



Rani Durgavati

Why in News?

Recently, the Madhya Pradesh government launched a six-day rally called the **Rani Durgavati Gaurav Yatra** to commemorate the life and **legacy of the 16th-century queen**, Rani Durgavati, who fought against the Mughals.

Who was Rani Durgavati?

▪ About:

- Rani Durgavati, born in 1524 in **Mahoba's Chandela dynasty** (present-day Uttar Pradesh, near the border with Madhya Pradesh), was a symbol of **India's self-determination**.
 - Chandelas were known for building the famous **Khajuraho temples** in the 11th century.
- Belonged to the **Gond tribe**, a prominent tribe in central India known for their rich cultural heritage and resilience.
- She married Dalpat Shah, the son of Gond King Sangram Shah, and ruled the kingdom of **Garha-Katanga** after the death of her husband in 1550 with great vigor and courage.
 - The Kingdom of Garha-Katanga included the regions of **Narmada Valley and parts of Northern Madhya Pradesh**.
- As per the government's documentation, **the queen and her generals managed the affairs of the kingdom for 16 years**.

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- **The Mughal Attack on Garha-Katanga:**
 - Rani Durgavati, the brave queen of Garha-Katanga, opposed the **Mughal Empire's expansion** in the mid-16th century.
 - Rani Durgavati displayed strong leadership while fighting against **Akbar's commander Asaf Khan** and the neighboring Malwa Sultan Baz Bahadur. She initially triumphed in the battle against Asaf Khan's attack on her kingdom.
 - However, the Mughals regrouped and overwhelmed her forces. Rather than surrendering, Rani Durgavati chose to sacrifice her life.
- **Legacy and Recognition:**
 - Revered as a patriotic ruler who symbolized **India's self-determination**.
 - Described as a combination of **beauty, grace, courage, and bravery** by Abul Fazl, the court historian of Akbar.
 - Remembered for her sacrifices and as a defender of her culture.

[Source: IE](#)

Titan Tragedy Lessons for Proposed Indian Submersible Dive

For Prelims: Matsya-6000, Titan submersible, [Deep Ocean Mission](#), RMS Titanic, [Atlantic Ocean](#), [NOAA](#), [UNESCO](#).

For Mains: Deep Ocean Mission and Its Significance for India.

Why in News?

Scientists are preparing for a Deep See Dive with the Vehicle **Matsya-6000 in late 2024 similar** to the Titan **submersible**, which recently went missing.

- **The Matsya-6000 project under [India's Deep Ocean Mission](#)**, scheduled for late 2024, aims to explore the Indian Ocean at a depth of about 6,000 meters.
- In light of the recent incident of **Titan Submersible**, the safety systems employed for the crew will undergo reviews to ensure their effectiveness.

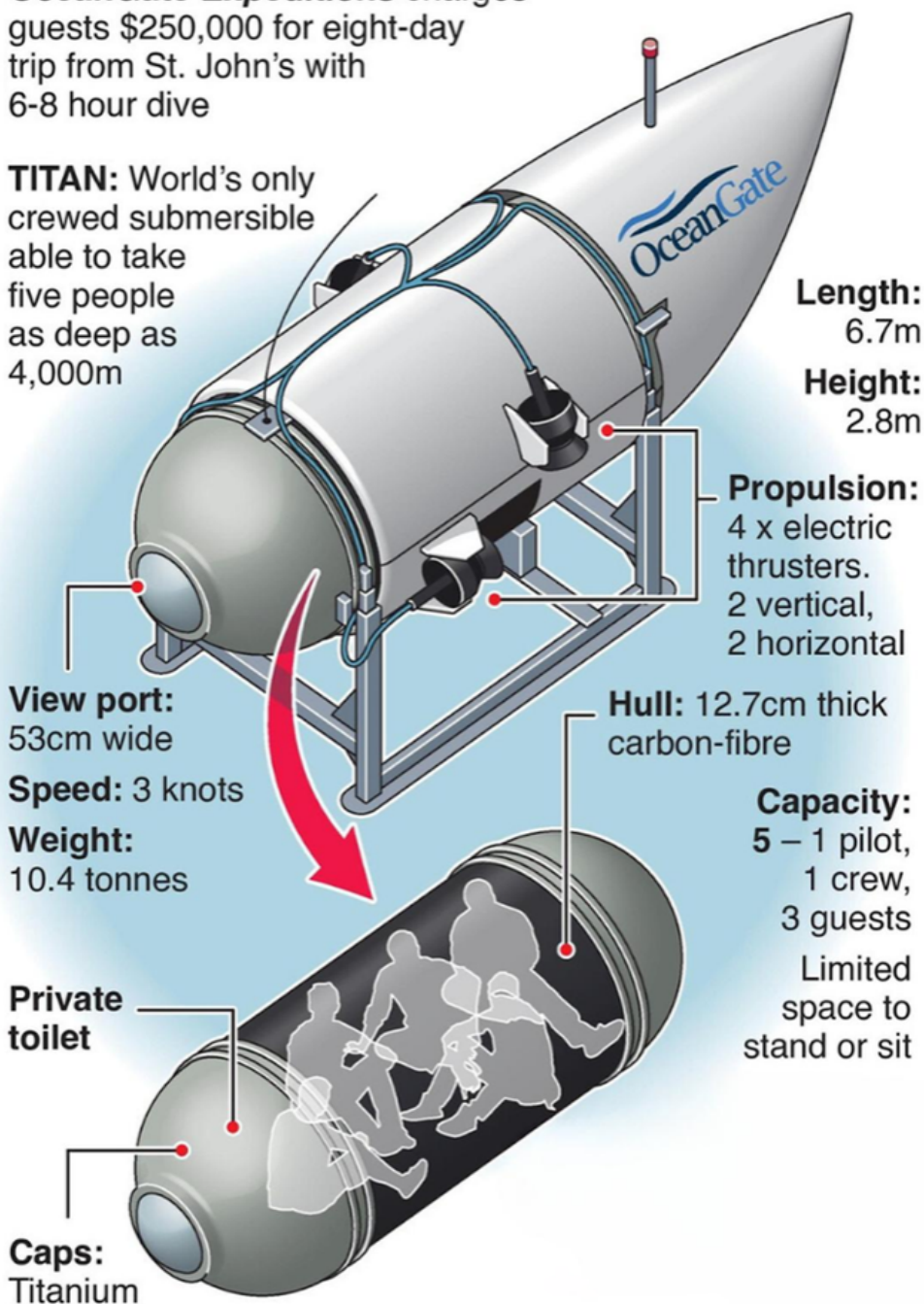
What are the Key Points of Titan Submersible?

- **About:**
 - Titan submersible is operated by the privately owned U.S. company **OceanGate that organizes underwater expeditions** for both research and tourism.
 - It was built with "off-the-shelf" components, is lighter and **more cost-efficient than other deep diving submersibles**.
 - Titan is made of **carbon fibre and titanium** and weighs 10,432 kilograms.
 - It is capable of **going 4,000 metres undersea** and moves as fast as three knots per hour (5.56 kph).

OceanGate's Titan Submersible

OceanGate Expeditions charges guests \$250,000 for eight-day trip from St. John's with 6-8 hour dive

TITAN: World's only crewed submersible able to take five people as deep as 4,000m



▪ Objective:

- Titan Submersible was travelling to see the **wreckage of RMS (Royal Mail Ship) Titanic**, which is nearly four thousand metres under water in the **frigid North Atlantic Ocean**.
 - One hour and forty-five minutes into the journey, contact with Titan was lost.

▪ Concerns:

- The submersible's forward viewport was certified for 1,300 meters, but OceanGate aimed to reach 4,000 meters.
- The technology and components of the submersible **may not have met rigorous safety standards**. Insufficient hull testing raises the risk of failure and endangers occupants.
- The **pressure vessel's combination of titanium and carbon fiber is unusual** and

raises concerns due to their different properties in deep diving situations.

What Happened to the Titan?

- The submersible “Titan” **experienced a “catastrophic implosion,”** according to the U.S. Coast Guard. The five occupants on board are presumed to have died during the implosion.
- An implosion is the **opposite of an explosion**. In an explosion, the force acts outwards, but in an **implosion the force acts inwards**. When a submersible is deep in the ocean it experiences **the force on its surface due to water pressure**.
- When this force becomes larger than the force hull can withstand, the **vessel implodes violently**.
 - With every **descent of 10 meters into the water**, the pressure increases by approximately one atmosphere.
 - One atmosphere is equivalent to the average atmospheric pressure at sea level, which is approximately **101.325 kilopascals (kPa) or 14.7 pounds per square inch (psi)**.

What are Carbon Fibres and Titanium?

- **Carbon Fibre:** Carbon fibre is a polymer that is **known to be quite strong despite being lightweight**. It can be as much as **five times stronger than steel** and twice as stiff.
 - A carbon-fibre composite, compared to titanium, is much stiffer and does not have the same kind of elasticity.
- **Titanium:** Titanium is as **strong as steel but around 45% lighter**. It is twice as **strong as aluminum** but only 60% heavier, according to the United States Geological Survey.
 - A titanium or thick steel pressure vessel is usually a spherical shape that can withstand the crushing pressures at 3,800m – the depth at which the Titanic wreck lies.
 - Titanium is elastic and **can adapt to an extended range of stresses without** any measurable permanent strain remaining after the return to atmospheric pressure. It shrinks to adjust to pressure forces and re-expands as these forces are alleviated.

Submarine Vs Submersible

- While the two categories can overlap, a **submarine refers to an underwater vehicle** that is largely independent and has power reserves to **help it depart from a port or come back** to the port after an expedition.
- Meanwhile, a submersible is **generally smaller in size** and has less power, so it needs to **work with a ship in order to be launched** and recovered.
 - The missing submersible Titan was working with a vessel named Polar Prince.

What are the Key Points Related to Matsya-6000?

- **About:**
 - Matsya-6000 is an indigenous deep-sea dive submersible being developed by the [National Institute of Ocean Technology \(NIOT\)](#) in India. It is designed to explore the depths of the Indian Ocean at a **depth of about 6,000 meters**.
 - The mission aims to send three Indian navigators to a point approximately 1,500 km away from Kanyakumari, India.
- **Objective:**
 - The mission's primary objective is to support India's energy requirements and explore ocean resources.
 - India aims to conduct exploratory mining for [Polymetallic Nodules](#) containing valuable resources such as copper, nickel, cobalt, and manganese.
 - This endeavor aligns with the Indian government's Deep Ocean Mission, which aims to develop vehicles and technology for ocean scanning and mining.

▪ **Features of Submersible:**

- The submersible features a **spherical titanium hull**, which is crucial for withstanding the immense pressure at great depths.
 - The titanium hull is manufactured by the [Indian Space Research Organisation \(ISRO\)](#), as no commercial fabricators in India were capable of producing such a hull.
- Two hemispheres of titanium alloy are **fused to create a single hull**, which serves as the primary barrier between the crew and the surrounding water columns.

▪ **Learning from Titan Incident:**

- The recent incident has highlighted the **need for thorough safety evaluations** and repeated testing.
- The inability to locate the submersible despite multiple communication systems **onboard raises questions**. Future submersibles may incorporate "**black box**" **equivalents**, similar to those found in aircraft, to aid in investigating the cause of such incidents.
- The choice of titanium for the submersible's enclosure, the utilization of syntactic foam, and the implementation of **acoustic communication and tracking systems should be thoroughly evaluated**.

UPSC Civil Services Examination, Previous Year Question

Q. Ilmenite and rutile, abundantly available in certain coastal tracts of India, are rich sources of which one of the following? (2023)

- (a) Aluminium
- (b) Copper
- (c) Iron
- (d) Titanium

Ans: (d)

Exp:

- India is endowed with large resources of heavy minerals which occur mainly along coastal stretches of the country.
- Heavy mineral sands comprise a group of seven minerals, viz, ilmenite, leucoxene (brown ilmenite), rutile, zircon, sillimanite, garnet and monazite. **Ilmenite (FeO.TiO₂) and rutile (TiO₂)** are the two chief mineral sources of titanium. Hence, option (d) is correct.

[Source: TH](#)

Special Assistance to States for Capital Investment 2023-24

For Prelims: [Special Assistance to States for Capital Investment](#), [Union Budget 2023-24](#), [Jal Jeevan Mission](#), [Pradhan Mantri Gram Sadak Yojana](#), [Make in India](#), [One District One Product](#)

For Mains: Special Assistance to States for Capital Investment 2023-24 Scheme, Effective Capital Expenditure

Why in News?

The **Department of Expenditure under the Finance Ministry of India** has approved [capital investment proposals of Rs. 56,415 crore for 16 states in the current financial year 2023-24](#).

- These loans are granted under the central scheme known as [“Special Assistance to States for Capital Investment 2023-24”](#).
- The **16 states include** Arunachal Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Mizoram, Odisha, Rajasthan, Sikkim, Tamil Nadu, Telangana, and West Bengal.

What is the Special Assistance to States for Capital Investment 2023-24 Scheme?

- **Background:**
 - The Scheme for financial assistance to States for capital investment/expenditure, first instituted by the **Ministry of Finance in 2020-21 in the wake of [Covid-19 Pandemic](#)**, has given a very timely boost to capital spending by the state.
- **About:**
 - The scheme was announced in the [Union Budget 2023-24](#) in continuation of a similar push for capex from the last three years.
 - Under the scheme, special assistance is being **provided to the state governments in the form of 50-year interest free loan up to an overall sum of Rs. 1.3 lakh crore** during the financial year 2023-24.

SPECIAL ASSISTANCE TO STATES			
State	Amount (in ₹ cr)	State	Amount (in ₹ cr)
Bihar	9640	Chhattisgarh	3195
MP	7850	Telangana	2102
West Bengal	7523	AP	1255
Rajasthan	6026	Haryana	1093
Odisha	4528	HP	826
Tamil Nadu	4079	Mizoram	399
Karnataka	3647	Sikkim	388
Gujarat	3478	Goa	386

- **Parts:**
 - The scheme has **eight parts, Part-I being the largest with allocation of Rs. 1 lakh crore**. This amount has been allocated amongst states in proportion to their share of central taxes and duties as per the award of the [15th Finance Commission](#).
 - Other parts of the scheme are **either linked to reforms or are for sector-specific projects**.
 - **Part-II provides incentives to states for scrapping of old vehicles and setting up of automated vehicle testing facilities;**
 - **Part-III and IV provide incentives to states for reforms in [urban planning](#)**

and urban finance;

- **Part-V** provides **funds for increasing the housing stock for police personnel and their families within the police stations in urban areas.**
- **Part-VI of the scheme** supports the vision of national integration, [Make in India](#) and [One District One Product](#) by promoting cultural diversity and local products through Unity Mall projects.
- Under **Part-VII**, Rs. 5,000 crore is provided as financial assistance to states for **establishing libraries with digital infrastructure** at the [Panchayat](#) and **Ward level**, primarily benefiting children and adolescents.

▪ **Objectives of the Scheme:**

- The scheme is expected to have a **higher multiplier effect on the economy by stimulating demand and creating jobs.**
- The scheme also aims to enhance the pace of projects in key sectors such as [Jal Jeevan Mission](#) and [Pradhan Mantri Gram Sadak Yojana](#) **by providing funds for meeting the state share.**
- The scheme also **seeks to encourage states to undertake reforms in urban planning and urban finance** to improve the quality of life and governance in cities.

What is Capital Expenditure in India?

▪ **Capital Expenditure (Capex):**

- It refers to the funds allocated by the government for the **acquisition, construction, or improvement of physical assets such as infrastructure, buildings, machinery, and equipment.**
- It is **considered to be productive and growth enhancing as it adds to the productive capacity of the economy** and generates income and employment in the future.
- The Indian government **allocates capital expenditure** through its annual budget, which is presented by the finance minister.
 - The capital investment outlay has experienced a consecutive **three-year increase**, reaching Rs 10 lakh crore, which accounts for **3.3% of the GDP, marking a significant growth of 33% (Union Budget 2023-24).**

▪ **Effective Capital Expenditure:**

- The capital expenditure presented in the budget **does not include the spending by the government on creating capital assets through grants-in-aid to states and other agencies.**
 - These grants are classified as revenue expenditure in the budget, but **they also contribute to the creation of fixed assets such as roads, bridges, schools, hospitals, etc.**
 - Therefore, to capture the true extent of public investment by the central government, **a concept of 'effective capital expenditure' has been introduced.**
- **Effective capital expenditure** is defined as the sum of capital expenditure and grants for creation of capital assets.
 - It is budgeted at Rs 13.7 lakh crore or 4.5% of GDP (Union Budget 2023-24).

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. Which of the following is/are included in the capital budget of the Government of India? (2016)

1. Expenditure on acquisition of assets like roads, buildings, machinery, etc.
2. Loans received from foreign governments
3. Loans and advances granted to the States and Union Territories

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (d)

[Source: PIB](#)

ART Regulations: Impact on Cost and Conception Opportunities

For Prelims: [Assisted Reproductive Technology](#), [fundamental right](#), [In Vitro fertilization](#)

For Mains: Government Policies & Interventions, Issues Related to Women

Why in News?

Recently, industry insiders have raised concerns about the restrictions imposed by the provisions of the [Assisted Reproductive Technology \(ART\) Regulations Act, 2021](#) introduced by the Health Ministry.

- These concerns pertain to the **increased costs and limited conception opportunities** faced by couples seeking ART treatments, despite the regulations aiming to enhance medical care and security for donors and patients.

What is Assisted Reproductive Technology?

- ART refers to medical procedures used to help **individuals or couples conceive a child**.
- It involves various techniques, such as [in vitro fertilization \(IVF\)](#), [intracytoplasmic sperm injection \(ICSI\)](#), Gamete Donation, Intrauterine Insemination, Pre-implantation Genetic Testing, Surrogacy, Altruistic Surrogacy.
- ART is often used by individuals or couples facing **fertility challenges**, including **infertility, genetic disorders, or reproductive system abnormalities**.
- ART procedures typically involve the manipulation of sperm, eggs, or embryos in a laboratory setting before transferring them to the woman's uterus.

What are the Main Features of the ART Regulations Act, 2021?

- **Registration:** Every ART clinic and bank must be registered under the **National Registry of Banks and Clinics of India**, maintaining a central database.
 - Registration is valid for **five years and can be renewed for another five years**.
 - Violations of the Act may result in cancellation or suspension of registration.
- **Conditions for Sperm & Egg Donation:** Registered ART banks can screen, collect, and store semen from **men aged 21-55 years**. Eggs can be stored from **women aged 23-35 years**.
- **Donor Limits:** Oocyte donors must be **ever-married women with at least one living child of their own (minimum three years of age)**.

- An oocyte donor **can only donate once in her lifetime**, and a **maximum of seven oocytes can be retrieved**.
- **Gamete Supply:** An **ART bank cannot supply gametes from a single donor to more than one commissioning couple** (couple seeking services).
- **Parental Rights:** Children born through ART are deemed the **couple's biological child**, and the **donor has no parental rights**.
- **Consent:** Written informed consent is required from both the couple and the donor for ART procedures.
- **Regulation of ART Processes:** The National and State Boards formed under the [Surrogacy Act 2021](#) will regulate ART services.
- **Insurance Coverage:** Parties seeking ART services must provide **insurance coverage in favor of the oocyte donor**, covering any loss, damage, or death of the donor.
- **Preventing Sex Selection:** Clinics are prohibited from offering to provide a **child of pre-determined sex, ensuring non-discriminatory practices**.
- **Offences:** Offences include abandonment or exploitation of children born through ART, sale or trade of embryos, and exploitation of the couple or donor.
 - Punishment includes **imprisonment of 8-12 years and a fine of Rs 10-20 lakhs**.
 - Clinics and banks are prohibited from advertising or offering sex-selective ART.
 - **Offences carry imprisonment of 5-10 years and a fine of Rs 10-25 lakhs**.

What are the Challenges and Concerns Regarding ART Regulations, 2021?

- **Increased Cost:** The regulations may lead to **higher treatment costs** due to additional requirements such as **insurance, testing, and registration fees**.
- **Reduced Availability:** Limitations on the **number of donors and cycles per donor** may result in a **shortage of suitable donors**, making it harder for couples to find matching gametes.
 - [Fertility rates are declining in India](#) and worldwide, making the limited availability of donors a significant challenge.
- **Challenges in Finding Suitable Donors:** The restrictions may pose challenges for doctors and couples in finding donors that **meet specific requirements** or preferences.
- **Discouragement for Potential Donors:** Concerns over legal and social repercussions, as well as **lack of incentives, may discourage potential donors** from participating in the ART process.

Way Forward

- Enhance **affordability through subsidies** and partnerships.
- Expand the **donor pool through awareness campaigns** and community support.
- **Streamline donor matching** with a centralized platform and advanced technology.
- Encourage research and innovation for cost-effective treatments.
- Develop a supportive legal framework protecting rights and addressing ethical concerns.

UPSC Civil Services Examination, Previous Year Question

Prelims

Q. In the context of recent advances in human reproductive technology, "Pronuclear Transfer" is used for (2020)

- (a) fertilization of egg in vitro by the donor sperm
- (b) genetic modification of sperm producing cells
- (c) development of stem cells into functional embryos
- (d) prevention of mitochondrial diseases in offspring

Ans: (d)

Exp:

- Pronuclear transfer involves the transfer of pronuclei from one zygote to another. This technique

first requires fertilisation of healthy donated eggs (provided by the mitochondrial donor) with the intended male parent sperm. Simultaneously, the intending mother's affected oocytes are fertilised with the intending father's sperm.

- By using a technique, called 'Maternal Spindle transfer', the maternal DNA is put into the egg of a donor woman, which is then fertilized using the father's sperm. The procedure was developed to help existing In-vitro-Fertilization (IVF) treatments in which mothers have mitochondrial diseases.
- Mutations in maternal DNA are a cause of mitochondrial disease, a heterogeneous group of diseases that can lead to premature death, sometimes in infancy or childhood. Most mitochondrial diseases lack specific treatments, and women who carry the causative mutations are at high risk of transmitting the diseases to their offspring. Therefore, option (d) is the correct answer.

[Source: TH](#)

CSR Guidelines for Empowering Ports

For Prelims: [Corporate Social Responsibility](#) , Sagar Samajik Sahayog, Ports, [Major Port Authorities Act, 2021](#).

For Mains: Significance of Corporate Social Responsibility

Why in News?

Recently, the Ministry of Ports, Shipping & Waterways has launched '**Sagar Samajik Sahayog**,' its new guidelines for [Corporate Social Responsibility \(CSR\)](#), aiming to empower ports to address local community issues in a more cooperative and swift manner.

What are the Key Highlights of the Guidelines?

- **CSR Funding:**
 - Ports in India will **allocate a specific percentage** of their net annual profit towards CSR activities. The CSR budget for ports will be **based on their respective turnover** for the year, the division will be as follows:
 - Ports with an annual turnover of less than Rs 100 crores will **spend 3-5% on CSR**.
 - Ports with a turnover between **Rs 100 to 500 crores will spend 2-3%**.
 - Ports with a turnover exceeding Rs 500 crores will spend **0.5-2%**.
 - 2% of the total CSR expenses will be **dedicated to project monitoring by the ports to ensure effective implementation** and monitoring of the respective CSR projects.
- **CSR Committee:**
 - Each [Major Port](#) will establish a corporate social responsibility committee, headed by a **deputy chairperson** of major port to plan and implement CSR initiatives.
 - The committee will consist of **two other members**. CSR projects must be implemented into the business plans of major ports, **addressing social and environmental concerns** related to their operations.
 - A CSR plan will also need to be prepared for each financial year.
- **Allocation and Focus Areas:**
 - The CSR projects and programmes will focus on activities specified in **Section 70 of the [Major Port Authorities Act, 2021](#)**.

- According to Section 70 of the Act, the organization may use its funds for providing **social benefits** including development of infrastructure in areas of education, health, housing, skill development, training and recreational activities for its own employees, customers etc.
- **20% of the CSR expenses** must be **earmarked for the Sainik Kalyan Board** at the district level, the National Maritime Heritage Complex, and the National Youth Development Fund.
- Additionally, **78% of the funds** should be **directed towards social and environmental welfare initiatives** benefiting the community.
 - These include projects related to **drinking water, education, vocational training**, non-conventional and renewable energy sources for electricity, health and family welfare, livelihood promotion for **Economically Weaker Sections (EWS)**, community centers, and hostels.
- **2 % of the total CSR expense** is allocated for project monitoring under the CSR programs by the ports.

What is the Significance of the Guidelines?

- The guidelines **enable ports to directly undertake CSR activities**, fostering community welfare and development.
- By embracing a framework that **includes local communities as partners**, CSR has the potential to drive positive change and **become a significant catalyst for progress**.
- The guidelines aim to make **CSR a potent force for positive transformation**. This initiative reflects the government's commitment to **maximum governance and community-centric development**.

What is Corporate Social Responsibility (CSR)?

▪ About:

- The concept of CSR is the **idea that companies should assess and take responsibility** for their effects on the environment and on social welfare, and to promote **positive social and environmental change**.
- The four main types of corporate social responsibility are:
 - Environmental Responsibility
 - Ethical Responsibility
 - Philanthropic Responsibility
 - Economic Responsibility
- The Corporate Social Responsibility provisions within **Companies Act 2013 is applicable to companies with an annual turnover of 1,000 crore** and more, or a net worth of Rs. 500 crore and more, or a net profit of Rs. 5 crore and more.
 - The Act requires companies to set up a **CSR committee** which shall recommend a Corporate Social Responsibility Policy to the Board of Directors and also monitor the same from time to time.

▪ Activities under CSR:

- Specified under **Schedule VII of the Companies Act 2013**, some major activities include:
 - Eradicating **hunger, poverty** and **malnutrition** and promotion of education, gender equality.
 - Fighting **Acquired Immune Deficiency Syndrome(AIDS)**, Human Immunodeficiency Virus, and other disorders
 - Ensuring Environmental Sustainability
 - Protection of **National Heritage**, Art and Culture including restoration of buildings and sites of historical importance and works of art.
 - Measures for the benefit of armed forces veterans, war widows and their dependents.
 - Training to promote rural sports, nationally recognized sports, paralympic sports and **Olympic sports**
 - **Contribution to the PM's National Relief Fund** or any other fund set up by the Central Government for socio-economic development and relief.

UPSC Civil Services Examination, Previous Year Question

Q. Corporate social responsibility makes companies more profitable and sustainable. Analyse. **(2017)**

Source: PIB

PDF Reference URL: <https://www.drishtias.com/current-affairs-news-analysis-editorials/news-analysis/28-06-2023/print>