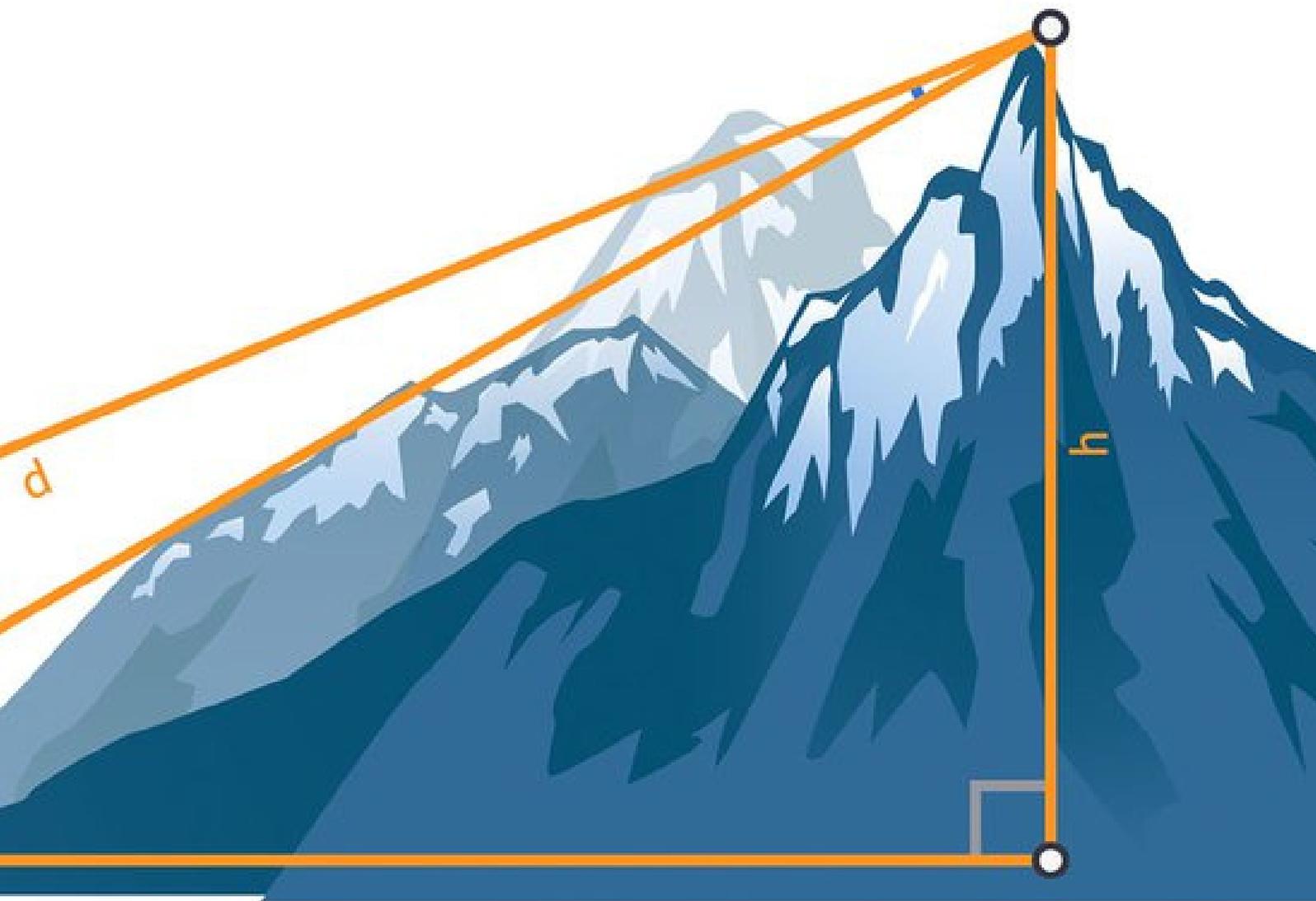


# PRAYAS<sup>4</sup>IAS

AN INITIATIVE BY THE PRAYAS INDIA

SPECIAL ISSUE DECEMBER WEEK 3





# **Special Issue**

**December (Week 3)**

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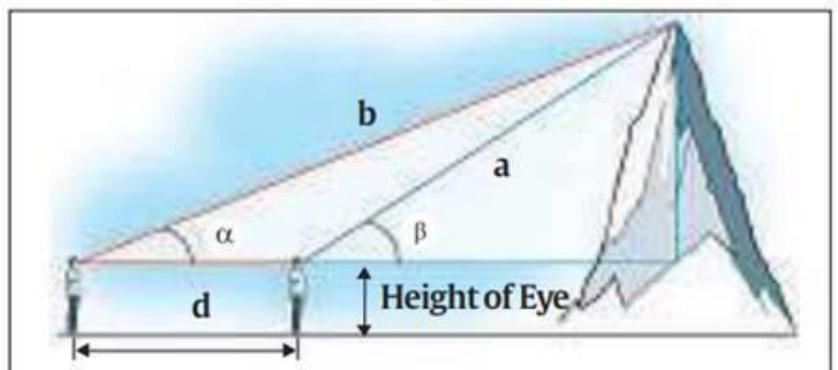
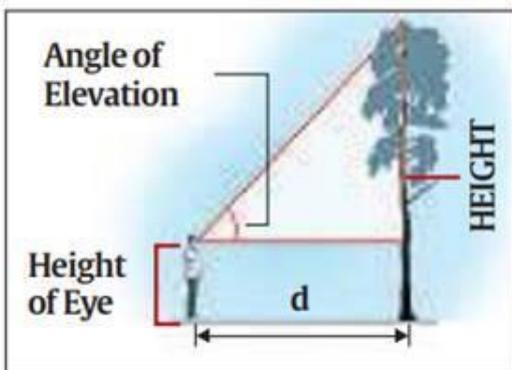
## How to measure a mountain

(Source: [Indian Express](#) )

**Context:** In a new measurement, China and Nepal have announced Mount Everest is 86 cm taller than the 8,848 m accepted globally so far. How was the original height calculated by Survey of India? What does the revision mean?

### How is the height of any mountain measured?

- The basic principle that was used earlier is very simple, and uses only trigonometry which most of us are familiar with, or at least can recall.
- There are three sides and three angles in any triangle. If we know any three of these quantities, provided one of them is a side, all the others can be calculated. In a right-angled triangle, one of the angles is already known, so if we know any other angle and one of the sides, the others can be found out.
- This principle can be applied for measuring the height of any object that does not offer the convenience of dropping a measuring tape from top to bottom, or if you can't climb to the top to use sophisticated instruments.



- Let's say, we have to measure the height of a pole, or a building. We can mark any arbitrary point on the ground some distance from the building. This can be our point of observation. We now need two things — the distance of the building from the point of observation, and the angle of elevation that the top of the building makes with the point of observation on the ground. The distance is not difficult to get. The angle of elevation is the angle that an imaginary line would make if it was joining the point of observation on the ground to the top of the building. There are simple instruments with the help of which this angle can be measured.
- So, if the distance from the point of observation to the building is  $d$  and the angle of elevation is  $E$ , then the height of the building would be  $d \times \tan(E)$ .
- The responsibility of the Survey of India is to prepare authoritative maps, and its work involves carrying out extensive land surveys and mapping topographical features.
- Starting in 1952, the Survey of India undertook an exercise to measure the height of Mount Everest (then known as Peak XV). That exercise measures the height at 8,848 m (29,028 feet), which remained the globally accepted standard, until now.

### Can it be that simple for measuring a mountain?

- The principle is the same, and ultimately, we use the same method, but there are a few complications. The main problem is that though you know the top, the base of the mountain is not known. The question is from which surface you are measuring the height.
- Generally, for practical purposes the heights are measured above mean sea level (MSL). Moreover, we need to find the distance to the mountain. It seems easy today, but there were no GPS or satellite images



in the 1950s. So, how to find the distance of a mountain where you cannot physically go? Till that time nobody had even climbed the Mount Everest.

- We can get around this problem by measuring the angles of elevation from two different points of observation in the same line of view. The distances between these different points of observations can be measured. We will now be dealing with two different triangles, but with a common arm, and two different angles of elevation.
- Again, by following simple rules of high-school trigonometry, the height of the mountain can be calculated, fairly precisely. In fact, this is how we used to do it before the advent of GPS, satellites and other modern techniques.

### **How accurate is this?**

- For small hills and mountains, whose top can be observed from relatively close distances, this can give quite precise measurements. But for Mount Everest and other high mountains, there are some other complications.
- These again arise from the fact that we do not know where the base of the mountain is. In other words, where exactly does the mountain meet flat ground surface. Or, whether the point of observation and the base of the mountain at the same horizontal level.
- The Earth's surface is not uniformly even at every place. Because of this, we measure heights from mean sea level. This is done through a painstaking process called high-precision levelling. Starting from the coastline, we calculate step by step the difference in height, using special instruments. This is how we know the height of any city from mean sea level.
- But there is one additional problem to be contended with — gravity. Gravity is different at different places. What that means that even sea level cannot be considered to be uniform at all places. In the case of Mount Everest, for example, the concentration of such a huge mass would mean that the sea level would get pulled upwards due to gravity. So, the local gravity is also measured to calculate the local sea level. Nowadays sophisticated portable gravimeters are available that can be carried even to mountain peaks.
- But the levelling cannot be extended to high peaks. So we have to fall back on the same triangulation technique to measure the heights. But there is another problem. The density of air reduces as we go higher.
- This variation in air density causes the bending of light rays, a phenomenon known as refraction. Due to the difference in heights of the observation point and the mountain peak, refraction results in an error in measuring the vertical angle. This needs to be corrected. Estimating the refraction correction is a challenge in itself.

### **Use of Technology**

- These days GPS is widely used to determine coordinates and heights, even of mountains. But, GPS gives precise coordinates of the top of a mountain relative to an ellipsoid which is an imaginary surface mathematically modelled to represent Earth. This surface differs from mean sea level. Similarly, overhead flying planes equipped with laser beams (LiDAR) can also be used to get the coordinates.
- But these methods, including GPS, do not take gravity into consideration. So, the information obtained through GPS or laser beams is then fed into another model that account for gravity to make the calculation complete.
- Considering that during 1952-1954, when neither GPS and satellite techniques were available nor the sophisticated gravimeters, the task of determining the height of Mount Everest was not easy.
- Nepal and China have said they have measured Mount Everest to be 86 cm higher than the 8,848 m that it was known to be. What would that mean?
- The 8,848-metre (or 29,028-foot) measurement was done by the Survey of India in 1954 and it has been globally accepted since then. The measurement was carried out in the days when there was no GPS or other modern sophisticated instruments. This shows how accurate they were even during that time.



- In recent years, several attempts have been made to re-measure Everest, and some of them have been produced results that vary from the accepted height by a few feet. But these have been explained in terms of geological processes that might be altering the height of Everest. The accuracy of the 1954 result has never been questioned.
- Most scientists now believe that the height of Mount Everest is increasing at a very slow rate. This is because of the northward movement of the Indian tectonic plate that is pushing the surface up. It is this very movement that created the great Himalayan mountains in the first place. It is this same process that makes this region prone to earthquakes.
- A big earthquake, like the one that happened in Nepal in 2015, can alter the heights of mountains. Such events have happened in the past. In fact, it was this earthquake that had prompted the decision to re-measure Everest to see whether there had been any impact.
- A 86-cm rise would not be surprising. It is very possible that the height has increased in all these years. But, at the same time, 86 cm in a height of 8,848 metres is a very small length.
- The detailed results of the Nepali and Chinese efforts at measuring Everest are still to be published in a journal. The real significance of this measurement would become evident only after that.

### **How Parliament is convened**

(Source: [Indian Express](#) )

**Context:** *In response to a letter from the Congress leader in Lok Sabha Adhir Ranjan Chowdhury seeking a short session of Parliament to discuss the new farm laws, Parliamentary Affairs Minister Pralhad Joshi has said that some opposition parties “have expressed concerns about the ongoing pandemic and opined of doing away with winter session”.*

#### **Sessions of Parliament**

- The power to convene a session of Parliament rests with the government. The decision is taken by the Cabinet Committee on Parliamentary Affairs, which currently comprises nine ministers, including those for Defence, Home, Finance, and Law. The decision of the Committee is formalised by the President, in whose name MPs are summoned to meet for a session.
- India does not have a fixed parliamentary calendar. By convention, Parliament meets for three sessions in a year. The longest, the Budget Session, starts towards the end of January, and concludes by the end of April or first week of May. The session has a recess so that Parliamentary Committees can discuss the budgetary proposals.
- The second session is the three-week Monsoon Session, which usually begins in July and finishes in August. The parliamentary year ends with a three week-long Winter Session, which is held from November to December.
- A general scheme of sittings was recommended in 1955 by the General Purpose Committee of Lok Sabha. It was accepted by the government of Prime Minister Jawaharlal Nehru, but was not implemented.

#### **What the Constitution says**

- The summoning of Parliament is specified in Article 85 of the Constitution. Like many other articles, it is based on a provision of The Government of India Act, 1935. This provision specified that the central legislature had to be summoned to meet at least once a year, and that not more than 12 months could elapse between two sessions.
- Dr B R Ambedkar stated that the purpose of this provision was to summon the legislature only to collect revenue, and that the once-a-year meeting was designed to avoid scrutiny of the government by the



legislature. On the floor of the Constituent Assembly, he said: “We thought and personally I also think that the atmosphere has completely changed and I do not think any executive would hereafter be capable of showing this kind of callous conduct towards the legislature.”

- His drafting of the provision reduced the gap between sessions to six months, and specified that Parliament should meet at least twice a year. He argued that “The clause as it stands does not prevent the legislature from being summoned more often than what has been provided for in the clause itself. In fact, my fear is, if I may say so, that the sessions of Parliament would be so frequent and so lengthy that the members of the legislature would probably themselves get tired of the sessions.”
- During the debate, members of the Constituent Assembly highlighted three issues: (i) the number of sessions in a year, (ii) the number of days of sitting and, (iii) who should have the power to convene Parliament.
- Prof K T Shah from Bihar was of the opinion that Parliament should sit throughout the year, with breaks in between. Others wanted Parliament to sit for longer durations, and gave examples of the British and American legislatures which during that time were meeting for more than a hundred days in a year.
- Prof Shah also wanted the presiding officers of the two Houses to be empowered to convene Parliament in certain circumstances. These suggestions were not accepted by Dr Ambedkar.

### **Moved, delayed, stretched**

- Over the years, governments have shuffled around the dates of sessions to accommodate political and legislative exigencies. In 2017, the Winter Session was delayed on account of the Gujarat Assembly elections. In 2011, political parties agreed to cut short the Budget Session so they could campaign for Vidhan Sabha elections in five states.
- Sessions have also been cut short or delayed to allow the government to issue Ordinances. For example, in 2016, the Budget Session was broken up into two separate sessions to enable the issuance of an Ordinance.
- Sessions have been stretched — in 2008, the two-day Monsoon Session (in which a no-confidence motion was moved against the UPA-I government over the India-US nuclear deal) was extended until December. The ostensible reason was to prevent the moving of another no-confidence motion. It meant that there were only two sessions that year.

### **Fewer House sittings**

- Over the years, there has been a decline in the sittings days of Parliament. During the first two decades of Parliament, Lok Sabha met for an average of a little more than 120 days a year. This has come down to approximately 70 days in the last decade.
- One institutional reason given for this is the reduction in the workload of Parliament by its Standing Committees, which, since the 1990s, have anchored debates outside the House. However, several Committees have recommended that Parliament should meet for at least 120 days in a year.
- Congress leader Pawan Kumar Bansal, during his tenure as member of Rajya Sabha, made this proposal in his private member Bills. Sitting Rajya Sabha MP Naresh Gujral, in his 2017 private member Bill, suggested that Parliament should meet for four sessions in a year, including a special session of 15 days for debating matters of urgent public importance.
- This year, Parliament has met for 33 days. The last time it met for fewer than 50 days was in 2008, when it met for 46 days.

## **How does India choose its Republic Day Chief Guest?**

(Source: [Indian Express](#) )



**Context:** Prime Minister Boris Johnson of the United Kingdom will be the Chief Guest at the forthcoming Republic Day parade.

### **Why is the invitation to attend India's Republic Day a special honour?**

- While the visit of the Chief Guest at the Republic Day parade is similar to a State visit by any foreign high dignitary, given the ceremony involved, it is the highest honour that India accords to a guest in protocol terms.
- The Chief Guest is given the ceremonial guard of honour at Rashtrapati Bhavan, he attends the reception in the evening hosted by the President of India, he lays a wreath at Rajghat, there is a banquet in his honour, a lunch hosted by the Prime Minister, and calls by the Vice-President and the External Affairs Minister.
- The centrepiece of the visit is that the Chief Guest accompanies the President of India, flanked by the horse-mounted President's Bodyguards, to the saluting base on Rajpath from where the President reviews the Republic Day parade.
- According to Ambassador Manbir Singh, a former Indian Foreign Service officer who served as Chief of Protocol between 1999 and 2002, the visit of the Chief Guest is full of symbolism — “it portrays the Chief Guest as participating in India's pride and happiness, and reflects the friendship between the two peoples represented by the President of India and the Chief Guest”.

### **How does India choose the Chief Guest for Republic Day?**

- The government extends its invitation to a Head of State or Government after careful consideration. This process commences almost six months ahead of Republic Day.
- According to Ambassador Manbir Singh, the Ministry of External Affairs (MEA) considers a number of issues, the most important of which is the nature of India's relationship with the country concerned.
- Other factors include political, economic, and commercial relations, the neighbourhood, military cooperation, prominence in regional groupings, or past association in the Non Aligned Movement, in which newly independent countries united in a common struggle against colonialism, apartheid, and the domination of the developed countries.
- All these considerations often point in different directions — and choosing a Chief Guest, therefore, often poses a challenge.

### **What happens after the MEA has zeroed-in on its options?**

- The MEA, after deliberations, seeks the Prime Minister's approval, after which the clearance of Rashtrapati Bhavan is sought. Thereafter, India's ambassadors in the concerned countries try to ascertain discreetly the potential Chief Guests' programme and availability for Republic Day.
- This is an important step, as it may well be that the high dignitary has an unavoidable engagement at that time, such as a session of Parliament in their country, or perhaps an important incoming State visit.
- Once this laborious process has been completed, the territorial divisions in the MEA work towards meaningful talks and agreements, while the Chief of Protocol works on the details of the programme and logistics.
- The Protocol Chief explains to his counterpart from the visitor's side the detailed programme which, for the Republic Day ceremonies, has to be followed minute-by-minute with military precision.
- All aspects of the visit are gone through, such as security, logistics, medical requirements, if necessary, with the active cooperation of the concerned Departments of the Government of India and the governments of the states which the Chief Guest may visit before coming to New Delhi, or after Republic Day.

### **What if there are disagreements during the consultation process?**

- This is an important consideration, because while some discussions on timings and the meetings may take place, there is no flexibility with regard to the Republic Day ceremonies and their schedules.



- However, Ambassador Singh wrote that in his experience, there has been no Chief Guest who did not — for whatever reason — adhere to India’s protocol requirements or programme timings.
- It must be noted that even United States President Barack Obama, the most powerful man in the world at the time, sat through the entire programme as was required.

#### **And what can go wrong during the ceremony?**

- There are so many things to coordinate, and so many moving parts in the grand show that there is always a possibility of a glitch. This is true of all state visits, including that of the Republic Day Chief Guest.
- During state visits, it has happened that the VIP, due to health reasons, has been late for engagements, or has been unable to walk through the Tri-Services Guard of Honour.
- During the monsoon, there is a constant threat of rain, and every contingency needs to be thought of, alternative arrangements made, and rehearsed to perfection. But in spite of all precautions, on rare occasions, some errors do occur.

#### **Who have been India’s Republic Day Chief Guests so far?**

- The list includes an impressive list of world leaders, and reflects both India’s foreign policy priorities and the way the world has perceived it over the decades.
  - 1950: President Sukarno, Indonesia
  - 1951: King Tribhuvan Bir Bikram Shah, Nepal
  - 1952 and 1953: No Chief Guest
  - 1954: King Jigme Dorji Wangchuck, Bhutan
  - 1955: Governor General Malik Ghulam Muhammad, Pakistan
  - 1956: Two guests: Chancellor of the Exchequer Rab Butler, United Kingdom; Chief Justice Kotaro Tanaka, Japan
  - 1957: Minister of Defence Georgy Zhukov, Soviet Union
  - 1958: Marshal Ye Jianying, China
  - 1959: Duke of Edinburgh Prince Philip, United Kingdom
  - 1960: Chairman Kliment Voroshilov, Soviet Union
  - 1961: Queen Elizabeth II, United Kingdom
  - 1962: Prime Minister Viggo Kampmann, Denmark
  - 1963: King Norodom Sihanouk, Cambodia
  - 1964: Chief of Defence Staff Lord Louis Mountbatten, United Kingdom
  - 1965: Food and Agriculture Minister Rana Abdul Hamid, Pakistan
  - 1966: No Chief Guest
  - 1967: King Mohammed Zahir Shah, Afghanistan
  - 1968: Two guests: Chairman Alexei Kosygin, Soviet Union; President Josip Broz Tito, Yugoslavia
  - 1969: Prime Minister Todor Zhivkov, Bulgaria
  - 1970: King Baudouin, Belgium
  - 1971: President Julius Nyerere, Tanzania
  - 1972: Prime Minister Seewoosagur Ramgoolam, Mauritius
  - 1973: President Mobutu Sese Seko, Zaire
  - 1974: Two guests: President Josip Broz Tito, Yugoslavia; Prime Minister Sirimavo Bandaranaike, Sri Lanka
  - 1975: President Kenneth Kaunda, Zambia
  - 1976: Prime Minister Jacques Chirac, France
  - 1977: First Secretary Edward Gierak, Poland
  - 1978: President Patrick Hillery, Ireland
  - 1979: Prime Minister Malcolm Fraser, Australia
  - 1980: President Valéry Giscard d’Estaing, France
  - 1981: President Jose Lopez Portillo, Mexico
  - 1982: King Juan Carlos I, Spain

- 1983: President Shehu Shagari, Nigeria
- 1984: King Jigme Singye Wangchuck, Bhutan
- 1985: President Raúl Alfonsín, Argentina
- 1986: Prime Minister Andreas Papandreou, Greece
- 1987: President Alan Garcia, Peru
- 1988: President J. R. Jayewardene, Sri Lanka
- 1989: General Secretary Nguyen Van Linh, Vietnam
- 1990: Prime Minister Anerood Jugnauth, Mauritius
- 1991: President Maumoon Abdul Gayoom, Maldives
- 1992: President Mário Soares, Portugal
- 1993: Prime Minister John Major, United Kingdom
- 1994: Prime Minister Goh Chok Tong, Singapore
- 1995: President Nelson Mandela, South Africa
- 1996: President Fernando Henrique Cardoso, Brazil
- 1997: Prime Minister Basdeo Panday, Trinidad and Tobago
- 1998: President Jacques Chirac, France
- 1999: King Birendra Bir Bikram Shah, Nepal
- 2000: President Olusegun Obasanjo, Nigeria
- 2001: President Abdelaziz Bouteflika, Algeria
- 2002: President Cassam Uteem, Mauritius
- 2003: President Mohammed Khatami, Iran
- 2004: President Luiz Inácio Lula da Silva, Brazil
- 2005: King Jigme Singye Wangchuck, Bhutan
- 2006: King Abdullah bin Abdulaziz al-Saud, Saudi Arabia
- 2007: President Vladimir Putin, Russia
- 2008: President Nicolas Sarkozy, France
- 2009: President Nursultan Nazarbayev, Kazakhstan
- 2010: President Lee Myung Bak, South Korea
- 2011: President Susilo Bambang Yudhoyono, Indonesia
- 2012: Prime Minister Yingluck Shinawatra, Thailand
- 2013: King Jigme Khesar Namgyel Wangchuck, Bhutan
- 2014: Prime Minister Shinzo Abe, Japan
- 2015: President Barack Obama, United States
- 2016: President François Hollande, France
- 2017: Crown Prince Mohammed bin Zayed Al Nahyan, United Arab Emirates
- 2018: Ten Chief Guests, Heads of ASEAN States:
  - Sultan Hassanal Bolkiah, Brunei
  - Prime Minister Hun Sen, Cambodia
  - President Joko Widodo, Indonesia
  - Prime Minister Thongloun Sisoulith, Laos
  - Prime Minister Najib Razak, Malaysia
  - State Counsellor Aung San Suu Kyi, Myanmar
  - President Rodrigo Duterte, Philippines
  - Prime Minister Lee Hsien Loong, Singapore
  - Prime Minister Prayut Chan-o-cha, Thailand
  - Prime Minister Nguyễn Xuân Phúc, Vietnam
- 2019: President Cyril Ramaphosa, South Africa
- 2020: President Jair Bolsonaro, Brazil
- 2021: Prime Minister Boris Johnson, United Kingdom

