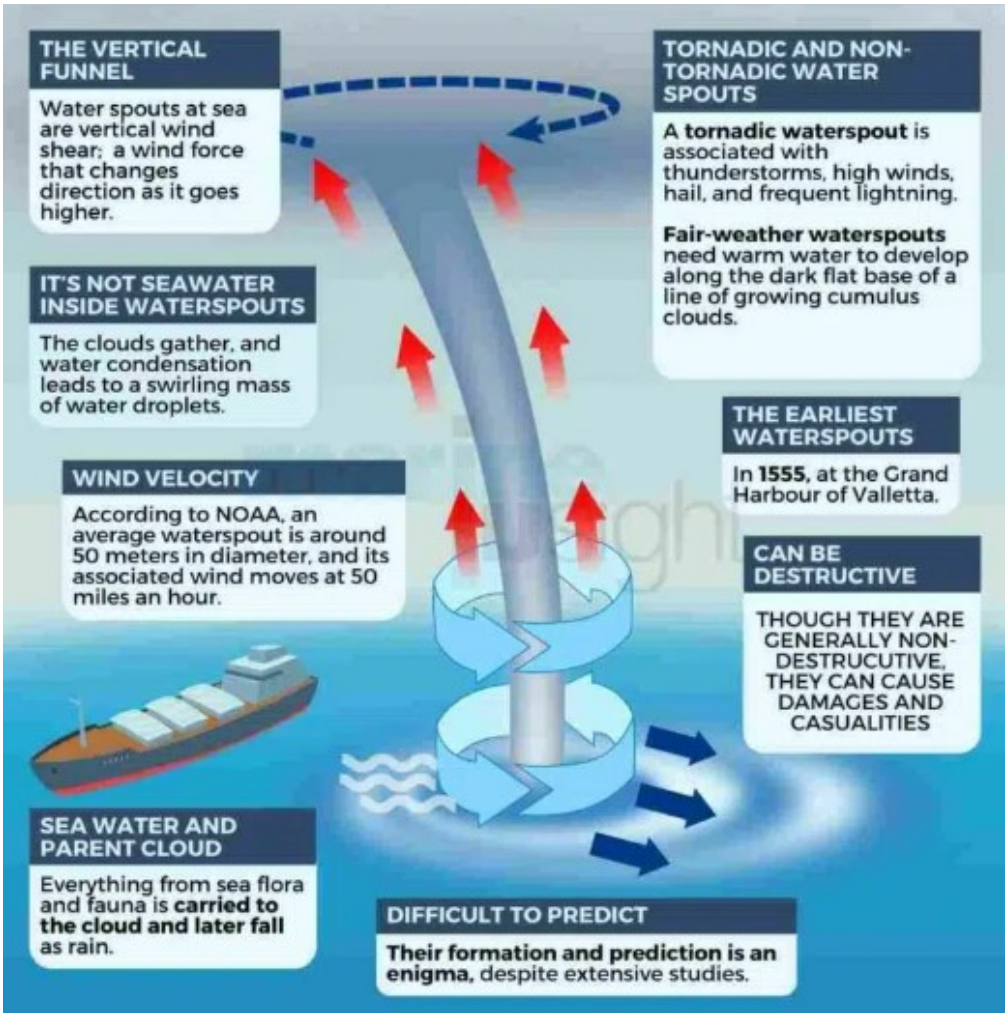
# UPSC Daily Current Affairs | Prelim Bits 21-08-2024

## Waterspout

*A luxury yacht in Mediterranean Sea was hit and sank by a violent storm, could be a waterspout off the coast of Sicily, Italy.*

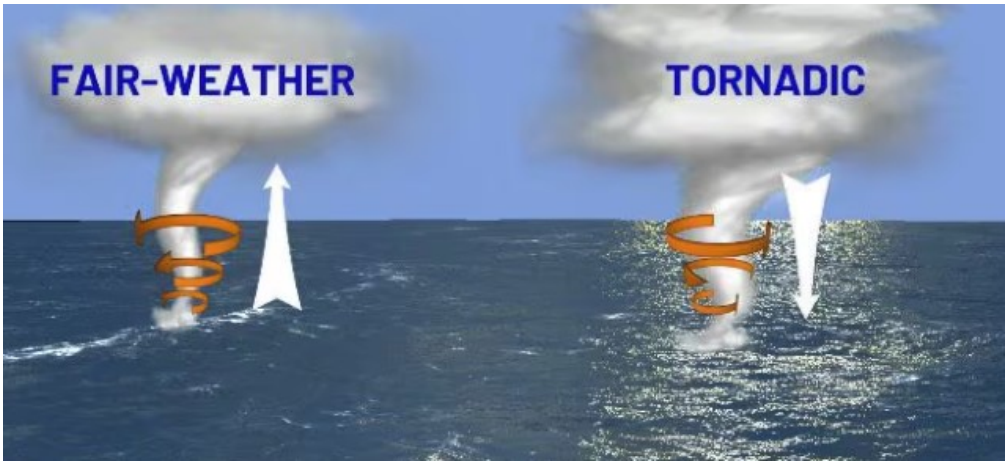
- **Waterspout –** It is essentially a tornado over water that is a large column of air and mist rotating over a water body.




- **Favourable Condition** - They occur when there are ***high levels of humidity and relatively warm water temperatures*** compared to the overlying air.
- **Size & Physical characteristics-** The average waterspout can be around 165 feet in diameter, with wind speeds of 100 kilometres per hour.
- **Duration -** It typically ***lasts for around 5 minutes*** and occasionally it

can last up to 10 minutes.

- **Occurrence -** Although waterspouts are more ***common in tropical*** waters, they can appear ***anywhere***.
- **Types of waterspouts -** Tornadic waterspouts and Fair-weather waterspouts.




- **Tornadic Waterspouts –** They are actual tornadoes that form ***over water or move from land to water.***
  - They are accompanied by severe thunderstorms, high winds and seas, large hail, and frequent dangerous lightning.
  - Tornadic waterspouts develop ***downward*** in a thunderstorm.
  - They can be large and may lead to considerable destruction.
- **Fair-weather waterspouts –** They form ***over only water*** usually along the dark flat base of a line of developing cumulus clouds.
  - It develops on the surface of the water and works its way upward.
  - This type of waterspout is generally not associated with thunderstorms.
  - **Favourable condition** - They are formed during fair weather.
  - **Movement** - Fair weather waterspouts form in light wind conditions so they normally move very little.
  - Typically, fair weather waterspouts dissipate rapidly when they make landfall, and rarely penetrate far inland.
  - They are less dangerous and usually small.
- **Increased frequency of occurrence –** With increase in sea surface temperature, the frequency of waterspouts is increasing.
- The best way to avoid a waterspout is to move at a 90-degree angle to its apparent movement.

### References

1. IndianExpress | Waterspouts

2. NOAA | Waterspouts

## '2+2' dialogue of India and Japan

*Recently, India and Japan held the 3rd edition of the "2+2" Foreign and Defence Ministerial Dialogue.*

- **Objective-** The dialogue focused on deepening defence cooperation and ensuring a ***free, open, and rules-based Indo-Pacific*** amidst China's growing military presence in the region.

## Key Outcomes of the meeting

- **ASEAN Outlook on the Indo-Pacific (AOIP) -** Both the countries strongly supported ASEAN's unity and the ASEAN Outlook on the Indo-Pacific (AOIP).
- It emphasizes principles like openness, transparency, inclusivity, and respect for international law.
- **Special Strategic and Global Partnership-** It aims to strengthen bilateral security and defence cooperation under Japan's 2022 National Security Strategy, recognizing it as a key pillar of the ***Japan-India Special Strategic and Global Partnership.***
- **Women, Peace, and Security (WPS) -** Emphasized the role of women in conflict prevention and peacebuilding, welcoming increased participation in peacekeeping operations.
- **Defence Cooperation-** India aims to become a developed nation by ***2047,*** with a strong focus on building domestic defence capabilities.
- It discussed future cooperation in space, cyber, and defence equipment and technology, and explored coordination for security assistance to third countries.
- **Quad Cooperation-** The meeting valued the cooperation within the Quad and committed to advancing it further for both the countries.
- **Defence Exercises-** It commended the progress in defence ties since September 2022, highlighting Japan's first air visit, participation in ***Tarang Shakti, and the 'Veer Guardian 2023' exercise.***
- They agreed to reaffirm the importance of multilateral defence efforts in the Indo-Pacific and their commitment to ongoing exercises like ***Dharma Guardian, JIMEX, and Malabar.***

*India holds ministerial-level dialogues with only a few countries, including the United States, Australia, and Russia.*

- **Significance**- The "2+2" dialogue is aimed at further deepening ***bilateral security and defence cooperation*** between India and Japan.
- It is a strategic plan adopted by the Association of Southeast Asian Nations (ASEAN) in 2019.
- The defence partnership with Japan is seen as crucial for ensuring freedom, inclusivity, and transparency in the Indo-Pacific region.

| **ASEAN Outlook on the Indo-Pacific (AOIP)** |
| --- |
| • Aim - To promote cooperation with external partners in the Indo-Pacific region.<br>• It also aims to address geopolitical tensions and the growing influence of major powers in the region.<br>• **Principles** - The AOIP's guiding principles include ASEAN centrality and ASEAN-led mechanisms, such as the East Asia Summit (EAS), as platforms for dialogue and implementation of cooperation.<br>• **Key areas -** The AOIP promotes cooperation in 4 key areas - Maritime cooperation, Economic, Connectivity, and Sustainable development.<br>• The AOIP also serves as a platform for<br>- The public, state-owned enterprises, and private sectors of ASEAN Member States, and<br>- ASEAN's external partners to engage in constructive discussions, cooperate on projects, and<br>- Enhance collaboration in the Indo-Pacific region |

**References**


1. The Hindu | '2+2' dialogue
2. PIB | 2+2 Ministerial Dialogue
3. MOFA | 2+2 Foreign and Defence Ministerial Meeting


## Drug delivery method using polymeric nanoparticles

*Recently, scientists at Agharkar Research Institute (ARI) under the Department of Science & Technology (DST) have developed a nanoparticle-based drug delivery system.*

- It is a unique method developed of drug delivery using ***Nikkomycin-loaded polymeric*** nanoparticles.

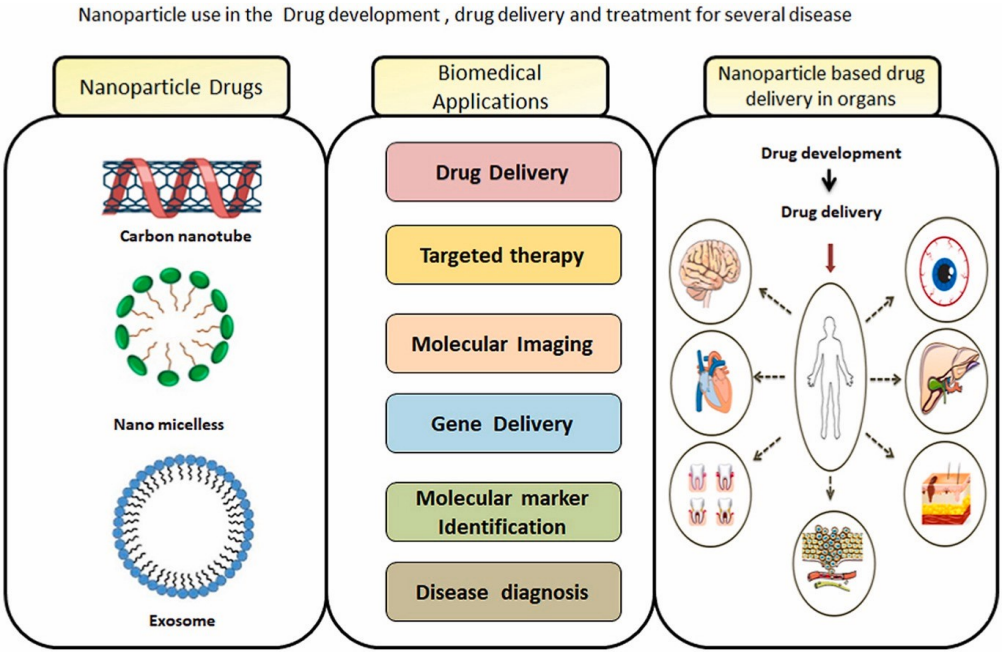
- **Nikkomycins-** Nikkomycins are nucleoside amide antibiotics produced by ***Streptomyces tendae Tü 901*** and are known to show antifungal, anti-insecticidal, and acaricidal activities.
- They work by interfering with the building of the fungal cell wall which results in the fungal cell breaking open.
- The specific agent nikkomycin Z has weak activity against ***Aspergillus fumigatus*** which may be of benefit when used with other medications.
- The drug-loaded nanoparticles were effective in disrupting the growth of ***Aspergillus species***.

*Aspergillus fumigatus is a species of fungus in the genus Aspergillus and is one of the most common Aspergillus species to cause disease in individuals with immunodeficiency.*

- **Streptomyces-** It is the largest genus of actinobacteria comprising high GC (guanine and cytosine) content in their genomic DNA.
- They are Gram-positive saprophyte and abundant in soil, water (fresh and sea), and air.
- One can also find this group of bacteria in association with plants and animals.
- ARI have used a chitin synthesis fungicide, Nikkomycin, produced by the bacterial Streptomyces spp. to develop Nikkomycin loaded polymeric nanoparticles.
- **Polymeric Nanoparticles**- It refers to solid particles composed of macromolecular polymers, with particle size ranging from 10 to 1000 nm.
- It can protect the encapsulated macromolecules from enzymatic degradation and change the dynamic behavior and tissue distribution of the encapsulated drugs in vivo.
- **Chitin -** Chitin is the most abundant aminopolysaccharide polymer occurring in nature and is the building material that gives strength to the exoskeletons of crustaceans, insects, and the cell walls of fungi.
- Chitin is absent in the human body, making this a targeted approach.
- The nanoformulation developed was found to be free of cytotoxic and hemolytic effects.
- The ARI team is hopeful about the method’s application in development of inhalation nanoformulations against pulmonary aspergillosis.
- **Benefits** - It may benefit patients with asthma, cystic fibrosis, HIV, cancer, lung diseases, and those on long-term corticosteroid medications.
- Nanoparticles enable controlled and effective drug release, with polymeric

nanoparticles being the most advanced delivery method.

- **Safety and potential applications-** The Nano formulation was free of cytotoxic and hemolytic effects, indicating safety for use.



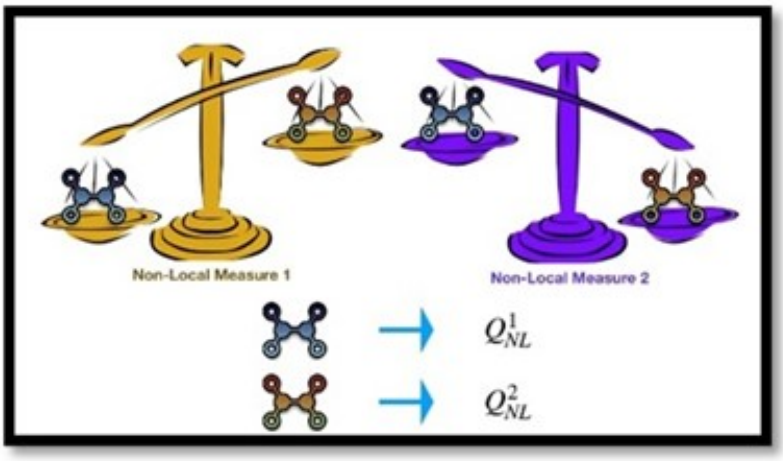

## Reference

PIB | Nanoparticle-based drug delivery system

## Quantum nonlocality

*Recent research has revealed that it is impossible to create a universal standard for measuring non-local quantum correlations, a key finding in quantum mechanics.*

- **Quantum Nonlocality-** It describes a connection between distant physical objects that does not allow for faster-than-light communication.
- It is often associated with entangled states, which violate ***Bell inequalities***, a way to test whether nature agrees with Einstein's local realism or with the standard quantum mechanical interpretation.




- **Bell's Theorem-** It was introduced by physicist ***John Stewart Bell in 1964***, it challenged the ***concept of 'local realism' in classical physics.***
- Bell's theorem showed that quantum systems with multiple distant parts exhibit correlations that cannot be explained by local realism.
- This theorem was confirmed by experiments and earned the 2022 Physics Nobel Prize.
- **Application-** Quantum nonlocality has been significant in natural sciences and has applications in secure communication, random number generation, and cryptographic key creation.
- **Finding-** The study noted that the nature of nonlocality varies depending on the type of correlation, meaning there is ***no single, universal resource in quantum nonlocality.***
- Each non-local resource is unique and capable of performing specific tasks that others cannot.
- **Implications-** The discovery expands the potential applications of quantum nonlocality and adds complexity to the understanding of quantum mechanics.

**References**

1. PIB | Quantum nonlocality
2. Azoquantum | Non-Local Quantum

## National Financial Reporting Authority (NFRA)

*The NFRA is set to meet with key financial regulators to adopt the revised International Standard of Audit 600 (ISA 600).*

### NFRA

| Aspect | Explanation |
|---|---|
| **Establishment** | • NFRA was established in 2018 under the Companies Act, 2013. |
| **Purpose** | • It is an independent regulator setup to oversee and enforce compliance with accounting and auditing standards. |
| **Jurisdiction** | • NFRA has authority over auditors of listed companies, large unlisted companies, and companies with securities listed on any stock exchange in India or abroad. |
| **Composition** | • Chairperson who will be appointed by the Central Government and a maximum of 15 members. |
| **Functions** | • Set standards, monitor compliance, investigate misconduct, and impose penalties. |
| **Significance** | • Aims to enhance transparency and accountability in financial reporting. |
| **Recent Activities** | • Currently focusing on adopting revised International Standard of Audit 600 (ISA 600). |

## ISA 600

| Aspect | Explanation |
|---|---|
| **Aim** | • To close auditing gaps that have caused major lapses and to ensure auditors gather sufficient evidence and evaluate component auditors' work. |
| **Objectives of ISA 600** | • Tighten oversight on auditors, especially regarding reliance on subsidiary audit reports.<br>• Enhance group auditor's supervision and review of component auditors' work and documentation.<br>• Improve communication, oversight, and ethical requirements between group and component auditors. |
| **Audit Lapses and Malfeasance** | • Auditors have been found shielding behind subsidiary audit reports, allowing malfeasance, such as siphoning off funds from listed companies.<br>• Reliance on subsidiary audits has been a recurring problem in lapses at companies like Reliance Capital, IL&FS, and CG Power. |

| | |
|---|---|
| **Legal Framework** | • The revised standards require adoption by financial regulators like ICAI, NFRA, and SEBI before implementation in India.<br>• The Chartered Accountants Act, 1949, considers disclosing information acquired during professional engagement without client consent as professional misconduct. |

## References


1. Business Standard | ISA 600
2. NFRA | About NFRA



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