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Table of Contents

1. PM Gati Shakti
2. Crypto-Currency
3. UNCLOS
4. Japan's SLIM Mission
5. Heat Waves
6. Exercise Bright Star-23
7. Nairobi Declaration
8. National Green Tribunal (NGT)
9. Swachh Vayu Sarvekshan 2023
10. Heat Index

PIB

Sept 7

PM GATI SHAKTI

(Syllabus: GS Paper 3 – Economy)

India showcases PM Gatishakti National Masterplan at Asian Development Bank's 2023 Regional Cooperation and Integration Conference

Context: India recently showcased **PM Gatishakti National Master Plan** at the **'2023 Regional Cooperation and Integration Conference**: Strengthening Regional Cooperation and Integration through Economic Corridor Development (ECD)', organized by **Asian Development Bank (ADB)** at Tbilisi, Georgia.

PM Gati Shakti

- **Launched:** October 2021.
- **Aim:** It is the first National Infrastructure Masterplan**. The National Master Plan for Multi-modal Connectivity** is essentially **a digital platform** to bring 16 Ministries includes Railways and Roadways and others.
  - To boost economic growth (Shakti) through infrastructure building.
  - To improve the productivity of industries and employment opportunities.
  - It is considered to be the government's integrated approach to developing modern railways, roadways, waterways and airways.
- **Method:** It **breaks the inter-ministerial silos and to integrate** the planning of infrastructure projects related to road, rail, air and waterways etc.
- **Integration:** It incorporates the infrastructure schemes of various Ministries and State Governments like Bharatmala, Sagarmala, inland waterways, dry/land ports, UDAN etc.
- **Pillars of PM Gati Shakti:** Comprehensiveness, Prioritization, Optimization, Synchronization, Analytical, Dynamic.

Asian Development Bank (ADB)

- **Formation:** 1966.
- **Objective:** It envisions a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty in the region.
- **Headquarter:** Manila, Philippines.
- **Members:** 68 members including India, China and Pakistan. The bank admits the members of the UN Economic and Social Commission for Asia and the Pacific (UNESCAP, formerly the Economic Commission for Asia and the Far East or ECAFE), and non-regional developed countries

LIVEMINT

Page 1

CRYPTO-CURRENCY

(Syllabus: GS Paper 3 – Economy)

'Blanket crypto ban hard to implement'

Rhik Kundu
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NEW DELHI

A blanket ban on crypto assets may be hard to pull off, and nations must instead apply rules on money laundering and terror finance to these assets and service providers, an influential policy paper said, while noting that increased adoption of these assets could undermine monetary policy transmission.

The joint paper from the International Monetary Fund (IMF) and G20's risk watchdog, the Financial Stability Board (FSB), has attempted to offer a roadmap for regulating crypto assets and helping nations integrate virtual digital assets into their digital financial systems.

"They (blanket bans) also tend to increase the incentives for circumvention due to the inherent borderless nature of crypto assets, resulting in potentially heightened financial integrity risks, and can also create inefficiencies," the paper said.

The paper also called on nations to implement the Financial Action Task Force (FATF) anti-money laundering and counter-terrorist financing (AML/CFT) standards for virtual assets (VAs) and virtual asset service providers (VASPs). It also recommended developing a common framework and collection of 'test data' on digital money and crypto assets for being used as a means of payment that are ena-

TURN TO PAGE 8

Context: A blanket ban on crypto assets **may be hard to pull off**, and nations must instead apply rules on money laundering and terror finance to these assets and service providers, according to joint paper from the **International Monetary Fund (IMF) and G20's risk watchdog, the Financial Stability Board (FSB).**

Crypto-Currency

- **About:** A crypto-currency is defined by three key elements.
  - **1st:** it is a digital representation of value,
  - **2nd:** it can be transferred electronically and
  - **3rd**: it is recorded in a digital ledger that is widely accessible.
- **Definition:** It is a digital payment system that doesn't rely on banks to verify transactions. It's a peer-to-peer system that can enable anyone anywhere to send and receive payments.
- **Working of Crypto-Currencies:**
  - It uses encryption to verify transactions.
  - It **run on a distributed public ledger called blockchain**, a record of all transactions updated and held by currency holders.
  - Units of crypto-currency are created through a process called **mining**.
- **Advantages of adopting crypto-currencies: C**heaper and safer, Transaction values cannot be replicated, potential to transform the entire financial system, a decentralised finance matrix, No identity theft, immediate settlement, access to everyone, lower fees etc.
- **Issues involved with legalizing crypto-currencies: Could pose** adverse destabilisation of financial systems, could weaken governments' ability to set monetary policy and bring changes accordingly, could also allow foreign powers to accrue influence in country's money supply, pose significant security risks, drug traffickers, ransomware attackers and money launderers can all make use of blockchain technology to operate outside of the legal framework.

ECONOMIC TIMES Page 2

UNCLOS

(Syllabus: GS Paper 2 – IR)

PM Bats for Open and Free Indo-Pac at East Asia Meet

'Code of Conduct should be effective for South China Sea, be UNCLOS compliant and interests of those not part of the discussions should be kept in mind'

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Indonesian President Joko Widodo greets Prime Minister Narendra Modi on his arrival in Jakarta on Thursday to attend the Asean summit - PTI

New Delhi: Prime Minister Narendra Modi emphasised while addressing the East Asia Summit on Thursday that "the need of the hour is an Indo-Pacific where international law, including UNCLOS (United Nations Convention on the Law of the Sea), applies equally to all countries, where there is freedom of navigation and overflight, and where there is unimpeded lawful commerce for the benefit of all".

He also addressed the India-Asean Summit in Jakarta, where he unveiled a 12-point plan across sectors ranging from connectivity to digital public infrastructure (DPI) and counter-terrorism. "India believes that the Code of Conduct should be effective for the South China Sea, be UNCLOS compliant and, in this, the interests of those countries which are not part of the discussions should also be kept in mind," the PM said.

At the East Asia Summit, the PM pitched for everyone's commitment and joint efforts to strengthen the sovereignty and territorial integrity of all countries against the backdrop of China's increasing military assertiveness in the South China Sea. He said all countries in the region have an interest in peace, security and prosperity in the Indo-Pacific.

His comments came days after a number of Asean member countries such as Malaysia, Vietnam and the Philippines reacted sharply to China's territorial claim over the South China Sea in its latest edition of the "standard map of China".

On August 28, China released the 2023 edition of the "standard map of China", showing Taiwan, the South China Sea, Arunachal Pradesh and Aksai Chin as Chinese territories. India dismissed the "map" and lodged a strong protest with China over it.

The 12-point plan unveiled by the PM at India-Asean summit proposes establishing multi-modal connectivity and an economic corridor that links India, Southeast Asia, West Asia and Europe.

> **The need of the hour is an Indo-Pacific where international law, including UNCLOS (United Nations Convention on the Law of the Sea), applies equally to all countries, where there is freedom of navigation and overflight, and where there is unimpeded lawful commerce for the benefit of all**
> **Narendra Modi, Prime Minister**

PM announces renewal of support to the Economic Research Institute for Asean and East Asia

PM Modi also called for a collective fight against terrorism, terror financing and cyber disinformation

PM announces India's decision to open an embassy in Dili, the capital of Timor-Leste

Modi was on a less than 24-hour visit to Jakarta to attend the India-Asean Summit and East Asia Summit held under Indonesian presidency ahead of the G20 summit. India also offered to share its DPI expertise with Asean partners and announced an "Asean-India fund for digital future".

The PM also announced the renewal of support to the Economic Research Institute for Asean and East Asia and called for collectively raising issues of the global south at multilateral forums and offered to share the country's expertise in providing affordable and quality medicines through the Jan-Aushadhi Kendras.

Modi also called for a collective fight against terrorism, terrorism financing and cyber disinformation, cooperation in disaster management and bolstering collaboration in maritime safety and security and domain awareness.

Other measures included in the plan are traditional medicine, India's Mission LiFE (Lifestyle for Environment) and the Coalition for Disaster Resilient Infrastructure. "The 21st century is the century of Asia. This is our century. This requires the creation of a rules-based post-Covid world order, and everyone's effort for human welfare," Modi said on the occasion. "We all have a common interest in amplifying the voices of the global south."

Asean-India cooperation is making steady progress in every field, "even in an environment of global uncertainties", the PM emphasised. India and the Asean states are connected by history and geography, shared values, peace, prosperity and a shared belief in a multipolar world, he said. "Asean is the central pillar of India's Act East policy. India fully supports Asean centrality and Asean's outlook on the Indo-Pacific. ASEAN holds a prominent place in India's Indo-Pacific initiative. Last year, we celebrated the India-Asean Friendship Year and elevated our relationship to a 'comprehensive strategic partnership'," he said.

During the summit, PM Modi announced India's decision to open an embassy in Dili, the capital of Timor-Leste. The Prime Minister of Timor-Leste attended the summit as an observer.

Context: Prime Minister of India recently emphasised while addressing the **East Asia Summit** that "the need of the hour is an Indo-Pacific where international law, including **UNCLOS (United Nations Convention on the Law of the Sea),** applies equally to all countries, where there is freedom of navigation and overflight.

UNCLOS

- **About**: An international agreement that establishes a legal framework for all maritime and marine activities.
- **Origin**: Signed in 1982 it came into effect in 1994.
- **Headquarter:** Kingston, Jamaica.
- **Members**: 168 countries.
  - 14 Members including USA, Iran, UAE, Afghanistan and others have signed the Convention but have not ratified it.
  - 15 United Nations member and observer states have neither signed nor acceded the convention. It includes Israel, Turkey, Peru, Uzbekistan etc.
  - India has been a party to the convention since 1995.

East Asia Summit:

- **Initiated in:** 2005, Kuala Lumpur, Malaysia.
- **Objective:** It is as a premier Leaders-led forum for dialogue and cooperation on broad strategic, political, and economic issues of common interest and concern with the aim of promoting peace, stability, and economic prosperity in IndoPacific region.
- **Members:** 18 members, the ten ASEAN Plus Six mechanism (Australia, China, India, Japan, New Zealand, the Republic of Korea) along with, Russia and the United States, both were added in 6th summit, 2011

JAPAN'S SLIM MISSION
(Syllabus: GS Paper 3 – Science & Tech)

Japan launches 'moon sniper' lunar mission, to land next year



A H-IIA rocket carrying a small lunar surface probe and other objects lifting off from the Tanegashima Space Centre on Tanegashima island, Kagoshima prefecture, Japan on Thursday. AFP

Reuters
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TOKYO: Japan launched a lunar exploration spacecraft on Thursday aboard a homegrown H-IIA rocket, hoping to become the world's fifth country to land on the moon early next year.

Japan Aerospace Exploration Agency (JAXA) said the rocket took off from Tanegashima Space Center in southern Japan as planned and successfully released the Smart Lander for Investigating Moon (SLIM). Unfavourable weather led to three postponements in a week last month.

Dubbed the "moon sniper", Japan aims to land SLIM within 100 metres of its target site on the lunar surface. The $100-million mission is expected to start the landing by February after a long, fuel-efficient approach trajectory.

"The big objective of SLIM is to prove the high-accuracy landing ... to achieve 'landing where we want' on the lunar surface, rather than 'landing where we can'," JAXA president Hiroshi Yamakawa told a news conference.

Hours after launch on Thursday, JAXA said it picked up signals from SLIM showing it was operating normally.

The launch comes two weeks after India became the fourth nation to successfully land a spacecraft on the moon with its Chandrayaan-3 mission to the unexplored lunar south pole. Around the same time, Russia's Luna-25 lander crashed while approaching the moon.

Two earlier lunar landing attempts by Japan failed in the last year. JAXA lost contact with the OMOTENASHI lander and scrubbed an attempted landing in November. The Hakuto-R Mission 1 lander, made by Japanese startup ispace, crashed in April as it attempted to descend to the lunar surface.

SLIM is set to touch down on the near side of the moon close to Mare Nectaris, a lunar sea that, viewed from Earth, appears as a dark spot. Its primary goal is to test advanced optical and image processing technology.

After landing, the craft aims to analyse the composition of olivine rocks near the sites in search of clues about the origin of the moon. No lunar rover is loaded on SLIM.

Context: Japan's **Moon-lander mission, called SLIM**, was recently launched. A successful landing on the Moon by the SLIM spacecraft would make Japan only the fifth country in the world to do so.

Smart Lander for Investigating Moon (SLIM) Mission

- **Launched by:** Japan by its **H-IIA rocket** that took the SLIM in space and also carried an **X-Ray Imaging and Spectroscopy Mission (XRISM),** a satellite meant for astronomical observations.
  - This is the first Moon-landing attempt being made by Japan Aerospace Exploration Agency (JAXA).
- **Unique route:** It is taking a uniquely long route to the Moon and is scheduled to make a landing in four to six months. If successful, SLIM would be the smallest and lightest spacecraft to land on the Moon.
- **Technicality:** SLIM is a pretty small spacecraft, weighing **just about 200 kg**.
- **Objective:** The main objective of SLIM is to demonstrate precision landing, within 100 metres of the chosen site.

DTE Sept 7

HEAT WAVES

(Syllabus: GS Paper 3– Disaster/Env & Eco)

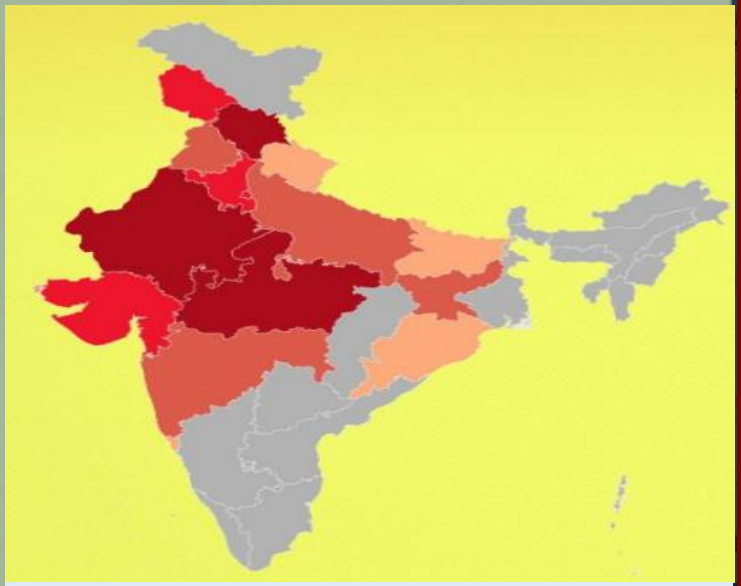
Heatwaves leading to ozone pollution, says WMO report

Climate change continues to increase heatwaves' intensity; extreme heat 'compounded' measurably impacts air quality, it adds

Context: Climate change is increasing the frequency and intensity of heatwaves, which, in turn, increase the risk and severity of wildfires. This, along with dust, is causing a spike in air pollutants including ozone, a report by the World Meteorological Organization (WMO) has stated.

Heat Waves

- **Meaning:** It is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season in the North-Western parts of India.
- **Criteria for declaring Heat waves:** A region is declared under heat waves when,
  - **Maximum temperature:** Of a station reaches at least 40°C for Plains and at least 30°C for Hilly regions.
  - **Based on Departure from Normal Heat Wave:**
    - ✓ Departure from normal is 4.5°C to 6.40°C
    - ✓ Severe Heat Wave: Departure from normal is >6.4°C
  - **Based on Actual Maximum Temperature Heat Wave:**
    - ✓ When actual maximum temperature ≥ 450°C
    - ✓ Severe Heat Wave: When actual maximum temperature ≥470°C
  - If above criteria met at least in 2 stations in a Meteorological sub-division for at least two consecutive days then it is declared on the second day.
  - **For coastal regions:** When maximum temperature departure is 4.50°C or more from normal, Heat Wave may be described provided actual maximum temperature is 370°C or more.



Conditions for heat wave:

- Transportation / prevalence of hot dry air over a region.
- Absence of moisture in the upper atmosphere.
- The sky should be practically cloudless.
- Large amplitude anti-cyclonic flow over the area.
- When soil is very dry and solar radiation is high, promoting even higher temperatures.

PIB

Sept 7

EXERCISE BRIGHT STAR - 23

(Syllabus: GS Paper 2 – IR)

INS SUMEDHA AT ALEXANDRIA, EGYPT FOR EX- BRIGHT STAR- 23

Context: INS Sumedha recently arrived at **Port Alexandria, Egypt** to participate in '**Exercise BRIGHT STAR-23'.**

Exercise BRIGHT STAR- 23

- **About:** This is a **multinational Tri-Services military exercise** that will see participation from **34 countries.**
  - It is the **largest ever joint military exercise in Middle East & North Africa region.**
- **India's participation:** This is the **maiden participation** of Indian Navy in Ex Bright Star, which will also see participation of Naval ships from other Friendly Foreign Navies.

About INS Sumedha

- **Make in India initiative:** It is the third ship of the **indigenously built Saryu class Naval Offshore Patrol Vessels (NOPV)** that possess long endurance, are fitted with requisite weapons, sensors, and capable of embarking an integral helicopter.
  - It bears testimony to the capabilities of the Indian shipbuilding industry which underscores the vision of **'Aatmanirbhar Bharat**'.

Exercise between India-Egypt:

- **Exercise Cyclone-I**: It is the first ever joint exercise between the special forces of the Indian Army and the Egyptian Army.

DTE

Sept 7

NAIROBI DECLARATION

(Syllabus: GS Paper 3 – Env & Eco)

Africa Climate Summit 2023 ends with 'Nairobi Declaration', but not everyone is happy

The declaration has received mixed reactions, with activists, members of civil society, energy and health experts, criticising it for not being inclusive and radical enough

Context: The inaugural **Africa Climate Summit (ACS23)** in Nairobi culminated in **the 'Nairobi Declaration',** giving the continent a common voice ahead of upcoming key global engagements.

Nairobi Declaration

- **About:** It has a raft of **recommendations, pledges and demands** believed to have boosted Africa's bargaining power on international platforms.
- **It calls for:** Reforms to multilateral financial systems, with concerted appeals for debt relief and restructuring existing debts.
  - This declaration will serve as a basis for Africa's common position in the global climate change process like COP28 summit.
- It highlights: Green investment opportunities in Africa's emerging blue and green economies. It also urges world leaders to back a proposed "carbon tax on fossil fuel trade, maritime transport and aviation".

Africa Climate Summit (ACS23)

- **About: It is Africa's First Climate Summit held in Nairobi, Kenya.**
- **Aim:** To achieve the necessary emissions reduction targets and ensure adequate funding for climate action, a comprehensive global funding mechanism is required.
- **Participation:** Governments and multilateral institutions play a central role, the private sector, civil society, philanthropic institutions, and local communities.

TIMES OF INDIA Page 1

NATIONAL GREEN TRIBUNAL (NGT)

(Syllabus: GS Paper 3 – Env & Eco)

NGT: Take steps against illegal mining near Ranthambore

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Jaipur: The National Green Tribunal (Bhopal) has directed the Union ministry of environment and forest and climate change (MoEF&CC) to take necessary action against illegal mining carried our without valid environmental clearance in the buffer zone of Ranthambore Tiger Reserve.

The tribunal sought an action taken report within three weeks, with an affidavit from the member secretary, State Pollution Control Board (PCB), that he/she would remain present at the time of hearing via video link on September 26.

The tribunal order followed an application by Devidas Khatri regarding alleged illegal mining by ACC Cement (now an Adani group company) without environmental clearance and, also, without permission to do so within 10 km of the national park and wildlife sanctuary at Ranthambore. It was also submitted by Rohit Kumar Tuteja, counsel for the petitioner, that the cement company continued illegal mining for more than five years but no action was taken by the Rajasthan State Pollution Control Board.

The NGT constituted a three-member committee consisting of a representative each from the MoEF&CC, central pollution control board and the state PCB to monitor and examine the matter.

The NGT asked the state PCB to submit a report on why the consent to operate application was kept pending by RSPCB from 2017 to 2022; how many consent-to-operate applications of mining leases were issued without environmental clearance; how many mining leases were accorded conditional consent to operate for a year without environmental clearance; the number of inspections carried out by RSPCB of the mining lease in a red category industry; why action was not taken for want of environmental clearance; the quantum of minerals excavated by respondent, with details of the area excavated from 2017 till date; the amount paid; and use of power for mining.

Context: The **National Green Tribunal (NGT),** Bhopal has directed the Union ministry of environment and forest and climate change (MoEF&CC) to take necessary action against illegal mining carried our without valid environmental clearance in the buffer zone of **Ranthambore Tiger Reserve.**

National Green Tribunal (NGT)

- **Background:** The NGT was established by an Act of the Parliament i.e., **National Green Tribunal, Act, 2010**.
- **Objective:** NGT was established **for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.**
- **Inspired by:** NGT draws inspiration from:
  - The **United Nations Conference on the Human Environment** held at Stockholm in 1972.
  - The **United Nations Conference on Environment and Development** held at Rio de Janeiro in 1992.
  - And, from the Constitution of India under **Article 21** which assures the citizens of India the right to a healthy environment (by judicial pronouncement).
- **NGT Powers: The following are the Acts under which NGT can take actions and has authority to take actions:**
  - The Water (Prevention and Control of pollution) Act, 1974.
  - The Water (Prevention and control of Pollution) Cess Act, 1977.
  - The Forest (Conservation) Act, 1980.
  - The Air (Prevention and Control of Pollution), 1981.
  - The Environment (Protection) Act, 1986.
  - The Biological Diversity Act, 2002.
- **However, the NGT Act does not cover two important legislations related to environment, they are:** The Wildlife (Protection) Act, 1972 Forest Rights) Act, 2006.

INDIAN EXPRESS Page 10

SWACHH VAYU SARVEKSHAN 2023
(Syllabus: GS Paper 3 – Env & Eco)

Indore tops clean air survey among cities with mn-plus people

EXPRESS NEWS SERVICE
NEW DELHI, SEPTEMBER 7

UNION ENVIRONMENT, Forest and Climate Change Minister Bhupender Yadav on Thursday announced awards under the Swachh Vayu Sarvekshan 2023 (clean air survey) in Bhopal, with Indore in Madhya Pradesh clinching the top rank in the million-plus population cities.

The second year of the Swachh Vayu Survekshan, carried out by the ministry based on self-assessments submitted by 130 identified cities under the National Clean Air Programme, saw Agra in Uttar Pradesh securing the second rank, followed by Thane in Maharashtra on the third spot.

The awards are announced in three categories of cities — million plus cities, cities with a population between three and ten lakh and cities of under three lakh population — based on the 2011 population census.

The assessment was done based on submission of self-assessment report, along with supporting documents, by urban local bodies. The reports and documents were further vetted by respective Air Quality Monitoring Committee, chaired by Principal Secretary, Environment, and further examined and evaluated by CPCB for rankings.

In the second category, Amravati of Maharashtra has secured the first rank, followed by Moradabad (Uttar Pradesh) and Guntur (Andhra Pradesh).

Two Himachal Pradesh towns — Parwanoo and Kala Amb — have bagged the first two positions in the under-three-lakh population category, while Angul in Odisha secured the third place.

The cities were assessed on eight major points, including control of biomass and municipal solid waste burning, road dust, dust from construction and demolition waste, vehicular emissions, industrial emissions, public awareness, and improvement in PM10 concentration.

The 2022 survey found the first three spots in the million-plus cities being secured by cities in Uttar Pradesh — Lucknow on first position, Prayagraj on second position and Varanasi securing third.

All three cities have been ranked lower this year.

Context: Union Environment, Forest and Climate Change Minister recently announced awards under the **Swachh Vayu Sarvekshan 2023 (clean air survey)** in Bhopal, with Indore in Madhya Pradesh clinching the top rank in the million-plus population cities.

Swachh Vayu Sarvekshan 2023 (clean air survey)

- **Conducted and released by:** Ministry of Environment, Forest and Climate Change.
- **Assessment criteria**: Self-assessments submitted by 130 identified cities under the **National Clean Air Programme**.
- **Evaluation factors:** Solid waste control, vehicular emissions, industrial emissions, and improvement in PM10 levels.
- **Categories and rank:**
  - **1st category (million plus population):** Indore >Agra>Thane.
  - **2nd category (3-10 lakhs population):** Amravati>Moradabad >Guntur.
  - **3rd category (less than 3 lakhs population):** Parwanoo > Kala Amb >Angul.

National Clean Air Programme (NCAP)

- **Launched:** 2019
- **AIM:** Time-bound, **national level strategy to tackle the air pollution** problem across India, in a comprehensive manner.
- **Targets:**
  - **Early targets: 20-30% reduction** of PM2.5 and PM10 concentration by **2024,** taking **2017** as the base year for comparison.
  - **New targets (Revised):** 40% reduction in particulate matter concentration in cities covered under the National Clean Air Programme (NCAP) by 2026
- **Implemented in 132 cities:**
  - 123 Non-Attainment cities (NACs) identified under NCAP
  - 8 million Plus Cities (MPCs) identified by 15th Finance Commission

THE HINDU

Page 12

HEAT INDEX

(Syllabus: GS Paper 1 – Geography)

What is heat index and why is it important to measure?

How does high humidity impact the human body during a heatwave? At what temperature and humidity levels do heat cramps or heat exhaustion become likely?

Priyali Prakash

The story so far:

Earlier in August, Iran recorded a scorching heat index of 70 degrees Celsius (°C) in the coastal part of the country, a metric at which survival of life is unfathomable, if not impossible. The country had also declared public holidays on August 2 and 3 on account of "unprecedented heat," *Reuters* reported. This is not the first time this year that Iran is dealing with extreme heat. In July, U.S.-based weather observer Colin McCarthy reported that the Persian Gulf Airport recorded a heat index of 66.7 °C.

What is heat index?

Heat index, also known as apparent temperature, is a measure of how the temperature feels to humans. Relative humidity is an important factor that determines heat index, along with air temperature.

How is the heat index calculated?

A complex formula to calculate heat index was published by Dr. Robert Steadman, a professor in the textiles and clothing department of Colorado State University, in 1979. Dr. Steadman published two papers titled *The Assessment of Sultriness - Part I: A Temperature-Humidity Index Based on Human Physiology and Clothing Science*, and *Part II: Effects of Wind, Extra Radiation and Barometric Pressure on Apparent Temperature*, both describing his calculations of heat index.

Dr. Steadman's study considers a "typical adult human of either sex, with a height of 1.7 metres and a weight of 67 kg."

Dew point, which is the temperature at which gas is transformed into a liquid state, is an important factor in the calculation of heat index. In terms of atmospheric moisture, it's the temperature at which air cannot hold any more water vapour, and droplets of water begin to form. Dr. Steadman used 14 °C as the dew point in his calculations. Some countries have developed their own corresponding indices to measure heat index instead of using the one developed by Dr. Steadman.

Is it important to measure the heat index?

Hot air can hold more moisture than cold air. Therefore, when temperature rises, the air's capacity to hold moisture also increases, thus affecting the apparent temperature or heat index. Humidity is typically higher during heat waves – which is why the heat index at the time is usually higher than just the temperature because humid air can feel hotter to humans.

How does high humidity impact the human body?

High humidity can lead to heat stress, meaning the body is unable to get rid of excess heat. Humans usually maintain a core temperature in the range of 36.1 to 37.2 °C. When the body is unable to get rid of excess heat, the heart rate increases due to a rise in core temperature, leading to heat-related exhaustion and rashes, among other symptoms. It can also be fatal if not addressed promptly.

At high temperatures, the human body can lose excess heat through perspiration and cool itself. But when humidity is high as well, it is difficult to sweat and then for that sweat to evaporate because the air around is already saturated with moisture. This makes it difficult for the body to lose heat.

On the other hand, if the humidity is low, evaporation of sweat is easier, thus making the apparent temperature feel close to the actual air temperature.

This is why a measure of heat index is more useful than just the temperature to gauge the impact of heat on humans.

What measures can we take to adapt?

A heat index value of 67°C or above can be extremely dangerous for people and animals who have direct and prolonged exposure, said Tashina Madappa Cheranda, senior associate at the Centre for Study of Science, Technology and Policy.

"With climate change, it is likely that we will continue to witness record-breaking heat index values across the world. We will need to prepare and adapt to such extreme conditions by investing in early warning, making changes to work timings, and finding sustainable cooling solutions," she added.

Context: Recently, **Iran** recorded a scorching heat index of 70 degrees Celsius (°C) in the coastal part of the country, a metric at which survival of life is unfathomable, if not impossible.

Heat Index

- **About:** Heat index, also known **as apparent temperature**, is a measure of how the temperature feels to humans.
  - Relative humidity is an important factor that determines heat index, along with air temperature.
- **Calculation:** A complex formula to calculate heat index was published by **Dr. Robert Steadman in 1979.** Different countries have developed their own corresponding indices.
  - In 2024, India is scheduled to launch its own heat index.
  - The **air temperature and the relative humidity** readings are needed to determine the heat index.
- **Significance: It** is more useful than just the temperature to gauge the impact of heat on humans.
  - A heat index value of 67°C or above can be extremely dangerous for people and animals who have direct and prolonged exposure.

Relative humidity (RH): It is a measure of the amount of moisture or water vapor present in the air compared to the maximum amount of moisture that the air can hold at a specific temperature and pressure.

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