

## TABLE OF CONTENTS

- [1. Vice President visit to Gabon](#)
- [2. World Summit of Information Society \(WSIS\) 2022](#)
- [3. Machine learning helps predict new materials for nano alloys, semiconductors & rare earths](#)
- [4. ASTRA Mk I](#)

### 1. Vice President visit to Gabon

**Syllabus: GS Paper 2- International Relations- Bilateral, Regional and Global Groupings and Agreements involving India and/or affecting India's interests.**

**Prelims: Western African nations; Sirte declaration and Ezulwini consensus**

#### Context:

- Indian Vice President, Shri M. Venkaiah Naidu has begun the first ever visit by a high-ranking Indian dignitary to Gabonese Republic with a series of high-level meetings in the capital city of **Libreville**.

#### Details:

- The Vice President highlighted the importance India attaches to its relationship with Gabon and called on to expand the ambit of cooperation in various spheres to further strengthen and broaden the bilateral, regional and multilateral cooperation.

#### **Bilateral cooperation:**

- During the visit, India and Gabon signed MoUs on establishment of Joint Commission between the two governments and diplomats' training institutes of the two countries.
- Capacity building has been an important pillar of India's partnership with Africa and as part of this India would be carrying out a special training programme for 20 Gabonese diplomats.
- The Vice President promised all possible assistance to Gabon to achieve its 100% renewable energy target by 2030.
  - Gabon was among the first countries to sign and ratify the [International Solar Alliance agreement](#).

#### **Regional cooperation:**

- The Vice President declared that India accords top priority to deepening ties with Africa.
- He declared India's support to the **Sirte Declaration**.
  - The Sirte Declaration was the resolution adopted by the Organisation of African Unity in September 1999. It called for the establishment of the [African Union](#).

#### **Multilateral cooperation:**

- The Vice President congratulated Gabon for getting elected as a non-permanent member of UN Security Council for the term 2022-23 and also thanked Gabon for its support for India's candidature for the permanent membership of UNSC. He reiterated India's support to the Common African Position, enshrined in the **Ezulwini Consensus**.
    - The Ezulwini Consensus is a position on international relations and reform of the United Nations, agreed by the African Union.
  - The Vice President called for more collaboration and co-operation in the functioning of the **Non-Aligned Movement (NAM)** given that NAM focusses on mainstream contemporary issues of relevance to the developing world.
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## 2. World Summit of Information Society (WSIS) 2022

**Syllabus: GS Paper 3- Economy- Communication infrastructure**

**Prelims: ITU; E band wireless carriers; Low mobility Large Coverage Standard**

**Mains: Initiative and developments in the communication sector in India and its significance**

### Context:

- Minister of State for Communications, Shri Devusinh Chauhan, attended the opening ceremony of World Summit of Information Society (WSIS) 2022, being organized by **International Telecommunications Unions (ITU)** at its headquarter in Geneva, Switzerland.
  - The [International Telecommunication Union](#) (ITU) is the United Nations specialized agency for information and communication technologies – ICTs. India has been a member of ITU, since 1869.
  - India is contesting the re-election to the ITU Council, for the term 2023-2026.

### Initiatives being taken in the communications sector:

- Speaking at the event, the minister highlighted some of the important initiatives being taken up in India.
  - Under the **BharatNet initiative** the government is seeking to provide broadband connectivity to 2,50,000 gram panchayats in India on optical fiber cable with a minimum of 100 Mbps speed.
  - In hilly and mountainous terrains where it is difficult to lay optical fibres, use of technologies like **E band wireless carriers, LEO and MEO satellite connectivity** among others are being promoted.
    - India has issued the first service license for LEO/MEO connectivity.
  - Developing **5G test bed**, indigenous 4G and 5G stack, development of Indian 5G standards and setting up of **6G innovation forum** are the initiatives to reduce cost, facilitate faster 5G spread in rural area and eliminate dependency on specific vendor.
  - India has developed the **Low mobility Large Coverage Standard (earlier called 5Gi)** using a new waveform that enables 5G towers to cover wider areas in rural and remote areas.

### Significance of the developments in the communication sector:

- The initiatives being taken up by the government to promote the access to ICT infrastructure in rural and relatively inaccessible areas are aimed at **digital inclusion**. This will help bring financial inclusion and inclusive economic development.
  - The initiatives will provide great impetus to digital health, education as well as e-governance. This will help India emerge as a **digitally empowered society and knowledge economy**.
  - India's innovations in communication technology will apart from helping bridge the domestic digital divide will also help it emerge as a **global leader in communication technology**.
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### 3. Machine learning helps predict new materials for nano alloys, semiconductors & rare earths

**Syllabus: GS Paper 3- Science and Technology- Achievements of Indians in Science & Technology; Indigenization of Technology and Developing New Technology.**

**Prelims: Machine Learning**

**Mains: Applications of Machine Learning**

**Context:**

- Work done by the researchers at the S N Bose Centre for Basic Sciences, an autonomous institute of the Department of Science and Technology in the domain of machine learning.

**Details:**

**Nano alloys:**

- The researchers have used machine learning to develop a design map of alloys at the nanoscale which can help predict the match of pairs of metals that can form **bimetallic nanoalloys**.
- The bimetallic nano alloys, also called core-shell nanocluster alloys, in which one metal forms the core and another stays on the surface as a shell, are a new frontier in the quest of scientists for new materials and have **applications in biomedicine and other areas**.

**Semi-conductor design:**

- The researchers have also been able to study the heterogeneous structure formed at the junction of two dissimilar semiconductors using machine learning.
- This is a significant development given that **hetero-structure types used in hetero-junctions of two semiconductors** find applications in devices like LEDs, solar cells and photovoltaic devices.

**Rare earth materials:**

- The team has also used machine learning to search for **cheaper substitutes of naturally occurring rare earth material**.

- Rare earth compounds with permanent magnetic properties are used in loudspeakers and computer hard drives. Rare earth materials are found sparsely on the earth's crust and their supply is monopolised by some countries. As a result, they cost high.
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#### 4. ASTRA Mk I

##### Syllabus: GS Paper 3- Defence and Internal Security- Defence equipment

##### Prelims: ASTRA missile

##### Context:

- The Ministry of Defence has signed a contract with Bharat Dynamics Limited for supply of ASTRA MK-I missile and associated equipment for the Indian Air Force & Indian Navy.

##### Details:

- ASTRA MK-I is a **Beyond Visual Range (BVR) Air to Air Missile (AAM)**.
- ASTRA MK-I BVR AAM has been **Indigenously Designed & Developed** by Defence Research and Development Organisation (DRDO).
- It has been bought under Buy (Indian-IDD) category.
- Air to Air missile with BVR capability provides large Stand Off Ranges to own fighter aircraft which can neutralise the adversary aircraft without exposing itself to adversary Air Defence measures, thereby gaining & sustaining superiority of the Air Space.