



**Mangroves in India**

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# MANGROVES IN INDIA



## FACTS

- \* UNESCO observes **July 26** as the **International Day for the Conservation of the Mangrove Ecosystem**.
- \* As per ISFR 2021, the mangrove cover in India is 4,992 sq km, which is **0.15%** of the country's total geographical area.
- \* **West Bengal>Gujarat>A&N Islands>Andhra Pradesh>Maharashtra**, have the largest Mangrove cover in India (ISFR 2021).
- \* In India, mangroves are protected by the **Environmental (Protection) Act 1986** and Coastal Zone Regulations.
- \* **Sunderbans**, a **UNESCO World Heritage Site**, is the world's largest single patch of **Mangrove Forests**.
- \* Sundarbans is the first Mangrove forest in the world, which was brought under scientific management, as early as in 1892.
- \* The emergence of **shrimp farms** is responsible for at least **35%** of the overall loss of mangrove forests.

## Fund of Funds for Startups (FFS)

**For Prelims:** Startup, Government Intervention & Schemes in Startup Sector

**For Mains:** Startup Ecosystem and its Significance, Government Intervention

### Why in News?

Recently, the Government of India has committed Rs. 7,385 crores under [Fund of Funds for Startup India Investment](#), launched in 2016, for 88 [Alternative Investment Funds \(AIFs\)](#).

- These AIFs, in turn, have invested Rs. 11,206 crores in 720 [startups](#).

### What is Fund of Funds for Startup?

#### ▪ About:

- Fund of Funds is a mutual fund scheme that invests in other [mutual fund](#) schemes.
  - In this, the fund manager holds a portfolio of other mutual funds instead of directly investing in equities or [bonds](#).
- Under FFS, support is extended to [Securities and Exchange Board of India \(SEBI\)](#) **registered Alternative Investment Funds (AIFs)**, which in turn invest in startups.
- FFS was announced with a corpus of Rs. 10,000 crore.
  - The corpus is to be built up over **14<sup>th</sup>** and **15<sup>th</sup>** [Finance Commission](#) Cycles (FY 2016-2020 and FY 2021-2025) through budgetary support by the **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry**.
- FFS has made capital available for startups at **early stage, seed stage and growth stage**.
  - It has also played a role in facilitating **raising of domestic capital, reducing dependence on foreign capital** and **encouraging home grown and new venture capital** funds.

#### ▪ Performance:

- The amount committed under FFS has **grown** over the years recording a [CAGR \(Compound Annual Growth Rate\)](#) of **over 21%** since the launch of the Scheme.
- [Small Industries Development Bank of India \(SIDBI\)](#), which is responsible for operationalising the Scheme, has undertaken a **series of reforms** recently to expedite the drawdowns to **enable AIFs assisted under FFS to avail accelerated drawdowns**.
  - This has resulted in a **year-on-year surge of 100%** in the amount of drawdowns.
- FFS has helped anchor 67 AIFs out of 88 AIFs supported.
  - 38 of these are first time fund managers which is in line with FFS's core objective of **anchoring venture capital investments for Indian startups**.
- Performing startups supported through FFS are showing valuation increase by more than 10 times with a number of them even achieving **unicorn status** (valuation of over USD 1 billion).

### What is Alternate Investment Funds AIF?

#### ▪ About:

- [Alternative Investment Fund or AIF](#) means any fund **established or incorporated in India**, which is a **privately pooled investment vehicle** which collects funds from sophisticated investors, whether Indian or foreign, for **investing it in accordance with a defined investment policy** for the benefit of its investors.

- **Regulation 2(1)(b)** of **Securities and Exchange Board of India (SEBI) Regulations (AIFs), 2012** lays down the definition of AIFs.
- Through a company, or a Limited Liability Partnership (LLP), an **Alternative Investment Fund can be established.**

▪ **Categories:**

## ALTERNATIVE INVESTMENT FUNDS

### Category I

Investment in Startups, SMEs and projects which are socially and economically viable



- Venture Capital Fund
- Infrastructure Fund
- Angel Fund
- Social Venture Fund

### Category II

Investment in Equity and Debt Securities



- Private Equity (PE) Fund
- Debt Fund
- Fund of Funds

### Category III

Investment aimed at short-term returns achieved by employing complex trading strategies



- Hedge Fund
- Private Investment in Public Equity Fund (PIPE)

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## What is the State of Startups in India?

▪ **About Startup:**

- The term startup refers to a **company in the first stages of operations**. Startups are founded by one or more entrepreneurs who want to develop a **product or service for which they believe there is demand**.
- These companies generally **start with high costs and limited revenue**, which is why **they look for capital from a variety of sources** such as venture capitalists.

▪ **Status in India:**

◦ **National Figure:**

- India has become the **3<sup>rd</sup> largest start-up ecosystem** in the world after the US and China.
- India is home to as many as **75,000 Startups**.
- **49% of start-ups** are from tier-2 and tier-3 cities.
- There are currently **105 unicorns**, out of which **44 were born in 2021** and **19 in**

**2022.**

- Startups are also emerging in the fields like **IT, [agriculture](#), [aviation](#), [education](#), [energy](#), [health](#) and [space sectors](#).**
- **Global Innovation Index:**
  - India has been ranked in its global ranking of **[Global Innovation Index \(GII\)](#)** from **81<sup>st</sup> in the year 2015 to 46<sup>th</sup> in 2021** among 130 economies of the world.
  - India ranks **2<sup>nd</sup> among 34 lower-middle-income** economies and **1<sup>st</sup> among 10 Central and Southern Asian economies** in terms of GI.
- **Other Rankings:**
  - **Publications:**
    - Globally ranked **3<sup>rd</sup> (2021)** from **6<sup>th</sup> in 2013** based on the **National Science Foundation database.**
  - **Patents:**
    - Globally ranked **9<sup>th</sup> (2021)** in terms of **resident patent filing.**
  - **Quality of Research Publications:**
    - Globally ranked **9<sup>th</sup> (2021)** from **13<sup>th</sup> in 2013.**
- **Initiatives for Startup:**
  - **[National Initiative for Developing and Harnessing Innovations \(NIDHI\)](#)**
  - **[Startup India Action Plan \(SIAP\)](#)**
  - **[Ranking of States on Support to Startup Ecosystems \(RSSSE\)](#)**
  - **Startup India Seed Fund Scheme (SISFS):** It aims to provide financial assistance to startups for proof of concept, prototype development, product trials, market entry and commercialization.
  - **National Startup Awards:** It seeks to recognize and reward outstanding startups and ecosystem enablers that are contributing to economic dynamism by spurring innovation and injecting competition.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q. What does venture capital mean? (2014)**

- (a) A short-term capital provided to industries
- (b) A long-term start-up capital provided to new entrepreneurs
- (c) Funds provided to industries at times of incurring losses
- (d) Funds provided for replacement and renovation of industries

**Ans: (b)**

**Explanation:**

- Venture capital is a form of fund for a new or growing business. It usually comes from venture capital firms that specialize in building high risk financial portfolios.
- With venture capital, the venture capital firm gives funding to the startup company in exchange for equity in the startup.
- The people who invest this money are called venture capitalists (VCs). Venture capital investment is also referred as risk capital or patient risk capital, as it includes the risk of losing the money if the venture does not succeed and takes a medium to long term period for the investments to fructify.
- Therefore, option (b) is the correct answer.

**Source: PIB**



## SC's Reference on Capital Punishment

**For Prelims:** Capital Punishment, Indian Penal Code, Bachan Singh v/s State of Punjab

**For Mains:** Arguments in Favour and Against Death Penalty in India, SC's Reference on Capital Punishment

### Why in News?

Recently, the [Supreme Court \(SC\)](#) has referred to a larger Bench the issues relating to the norms for imposing the [Capital Sentence](#).

### What has the Court Said?

- The current referral of the three-judge [bench](#) of the Supreme Court to a five-judge bench **is based on an argument that the process of same-day sentencing is hopelessly tilted against the accused.**
- The Bench said that the **State is given an opportunity to present aggravating circumstances** against the accused throughout the duration of a trial.
- The accused, on the other hand, **is able to produce evidence showing mitigating circumstances** in their favour, only after their conviction.

### What are the Issues?

- There are **conflicting judgments on when and how the sentencing hearing must take place** mainly on whether it is necessary to hold the hearing on sentencing on a **subsequent day and not on the day of the conviction.**
- The issue pertains to giving **meaningful opportunity to those found guilty of a capital offence** to present mitigating factors and circumstances so that **they can better plead for a life term instead** of a death sentence.
- The issue arises from the legal requirement that whenever a court records a conviction, **it has to hold a separate hearing on the quantum** of sentence.

### What are the Legalities and Judgements?

- **Section 235** of the [Code of Criminal Procedure \(CrPC\)](#) says if the **accused is convicted**, the judge will hear the **accused on the question of sentence and then pass sentence.**
  - This process is significant **if the conviction is for an offence that entails either death or life imprisonment.**
- **Section 354(3)** says that when there is **death Punishment or imprisonment for life**, the judgment will have to state the reason for why the sentence was awarded.
- If the **sentence is death, "special reasons"** will have to be provided in the judgment.
- **In 1980**, the Supreme Court upheld the constitutionality of capital punishment in '[Bachan Singh v State of Punjab](#)' on the condition that the **punishment will be awarded in the "rarest of the rare" cases.**
  - Crucially, the ruling also stressed that a separate sentencing hearing would be held, where a judge would be persuaded on why the death sentence need not be awarded.
- This position was reiterated in several subsequent rulings of the court, including in '[Mithu v State of Punjab](#)', a 1982 ruling by a five-judge Bench **that struck down mandatory death sentence** as it falls foul of the right of an accused to be heard before sentencing.

## What are the Views on Same-Day Sentencing?

- Even though a separate hearing on sentencing is practiced in all trials, **most judges do not adjourn the case to a future date** to go through this.
- As soon as the verdict of 'guilty' is pronounced, they ask counsel on both sides to argue on sentencing.
- There is a view that **such 'same-day' sentencing is inadequate and violates natural justice** as convicts do not get enough time to gather mitigating factors.
- In a series of judgments, the Supreme Court **has advocated that the sentencing hearing be done separately**, that is, at a future date after conviction.
- However, in a contradiction of sorts, several judgments have upheld the practice of 'same-day' sentencing.

## What is the likely Outcome?

- The Constitution Bench may lay down **comprehensive guidelines** on the manner in which sentencing **decisions can be arrived at**.
- The SC may make it **necessary for the trial court to get to know the accused better** before passing the sentence.
- The courts may **draft the help of psychologists and psychoanalytical experts**.
  - A study into the childhood experiences and upbringing of the accused, mental health history in the family and the likelihood of traumatic past experiences and other social and cultural factors **may be mandated to be part of the sentencing process**.
- This may mean that **trial courts will be better informed than now**, when only basic data such as educational and economic status are ascertained before a sentence is imposed.

## What is Capital Punishment?

- Capital Punishment stands for **the most severe form of punishment**. It is the punishment which is awarded for the **most heinous and grievous crimes against humanity**.
  - Certain offences under [Indian Penal Code](#), for which the offenders can be sentenced to punishment of death are:
    - Murder (Section 302)
    - Dacoity with murder (Section 396)
    - Criminal Conspiracy (Section 120B)
    - Waging war against the Government of India or attempting to do so (Section 121)
    - Abatement of mutiny (Section 132) and others.
- The term death penalty is sometimes **used interchangeably with capital punishment**, though imposition of the penalty is not always followed by execution, it can be [commuted into life imprisonment](#) or [pardoned by the President](#) under [Article 72 of Indian Constitution](#).

## Way Forward

- The hearings will effectively settle the debate on whether the fast-tracked hearings by trial courts awarding death sentences — in a matter of days in some cases — is legally tenable.
- The ruling could also **be a crucial step in raising the bar further in awarding** the death sentence.
- The focus should not only be on eliminating the criminal but also on elimination of the crime. The purpose of punishment in criminal law, if looked at from a wider angle and a broader perspective, is to achieve the goals of an orderly society. There is a need to ensure the restoration of peace and prevent future occurrences of crimes by balancing the competing rights of the criminal and the victim.

**Q.** Instances of President's delay in commuting death sentences has come under public debate as denial of justice. Should there be a time limit specified for the President to accept/reject such petitions? Analyse. (2014)

**Source:** TH

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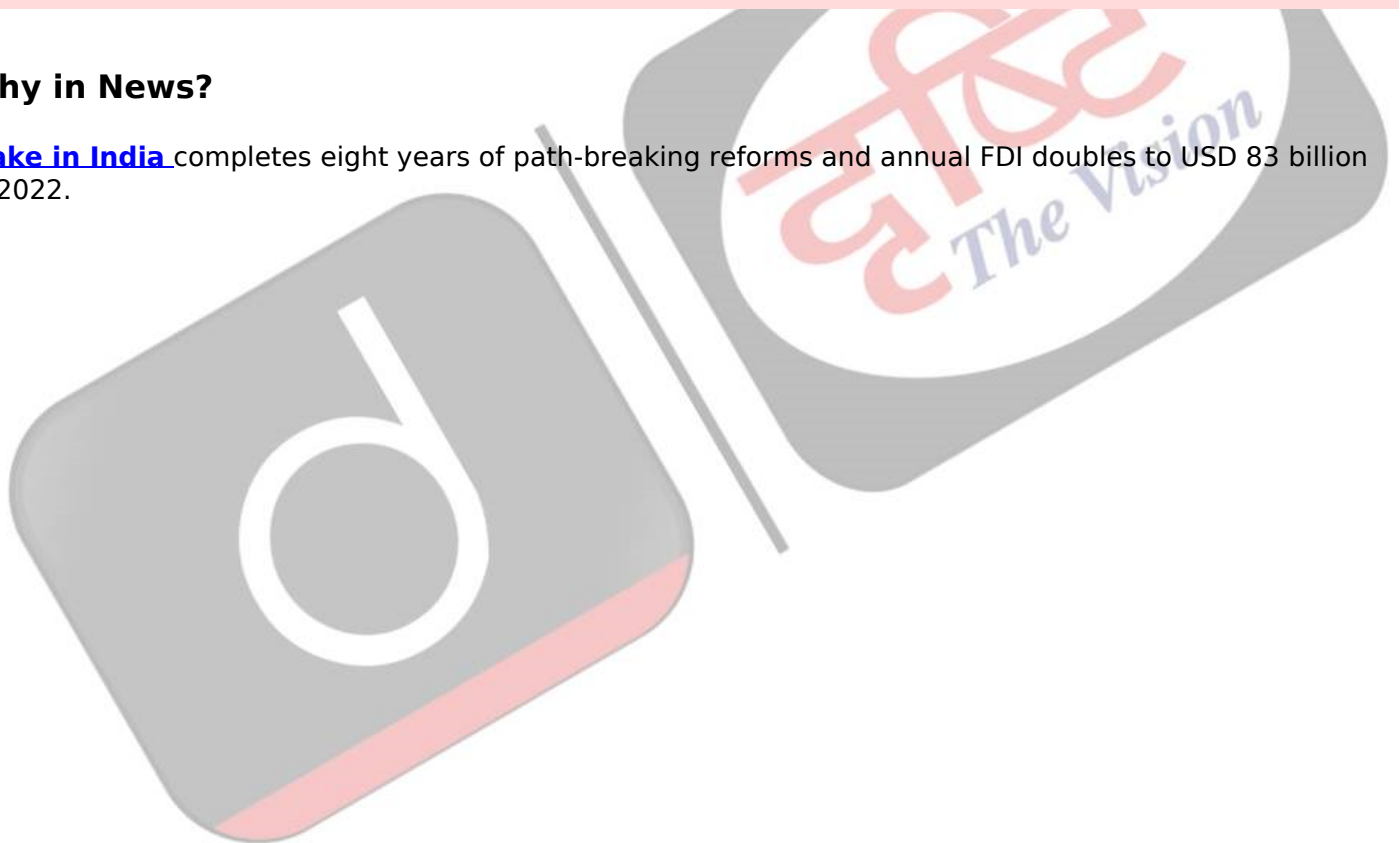
## Eight Years of Make in India

**For Prelims:** Make in India, Foreign Direct Investment, Ease of Doing Business, Production Linked Incentive (PLI), National Single Window System (NSWS), One-District-One-Product (ODOP)

**For Mains:** Significance of Make in India in Transforming Indian Economy

### Why in News?

[Make in India](#) completes eight years of path-breaking reforms and annual FDI doubles to USD 83 billion in 2022.





# Make in India@8

**Eight yrs of Make**  
in India; annual FDI  
doubles to \$83 b

**Govt focus on**  
key sectors like  
semiconductors

**PLI boost to localised**  
manufacturing, 14 schemes  
operational



**Apr-Aug 2022**  
**toy exports**  
**up 636%**  
**from 2013**

**Preference in**  
**public procurement**  
**of goods, works**  
**and services**

BCCL

## What do we Know about the Make in-India Programme?

### ▪ About:

- **Launched in 2014**, Make in India aims to **transform the country into a leading global manufacturing and investment destination**.
- The initiative is an open invitation to potential investors and partners across the globe to participate in the growth story of 'New India'.
- Make In India has substantial accomplishments across 27 sectors. These include strategic sectors of manufacturing and services as well.

### ▪ Objectives:

- To **attract foreign investment for [new industrialisation](#)** and develop the already existing industry base in India to surpass that of China.
- Target of an **increase in manufacturing sector growth to 12-14% per annum** over the medium term.
- To **increase the share of [manufacturing](#) sector in the country's Gross Domestic Product from 16% to 25% by 2022**.
- To **create 100 million additional jobs by 2022**.
- To **promote export-led growth**.

### ▪ Outcomes:

- **FDI inflows:** FDI inflows in India stood at USD 45.15 billion in 2014-2015 and have since consecutively reached record FDI inflows for eight years.
  - The year 2021-22 recorded the **highest ever FDI at USD 83.6 billion.**
  - On the back of **economic reforms and [Ease of Doing Business](#) in recent years, India is on track to attract USD 100 Billion in FDI** in the current Financial Year (2022-23).
- The import of toys in FY21-22 has reduced by 70% to USD 110 Mn (Rs. 877.8 cr.). India's export of toys registers tremendous growth of 636% in April-August 2022 over the same period in 2013
- **Production Linked Incentive (PLI):** The [Production Linked Incentive \(PLI\)](#) scheme across 14 key manufacturing sectors, was launched in 2020-21 as a big boost to the Make in India initiative.

## What are the Initiatives to Support Make in India Scheme?

- **National Single Window System (NSWS):**
  - The [National Single Window System \(NSWS\)](#) has been soft-launched in September 2021 to improve the ease of doing business by providing a single digital platform to investors for approvals and clearances.
  - This portal has **integrated multiple existing clearance systems of the various Ministries/Departments of the Government** of India and State Governments to enhance the investor experience.
- **Gati Shakti:**
  - The Government has also launched a programme for **multimodal connectivity to manufacturing zones in the country**, called the [Prime Minister's Gatishakti programme](#), which will **ensure logistical efficiency in business operations through the creation of infrastructure that improves connectivity.**
- **[One-District-One-Product \(ODOP\):](#)**
  - This initiative aims at facilitating the **promotion and production of indigenous products from each district** of the country and providing a global platform to the artisans and manufacturers of handloom, handicrafts, textiles, agricultural and processed products, thereby further contributing to the socio-economic growth of various regions of the country.
- **Improving toy exports and reducing Imports:**
  - To **address the import of low-quality and hazardous toys and to enhance domestic manufacturing of toys**, several strategic interventions such as increase of **Basic Custom Duty from 20% to 60%**, implementation of Quality Control Order, mandatory sample testing of imported toys, granting more than 850 BIS licenses to domestic toy manufacturers, development of toy clusters etc. have been taken by the government.
- **Scheme for building Semiconductor Ecosystem:**
  - Recognising the importance of semiconductors in the world economy, the Government has launched a USD 10 billion incentive scheme to build a semiconductor, display, and design ecosystem in India.

## What are the Issues Related to the Make in India Programme?

- **Investment from Shell Companies:** Large part of the Indian FDI is neither foreign nor direct but comes from [Mauritius-based shell companies](#) which are suspected to be investing black money from India only, which is routed via Mauritius.
- **Low Productivity:** The productivity of Indian factories is low and workers have insufficient skills.
  - **McKinsey report** states that Indian workers in the manufacturing sector are, on average, almost four and five times less productive than their counterparts in Thailand and China.
- **Small Industrial Units:** The size of the industrial units is small for attaining the desired economies of scale, investing in modern equipment and developing supply chains.
- **infrastructure:** Electricity costs are almost the same in India and China but **power outages are much higher in India.**
- **Transportation:** Average speeds in China are about 100 km per hour, while in India, they are about 60 km per hour. **Indian railways have saturated and Indian ports have been**

**outperformed** by a lot of Asian countries.

- The **2018 World Bank's Logistics Performance Index (LPI)** ranked **India 44th among 160 countries**. Singapore was ranked seventh, China 26th and Malaysia 41th. The average ship turnaround time in Singapore was less than a day and in India, it was 2.04 days.

- **Red Tapism: Bureaucratic procedures and corruption** make India less attractive for investors.

## Way Forward

- The Make in India initiative has been **striving to ensure that the business ecosystem in the nation is conducive for investors** doing business in India and contributing to the growth and development of the Nation.
- This has been done through a range of reforms that have led to increased investment inflows as well as economic growth.
- With this initiative at the forefront, the businesses in India are aiming that the products that are 'Made in India' are also 'Made for the World,' adhering to global standards of quality.

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

### Prelims

**Q. What is/are the recent policy initiative(s) of Government of India to promote the growth of manufacturing sector? (2012)**

1. Setting up of National Investment and Manufacturing Zones
2. Providing the benefit of 'single window clearance'
3. Establishing the Technology Acquisition and Development Fund

**Select the correct answer using the codes given below:**

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

**Ans: (d)**

**Exp:**

- National Investment and Manufacturing Zone is a new concept which is an integral part of the National Manufacturing Policy, 2011. The National Manufacturing Policy is a policy tool to be applied to select zones designated for promoting manufacturing. Hence, 1 is correct.
- The 'single window clearance' has been provided, which will cut red tapism and facilitate investment and ease of doing business in the country. Hence, 2 is correct.
- The Technology Acquisition and Development Fund (TADF) was launched under the National Manufacturing Policy. TADF is a new scheme to facilitate acquisition of Clean, Green and Energy Efficient Technologies, in the form of Technology/ Customised Products/Specialised Services/Patents/ Industrial Design available in the market in India or globally, by Micro, Small and Medium Enterprises (MSMEs). Hence, 3 is correct.
- The Scheme is conceptualised to catalyse the manufacturing growth in the MSME sector to contribute to the national focus of "Make in India". Therefore, option (d) is the correct answer.

### Mains

**Q. "Success of 'Make in India' program depends on the success of 'Skill India' programme and radical labour reforms." Discuss with logical arguments. (2019)**

## Modified Incentive Scheme for Semiconductor Chip-Making

**For Prelims:** Semiconductors and Related Schemes, Chip-making Initiative, PLI Scheme, DLI Scheme, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPecs), Internet of Things (IoT).

**For Mains:** Significance of Semiconductor Devices in Indian Economy, Semiconductors and their Future in India.

### Why in News?

Recently, the **Centre approved changes to the scheme for the development of a semiconductor and display manufacturing ecosystem** in the country in order to **make India's \$10 billion chip-making initiative more attractive to investors**.

### What are the Approved Changes to India's Chip-making Scheme?

#### ▪ Background:

- In 2021, India announced its roughly **\$10 billion dollar Production-Linked Incentive (PLI) scheme to encourage semiconductor and display manufacturing** in the country.
- Also, a **Design-Linked Initiative (DLI) scheme to drive global and domestic investment** related to design software, IP rights etc. was announced.

#### ▪ Changes:

- **Uniform 50% Fiscal Support:** In the previous version of the scheme, the Centre was offering to fund 30% of the project cost for 45nm to 65nm chip production, 40% for 28nm to 45nm, and 50% or half of the funding for chips 28nm or below. The modified scheme provides **uniform 50% fiscal support for all nodes**.
- **Setting-up of New Semiconductor Plants:** Vedanta and Taiwanese chipmaker Foxconn have signed a Memorandum of Understanding (**MoU**) to set up a ₹1,54,000 crore **semiconductor plant in Gujarat**.
- **Two other projects have also been announced:**
  - **A \$3 billion plant in Karnataka** by the International consortium **ISMC**.
    - ISMC is a joint venture between Abu Dhabi-based Next Orbit Ventures and Israel's Tower Semiconductor.
  - **A \$3.5 billion plant in Tamil Nadu by Singapore's IGSS Ventures.**
- **Production of the 45nm Chip:** The modified scheme also **emphasised** the production of the 45nm chip, which is **fairly less time-consuming and economical in terms of production**.
  - These chips have **high demand, driven primarily by automotive, power and telecom applications**.

#### ▪ Significance:

- The changes will lead to the **harmonisation of government incentives for all technology nodes of semiconductors**.
- It will encourage all areas of chip-making to **create an integrated ecosystem in India**.
- PLI and DLI schemes had attracted many global semiconductor players for setting up semiconductor fabrication plants (fabs) in India and the **modified programme would**



further expedite these investments and bring in more applicants.

▪ **Associated Concern:**

- Although the scheme is an encouraging move, chip production is a **resource-intensive and expensive process**. The new scheme **provides equal funding** for all steps of the process. **However, the outlay of the scheme remains \$10 billion**.
- It requires an **investment of anywhere between \$3 and \$7 billion to just set up one semiconductor fab**.

## What are Semiconductor Chips?

▪ **About:**

- **Semiconductors** are materials which have a **conductivity between conductors and insulators**.
- They can be pure elements, **silicon or germanium** or compounds; **gallium, arsenide or cadmium selenide**.
- The **basic component of a semiconductor chip is a sliver of silicon, which is etched with billions of microscopic transistors** and projected to specific minerals and gases, forming **patterns to control the flow of current** while following different computational instructions.
- The **most-advanced semiconductor technology nodes** available today are the **3 nm and the 5 nanometer (nm) ones**.
- Semiconductors having **higher nanometer value** are applied in automobiles, consumer electronics and so on, while those with **lower values** are used in devices such as smartphones and laptops.
- The **chip-making Process** is complex and highly exact, having **multiple other steps in the supply chain** such as **chip-designing** done by companies to develop new circuitry for use in appliances, **designing software for chips and patenting them through core [Intellectual Property Rights \(IPR\)](#)**.
  - It also **involves making chip-fabrication machines; setting up fabs or factories; and ATMP**.

▪ **Significance:**

- Semiconductors are the thumbnail-sized **building blocks of almost every modern electronic device** from smartphones to connected devices in the **[Internet of Things \(IoT\)](#)**. They help give computational power to devices.

▪ **Global Scenario:**

- The chip-making industry is a **highly-concentrated one**, with the big players being Taiwan, South Korea and the U.S. among others. Infact, **90% of 5nm chips are mass-produced in Taiwan**, by the Taiwan Semiconductor Manufacturing Company (TSMC).
- Therefore, the **[global chip shortage](#)**, **[U.S.-China tensions over Taiwan](#)**, and the **supply chain blockages owing to the [Russia-Ukraine conflict](#)** have **led major economies to enter the chip-making sector with a renewed push**.
- The **global semiconductor industry is currently valued at \$500-\$600 billion** and caters to the **global electronics industry** currently valued at about **\$3 trillion**.

▪ **Indian Scenario:**

- **India currently imports all chips** and the market is estimated to touch \$100 billion by 2025 from \$24 billion now. However, for the domestic manufacturing of semiconductor chips, **India has recently launched several initiatives**:
  - The Union Cabinet has allocated an amount of ₹76,000 crore for supporting the development of a **'semiconductors and display manufacturing ecosystem'**.
  - India has also launched the **[Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors \(SPecs\)](#)** for manufacturing electronics components and semiconductors.
  - In 2021, the MeitY also launched the **Design Linked Incentive (DLI) Scheme** to nurture at least 20 domestic companies involved in semiconductor design and facilitate them to achieve a turnover of more than Rs.1500 Crore in the next 5 years.
- India's own consumption of semiconductors is **expected to cross \$80 billion by 2026 and to \$10 billion by 2030**.



## What can be the Way Ahead for India's Semiconductor Dream?

- Though India is focusing on “**lagging-edge**” **technology** nodes in the start to supply to the automotive and appliance sector, **creating global demand may be difficult as big players like Taiwan offer viable cutting-edge chip-tech worldwide**. Thus, **attracting global players to set up here would be beneficial** as they come with their customer base.
- Much of the current scheme outlay could be allocated to supporting other elements including display fabs, packaging and testing facilities, and chip design centres. However, the **initial funding should focus on areas like design and R&D**, for which India already has an established talent pool.
- Chip-making also **requires gallons of ultrapure water in a single day**, which could be a task for the **government to provide to factories, compounded also by the drought conditions** which often prevail in large parts of the country.
  - Besides, an uninterrupted supply of power is central to the process, with just seconds of fluctuations or spikes causing millions in losses.
- Another task for the government is to **drive up consumer demand in the semiconductor industry** to not end up in a situation where these ventures remain successful only till taxpayers are forced to fund required subsidies.

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

**Q. With reference to solar power production in India, consider the following statements: (2018)**

1. India is the third largest in the world in the manufacture of silicon wafers used in photovoltaic units.
2. The solar power tariffs are determined by the Solar Energy Corporation of India.

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

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

**Ans: (d)**

**Exp:**

- Silicon wafers are thin slices of semiconductor, such as a crystalline Silicon (c-Si), used for the fabrication of integrated circuits and, in photovoltaics, to manufacture solar cells. China is by far the world's largest producer of Silicon, followed by Russia, the United States, and Brazil. India does not figure among the top five producers of Silicon and Silicon wafers. **Hence, statement 1 is not correct.**
- Solar tariffs are determined by the Central Electricity Regulatory Commission and not by Solar Energy Corporation of India. **Hence, statement 2 is not correct.**
- **Therefore, option D is the correct answer.**

**Source: TH**

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# Renewable Energy and Jobs

**For Prelims:** IRENA, ILO, Renewable Energy, Solar Energy, Decentralized Renewable Energy

**For Mains:** Renewable Energy and Jobs-Annual Review 2022

## Why in News?

Recently, the [International Renewable Energy Agency \(IRENA\)](#) and the [International Labour Organization \(ILO\)](#) released a report titled “**Renewable Energy and Jobs-Annual Review 2022**”, which says that around 700,000 new jobs were created in the [Renewable Energy Sector](#) in just one year.

- The report identified **domestic market size, along with labor**, as a major factor influencing job growth in the sector.

## What are the Findings?

### ▪ Overview:

- The Renewable Energy sector employed **12.7 million people across the world in 2021**, up from 12 million in 2020.
- Close to **two-thirds of all such jobs are in Asia**, with China alone **accounting for 42 % of the global total**. It is followed by the European Union and Brazil with 10 % each and the United States and India with 7 % each.
- Developed economies received the largest share of investment in the renewable energy field. These countries are on their way to **achieving a 60 % growth in the clean energy sector by 2022**.

### ▪ Regional Trends:

- **Southeast Asian** countries are **becoming major Solar Photovoltaic (PV) manufacturing hubs** and biofuel producers, while China is the pre-eminent manufacturer and installer of solar PV panels and is creating a growing number of jobs in offshore wind.
- **India** added more than **10 Gigawatts of solar PV**, generating many installation jobs, but remains heavily dependent on imported panels.
- **Europe** accounts for about 40 % of the **world's wind manufacturing output and is the most important exporter** of wind power equipment; it is trying to reconstitute its solar PV manufacturing industry.
- In Africa there are growing **job opportunities in decentralized renewables**, while in the Americas, Mexico is the leading supplier of wind turbine blades.
- **Brazil remains the leading employer in biofuels** but is also adding many jobs in wind and solar PV installations.
- **The US** is beginning to build a domestic industrial base for the budding offshore wind sector.

### ▪ Solar Energy:

- Solar energy remained the **fastest-growing sector**.
- In 2021 it provided **4.3 million jobs** — more than a third of the total renewable energy workforce.
  - In 2021, a record 132.8 gigawatts of solar PV capacity were installed globally, up from 125.6 GW in 2020.
- China accounted for **53 GW (40 %) of this addition**. It was followed by the US, India and Brazil, all of which set new annual records.

### ▪ Decentralized Renewable Energy:

- The number of people directly employed in **Decentralised Renewable Energy (DRE)** in 2021 was more than 80,000 in India (mostly in solar PV), 50,000 each in Kenya and Nigeria, almost 30,000 in Uganda.
  - DRE is a system that uses **renewable energy to generate, store and**

**distribute power in a localised way.**

- The share of women in the **DRE** workforce is still low, particularly for skilled jobs, the researchers observed.
  - Overall, the share of women in DRE was 41 % in Kenya, 37 % in Ethiopia and Nigeria, 28 % in Uganda and 21 % in India.

## **What are the Recommendations?**

- An energy transition that can be considered just needs not only to create decent jobs but **also to offer social protection for affected workers**, communities and regions during the transition.
- A successful and just energy transition requires strong public policy interventions and capable institutions for policy implementation.
- Pursuing **industrial policies that encourage the expansion of decent renewables jobs** at home.
- Not only the ultimate outcome of the energy transition but also the process of a decades-long transformation of all economies must be just.
- The expansion of renewable energy needs to be **supported with holistic policy packages**, including training for workers to ensure jobs are decent, high quality, well paid and diverse in pursuit of a just transition.

## **What is the International Renewable Energy Agency (IRENA)?**

- It is an intergovernmental organisation, it was officially founded in Bonn, Germany, in January 2009.
- It has 168 members and India is the 77th Founding Member of IRENA.
- It has its headquarters in Abu Dhabi, United Arab Emirates.

## **What is the International Labor Organization?**

- It is the only tripartite [United Nation \(UN\)](#) agency. It brings together governments, employers and workers of 187 member States (India is a member), to set labour standards, develop policies and devise programmes promoting decent work for all women and men.
  - Received the [Nobel Peace Prize](#) in 1969.
- Established in 1919 by the [Treaty of Versailles](#) as an affiliated agency of the [League of Nations](#).
- Became the first affiliated specialized agency of the UN in 1946.
- Headquarters: Geneva, Switzerland.

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

**Q.** Give an account of the current status and the targets to be achieved pertaining to renewable energy sources in the country. Discuss in brief the importance of National Programme on Light Emitting Diodes (LEDs). **(2016)**

**Source:** [DTE](#)

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## **World Environmental Health Day**

## Why in News?

World Environmental Health Day 2022 is observed annually on September 26 to spread awareness globally regarding the health of the environment.

- The central idea behind celebrating this day is that the health of the human race is irrevocably intertwined with the health of the environment.

## What are the Key Highlights of World Environmental Health Day?

- **History:**
  - The day was first observed by the **International Federation of Environmental Health (IFEH)** in the year 2011. The main aim is the well-being of people across the globe.
    - The IFEH is wholly dedicated to the development and dissemination of knowledge on the protection and subsequent improvement of environmental health.
- **Theme:**
  - The theme for this year is **'Strengthening Environmental Health Systems for the implementation of the [Sustainable Development Goals](#).'**
- **Significance:**
  - It is necessary that the world understands there is an integral connection between the environment, health and the economy. It is therefore **important to invest in healthy and green recovery**, close to all communities.
  - It becomes all the more important for the human race to pay attention to the environment and try to create balance.
  - The World Health Organization launched the **"Manifesto for a healthy recovery of [COVID-19](#)"**, with the objective of taking advantage of the momentum that we are facing worldwide.
  - **Environmental Health plays** a pivotal role in the implementation of the SDGs. It is interesting to note that Environmental Health fits into 7 SDGs, 19 targets and 30 indicators of the SDGs.

## What do we Know about India's Environmental Health?

- **Present status:**
  - India was ranked at the **bottom of the list of 180 countries with a paltry score of 18.9** on the [Environmental Performance Index](#) 2022.
    - India ranked behind Myanmar at 179, Vietnam (178), Bangladesh (177) and Pakistan (176).
- **Related Initiatives:**
  - **Nagar Vana Udyan Scheme:** This scheme aims to **develop at least one city forest in each city having Municipal Corporation or Class 1 Cities (over 200)** to accommodate a wholesome healthy environment.
  - **National Wetland Conservation Programme (NWCP):** The initiative was launched to **conserve and make use of wetlands in the country.**
  - **Green Skill Development Programme :** The Ministry of Environment, Forest and Climate launched the [Green Skill Development Programme](#) in June 2017 to teach skills required for **conserving and protecting the environment among the youth.**
  - **Save Soil Movement:** On World Environment Day 2022, the Prime Minister launched the **'Save Soil Movement'**. The initiative focuses on five things making the **soil chemical-free, saving organisms that live in the soil, maintaining soil moisture, increasing the availability of water**, and stopping the continuous erosion of soil due to the reduction of forests.
  - India has set a **goal of making 26 million hectares of barren land fertile by 2030** and aims to be **Net-Zero in emissions by 2070.**

[Source: DTE](#)

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# White Fly

## Why in News?

Recently, there has been a rise in the number of white fly attacks on cotton in various states like Punjab and Rajasthan.



## What do we Know about White Fly?

### ▪ About:

- **Whitefly** is a **serious pest of cotton that lowers yield by feeding on the underside of the leaf** and spreading diseases like **Cotton Leaf Curl Virus**.
- They feed on the sap of the leaves and release fluid onto the leaves on which a black fungus grows, this affects photosynthesis, the food-making process of the plant, and so lowers the strength of the plant.

### ▪ Spread:

- The **first reported invasive spiralling whitefly (*Aleurodicus dispersus*)** is now distributed throughout India.
- Similarly, the **rugose spiralling whitefly (*Aleurodicus rugioperculatus*)** which was reported in Pollachi, Tamil Nadu in 2016 has now spread throughout the country.
- *Aleurodicus dispersus* and *Aleurodicus rugioperculatus* have been **reported on over 320 and 40 plant species**, respectively.
- Most of the whitefly species are **native to the Caribbean islands or Central America**.

### ▪ Reasons for Spread:

- The host range of all of the invasive whiteflies has been increasing due to their **polyphagous nature** (ability to feed on various kinds of food) and **prolific breeding** (produces a large number offsprings).
- The **increasing import of plants and increasing globalization and movement of people** have aided the spread of different varieties and their subsequent growth into invasive species.

### ▪ Concerns:

#### ◦ Damage to Crops:

- Whiteflies reduce the production yield and also damage crops. Approximately **1.35 lakh hectares of coconut and oil palm** in India are **affected by the rugose spiralling whitefly**.
- **Other invasive whiteflies** were also found to **expand their host range on valuable plant species**, especially coconut, banana, mango, sapota, guava, cashew, oil palm, and ornamental plants such as bottle palm, false bird of paradise, butterfly palm and important medicinal plants.

#### ◦ Ineffectiveness of Insecticides:

- Whiteflies have been difficult to control by using available synthetic insecticides.



- **Controlling Whiteflies:**

- They are currently being controlled by naturally occurring **insect predators, parasitoids** (natural enemies of pests, provide biological control of pests in greenhouses and crop fields) and **entomopathogenic fungi** (fungi that can kill insects).

## What are other Pests/Insects Attacking Crops?

- **Fall Armyworm (FAW) Attack:**

- It is a dangerous transboundary insect with a high potential to spread rapidly due to its natural distribution capacity and opportunities presented by international trade.
- In 2020, the Directorate of Agriculture reported an armyworm attack on the standing crops in the northeastern Dhemaji district of Assam.

- **Locust Invasion:**

- A locust (Migratory insect also known as tiddi) is a large, mainly tropical grasshopper with strong powers of flight. They differ from ordinary grasshoppers in their ability to change behaviour (gregarize) and form swarms that can migrate over large distances.
- Locust adults can eat their own weight every day, i.e. about two grams of fresh vegetation per day. A very small swarm eats as much in one day as about 35,000 people, posing a devastating threat to crops and food security.

- **Pink Bollworm (PBW):**

- It (*Pectinophora gossypiella*), is an insect known for being a pest in **cotton farming**.
- The pink bollworm is native to Asia but has become an invasive species in most of the world's cotton-growing regions.

[Source: DTE](#)

## Thamirabarani River

### Why in News?

The district administration of Tirunelveli in Tamil Nadu along with **Ashoka Trust for Research in Ecology and the Environment (ATREE)**, a non-profit Organisation, are using a 'hyper local' approach called TamiraSES to restore the **Thamirabarani River**.

### What is the Project About?

- **Need:**

- The Thamirabarani is of great importance to southern Tamil Nadu environmentally and historically. But it too has suffered, which is why the restoration project has been started.
- While the Thamirabarani landscape, in general, appears water-rich, it **faced severe drought in 2016 despite** the diverse water storage systems in place.
- Settlements have been on the rise, **which has led to the shrinkage of agricultural land** and water bodies.

- **TamiraSES project:**

- It is a district level initiative, which aims to **restore the Social Ecological Systems of Tamiraparani river riverscape from head-waters to the estuary to enable conditions for native biodiversity to thrive** and maintain and enhance multiple ecosystem services to local stakeholders.
- Five social ecological observatories will be set up **as part of the first phase of the project**. These will serve as pilots to scale up from the learnings from these sites.

- The idea is to rejuvenate not just the **Thamirabarani** but **all the water bodies in the riverscape of Tirunelveli**.

## What are the Key Points of Thamirabarani River?

- The Thamirabarani is the **only perennial** (continuous flow of water) **river in Tamil Nadu**.
- This is the shortest river in the state, the Thamirabarani **starts in Pothigai hills of the Western Ghats** in the Ambasamudram taluk, flows through Tirunelveli and Thoothukudi districts and empties at Korkai into the **Gulf of Mannar (Bay of Bengal)**. It thus **originates and ends in the same state**.
- The river supports wildlife such as the Nilgiri marten, **slender loris**, lion-tailed macaque, white spotted bush frog, galaxy frog, Sri Lankan Atlas moth and the **great hornbill**.
- Besides the ecosystem services it provides, the river also has **historical value for the people of the state**. It is mentioned extensively in **Sangam Era literature**.



**Source: DTE**