

## MOST IMPORTANT TOPICS

1. FIRST WINTER EXPEDITION TO THE ARCTIC REGION  PRELIMS, INTERVIEW, GS-1
2. GELEPHU MINDFULNESS CITY PROJECT  GS-5, PRELIMS, INTERVIEW
3. INDIA LEADS GLOBAL REMITTANCES  PRELIMS, GS-3
4. KAKRAPAR ATOMIC POWER PROJECT  PRELIMS

## PRELIMS PRACTICE QUESTION

Q. With respect to Oman, consider the following statements:

1. Oman is a member of the Gulf Cooperation Council (GCC).
2. The country has a coastline along both the Arabian Sea and the Persian Gulf.

Which of the statements given above is/are correct?

- a) 1 only
- b) Both 1 and 2
- c) 2 only
- d) None of them



# FIRST WINTER EXPEDITION TO THE ARCTIC REGION

## India's first winter Arctic expedition begins; Raman Research Institute team to hold study

**The Hindu Bureau**  
BENGALURU

The Raman Research Institute (RRI) here is participating in the first winter Indian expedition to the Arctic region.

The institute said on Monday, the day when Earth Sciences Minister Kiren Rijju flagged off the expedition, that its researchers would examine the characterisation of the radio frequency environment in the Svalbard region of the Arctic in Norway. The survey will help astronomers assess the suitability of this uniquely located region for carrying out precision astronomy measurements.

India has been running its own research station, Himadri, in Svalbard since 2008. The winter expedition is a bid to maintain a year-long presence at the



Union Earth Sciences Minister Kiren Rijju (second from left) with the team from the Raman Research Institute. SPECIAL ARRANGEMENT

scientists will embark on the journey on Tuesday to India's research station in Alesund town on the Brogger peninsula, where research institutes from 10 countries have laboratories.

The RRI team was selected as the first batch of scientists who will conduct experiments spanning astronomy, climate change

Girish B.S., from the Electronics Engineering Group at the RRI, has been designated as the team leader for this batch.

The institute said the survey of the radio frequency environment had never been done before at the site and could potentially open avenues for deploying low-frequency radio telescopes in the

month-long scientific expedition is being funded by the Earth Sciences Ministry. The National Centre for Polar and Ocean Research, Goa, is the nodal agency spearheading the expedition, which will go on till January 15.

For nearly a decade now, engineers and scientists at the RRI have been working on the development of the shaped antenna measurement of the background radio spectrum (SARAS) series of experiments. SARAS aims to study the faint cosmological signal from hydrogen, commonly referred to as the 21-cm signal, emerging from the cosmic dawn and the epoch of reionization.

Cosmic dawn denotes the period when the first stars and galaxies were born in the universe. These are the two vital phases that the universe

stages of evolution several billions of years ago. These periods in cosmic history are not well understood due to a lack of observations.

"Due to rampant urbanisation in recent years, the space for the deployment of scientific experiments for cosmological studies is fast shrinking. Several places where low-frequency astronomical observations were conducted in the past, are no longer suitable for carrying out precision measurements. And the biggest limitation in achieving the required sensitivity is RFI," Mr. Girish said.

Sensitive electronic instruments will be used to study the incoming radio signals in the frequency range of 5-500 megahertz (MHz) at the accessible sites in the vicinity of Himadri.

## CONTEXT

- India embarks on its **first-ever winter expedition** to the **Arctic**, starting this week.
- Significance: With this initiative, India's own research station, **Himadri** becomes the **fourth research station** in the **Arctic** to be manned year-round.



## VISION OF THE MISSION

- The expedition will focus on **atmospheric sciences**, astronomy, astrophysics and **climate studies** among other parameters affecting our mother Earth, to be organized by the Raman Research Institute (RRI) with the **Earth Sciences Ministry** at the helm.

# WHAT MAKES THE ARCTIC CHALLENGING FOR SCIENTIFIC EXPLORATIONS?

- The **Arctic region** has its own **challenges** in terms of **limited access**, **harsh climate**, several months of darkness and, most importantly, the presence of dangerous wildlife like **polar bears**.
- While the **Antarctic** is harsher and more **remote** for **exploration**, the Arctic is challenging mainly because of the **limited space** for **independent studies**.



- Unlike **Antarctica**, which is governed by the **Antarctic Treaty**, the **Arctic region** belongs to various **national jurisdictions**.
- And various **geopolitical complications**, such as the current war between **Ukraine** and **Russia**, have made half of the Arctic region (the Russian Arctic) inaccessible to the world.



# INDIA'S PROGRESS IN THE REGION

- Initial Expeditions: The **first Indian expedition** to the **Arctic** was in **2007**, leading to the establishment of **Himadri** in 2008.
- **India's Arctic Policy**: Released in May **2022**, it outlines **six pillars** including science, **environmental protection** and international cooperation.



# ARCTIC REGION AND ITS GLOBAL IMPACT

- The **Arctic warming** and the changes are already impacting us, with clear evidence pointing out that many of the **extreme precipitation events** happening in **India** have its origins in the **loss of Arctic sea-ice**.
- Our studies also reveal that the increased **intensification** of **Arabian Sea cyclones** are associated with a **warmer Arctic**.

- Further, the **Arctic** is a **natural laboratory** for understanding **life** and life adaptations in **extreme conditions**.
- There are huge opportunities to establish experiments to understand the **ongoing warming** and its **potential connection** with **tropical climate**.

➤ The **NCPOR**, the **nodal agency** for **India's polar expeditions**, welcomes scientific proposals that come broadly under the branches of marine, cryosphere and atmospheric sciences and **India's first winter expedition** to the **Arctic** is a significant development that aligns with the **country's Arctic Policy** and its commitment to **scientific research, environmental protection** and sustainable development in the **Arctic region**.



# GELEPHU MINDFULNESS CITY PROJECT

## Hopes of Gelephu project, and economy revival dominate voters in Bhutan

**Sahasini Haldar**  
THIMPHU

The Gelephu "mindfulness" mega-city project or Special Administrative Region (SAR) announced by Bhutan's King Jigme Khesar Namgyel Wangchuck on Sunday, as well as fixing the economy and reversing youth migration trends will be the major tasks for the next Prime Minister after the January 9 elections, contenders for the position told *The Hindu* here.

The contenders, former Bhutanese Prime Minister Tshering Tobgay, whose PDP (People's Democratic Party) lost the last elections in 2018, and former top civil servant Pema Chewang, whose BTP (Bhutan Tendrel Party) is the newest entrant in Bhutanese politics, began their campaign last week for the second round of elections, after defeating former PM Lotay Tshering's DNT party in the first round held in November.

"The Gelephu project will be a big responsibility for the next government," said Mr. Chewang, who was in Thimphu for the National Day. "His Majesty [King Jigme Wangchuck] has initiated it, and anyone who comes to power must give it their full support to realise the vision," he added, when asked about the viability of the project, billed ambitiously as an economic hub on Bhutan's southern border with Assam. "It is not only for Bhutanese but for all of South Asia," he added.

Calling the announcement of the 1000-sq. km SAR historic, Mr. Tobgay



Young Bhutanese attend National Day announcement of mega city project by Bhutan King in Thimphu on Sunday. SUHASINI HAIDAR

said the project's big hope was to ensure that Bhutan's youth see work and skilling opportunities in Bhutan itself, while those who have left the country, with estimates of numbers growing between 3,000 a month last year to 5,000 a month of Bhutanese leaving the country for longer terms this year, according to one study quoted by the *Kuensel* newspaper.

### **Economy battered**

"The economy took a battering during COVID, and we have not been able to resuscitate it since, which has led to this out-migration by our youth. We have to reverse this trend by creating opportunities within Bhutan," Mr. Tobgay said when asked about the benefits of the Gelephu project.

While the PDP secured the highest number of votes and seats by far in the first round, and is the frontrunner ahead of the BTP, analysts have warned that second rounds in Bhutan have often sprung a surprise winner.

This is the fourth Bhuta-

nese election since the former King Jigme Singye Wangchuck abdicated in favour of his son in 2006 and introduced multi-party elections, and each time, the incumbent government has been voted out.

Most voters here, when asked, also pointed to solving economic issues as their main worry ahead of the vote on January 9. "Inflation today is a real problem, we are all dealing with higher prices, and this is the reason so many young Bhutanese are leaving the country," said Goma Rai, an accountant in her 20s. Tour operator Nima said he hoped the Gelephu project would be implemented along with a "stable tourism policy".

During his National Day speech on Sunday, delivered in Thimphu to a crowd of about 30,000 people, mostly young Bhutanese, King Jigme Wangchuck said the Gelephu project, which he would "personally be involved in", was meant to ensure educated and skilled Bhutanese abroad would return.

## CONTEXT

- Bhutan's King Jigme Khesar Namgyel Wangchuck recently announced the **Gelephu Smartcity Project**, a mega “**international city**” near the **Indian border**.
- This project, officially named the Gelephu Special Administrative Region (SAR), spans 1,000 square kilometers and aims to be an economic corridor connecting **South Asia** with **Southeast Asia** via **India's northeastern states**.



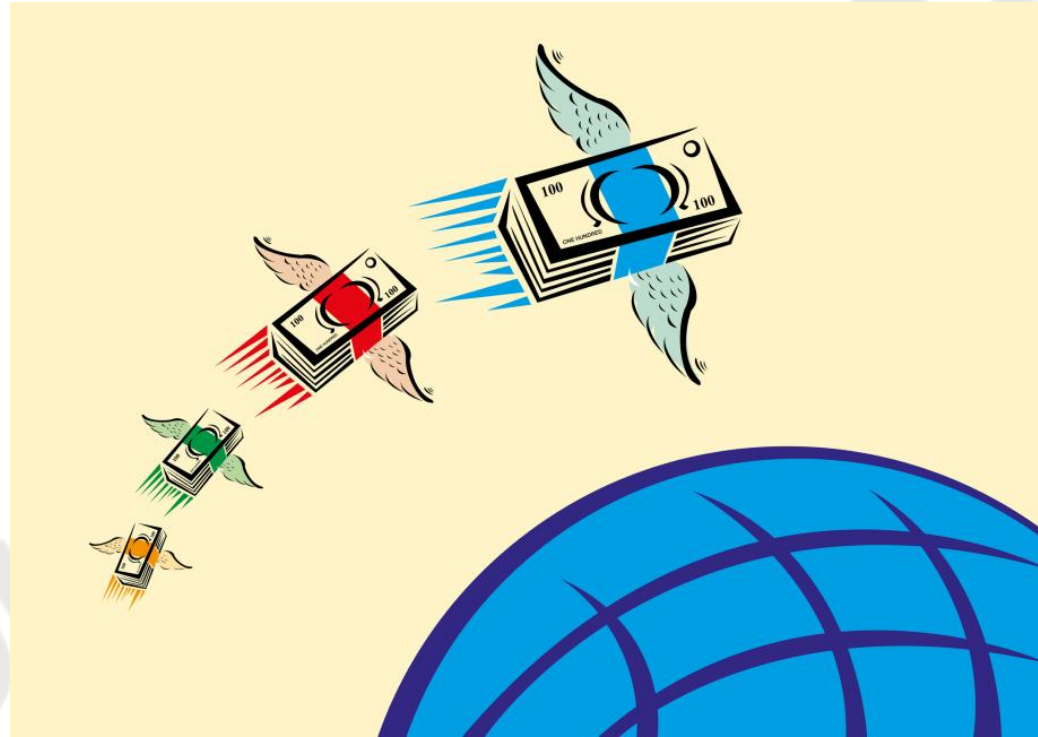
## SIGNIFICANCE FOR INDIA

- The **Gelephu Mindfulness City project**, unveiled by **Bhutan**, is expected to bring substantial benefits to the entire country, including **India**.
- The proposed land connection originating from Gelephu or Samdrup Jongkhar, traversing **Assam** and **Northeast Indian states**, extends to **Myanmar, Thailand, Cambodia**, Laos, Vietnam, Malaysia, and Singapore, forming a dynamic economic corridor that bridges South Asia to **Southeast Asia**.

- **Foreign Direct Investment (FDI)** is expected to **increase**, strengthening **bilateral ties** between **India** and **Bhutan**.
- **India** being **Bhutan's largest trading partner**, the project is expected to enhance economic integration between the two countries, leading to increased investment and trade.



# INDIA LEADS GLOBAL REMITTANCES



## CONTEXT

- In the most recent **World Bank** report, **India** is projected to **top** the list of **remittance** beneficiaries, with its inflows forecasted to grow by **12.4%** to \$125 billion in **2023**, making up **3.4%** of its GDP.



## KEY DRIVERS OF REMITTANCE SURGE IN 2023

- The report attributes the 2023 remittance growth to:
  - **Tight labor markets** in the USA.
  - **Employment growth** in Europe due to worker retention initiatives.
  - **Reduced inflation** in **high-income nations**.

# GLOBAL REMITTANCE TRENDS

## ➤ Predictions include:

- \$135 billion inflow in 2024.
- Growth rate moderating to 8% in 2024, down from 12.4% in 2023.
- This rate is half of 2023's 24.3%, but still well above the 3.8% growth seen in low- and middle-income countries.

## INDIA'S 2024 REMITTANCE OUTLOOK

- Expectations of sustained inflow due to:
  - Marginal rises in US and UK unemployment rates.
  - Declining unemployment in Singapore.
- High reliance on skilled Indian migrants, subject to geopolitical and Gulf region developments.

## IMPACT OF INDIA'S FINTECH EVOLUTION

- Initiatives like the **UPI**-PayNow linkage with **Singapore** aim to:
  - Lower transaction costs.
- Boost formal remittance channels.

# COSTS IN GLOBAL CORRIDORS AND GULF SUPPORT

- **Malaysia and Singapore:** Most **cost-effective corridors** in 2023.
- Japan, South Africa, and Thailand to India: Highest transaction costs.
- Significant support from **Gulf countries**, especially the **UAE agreement** promoting **local currency use** in transactions.

## UTILIZING LOCAL CURRENCIES

- The **UAE-India agreement** is pivotal for:
  - **Increasing formal remittance channels.**
  - Benefitting from the use of dirhams and rupees in cross-border transactions, enhancing India's financial inflows.



# KAKRAPAR ATOMIC POWER PROJECT



## CONTEXT

- Unit 4 of the **Kakrapar Atomic Power Project** (KAPP 4 – 700 MW) successfully reached **criticality** on December 17, 2023.
- This event signifies the start of a controlled **nuclear fission chain reaction**, an essential phase in the reactor's path to operation.



## RIGOROUS SAFETY CLEARANCES

- The achievement of criticality was preceded by rigorous safety inspections by the **Atomic Energy Regulatory Board (AERB)**, confirming adherence to safety norms and regulations.

## INDIGENOUS PHWRS

- KAPP-4 is the latest in a sequence of sixteen 700 MW indigenous Pressurised Heavy Water Reactors (PHWR) developed in India.
- Located at Kakrapar in Gujarat's Surat district, it closely succeeds KAPP-3, attaining commercial operation within a mere six months.

## ATMANIRBHAR BHARAT SPIRIT

- KAPP 3 and 4 are prime examples of the **AtmaNirbhar Bharat** initiative, being entirely designed, built, commissioned, and managed by **NPCIL (Nuclear Power Corporation of India Limited)**.
- The procurement of equipment and the fulfillment of contracts are exclusively conducted by domestic Indian industries and companies.

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