systematic use somewhere in the middle of the last century. Until then, terms like meteorological province, division, or district were in vogue and used hierarchically but at times synonymously.

Since a sub-division by definition has a homogeneity of climate, it would be just natural for its inhabitants to have a commonality of language, tradition, culture and thought and even political aspirations. Interestingly, therefore, IMD's delineation of meteorological sub-divisions has in many cases been prophetic in the sense that its sub-divisions have later become the nation's formal political entities or states.

The purpose of this paper is to trace the heritage of IMD's 36 meteorological sub-divisions as of 2020 to the past, in terms of history, geography and political changes.

2. Meteorological sub-divisions of India (2020)

Currently, the number of meteorological sub-divisions in India is 36 and with some exceptions they are

comparable in size (Fig. 1). Out of the 36 sub-divisions, 9 are identical to the states after which they have been named. These are 'Arunachal Pradesh', 'Odisha', 'Jharkhand', 'Bihar', 'Uttarakhand', 'Punjab', 'Himachal Pradesh', 'Chhattisgarh' and 'Telangana'.

There are 6 sub-divisions that are named as groups of states or union territories which have a smaller geographical area and have a similar climate. These are 'Assam and Meghalaya', 'Nagaland, Manipur, Mizoram and Tripura', 'Haryana, Chandigarh and Delhi', 'Jammu and Kashmir and Ladakh', 'Tamil Nadu, Puducherry and Karaikal' and 'Kerala and Mahe'.

On the other hand, some of the larger states have been bifurcated into two meteorological sub-divisions. Thus there are 6 sub-divisions named 'East Rajasthan', 'West Rajasthan', 'East Uttar Pradesh', 'West Uttar Pradesh', 'East Madhya Pradesh' and 'West Madhya Pradesh'. The state of Gujarat has 2 sub-divisions which are named as 'Gujarat Region' and 'Saurashtra and Kutch'. The states of West Bengal and Sikkim together are covered by 2 sub-divisions named as 'Sub-Himalayan West Bengal and Sikkim' and 'Gangetic West Bengal'. Similarly, Andhra Pradesh has 2 sub-divisions named as 'Rayalaseema' and 'Coastal Andhra Pradesh and Yanam'.

There are other larger states which have a greater variation in climate within them. Karnataka is divided into 3 sub-divisions of 'Coastal Karnataka', 'North Interior Karnataka' and 'South Interior Karnataka'. The state of



Fig. 2. Political map of British India as of 1909, showing princely states in yellow (Source : Imperial Gazetteer of India, Public Domain)

Maharashtra is split into as many as 4 sub-divisions called 'Konkan and Goa', which combines the heavy rainfall coastal region with the neighbouring state of Goa, 'Madhya Maharashtra', 'Marathwada' and 'Vidarbha'.

Finally, the 'Andaman and Nicobar Islands' in the Bay of Bengal and the 'Lakshadweep' islands in the Arabian Sea are regarded as 2 separate meteorological sub-divisions.

3. Meteorological provinces, divisions and districts of India (1875-1947)

3.1. Historical Background

After setting foot in the city of Surat in the early years of the 17th century, the British East India Company

rapidly expanded its trading business and also indulged in fulfilling its political ambitions using various unscrupulous and ruthless tactics. The Company made agreements with local rulers, annexed their territories and appointed its agents over them. During that period in history, India had more than 500 princely states, mostly small, over which the company slowly but surely established its firm control even though they were not formally under its rule. By 1851, the East India Company's sovereignty extended across the three large presidencies of Madras, Bombay and Bengal with its capital at Calcutta and the North-West Provinces governed from Agra. In the aftermath of the Sepoy Mutiny of 1857, called more appropriately the First War of Indian Independence, the British East India Company was dissolved and India came under the direct rule of the British Crown.

independence as separate countries, with Pakistan itself comprising two separate wings or exclaves of West Pakistan and East Pakistan. In 1970, West Pakistan was devolved and renamed Pakistan. In 1971, East Pakistan seceded from it and became the new country of Bangladesh.

The political map of British India was thus a dynamic one. At the turn of the 20th century (Fig. 2), British India consisted of eight major provinces, Burma, Assam, Bengal, United Provinces, Punjab, Central Provinces and Berar, Bombay and Madras, which were administered by a governor or a lieutenant-governor. There also were five minor provinces, Andaman and Nicobar Islands, Ajmer-Merwara, North-West Frontier Province, Baluchistan and Coorg, that were administered by a chief commissioner.

From the very beginning, therefore, IMD decided to define its own spatial domains that it could adhere to for meteorological analysis and forecasting even while the political boundaries kept changing. In 1877, just a couple of years after its establishment, IMD had divided the country into 26 areas which it then called meteorological provinces. By and large, this demarcation prevailed until the end of the nineteenth century (Eliot, 1895). Around 1900, IMD increased the number of meteorological provinces to 34 but then onwards preferred to call them divisions, while they were also sometimes referred to as districts. This pattern of meteorological divisions remained essentially unchanged until 1947 (Fig. 3 and Table 1).

3.2. *Burma, Ceylon and the Islands in the Bay of Bengal*

IMD initially had three meteorological provinces, 'Arakan', 'Pegu' and 'Tenasserim', in Lower Burma. Later when Upper Burma came under British rule, they were combined into one province of 'Lower Burma' and 'Upper Burma' also became a new meteorological province. Both 'Lower Burma' and 'Upper Burma' ceased to be meteorological divisions of India after Burma became a British colony in 1937.

Likewise, Ceylon being a British colony, was never regarded as a meteorological sub-division of India, although its data was being included in IMD's weather reports and analyses. In fact, observatories in Ceylon were not under IMD but managed by the Ceylon Surveyor General's Office (Zubair, 2002).

The Andaman and Nicobar group of Islands became a part of British India in 1869 and given the status of a province in 1875, although the British had established a

presence there as early as in 1789 and had been using it as a penal colony. In spite of its remoteness from the Indian mainland, IMD had recognized the importance of the meteorological observations over the islands and had named 'Bay Islands' as a meteorological province in 1877 itself.

3.3. *East and northeast India*

The partition of Bengal in 1905 was a major and controversial territorial reorganization of the large Bengal Presidency by the then Viceroy of India, Lord Curzon, who created a new province of Eastern Bengal and Assam and joined parts of Orissa and Bihar with Bengal. This partition was however, partially reversed in 1911 when Eastern Bengal was reunified with Bengal, while Assam, Bihar and Orissa were separated again. In the same year, the capital of India was shifted from Calcutta to Delhi.

What is significant is that IMD since the very beginning had never regarded Bengal as a single entity but had divided it into the meteorological provinces of 'Assam and Eastern Bengal', 'Western Bengal' and 'Lower Bengal'. 'Eastern Himalaya' was also another meteorological province. After the partition of Bengal was revoked, IMD reorganized its provinces into 'Assam', 'Bengal', 'Orissa', 'Chota Nagpur' and 'Bihar'. It is worthwhile noting that while IMD had made 'Orissa' a division in 1908 itself, Orissa was actually made a separate political province in 1936 by carving out certain portions from the Bihar-Orissa and Madras Provinces.

3.4. *North and northwest India*

IMD had demarcated 'Sind' as a meteorological province in 1908. It was made a political province by separating it from the large Bombay state in 1936.

3.5. *Central India*

The present Vidarbha region of Maharashtra was known as Berar or Berars in British India, its name having been derived from the Marathi word Varhad. Berar was under the rule of the Nizam of Hyderabad until 1853, when on the pretext of his misgovernance, the British assumed direct control over the province. Berar was joined with the Central Provinces in 1903.

Berar has always been given due importance by IMD. To start with, IMD had a meteorological province called 'Berar and Khandesh', Khandesh being the region presently covered by the districts of Jalgaon and Dhule in Maharashtra. Later, it was just 'Berar' and afterwards it was made a part of the larger meteorological province of 'Central Provinces West'.

TABLE 1
Meteorological provinces/divisions/districts of India (1875-1947)

Provinces 1877-1889	Divisions 1908-1912	Divisions 1913-1938	Divisions 1938-1947
Total 26 Provinces	Total 34 Divisions	Total 33 Divisions	Total 31 Divisions
Bay Islands	Bay Islands	Bay Islands	Bay Islands
Arakan			
Pegu	Lower Burma	Lower Burma	-
Tenasserim			
	Upper Burma	Upper Burma	-
Assam and Eastern Bengal	Assam Eastern Bengal	Assam	Assam
Eastern Himalaya			
Western Bengal	Bengal	Bengal	Bengal
Lower Bengal			
Orissa and Northern Circars	Orissa	Orissa	Orissa
Bihar	Chota Nagpur Bihar	Chota Nagpur Bihar	Chota Nagpur Bihar
North-West Provinces and Oudh	United Provinces East United Provinces West	United Provinces East United Provinces West	United Provinces East United Provinces West
Punjab Plains	Punjab East and North	Punjab East and North	Punjab East and North
Western Himalaya	Punjab Southwest Kashmir North-West Frontier Province Baluchistan	Punjab Southwest Kashmir North-West Frontier Province Baluchistan	Punjab Southwest Kashmir North-West Frontier Province Baluchistan
Sind and Kutch	Sind	Sind	Sind
Rajputana West	Rajputana West	Rajputana West	Rajputana West
Rajputana East	Rajputana East	Rajputana East	Rajputana East
Guzerat	Gujarat	Gujarat	Gujarat
Central India States	Central India West Central India East	Central India West Central India East	Central India West Central India East
Central Provinces South	Central Provinces West Central Provinces East	Central Provinces West Central Provinces East	Central Provinces West Central Provinces East
Berar and Khandesh	Berar	Berar	Berar
Konkan and Ghats	Konkan	Konkan	Konkan
North Deccan	Bombay Deccan	Bombay Deccan	Bombay Deccan
Hyderabad	Hyderabad North Hyderabad South	Hyderabad North Hyderabad South	Hyderabad North Hyderabad South
Mysore and Bellary	Mysore	Mysore	Mysore
Malabar and Ghats	Malabar	Malabar	Malabar
Carnatic	Madras Coast North Madras Deccan Madras Southeast	Madras Coast North Madras Deccan Madras Southeast	Madras Coast North Madras Deccan Madras Southeast

Source : Blanford (1886, 1889) and archives of IMD, Pune

3.6. *Western and south India*

While the Bombay and Madras states covered extensive areas of the country, IMD had separated them into several meteorological divisions and they continued as such until India got independence (Table 1).

It is interesting to note that initially, during 1877-1889, along the west coast of the peninsula there were two meteorological provinces named as 'Konkan and Ghats' and 'Malabar and Ghats'. Subsequently, they were renamed as 'Konkan' and 'Malabar' divisions, with the Ghats regions decoupled from the coastal regions and joined with the adjacent divisions to their east. More recent changes in the sub-divisions are discussed in Sections 4.5 and 4.6. The implications of these changes, particularly in respect of the Ghats, are discussed in the companion paper by Kulkarni *et al.* (2020).

4. Meteorological sub-divisions of India (1947-2020)

4.1. *Historical background*

Between 1947 and 1950, the first three years after India got its independence from British rule, the territories of the numerous princely states were politically integrated into the Indian Union. Most of them were merged into existing provinces, many were organised into new provinces and some of the larger princely states became separate provinces. In 1950, these provinces were categorized as Part A, B and C states of India as follows:

Part A states : Assam, Bihar, Bombay (formerly Bombay Province), East Punjab, Madhya Pradesh (formerly Central Provinces and Berar), Madras, Orissa, Uttar Pradesh (formerly the United Provinces) and West Bengal.

Part B states : Hyderabad, Jammu and Kashmir, Madhya Bharat, Mysore, Patiala and East Punjab States Union (PEPSU), Rajasthan (formerly Rajputana Agency), Saurashtra and Travancore-Cochin.

Part C states : Ajmer, Bhopal, Bilaspur, Coorg, Delhi, Himachal Pradesh, Kutch, Manipur, Tripura and Vindhya Pradesh.

Part D state : Only Andaman and Nicobar Islands were placed in this category.

A major restructuring of Indian states, mainly on linguistic grounds, was implemented in 1956 in which several existing states were reorganized and many new states were created.

It was around 1952 that IMD adopted 'meteorological sub-division' as its standard terminology in place of varied terms like meteorological province, division or district used before. In 1947, undivided India had 31 meteorological divisions of which 26 remained in India after independence, either wholly or in part. In the initial years, while India's internal political boundaries underwent rapid changes, it was prudent on IMD's part not to make a hurried and abrupt transition to a new sub-divisional pattern. The delineation of a meteorological sub-division is not simply a matter of territorial adjustment but involves the exhaustive compilation of statistics like normals, averages and records of extreme events, as well as carrying out internal homogeneity checks. IMD settled down to a new pattern of 27 sub-divisions by 1952, which was further modified in 1957 bringing their number to 29. Thereafter the total number of sub-divisions has increased at a very conservative pace and it currently stands at 36, meaning that only 7 sub-divisions have been added in the last 63 years [Tables 2(a&b)]. There have, however, been several changes in the names of sub-divisions over the years as discussed below.

4.2. *East and northeast India*

In 1953, IMD bifurcated the 'Bihar' sub-division into 'Chota Nagpur' and 'Bihar' sub-divisions. In 1958, as a part of the linguistic reorganization of states, the princely states of the Chota Nagpur plateau were merged into a larger state of Bihar. However, IMD chose to keep the sub-divisions separate and only renamed them as 'Bihar Plateau' and Bihar Plains' in 1959. IMD's foresight seemed justified as four decades later, Bihar was again split into two. The plateau area of Bihar became the new state of Jharkhand and the plains became the smaller state of Bihar. In 2001, IMD only had to change the names of the sub-divisions to 'Jharkhand' and 'Bihar'.

In 1952, IMD also bifurcated its 'Bengal' sub-division into 'Sub-Himalayan West Bengal' and 'Gangetic West Bengal' sub-divisions. These have remained essentially the same till now, except that in 1976, the area of the 'Sub-Himalayan West Bengal' sub-division was extended northwards to cover the new state of Sikkim and the name changed to 'Sub-Himalayan West Bengal and Sikkim'.

After the reversal of the partition of Bengal in 1911, the entire northeastern region of India remained as just one meteorological sub-division, 'Assam', for a very long time. It was only in 1965 that IMD bifurcated it into two meteorological sub-divisions, 'North Assam' and 'South Assam'. Seven years later, major political changes followed. In 1972, a new state of Meghalaya was created

TABLE 2 (b) (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Telangana	Telangana	Telangana	Telangana	Telangana	Telangana	Telangana	Telangana	Telangana
Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema	Rayala-seema
Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu	Tamil Nadu, Puducherry and Karaikal
Coastal Mysore	Coastal Mysore	Coastal Mysore	Coastal Karnataka	Coastal Karnataka	Coastal Karnataka	Coastal Karnataka	Coastal Karnataka	Coastal Karnataka
Interior Mysore North	Interior Mysore North	Interior Mysore North	Interior Karnataka North	Interior Karnataka North	North Interior Karnataka	North Interior Karnataka	North Interior Karnataka	North Interior Karnataka
Interior Mysore South	Interior Mysore South	Interior Mysore South	Interior Karnataka South	Interior Karnataka South	South Interior Karnataka	South Interior Karnataka	South Interior Karnataka	South Interior Karnataka
Kerala	Kerala	Kerala	Kerala	Kerala	Kerala	Kerala	Kerala	Kerala and Mahe
Arabian Sea Islands	Arabian Sea Islands	Arabian Sea Islands	Laksha-dweep	Laksha-dweep	Laksha-dweep	Laksha-dweep	Laksha-dweep	Laksha-dweep

Source : Archives of IMD Pune

out of the hilly districts of Assam and statehood was accorded to Manipur and Tripura. The North-East Frontier Agency (NEFA), known earlier as the North-East Frontier Tract (NEFT) under the British rule, was given the status of a union territory with the name of Arunachal Pradesh. The union territory of Mizoram was also created. In tune with these changes in the political map of India, IMD in 1972 delineated 'Arunachal Pradesh' as a separate meteorological sub-division, the third in the northeastern region. It renamed the remaining part of 'North Assam' as 'Assam and Meghalaya' sub-division. It also renamed 'South Assam' as 'Nagaland, Manipur, Mizoram and Tripura' sub-division including Nagaland which had been made a state in 1963. Fifteen years later in 1987, both Arunachal Pradesh and Mizoram became states.

The Andaman and Nicobar group of islands became a part of independent India only in 1950 and was declared as a union territory in 1956. In 1957, IMD created a new sub-division with the name of 'Bay Islands' which in 1980, was made more specific as 'Andaman and Nicobar Islands'.

4.3. North and northwest India

The United Provinces of Agra and Oudh had been created in 1937 in north India under the British rule. After independence, the name was shortened to Uttar Pradesh in 1950. In 1953, IMD split the large meteorological sub-division of 'United Provinces' into two, naming them as

'Uttar Pradesh East' and 'Uttar Pradesh West'. This situation continued until 1971, when 'Uttar Pradesh West' was further bifurcated by IMD into two sub-divisions, 'Plains of West Uttar Pradesh' and 'Hills of West Uttar Pradesh'. Three decades later, in the year 2000, in deference to persistent public demand, a new state was carved out of the northwestern hilly regions of Uttar Pradesh and given the name of Uttarakhand. It was renamed as Uttarakhand in 2007. The sub-division formerly known as 'Hills of West Uttar Pradesh' was accordingly given the name of the state, first 'Uttarakhand' and then 'Uttarakhand'.

Himachal Pradesh was established in 1948 as a Chief Commissioner's Province within the Union of India. It comprised the hill districts around Shimla and southern hill areas of the former Punjab region. It became a Part C state in 1950 and a union territory in 1956. IMD created the meteorological sub-division of 'Himachal Pradesh' in 1964 by bifurcating the larger 'Punjab' sub-division. Himachal Pradesh actually came into existence as a state in 1971.

Even before the linguistic reorganization of states in 1956, there had been several movements for the separation of the predominantly Hindi-and Punjabi-speaking districts of Punjab state. Eventually this was agreed to and a new state of Haryana was carved out of Punjab in 1966 with Chandigarh as a union territory. IMD acting in parallel, bifurcated the 'Punjab' meteorological sub-division into

'Punjab' and 'Haryana' sub-divisions in 1967. In 1969, the 'Haryana' sub-division was renamed as 'Haryana, Chandigarh and Delhi' so as to specifically clarify that it included the two union territories.

'Rajputana West' and 'Rajputana East' meteorological divisions which existed from the very beginning, were renamed as 'West Rajasthan' and 'East Rajasthan' sub-divisions in 1952.

In 2019, the Jammu and Kashmir state was bifurcated into two union territories, Jammu and Kashmir and Ladakh. The meteorological sub-division known as 'Jammu and Kashmir' was subsequently renamed by IMD as 'Jammu and Kashmir and Ladakh'.

4.4. *Central India*

The Central India Agency came into being in 1854 and comprised some 148 princely states, big and small and it continued to exist until India got independence. IMD always had a meteorological province or division named 'Central India' and it was further bifurcated into 'Central India West' and 'Central India East' in 1908. In 1948, Vindhya Pradesh state was created in 1948, from 35 princely states in the former Central India Agency and named after the Vindhya range of mountains, which ran across it. In the same year, Madhya Bharat state was also created from another 25 princely states. In 1949, Bhopal state was formed out of the princely state of Bhopal. In 1952, IMD created two sub-divisions named similarly as 'Vindhya Pradesh' and 'Madhya Bharat' but they were merged into the 'Madhya Pradesh West' sub-division in 1957. The present state of Madhya Pradesh came into being in 1956.

In the year 2000, a new state of Chhattisgarh was carved out of the eastern and southeastern districts of Madhya Pradesh state, fulfilling a longstanding public demand. IMD followed this development with the bifurcation of the 'East Madhya Pradesh' meteorological sub-division into a new 'Chhattisgarh' sub-division and a truncated 'East Madhya Pradesh' sub-division in 2002.

In 1950, Central Provinces and Berar became a part of the newly created state of Madhya Pradesh. In 1956, Berar being a Marathi-speaking area, was transferred to Bombay state. IMD promptly created a new sub-division named 'Vidarbha' in 1957.

4.5. *Western India*

'Gujarat' which had always been a meteorological province, was bifurcated into 'Saurashtra and Kutch' and 'Gujarat State' sub-divisions in 1952. In keeping with the

subsequent reorganization of the Gujarat state, the latter sub-division was renamed as 'East Gujarat State' in 1959 and as 'Gujarat Region' in 1961.

In 1960, Bombay state was split into the linguistic states of Gujarat and Maharashtra. Maharashtra was formed by merging the western and south-western parts of the Bombay state with the Marathi-speaking districts in Hyderabad and Madhya Pradesh states. After toying with names like 'Bombay Deccan', 'Deccan (Desh)', 'Maharashtra' and 'Deccan including Marathwada' over the earlier years, IMD in 1961 divided Maharashtra into four meteorological sub-divisions named 'Konkan', 'Madhya Maharashtra', 'Marathwada' and 'Vidarbha', three of which have since remained unchanged.

In 1961, the Portuguese colony of Goa was integrated with India, but it was much later in 1967 that the 'Konkan' sub-division was extended southwards to include Goa and renamed as 'Konkan and Goa'.

4.6. *South India*

IMD had a sub-division named 'Tamilnad' between 1952 and 1956, when Madras state was formed. However, Madras state was renamed as Tamil Nadu in 1969 and IMD reverted back to that name for its sub-division.

Andhra state was created in 1953 from the Telugu-speaking northern districts of Madras state. The state of Andhra Pradesh was formed in 1956, with the dissolution of the Hyderabad state and the merger of Telangana with Andhra Desa. However, IMD did not merge its respective sub-divisions. In 1957, IMD settled down with three separate sub-divisions named 'Coastal Andhra Pradesh', 'Telangana' and 'Rayalaseema', which have remained unchanged to date. Significantly, the merger of Telangana with Andhra Pradesh was revoked in 2014, when Telangana became a separate state. This is yet another example of the boundaries of a meteorological sub-division getting ratified as the political boundaries of a state.

In 1957, after the state of Travancore-Cochin was renamed as Kerala, IMD renamed its sub-division likewise. In 1974, after the state of Mysore had changed its name to Karnataka, IMD also changed the names of its three sub-divisions in the state accordingly. At the same time, the 'Arabian Sea Islands' sub-division was renamed as 'Lakshadweep'.

Recently, IMD has expanded the names of three of its sub-divisions to include explicitly the names of union territories in their geographical domain. These are

'Coastal Andhra Pradesh and Yanam', 'Tamil Nadu, Puducherry and Karaikal' and 'Kerala and Mahe'.

5. Results and conclusion

An attempt has been made in this paper to trace the geopolitical evolution of the meteorological sub-divisions of India from the time IMD was established in 1875. Two significant results that emerge from this study are that, (i) IMD's sub-divisional classification of the country has stood the test of time and (ii) IMD has not simply accepted or followed new alignments of geopolitical boundaries, but in many instances has preceded or foreshadowed them.

5.1. Coherence and homogeneity

The first result of this paper finds an independent and detailed scientific corroboration in a very recent study by Kulkarni *et al.* (2020) who have reexamined the coherence and homogeneity of rainfall within each of the current 34 sub-divisions of mainland India. They found all of them to be "homogeneous and reasonably coherent" with just three exceptions, 'South Interior Karnataka', 'North Interior Karnataka' and 'Madhya Maharashtra'. Considering that many of the current sub-divisions derive their heritage from the meteorological provinces and divisions of Blanford and his successors, this is a truly remarkable conclusion. It is only a pointer to the deep insight that the British meteorologists had into the climate of the Indian region despite the scanty data available to them at that time. Kulkarni *et al.* have further suggested that in order to improve coherence and homogeneity in certain cases, (i) two of the current sub-divisions, 'Madhya Maharashtra' and 'Konkan and Goa', need to be realigned and (ii) all three current sub-divisions in Karnataka state need to be reorganized so as to include the Ghats region along with the coastal region similar to the erstwhile 'Konkan and Ghats' and 'Malabar and Ghats'. The suggested re-delineation also calls for a split in some of the districts such as Satara in Maharashtra which include the Ghats region as well as the plains region, reallocating the former to the coastal and Ghats sub-divisions. These suggestions call for a paradigm shift from IMD's philosophy of keeping revenue districts intact within a sub-division. If the suggestions are found acceptable on their own merit, it would be worthwhile to convince the state administrations that it would be beneficial for them to redraw their district boundaries in line with IMD's new sub-divisions.

5.2. Geopolitical correlation

As far as the second result of this paper is concerned, it is interesting to note that as many as 8 sub-divisions

defined by IMD or named by it, have eventually been granted statehood or given that name as a state. These instances are summarized below:

'Gujarat' had been regarded as a meteorological province by IMD since 1877 itself, although it was then a part of the Bombay presidency. In 1960, Gujarat became a state.

'Chota Nagpur' was a meteorological division of IMD since 1908. In 1959, the Chota Nagpur region was merged with Bihar to form a unified Bihar state. However, IMD maintained the status quo with 'Bihar Plateau' and 'Bihar Plains' as separate sub-divisions. Eventually in 2001, Bihar state was once again split into two states, with the plateau region becoming the new state of Jharkhand and the plains area became the truncated state of Bihar.

Between 1957 and 1959, IMD had a sub-division named 'Maharashtra' which roughly conformed to the present sub-division of 'Madhya Maharashtra'. In 1960, a much larger state with the name of Maharashtra was created.

A sub-division named 'Tamilnad' existed from 1952 to 1956. Madras State was renamed as Tamil Nadu in 1969.

In 1971, the 'Uttar Pradesh West' sub-division was split into 'Plains of West Uttar Pradesh' and 'Hills of West Uttar Pradesh' sub-division. In 2001, Uttar Pradesh state itself was split and the region covered by 'Hills of West Uttar Pradesh' sub-division became a separate state with the name of Uttaranchal, which in 2007 was renamed as Uttarakhand.

Since 1957 to date, IMD has had a sub-division named 'Telangana'. In 2014, Telangana became a separate state with the bifurcation of Andhra Pradesh state.

What may only be of historical interest now is the fact that even in 1877, 'East Bengal and Assam' was regarded by IMD as a separate meteorological province, distinct from the rest of Bengal. This became a political reality in 1905, when Lord Curzon actually partitioned the province of Bengal. Also in 1908, IMD had made 'Orissa' a meteorological division and Orissa became a political province in 1936. Likewise, IMD had demarcated 'Sind' as a meteorological province in 1908. That too was made a political province by separating it from the large Bombay state in 1936.

5.3. Concluding remarks

That the weather does not recognize political boundaries, may be called a clichéd statement, but it is

certainly true. Weather systems like monsoons, cyclones and western disturbances can sweep across all internal and external political boundaries without any hindrance. Climate, unlike the weather, does not simply play a passive role but in the long run, gives shape to the geopolitical boundaries of a region. This happens through a subtle and indirect process as climate determines the lifestyle of its people, their language, culture, traditions and sources of livelihood. However, climate has its internal spatial variations as well, under whose influence, smaller populations develop their own separate linguistic and cultural identities and aspirations, which eventually result in a realignment of political boundaries as discussed by Kumar (1998). It is not the aim of this paper to make any future projection. It is limited to providing some basic historical information to those who are involved in long term climate change research and may be using the data that IMD has meticulously preserved over a century and a half.

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