



## Significance of Carrier Aviation

**For Prelims:** [INS Vikrant](#), [INS Vikramaditya](#), [Indian Ocean region](#), [Indo-Pak War 1971](#), Defence Public Sector Units, SRIJAN Portal, Project 75I, Defence Procurement Policy

**For Mains:** Key features of INS Vikrant, Significance of aircraft carriers in India's Maritime Security

[Source: TH](#)

### Why in News?

Recently, the Indian Navy's two aircraft carriers, **INS Vikramaditya** and **INS Vikrant**, demonstrated "twin carrier operations," featuring simultaneous take-offs of MiG-29K fighter jets from both carriers, followed by cross-deck landings, underscoring a capability possessed by only a select few nations.

### What are the Key Features of Indian Aircraft Carriers?

- India boasts **two operational aircraft carriers**, each with a rich history and unique capabilities.
- **Origin:**
  - [INS Vikrant](#) is the **first domestically built** aircraft carrier boasting **76% indigenous content**. It was constructed at **Cochin Shipyard Limited**, it's a symbol of India's growing shipbuilding prowess.
  - On the other hand, **INS Vikramaditya** is a **modified Kiev-class carrier**, originally built for the Soviet Navy. After extensive refitting and modernisation, it was inducted into the Indian Navy in 2013.
- **Size and Speed:**
  - **INS Vikrant** weighs around **43,000 tonnes and 262 meters long**. Its design **prioritises manoeuvrability** with a **top speed of 28 knots**.
  - Whereas, **INS Vikramaditya** is slightly larger, weighs around **44,500 tonnes** and a **length of 284 meters**. It can reach speeds of up to **30 knots**.
- **Firepower and Flexibility:**
  - **Both carry a similar arsenal of aircraft**, including [MiG-29K fighter jets](#) for air defense and ground attack, **Kamov-31 helicopters** for airborne early warning, [MH-60R helicopters](#) for multi-role operations, and indigenously built Advanced Light Helicopters (ALH) for utility tasks.
- **Modernity and Innovation:**
  - **INS Vikrant** incorporates the latest advancements in design, sensors, and electronics. It boasts a new combat management system, potentially offering superior situational awareness and operational efficiency.
  - **INS Vikrant** ensures precision operations even in adverse conditions by utilising the **STOBAR (Short Take-Off but Arrested Recovery) method**.
  - Whereas modernised, **INS Vikramaditya** still uses older technology.
- **India's Future Plans:**
  - India is planning to have **four aircraft carrier battle groups** (CBGs) instead of three to strengthen its naval presence.

- The **Indian Navy's 15-year plan** includes four fleet carriers and two light fleet carriers.
- The new indigenous aircraft carrier **INS Vishal**, also known as Indigenous Aircraft Carrier 3 (IAC-3), will be built at the **Cochin Shipyard**, similar to INS Vikrant.

## // Naval forces in the Indo-Pacific Carriers and Submarines by Country

Country	Aircraft Carriers	Helicopter Carrier	Submarines
United States	11	9	68
China	3	3	72
India	2	0	16
South Korea	0	2	18
Japan	0	4	22
Australia	0	2	6
Taiwan	0	0	4

### Debate on Aircraft Carriers vs Submarines

- A debate has emerged among navies on whether to focus on submarines or aircraft carriers due to technological developments.
- **Technological developments** such as anti-ship missiles, hypersonic missiles, and new anti-aircraft systems have raised concerns about the **vulnerability of aircraft carriers**.
- The **economic costs of aircraft carriers are huge**, limiting the ability of many countries to operate both submarines and carriers.
- Submarines are seen as a better alternative due to their **stealth advantage** and **relatively cheaper cost** compared to aircraft carriers.

# INS VIKRANT REBORN

India's First Indigenously-Built Aircraft Carrier

## DID YOU KNOW?

- Flight deck is the size of two football grounds
- 8 power generators enough to light up Kochi city

## VITAL STATS

₹20,000 Crore

Cost

45,000 tonnes

Weight

262 metres

Length

62 metres

Width

28 knots

Top Speed

2,300

Compartments

1,700

Crew Strength

## AIR POWER TO BE DEPLOYED



MiG-29K  
Fighter Jets

(Image Source: US Navy)



Kamov-31  
Helicopters

(Image Source: Indian Navy)



MH-60R Multi-role  
Helicopters

(Image Source: US Navy)

## TOP FEATURES

- First aircraft carrier to be constructed in India
- Largest warship to be built in India
- Has capacity to operate 30 aircraft
- 15 decks, multi-speciality hospital, pool
- Specialised cabins for women officers

## What are the Challenges Associated with Indigenisation of Aircraft Carriers?

### ▪ Technological Complexity:

- Building an aircraft carrier involves integrating numerous advanced technologies from propulsion systems to combat management and aviation facilities.
  - India initially planned for a **catapult launch system (CATOBAR)** but later switched to a **ski-jump launch with arrested recovery (STOBAR)** due to technological limitations. While STOBAR is a proven system, it limits the operational capabilities of heavier, more advanced aircraft.

### ▪ Time-Consuming Process and High Cost Burden:

- Designing, procuring materials, and constructing a complex warship like an aircraft carrier is a time-consuming process. Delays can **impact overall costs and strategic planning**.
  - The design work for INS Vikrant began in 1999, but the carrier wasn't commissioned until 2023 – a delay of over two decades.
  - This **extended timeline** can also lead to technological advancements rendering some aspects of the carrier obsolete even before its completion.
- Building an aircraft carrier is an **expensive** undertaking, requiring significant investment in materials, labour, and specialised technologies.

### ▪ Skilled Manpower and Industrial Base:

- Constructing an aircraft carrier necessitates a large pool of skilled workers with expertise in various disciplines.
  - India had to rely on **foreign expertise and technology** transfer for certain aspects of **INS Vikrant's** construction, highlighting the need for further development of its domestic shipbuilding industry.

#### ▪ **Material Dependence:**

- Even with an indigenous design, some critical materials and components might still need to be imported, creating a **reliance on foreign suppliers**.
  - Although INS Vikrant boasts a high percentage of indigenous content, some key elements like high-tensile steel and specialised electronics might have been sourced internationally. This can create vulnerabilities in times of geopolitical tensions.

## **What is the Significance of Carrier Aviation for India in Modern Strategic Terms?**

#### ▪ **Supporting Land and Air Operations:**

- In the context of the ongoing disputes along India's land boundaries, the potential for border conflicts persists, emphasising the strategic advantage robust aircraft carriers would provide in future conflicts.
  - During the [1971 operations for the liberation of Bangladesh](#), INS Vikrant's aircraft played a crucial role in striking deep into East Pakistan, highlighting its strategic significance in supporting land battles.

#### ▪ **Maintaining Security of Sea-Lines of Communication:**

- In times of military conflict, an **aircraft carrier serves as the primary naval asset** capable of comprehensively protecting merchant shipping routes vital for carrying strategic commodities to India.
  - Concerns have been raised regarding the **vulnerability of energy imports through the Strait of Hormuz** due to **China's strategic presence** in Pakistan's Gwadar port, underscoring the importance of carriers in safeguarding sea-lines of communication.

#### ▪ **Ensuring Presence in the Indian Ocean Region (IOR):**

- India's security interests are intricately linked to the [Indian Ocean and its surrounding littoral region](#), where the presence of Chinese strategic assets poses challenges to India's influence.
  - An aircraft carrier enables India to assert its influence in these waters and deter potential threats from extra-regional powers, thereby safeguarding its interests in the IOR.

#### ▪ **Protection of Important Overseas Interests:**

- Carrier aviation provides India with the capability to safeguard its strategic interests overseas, particularly in **Afro-Asian states facing political, socio-economic, and ethnic instabilities**.
  - India's economic and strategic stakes are increasing in these regions, necessitating the ability to respond effectively to emerging threats and protect its citizens and assets abroad.

#### ▪ **Securing Island Territories:**

- Integral naval aviation is essential for defending India's remote island territories, such as the Andaman and Nicobar Islands, which are **vulnerable due to their geographical spread** and limited infrastructure.
  - The presence of an [aircraft carrier](#) serves as a **deterrent** against potential foreign military occupation or claims, ensuring the security of these strategically important territories.

#### ▪ **Other Non-Military Missions:**

- Beyond its military role, an aircraft carrier significantly expands India's operational capabilities to **respond to natural disasters in regional seas** or littoral areas.
- With its capacity akin to a floating city, a carrier can provide essential services and logistical support, **complementing existing sealift platforms** and enhancing India's disaster response capabilities.
- Efforts to incorporate modular concepts further enhance the carrier's versatility for non-military missions, enabling rapid deployment of specialised resources for **specific humanitarian missions**.

## **What are the Related Initiatives Towards Expanding India's Defence**

## Infrastructure?

- [Development cum Production Partner Initiative](#)
- [Defence India Startup Challenge](#)
- [SRIJAN Portal](#)
- **Increased the [Foreign Direct Investment \(FDI\)](#) limit in defence sector from 49% to 74%**
- [Innovations for Defence Excellence \(iDEX\)](#)
- [Positive Indigenisation List \(Defence Procurement Policy\)](#)
- [Project 75I](#)

## Conclusion

India's focus on indigenous production and ambitious plans for additional carriers demonstrate its commitment to building a future-proof and powerful navy. While the debate between aircraft carriers and submarines continues, India's twin carrier operations showcase its strategic intent to leverage both for a comprehensive maritime defence strategy.

### **Drishti Mains Question:**

Q. Discuss about the key features of Indian aircraft carriers. Also, mention the significance of carrier aviation for India in modern strategic terms.

## **UPSC Civil Services Examination, Previous Year Question (PYQ)**

**Q.1 Which one of the following is the best description of 'INS Astradharini', that was in the news recently? (2016)**

- (a) Amphibious warfare ship
- (b) Nuclear-powered submarine
- (c) Torpedo launch and recovery vessel
- (d) Nuclear-powered aircraft carrier

**Ans: (c)**

**Q.2 Consider the following in respect of Indian Ocean Naval Symposium (IONS): (2017)**

1. Inaugural IONS was held in India in 2015 under the chairmanship of the Indian Navy.
2. IONS is a voluntary initiative that seeks to increase maritime co-operation among navies of the littoral states of the Indian Ocean Region.

**Which of the above statements is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Ans: (b)**

PDF Reference URL: <https://www.drishtias.com/printpdf/significance-of-carrier-aviation>

