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Daily News Feed

D.N.F

27.11.2025

**Sabaijor Complex, Near Jamunajor Pul,
Castair Town**

Deoghar, Mob: -9162500508

3.5 billion-year-old crater on Mars to be christened after geologist M.S. Krishnan

Tiki Rajwi

THIRUVANANTHAPURAM

A 3.5 billion-year-old crater on Mars will henceforth be known after M.S. Krishnan, the pioneering Indian geologist. The International Astronomical Union (IAU) has approved it and several other names for Martian landforms proposed by two Kerala-based researchers.

Apart from 'Krishnan,' the IAU has also accepted several Kerala-based names for smaller landforms associated with the crater. These are 'Valiamala,' 'Thumba,' 'Bekal,' 'Varkala' and 'Periyar' for smaller craters and a vallis



Smaller craters and vallis in Mars are set to get names — 'Valiamala,' 'Thumba,' 'Bekal,' 'Varkala' and 'Periyar'. SPECIAL ARRANGEMENT

(valley). Which means, these places in Kerala now have counterparts on Mars.

The naming proposal was jointly submitted by Asif Iqbal Kakkassery, formerly research scholar at

the Indian Institute of Space Science and Technology (IIST) here and who is now Assistant Professor in Geology at Government College, Kasaragod, and Rajesh V.J. of the Department of Earth and Space

Sciences, IIST.

Born in Thanjavur in what was then Madras Presidency in 1898, Dr. Krishnan was the first Indian to be director of the Geological Society of India. As for the other names, it is the first time that place names from Kerala are being adopted for Martian features, the team said.

"The plain inside Krishnan Crater has been officially named Krishnan Palus, and a channel cutting across it has been named Periyar Vallis," Dr. Rajesh said.

The findings have been published in the journal *Meteoritics & Planetary Science*.

A 3.5-billion-year-old crater on Mars has been officially named "**Krishnan Crater**", honouring **M.S. Krishnan**, a pioneering Indian geologist and the first Indian Director of the Geological Survey of India (GSI). The **International Astronomical Union (IAU)** approved the proposal submitted by two Kerala-based researchers—**Asif Iqbal Kakkassery** and **V.J. Rajesh** (IIST). This is part of a broader set of names, all inspired by **Kerala locations**, marking the **first time** that Kerala-based place names are adopted for Martian features.

Other Martian features named after Kerala places

- **Valiamala**
- **Thumba**
- **Bekal**
- **Varkala**
- **Periyar Vallis** (a channel cutting across the crater)
- **Krishnan Palus** (plain inside the crater)

These names will now appear on official Martian maps.

About M.S. Krishnan

- Born in 1898 in Thanjavur (then Madras Presidency)
- Renowned Indian geologist
- First Indian Director of the Geological Society of India
- Authored significant works in Indian geology

The research and naming details were published in **Meteoritics & Planetary Science**.

हिंदी सारांश

मंगल ग्रह पर 3.5 अरब वर्ष पुराना एक क्रेटर अब भारत के प्रसिद्ध भूवैज्ञानिक एम.एस. कृष्णन के नाम से जाना जाएगा। इंटरनेशनल एस्ट्रोनॉमिकल यूनियन (IAU) ने यह नामकरण मंजूर किया है। दो केरल-आधारित शोधकर्ताओं — असिफ़ इक़बाल कक्कास्सेरी और वी.जे. राजेश — ने यह प्रस्ताव भेजा था। यह पहली बार है जब केरल के स्थानों के नाम मंगल ग्रह की सतह पर आधिकारिक रूप से अपनाए गए हैं।

मंगल पर केरल आधारित अन्य नाम

- वलियामला
- थुम्बा
- बेकल
- वार्कला
- पेरियार वैलिस — क्रेटर के अंदर से गुजरने वाली घाटी
- कृष्णन पालुस — क्रेटर के भीतर का मैदान

एम.एस. कृष्णन के बारे में

- जन्म: 1898, तंजावुर
- भारत के प्रख्यात भूवैज्ञानिक
- Geological Survey of India के पहले भारतीय निदेशक
- भारतीय भूविज्ञान में महत्वपूर्ण योगदान

यह अध्ययन *Meteoritics & Planetary Science* में प्रकाशित हुआ है।

GS Paper Linkages — UPSC

GS Paper 1 – Geography (Physical Geography & Geomorphology)

- Planetary landforms
- Craters, palus, vallis, surface mapping

GS Paper 3 – Science & Technology

- Space exploration
- International Astronomical Union (IAU)
- Contribution of Indian scientists in planetary science

GS Paper 2 – International Institutions

- Global standard-setting bodies

GS Paper 4 – Ethics

- Recognition of scientific legacy
- Contribution of Indian scientists to global knowledge

Limited room

India must reduce dependence on oil imports to stabilise the rupee

Between late November 2024 and now, the rupee has depreciated about 7%, sliding from roughly ₹83.4 a dollar to about ₹89.2. This is not unprecedented as in 2018, it slid 11%-12% against the dollar. The comparison is instructive because the political and trade backdrops have echoes of that earlier period. In 2018, during the first term of U.S. President Donald Trump, global dollar strength, rising U.S. interest rates and trade tensions pressured emerging market currencies, including the rupee. The RBI used its first longer-term currency-swap as a systemic liquidity check. In 2019, it completed a \$5 billion three-year dollar/rupee swap. And in February 2025, it carried out a \$10 billion dollar/rupee buy-sell swap auction to infuse long-term rupee liquidity into the banking system under global stress. Such swaps are a standard tool by central banks to supply liquidity, shore up forex reserves and prevent disorderly currency depreciation when the dollar surges or capital flows reverse. The steep rupee slide in November arises in a context of external pressures – a widening current-account deficit, driven partly by higher imports of bullion, as a hedge in uncertain times, and exporters scrambling to maintain competitiveness amid high U.S. trade tariffs. In such a hostile global macro-environment, the RBI's mandate is limited: under the floating-but-managed regime, it can only 'smoothen volatility' rather than fix the exchange rate.

Between November last year and now, the RBI sold a net of roughly \$50 billion in forex to stabilise the rupee. Even so, the slide has proceeded, highlighting the external pressures. That said, there is room for cautious optimism. India's foreign exchange reserves are comfortable – close to \$693 billion. On the domestic front, retail inflation has slumped: headline CPI inflation came in at just 0.25% in October 2025, well below the RBI's target-band of 2%-6%. This gives the RBI space to tolerate modest currency depreciation without triggering aggressive rate hikes especially as India transitions from cheaper Russian crude to relatively costlier U.S. oil imports. With crude accounting for over a fifth of total imports in FY25, rupee depreciation combined with costlier oil imports could exert upward pressure on inflation. Given this environment, monetary stabilisation alone cannot suffice. The Centre must address India's long-standing vulnerability: heavy dependence on oil. Steps such as faster transport electrification must be treated as strategic imperatives and pursued with urgency. These must be done with a well thought-out trade policy, as opposed to a raft of bilateral trade deals that India has focused on, in the hope that these would diversify trade routes. If anything, trade agreements with Japan, the UAE and ASEAN have tilted the trade balance against India.

The article explains that the **Indian Rupee has depreciated nearly 7% between November 2024 and late 2025**, moving from ₹83.4 to ₹89.2 per USD.

This depreciation is similar to past episodes, especially **2018**, when U.S. trade tensions, high U.S. interest rates, and strong dollar conditions weakened emerging market currencies, including the rupee.

Why the Rupee is Falling

- **Widening current account deficit**, partly due to high imports of gold and expensive oil.
- **U.S. tariffs** affecting Indian exporters.
- **Global uncertainty** pushing investors away from emerging markets.
- **Dependence on oil imports**, which make up over 20% of India's total imports.

RBI's Limited Capacity

- Under India's **floating-but-managed exchange rate regime**, the RBI can only:
 - smooth volatility
 - intervene using forex reserves
 - conduct currency swaps
- **It cannot fix the rupee's value.**

Despite selling **\$50 billion of forex**, depreciation continues, showing global pressures are stronger.

Reasons for Mild Optimism

- India's **forex reserves are strong** (\$693 billion).
- **Retail inflation has dropped sharply** to 0.25% (October 2025).
- This gives RBI space to allow mild depreciation without raising interest rates.

Strategic Concern: Oil Dependence

As India shifts from cheaper Russian crude to expensive U.S. crude, depreciation makes imports costlier, risking inflation.

The article argues that long-term stability requires reducing oil dependence, especially through:

- large-scale transport electrification
- trade diversification
- high-quality trade agreements with partners like Japan, UAE, ASEAN

Monetary policy alone cannot stabilise the rupee unless the structural vulnerability of oil dependence is tackled.

हिंदी सारांश

लेख बताता है कि **नवंबर 2024 से 2025 के अंत तक भारतीय रुपया लगभग 7% गिरा**, यानी ₹83.4 प्रति डॉलर से फिसलकर ₹89.2 तक पहुंच गया।

यह गिरावट 2018 जैसी परिस्थितियों की याद दिलाती है, जब वैश्विक डॉलर की मजबूती, अमेरिका की ऊँची ब्याज दरें और व्यापार तनाव ने उभरती अर्थव्यवस्थाओं की मुद्राओं को कमजोर किया था।

रुपया क्यों गिर रहा है?

- बढ़ता **चालू खाता घाटा**, विशेष रूप से सोने और महँगे तेल आयात के कारण।
- अमेरिका द्वारा **उच्च टैरिफ**, जिससे भारतीय निर्यातक प्रभावित हो रहे हैं।
- वैश्विक अनिश्चितता।
- **तेल पर अत्यधिक निर्भरता**, जो भारत के कुल आयात का 20% से अधिक है।

RBI की सीमाएँ

भारत की **फ्लोटिंग-बट-मैनेज्ड विनिमय दर प्रणाली** के तहत RBI केवल:

- उतार-चढ़ाव को नियंत्रित कर सकता है
 - फॉरेक्स बेचकर हस्तक्षेप कर सकता है
 - डॉलर/रुपया स्वेप कर सकता है
- लेकिन वह **रुपये का मूल्य स्थिर नहीं कर सकता**।

\$50 बिलियन खर्च करने के बावजूद रुपए में गिरावट जारी है, जिससे पता चलता है कि वैश्विक दबाव ज़्यादा मजबूत हैं।

कुछ सकारात्मक संकेत

- **\$693 बिलियन** का मजबूत विदेशी मुद्रा भंडार।
- खुदरा मुद्रास्फीति **0.25%** (अक्टूबर 2025) तक गिर गई।
- इससे RBI ब्याज दरें बढ़ाए बिना थोड़ी गिरावट सहन कर सकता है।

रणनीतिक समस्या: तेल पर निर्भरता

सस्ती रूसी तेल से महंगे अमेरिकी तेल पर संक्रमण के दौरान, रुपये की गिरावट भारत के लिए महँगे आयात और महँगाई का जोखिम बढ़ाती है।

लेख का मुख्य संदेश:

रुपये को लंबे समय तक स्थिर करने के लिए भारत को तेल पर निर्भरता कम करनी होगी, जैसे—

- बड़े पैमाने पर **परिवहन का विद्युतिकरण**
- व्यापार का विविधीकरण
- जापान, UAE, ASEAN जैसे देशों के साथ संतुलित, उच्च-गुणवत्ता वाले व्यापार समझौते

सिर्फ मौद्रिक नीति से समस्या हल नहीं होगी।

GS Paper Linkages — UPSC

GS Paper 3 – Indian Economy

- Exchange rate management
- Balance of payments
- Current account deficit
- Forex reserves
- Rupee depreciation & monetary policy
- Energy security and oil import dependence

GS Paper 2 – International Relations

- Impact of U.S. tariffs
- Trade negotiations (Japan, UAE, ASEAN)

GS Paper 3 – Environment & Energy

- Transport electrification
- Renewable transition and oil vulnerability

GS Paper 1 – Geography (Economic Geography)

- Global commodity price impacts (oil, bullion)

Fighting the fire

COP30 sought to change the narrative
by focusing on 'implementation'

The 30th edition of the Conference of Parties (COP) concluded in Belem, Brazil, a city chosen for its proximity to the Amazon rainforest. The symbolism was high this year. It is 10 years since the Paris Agreement was signed by 195 countries – a pact to ensure that the globe did not heat up beyond 2°C of pre-industrial times and, as far as possible, contain it to 1.5°C. That was a goal easier stated than done; 2024 ended up being the first time that temperatures breached the 1.5°C territory though it will require several more such transgressions for 1.5°C to be the 'new normal'. In all the years since, COPs have been about systematically getting all countries to move on the path of restructuring their economies away from their fossil-fuel hardwiring; apportioning responsibility – and finance – in ways to actualise these goals, and finally work towards addressing the damage that climate change had already done to societies, livelihoods and ecologies. While there has been success, in that most countries – even the United States – recognise that renewables are the future of energy, it has been challenging for countries to execute the transformation while also growing their economies and keeping their competitive edges sharp. This has led to the formation of the two broad blocs – one led by developed countries and affiliated allies that has pushed for hard targets and road maps to phase out fossil fuels, and the other by developing countries or petro states who reject such prescription and demand more money and action from the developed countries.

The Brazil COP sought to bring a change in the narrative by stressing 'implementation', and reminding the world that multilateralism and 'mutirão' (coming together) were indispensable to the Paris Agreement. While the absence of the U.S. weakened the developed country blocs, this year saw greater thrust on topics such as 'adaptation' and 'just transition' – concepts that acknowledge the everyday effects of climate change and stress practical preparatory steps and finance pledges to help countries burnish climate defences. India, which has been one of the prominent voices for developing country coalitions, was welcoming of the Brazil Presidency's acknowledgement of concerns but did not declare its updated Nationally Determined Contributions (actions on adopting clean energy). The COP's negotiation process often leaves one wondering about the net gains made, given that pollution, deforestation and climate denialism seem more voluble and visible but, as it is often said, this is humanity's only opportunity to mitigate a cataclysm of its making.

English Summary

The article discusses the outcome of **COP30**, held in **Belem, Brazil**, a symbolic venue due to its proximity to the Amazon rainforest. COP30 attempted to shift the global climate discourse toward **implementation**, moving beyond promises and commitments to actual on-ground actions.

Key Points

- **Ten years after the Paris Agreement**, global temperatures have already breached the **1.5°C threshold** in 2024, and repeated transgressions are likely to make 1.5°C the “new normal.”
- COPs aim to guide countries toward restructuring their economies away from fossil fuels, assigning responsibilities, mobilizing finance, and repairing climate-induced damage.
- Despite growth in renewable energy acceptance worldwide, countries face **major difficulties** in executing transitions while maintaining competitiveness.
- This has led to two global blocs:
 1. **Developed countries** pushing for hard timelines to phase out oil, gas, and coal.
 2. **Developing countries & petro-states** demanding more financial support and flexibility.
- COP30 focused heavily on:
 1. **Implementation**
 2. **Adaptation**
 3. **Just transition**These acknowledge the everyday effects of climate change on livelihoods and aim for fairness in transition pathways.
- India welcomed Brazil's balanced approach but **did not update its NDCs**.
- The article ends on a philosophical note: COP negotiations may be slow and frustrating, but they remain **humanity's only real avenue** to prevent catastrophic climate outcomes.

हिंदी सारांश

यह लेख **COP30** के परिणामों पर केंद्रित है, जो ब्राज़ील के बेलें शहर में आयोजित हुआ—एक प्रतीकात्मक स्थल क्योंकि यह अमेज़न वर्षावन के नज़दीक है। COP30 का मुख्य प्रयास था कि जलवायु वार्ताओं में “**घोषणाओं**” से **आगे बढ़कर “क्रियान्वयन” पर जोर दिया जाए।**

मुख्य बिंदु

- **पेरिस समझौते के दस वर्ष बाद** वैश्विक तापमान 2024 में ही **1.5°C** की सीमा पार कर चुका है, और भविष्य में कई बार ऐसा हो सकता है।
- COPs का उद्देश्य देशों को जीवाश्म ईंधन आधारित अर्थव्यवस्थाओं से हटकर नई अर्थव्यवस्थाओं की ओर ले जाना है, जिसमें जिम्मेदारियों का बंटवारा और वित्तीय सहयोग शामिल है।
- नवीकरणीय ऊर्जा का महत्व स्वीकार किया जा रहा है, परंतु **आर्थिक प्रतिस्पर्धा बनाए रखते हुए ऊर्जा परिवर्तन लागू करना कठिन है।**
- दुनिया दो खेमों में बंट गई है:
 1. **विकसित देश**, जो कठोर समय-सीमा के साथ जीवाश्म ईंधन को चरणबद्ध समाप्त करने की मांग करते हैं।
 2. **विकासशील देश और पेट्रो-स्टेट्स**, जो अधिक वित्तीय सहायता और लचीलापन चाहते हैं।
- COP30 ने विशेष ध्यान दिया:
 1. **क्रियान्वयन (Implementation)**
 2. **अनुकूलन (Adaptation)**
 3. **न्यायपूर्ण परिवर्तन (Just Transition)**
- भारत ने जलवायु न्याय और विकासशील देशों की चिंताओं पर जोर दिया, परंतु **अपने संशोधित NDCs प्रस्तुत नहीं किए।**
- लेख अंत में बताता है कि भले ही COP की प्रक्रिया धीमी और जटिल हो, यह **मानवता के पास जलवायु आपदा से बचने का एकमात्र रास्ता है।**