MAKE IN INDIA: CATALYSING GROWTH OF STUDENTS AND YOUTH

Countries initially prioritize staple food production in their economic growth process, shifting towards manufacturing and services as labour productivity and industrial capital improve. India's growth has been service-centric, resulting in slower manufacturing sector growth compared to overall GDP. This has led to manufacturing's GDP share remaining around 16%. To address this, India launched the **National Manufacturing Policy** in 2011 and the **'Make in India' initiative**, aiming to enhance self-sufficiency and job creation, thus reshaping the country's economic trajectory.

The 'Make in India' initiative was launched in September 2014, by Prime Minister Narendra Modi aimed to create and encourage companies to develop, manufacture, and assemble products in India and incentivise dedicated investments in the manufacturing space. The 'Make in India-Make for World' aims at promoting self-reliance and transform India into a global design and manufacturing hub.

India, with over 140 crore people, boasts a large working-age population (67%). As the world's top contributor to the workforce (24.3%), ensuring quality education and facilities is vital for future readiness.

The Challenges

- Indian education is criticized for rote learning, grades, not fostering creativity, hindering innovation and critical thinking development among students.
- Practical exposure remains limited, with a gap between theoretical knowledge and real-world applications. Many educational institutions lack access to advanced technology, practical training, and exposure to industries, restricting students' ability to apply their knowledge practically.
- India's investment in **research and development** falls short compared to other nations, hampering the growth of innovative ideas and technologies.
- In terms of **infrastructure and access**, inadequate facilities in rural areas pose significant challenges for students and innovators who require reliable internet connectivity, electricity, and other basic amenities. Access to resources, such as laboratories, libraries, and mentorship, is also a struggle for many students and young innovators.
- In the **regulatory and business environment**, securing intellectual property rights and patents can be complex and time-consuming, deterring some innovators from protecting their ideas. Additionally, the ecosystem is still developing, making it challenging for young innovators to secure funding, find mentors, and navigate the business landscape.
- **Societal and cultural factors** also play a significant role in hindering innovation.
- Additionally, **gender disparities persist**, with female students and innovators facing unique challenges due to biases and limited opportunities.

India's Steps Towards Nurturing Young Talents to Make in India

With the above challenges in mind, there have been multiple efforts by Govt to solve these and provide a boost to the students to think about making, creating, tinkering, and solving the challenges themselves -

Addressing the Challenge of Rote Learning

- The surge in big data, machine learning, and artificial intelligence threatens unskilled jobs. Therefore, it's crucial to enhance education in math, data science, and computer science while fostering multidisciplinary skills in social sciences and humanities.
- This led to the birth of the National Education Policy in 2020, which addresses the challenge of 'rote learning' faced by the Indian education system. The policy is aimed at identifying the unique skills and capabilities of students and promoting creativity and critical thinking, which are important to develop at a young age.

Instilling Behavioural Change at a Young Age

The Government of India, via the **Atal Innovation Mission (AIM)**, initiated 10,000 Atal Tinkering Labs (ATL) nationwide - 60% in government schools and 40% in private schools. These labs cater to students from **Grades 6 to 12**, encouraging curiosity, creativity, and **STEM** (Science, Technology, Engineering and Math) understanding through hands-on experiences with DIY kits, scientific instruments, robotics, 3D printers, and more.

Developing Infrastructure for Innovation and Access to Resource

The Indian government's Atal Innovation Mission fosters innovation by establishing Atal Incubation Centres (AICs). These centres nurture startups through the innovation cycle and encourage their growth into sustainable businesses. Additionally, the 'Mentor India' initiative connects innovators with professionals and academicians for mentorship in various fields, including innovation, marketing, product development, and patenting.

Ease of Doing Business and Protection of Intellectual Property Rights

The "Start-up India" initiative was launched with the aim of fostering entrepreneurship and promoting innovation by creating an ecosystem that is conducive to the growth of start- ups. Since then, the number of startups in the country has increased from 452 in 2016 to 84,012 by November 2022, which is relatively higher than the rest of the world.

Addressing Local Needs by States

State has the flexibility to design and implement its own programmes based on local needs and opportunities. These state-level initiatives may include additional funding schemes, incubators, skill development programmes, and innovation challenges specific to their respective regions. Few such examples are - Kerala Startup Mission, T-Hub in Telangana, and Gujarat Startup and Innovation Scheme.

Ways to Measure India's Manufacturing Growth

- The National Manufacturing Innovation Survey (NMIS) 2021-22 is a joint study by the Department of Science and Technology (DST) and the United Nations Industrial Development Organization (UNIDO) to evaluate the innovation performance of manufacturing firms in India.
- According to Indian Manufacturing Innovation Index (IMI), **Karnataka** is the most 'Innovative' State, followed by Telangana, and Tamil Nadu.

Conclusion

Nine years of 'Make in India' represent a transformative vision that has set India on a path of economic resurgence and self-reliance. It is crucial for all stakeholders, Government, industries, educational institutions, and citizens, to collaborate synergistically to build a resilient, sustainable, and inclusive manufacturing ecosystem. By harnessing the collective potential of its people, resources, and entrepreneurial spirit.

MAKE IN INDIA: CHALLENGES OPPORTUNITIES AND OUTCOMES

Why Make in India?

The initiative Make in India envisaged the following:

- Lay focus on employment creation and skill upgrading in 27 sectors of the economy.
- Increase contribution of the manufacturing sector to overall GDP growth.
- Enhance tax revenues of the nation by positively enhancing business activity through the manufacturing revolution.
- Eliminate unnecessary laws, controls, and bureaucratic procedural hurdles.
- Ensure and adopt higher quality standards for manufacturing products with reduced impact on the environment.
- Attract FDI for capital financing and technological investment in different economic schemes of the country.

- Identify and promote the growing services and industrial sectors in the Indian economy.

Scope and Sectoral Coverage

- 'Make in India' aims to transform India into a global manufacturing hub by attracting domestic and foreign investments, promoting industrial growth, job creation, and innovation.
- The 'Make in India' campaign aims to transform India's economy by promoting transparency, accountability, and ease of doing business.
- The objectives of Make in India include attracting FDI, promoting domestic industries, boosting employment, fostering innovation, enhancing export competitiveness, and impacting economic growth, job creation, FDI inflows, skill and infrastructure development, and global competitiveness.
- The 'Make in India 2.0' initiative is an ambitious endeavour targeting 27 pivotal economic sectors, dividing them into 15 in manufacturing (including Aerospace, Pharmaceuticals, Electronics System Design and Manufacturing, and Renewable Energy) and 12 in services (ranging from IT to Tourism & Financial Services).
- The initiative relies on a collaborative effort between Central and State Governments, where Ministries and Departments fashion tailored strategies, programs, and policies for their specific sectors.
- Oversight is split between the Department of Promotion of Industry and Internal Trade (DPIIT) for manufacturing and the Department of Commerce for services.
- Outreach endeavours extend through Ministries, State Governments, and Indian Missions globally, fostering international collaboration and encouraging both domestic and foreign investments to rejuvenate India's diverse economic panorama.

Pillars of Make in India

Considering the importance of manufacturing sector in India in the national development and based on the hopes to attract more capital, entrepreneurship, and technological investment in India, the 'Make in India' initiative is built on following four vital pillars:

- **New Processes:** To improve India's 'Ease of Doing Business' (EODB) ranking, reforms were aligned with World Bank parameters. 'Make in India' identified EODB as vital for entrepreneurship, process review, and customizations boosted manufacturing growth, mitigating post-Covid economic challenges.
- **New Infrastructure**: Make in India aims to establish advanced industrial corridors, smart cities, and cutting-edge infrastructure, including high-speed communication networks. It also enhances research, innovation, and simplifies Intellectual Property Rights (IPR) registration.
- **New Sectors**: India's 'Make in India' initiative initially pin pointed 25 key sectors, later adding two more. Investment barriers were eliminated or eased in select sectors, prioritizing growth, and national economic development.
- **New Mindset**: Make in India brought about a paradigm shift in the way Government interacts with various industries. Attempts were made to transform Govt's outlook towards the industrial growth by making it a partner in the economic development of country along with the development of corporate sector.

Advantages of Make in India

- The 'Make in India' initiative encompasses socio-economic dimensions with potential for substantial growth, especially in manufacturing and job creation, benefitting both rural and urban areas.
- Its export-oriented model can bolster India's balance of payments, addressing post-Covid economic uncertainties.
- This holistic approach aims to boost credit ratings and position India as a global manufacturing hub, attracting more investors.

Carrying Out Reforms

Since 2014, the Indian government has undertaken reforms to simplify taxation, remove price rigidities, attract FDI, boost innovation, enhance skills, modernize infrastructure, liberalize services, and ensure Ease of Doing Business (EODB).

Urgent manufacturing revival has been the most important focal point for guaranteeing sustainable economic development that is based on several policy judgements, viz.

- Guarantee basic production inputs - power, minerals and water at competitive prices.
- Make modern transport, logistic, and communication infrastructure accessible.
- Ensure accessibility to domestic and international markets.
- Develop entrepreneurship and improve the capacity of entrepreneurs.
- Extend support for bringing in EoDB through access to venture capital, strong industrial delicensing and deregulating environment, etc.

In 2021-22 Union Budget, India allocated Rs. 1.97 lakh crore for production-linked incentives (PLI) in 14 manufacturing sectors, beginning in FY 2021-22. This is projected to boost production, skills, jobs, economic growth, and exports over the next five years.

Impact of Make in India

The primary aim is to bolster manufacturing, boosting economic growth, employment, income, and its contribution to the economy. It intends to transform India into a global manufacturing hub by expediting project clearances, building infrastructure, and fostering research and development.

The 'Make in India' initiative has had a positive impact on the economy. The following are some of the major achievements of the last 8 years:

- Over the past eight years, India's Ease of Doing Business (EoDB) ranking improved significantly, moving from 142 in 2014 to an impressive 63 in 2022, a remarkable gain of 79 positions.
- Policy liberalization and increased FDI opportunities over the past eight years led to a structural shift in India's FDI landscape. Gross FDI grew from 2.2% to 2.6% of GDP, with annual inflows reaching a record high of $84.84 billion in FY 2022.
- India's agriculture sector saw 4.6% annual growth from 2014-15 to 2021-22. It became a net exporter with agri-product exports reaching $50.2 billion in 2021-22.
- The Economic Survey 2021-22 reported growth in Gross Value Addition (GVA) in manufacturing. Employment in the sector increased from 57 million in 2017-18 to 62.4 million in 2019-20 despite COVID-19 disruptions.
- India witnessed a resilient performance of service trade, where the total services exports grew by 48.4 billion US $ in 2021-22 over 2020-21 from 206.1 US $ billion to 254,5 US $ billion.

Attracting FDI Into India

The Govt has taken various steps to boost domestic and foreign investment in India. These, inter alia, include:

(a) Introduction of Goods and Services Tax

(b) Reduction in Corporate Tax

(c) Innovation to improve EODB

(d) FDI policy reforms

(e) Measures for reduction in compliance burden

(f) Policy measures to boost domestic manufacturing through public procurement orders.

(g) Phased manufacturing programmes

Challenges

There is a need to facilitate the land acquisition process, create an appropriate labour development ecosystem for efficient and effective enforcement of laws/rules outlining entry and exit guidelines with clarity, rationalise the taxation regime, and enable technology acquisition and dissemination. India has a vast micro, small, and

medium-sized business environment, with more than two crore MSMEs operating in the country. The complex taxation system needs to be reviewed and actions taken in terms of EoDB. The world class research and development infrastructure need to be created on a networking basis with reputed universities and research organisations with a guarantee to protect innovation and development in the country.

Concluding Remarks

The Make in India initiative seeks sustainable economic growth and aims to position India as a global manufacturing hub. It leveraged post-Covid challenges through **Atmanirbhar packages, PLI schemes, National Infrastructure Pipeline (NIP), National Monetization Pipeline (NMP), India Industrial Land Bank (IILB), Industrial Park Rating System (IPRS), and the National Single Window System (NSWS)**. This long-term strategy can drive balanced regional growth, address poverty, unemployment, and income disparities, with a vital role for MSMEs, the services sector, and startups in its success.

FOSTERING BALANCED REGIONAL DEVELOPMENT

'Make in India' emphasizes development decentralization, with 'One-District One-Product' (ODOP) initiative as a key component. ODOP covers 1,000+ products from 761 districts, focusing on the following activities for success:

- Need-based and regular capacity building initiatives in collaboration with related govt/private training and education imparting bodies, viz. National Institutes of Design/National Institutes of Fashion Technology,
- On boarding onto e-commerce platforms, including Government e-Market (GEM).
- Identify market players and conduct physical/virtual buyer-sellers meets along with Indian embassies and missions abroad. Facilitating trade events in India and abroad.
- Promoting brand image and propelling an international marketing for local products.
- Products to be selected by States/UTS by taking into consideration the existing ecosystem on the ground.
- Channelising the potential and diverse identity in each District by setting up District Export Hubs (DEH).

The ODOP initiative, aligning with government schemes, supports local economies by enhancing linkages for chosen products. It bolsters Make in India in rural areas, leveraging contributions from agriculture, handicrafts, fisheries, poultry, and dairy. These processes drive economic growth locally and nationally.

FOSTERING SKILLS FOR ENVIRONMENTALLY CONSCIOUS SUSTAINABLE FUTURE

The connection between environmental knowledge and environmental attitudes is well-established. India's environmental concerns drive efforts to educate and empower youth for a sustainable future. Environmental science's growth demands empowering youth for conservation, addressing the environmental crisis with green skills and targeted green job initiatives.

- The ILO defines green jobs as **eco-conscious roles**, spanning renewable energy and conservation, promoting sustainability via resource efficiency, emissions reduction, and climate adaptation. UNIDO emphasizes green skills for a sustainable society. India's Ministry of Environment, Forest & Climate Change uses **ENVIS Hubs** for green skills, aiding youth employment in environmental and forest sectors.
- The **Green Skill Development Programme (GSDP)**, launched in June 2017, initially trained Biodiversity Conservationists and Para-taxonomists in ten districts. MSDE coordinates national skill development, aligning GSDP courses with NCVET guidelines. Graduates can secure positions in MoEF&CC bodies, including Biodiversity Management Committees, state Biodiversity Boards, CPCB, and wildlife conservation agencies. Topics in the course list encompass water budgeting, bamboo management, greenbelt development, and geospatial wildlife management.

The **National Action Plan on Climate Change (NAPCC)**, which is a national strategy to adapt to climate change and enhance the ecological sustainability of India's development path. It has eight missions as a long-term and integrated approach to address the issue of climate change:

- National Solar Mission
- National Mission for Enhanced Energy Efficiency
- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Eco- system
- National Mission for a Green India
- National Mission for Sustainable Agriculture,
- National Mission on Strategic Knowledge for Climate Change.

States develop Climate Change Action Plans for adaptation.

India's UNFCCC submission emphasizes resource-efficient, energy-secure development (source: www.moef.nic.in). India is actively promoting **Resource Efficiency and Circular Economy** in alignment with the UN Decade of Action for SDGs. These efforts include waste prevention and management. Key principles like Extended Producer Responsibility and Circular Economy emphasize **reduce-reuse-recycle** for sustainable consumption and production. NITI Aayog forms committees for circular economy action plans on various waste types, while MOEFCC is leading efforts in Circular Economy Action Plans, particularly for Tyre and Rubber, and has issued guidelines on Extended Producer Responsibility for Plastic Packaging under Plastic Waste Management Rules, 2016.

NREP 2019 is guided by the principles of

(i) reduction in primary resource consumption to 'sustainable' levels, in keeping with achieving the Sustainable Development Goals and staying within the planetary boundaries,

(ii) creation of higher value with less material through resource efficient and circular approaches,

(iii) waste minimization,

(iv) material security, and

(v) creation of employment opportunities and business models beneficial to the cause of environment protection and restoration.

- The Circular economy keeps resources in use for as long as possible, extracting the maximum value, and recovering and regenerating products and materials at the end of each service life, so as to limit the extraction of natural resources to the maximum possible extent.
- Off-farm technologies like **'bio-briquetting'**, which is a sustainable technology, can be promoted to generate energy at a local scale (http://gbpihedenvis. nic.in).
- Biomass energy from pine needles can be generated by using the simple technology of biomass briquetting.
- Under the niche of G.B. Pant National Institute of Himalayan Environment, Almora, which is an autonomous body of MoEFCC, lower and marginalised groups of villagers are manufacturing Bio-briquettes and Bio-globules, practising resource utilisation, and furthermore generating livelihood.

India at 26th session of the Conference of the Parties (COP 26) to the UNFCCC held in Glasgow, presented **'Panchamrit' of India's climate action**. These were:

1. India will get its non-fossil energy capacity to 500 GW by 2030,
2. India will meet 50 % of its energy requirements from renewable energy by 2030,
3. India will reduce the total projected carbon emissions by one billion tonnes from now onwards till 2030,
4. By 2030, India will reduce the carbon intensity of its economy by less that 45 per cent and
5. By the year 2070, India will achieve the target of Net Zero carbon emissions.

Conclusion

In pursuant to the spirit of 'Digital India' initiation and capturing the essence of Minimum Government and Maximum Governance, **PARIVESH** (Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single window Hub) has been developed by the Ministry of Environment, Forest, and Climate Change. It has automated entire process, starting with the submission of applications, minutes, as well as grant of environment/forest/wildlife clearances for developmental projects. Such initiatives and others like GSDP will augment 'Make in India' campaign in the ensuing years.

INDIA: HUB FOR ELECTRONICS MANUFACTURING

During PM Modi's US visit, Micron unveiled a $2.7B semiconductor plant for India, echoing India's push for manufacturing growth since 2014. Notably, Apple, Wistron, and Foxconn have established factories in India to diversify their supply chains. Further, First Solar, a US-based solar manufacturer, plans significant investments in Indian solar panel production. The Production Linked Incentive (PLI) scheme drives India's thriving electronics sector, boosting exports and aiming for substantial job growth by 2025-26.

Early Signs Of Success

- India's telecom and allied industries are key job creators, with a booming mobile phone manufacturing sector. The PLI and PMP initiatives have driven significant value addition, particularly in smartphone manufacturing. In FY 2022-23, smartphones constituted $44 billion of the $101 billion electronics production, with $11.1 billion in exports. India achieved 60% import substitution in the telecom sector and self-reliance in Antennae, GPON, and CPE. The drone sector, led by MSME startups, experienced a seven-fold increase in turnover due to the PLI Scheme.
- India's electronics exports surged at a 22.39% CAGR, reaching $14.6 billion in 2021-22, with its global manufacturing share rising from 1.3% to 3.75%. The PLI scheme for Large-Scale Electronics Manufacturing attracted significant investments, resulting in substantial production, exports, and job creation. A similar PLI scheme for IT hardware also led to notable production and job opportunities.

Make in India Initiative: The Game-Changer

- The electronics manufacturing transformation in India, spurred by the Make in India initiative since 2014, aims to facilitate investment, innovation, infrastructure development, and industry-government partnerships.
- The Make in India initiative, encompassing 27 sectors in its 2.0 version, is coordinated by different departments. Electronics and IT & ITeS sectors play a pivotal role, with the government's goal of achieving $300 billion in electronics manufacturing by 2025-26.

The Indian government aims to bolster electronics manufacturing and become a global hub by implementing the **National Policy on Electronics 2019**. Several schemes have been initiated under NPE 2019 to attract investments, foster capabilities, and encourage exports.

1. The **PLI scheme for Large Scale Electronics Manufacturing**, effective from April 1, 2020, offers 4-6% incentives to eligible companies involved in mobile phone manufacturing and specific electronic component manufacturing.
2. The **PLI scheme for IT Hardware**, introduced on March 3, 2021, offers 4-2%/1% incentives on net incremental sales for eligible companies in the target segments: laptops, tablets, all-in-one PCs, and servers, for a four-year period. The scheme promotes local manufacturing, encourages localization, and includes semiconductor design and IC manufacturing. It targets significant production, investment, job creation (75,000 direct employment), and a $300 billion electronics manufacturing turnover by 2025-26.
3. **Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)**, initiated on April 1, 2020, offers a 25% financial incentive on capital expenditure for electronic goods in the downstream value chain, including components, semiconductors, ATMP units, and capital goods.

4. **Electronics Manufacturing Clusters (EMC 2.0)**, launched on April 1, 2020, aids in developing top-tier infrastructure and common facilities to attract global electronics manufacturers and their supply chains to establish units in India.
5. The **Modified Scheme** offers 50% fiscal support for -- silicon-based fabrication facilities, Display Fabs (setting up TFT LCD/AMOLED- based display fabrication facilities), and setting up Compound Semiconductors, Silicon Photonics, Sensors, Discrete Semiconductor Fabs, and Semiconductor ATMP/OSAT facilities in India.
6. **Design Linked Incentive Scheme** supports semiconductor design, including ICs, Chipsets, SoCs, Systems & IP Cores, with 'Product' and 'Deployment' incentives.
7. To enhance electronics manufacturing, a program with Rs. 76,000 crore funding has been approved for Semiconductors and Display ecosystem development.

Digital India Mission

The Digital India mission aims to transform India into a digitally empowered society and knowledge economy, generating employment and emphasizing electronics manufacturing. Meity has launched schemes and approved skill development initiatives in the Electronics System Design and Manufacturing (ESDM) sector to foster its growth. These schemes are run concurrently with designated implementing agencies.

As of March 1, 2023, both schemes have enrolled 4,35,165 candidates, with 4,28,540 trained and 3,11,862 certified. Additionally, Meity initiated the C2S Programme to produce 85,000 industry-ready workers specialized in VLSI and Embedded System Design, fostering semiconductor design culture and entrepreneurship in India.

Looking Ahead

- PLI schemes in LSEM and IT hardware bolster India's electronics manufacturing, enhance self-reliance, and elevate global competitiveness. India now ranks **63rd in the world** for manufacturing, up 23 places from a few years ago, according to the World Economic Forum's Global Competitiveness Index.
- However, India faces obstacles to becoming a global manufacturing leader, including infrastructure limitations, bureaucratic red tape, complex taxation, and a shortage of skilled labour. While investment plans are announced, the journey to actual foreign direct investment and operations is lengthy. Efforts to streamline the process are underway, but further improvements are needed.
- India has a limited timeframe of 3-5 years to attract investments and become a credible global supply chain alternative amid the growing desire to diversify manufacturing beyond China. Despite China's larger economy, India aims to boost its manufacturing sector from 16% to 25% of GDP by 2025, relying on domestic demand, government initiatives, and its demographic advantage. Concurrent and aggressive efforts are needed to seize this opportunity.

PRODUCTION LINKED INCENTIVE SCHEME FOR AATMANIRBHAR BHARAT

Aatmanirbhar Bharat promotes domestic manufacturing and reducing overreliance on China, as seen during the COVID-19 crisis's global supply chain disruption. Global MNCs, especially from the USA, sought to reduce their reliance on China due to supply chain risks and trade tensions. India welcomed these companies, facilitating their entry through streamlined clearances and land acquisition support.

- NITI Aayog launched the PLI Scheme to offer financial incentives to companies establishing manufacturing units in India across 10 sectors with a budget of Rs. 1,45,980 Cr. The Union Cabinet approved the scheme on November 11, 2020.
- Manufacturing of Drones and Drone component was also added subsequently to these 13 sectors, and an outlay of Rs. 120 Cr. was earmarked for this emerging sector, with a view to promote MSMEs and Startups.
- With this, the total commitment of GoI towards PLI scheme for 14 Sectors stood at Rs. 197411 Cr.
- The PLI scheme aims to attract investments in specific products across 14 sectors, focusing on areas with import dependency, limited domestic capacity, export potential, and strong global demand.

- The PLI scheme was introduced due to challenges with the Merchandise Export Incentive Scheme (MEIS) and WTO disputes, leading to the discontinuation of MEIS and related schemes.
- The MEIS scheme offered an average incentive of about 2% of export value, but its effectiveness in promoting domestic manufacturing was debated. In contrast, the PLI scheme has attracted over Rs. 62,500 Cr in investment, generated Rs. 2,60,000 Cr in exports, and created over 3.5 lakh jobs in 14 sectors.
- Manufacturers are the sole beneficiaries under the PLI scheme, making it a direct promoter of self-reliance and domestic manufacturing.
- The sectoral ministries developed their PLI schemes following government approval. These schemes aimed to attract maximum investment for greenfield or brownfield manufacturing in India, focusing on products that required advanced technology.
- The **Ministry of Steel's PLI scheme**, initiated on July 24, 2021, allocated Rs. 1293 Cr to encourage domestic production of Electrical steel, including CRGO (Cold Rolled Grain Oriented) and CRNO. This supports the power sector and EV charging infrastructure. Eligible applicants must commit a minimum investment of Rs. 5000 Cr and achieve a minimum 40% YoY incremental production rate.
    - JSW Steel Ltd., an Indian company, has partnered with JFE Japan to establish a 2-lakh ton capacity CRGO plant in Karnataka, investing over Rs. 8000 Cr.
- PLI scheme led to substantial investments in the **Pharma sector**, particularly for manufacturing APIs and drug intermediaries, reducing import dependence for 35 out of 53 critical APIs.
- The PLI scheme has led to over 60% import substitution in the **telecom sector**, making India self-reliant in antennas, GPON, and CPE. The PLI scheme has significantly impacted mobile phone manufacturing and exports, with India expected to reach Rs 1.2 lakh crore in exports in 2023-24, driven partly by Apple's plans to increase iPhone production in India. This initiative aims to reduce India's electronics imports, which reached $77 billion in 2022-23, second only to petroleum imports at $158 billion. The rapid establishment of domestic manufacturing in mobile devices and telecom equipment within 3 years is remarkable.
- The Ministries have approved 733 applications in 14 sectors, expecting an investment of Rs. 3.65 lakh Cr. Over Rs. 3,420 crore incentive claims have been received, with Rs. 2,800 crores disbursed. Notably, the largest disbursal of Rs. 1,649 crore was in large-scale electronics manufacturing. In 2021-22, there was a 76% increase in FDI in the manufacturing sector compared to the previous year.
- Sectors like high-efficiency solar PV modules, ACC batteries, and MMF textile products are struggling due to longer setup times, unattractive incentives, limited proposal windows, and MNC reluctance to bring cutting-edge. The government is considering adding sectors such as toys, leather, footwear, and new-age bicycle components due to growing imports and a lack of state-of-the-art facilities in India. This expansion aims to establish a manufacturing base for domestic and export purposes.

The Way Forward

To conclude, the PLI scheme has been a game changer for promoting Aatmanirbharta, and a lot has been achieved in the last three years. The impact of the scheme on employment generation has also been phenomenal. As manufacturing commences in sectors such as specialty steel, where the gestation period required for setting up manufacturing facilities is long, the impact on downstream industries shall be phenomenal and would help boost both direct and indirect employment as well as exports.

MAKE IN INDIA'S SUPER STAR SECTORS AND WATER MANAGEMENT

Water is a crucial element in industry, influencing investor decisions. India's Make in India initiative, launched in 2014, relies heavily on water efficiency. **Six "super star sectors"—***Automotive, Electronics, Renewable Energy, Roads, Pharmaceuticals, and Food Processing*—are expected to attract significant Foreign Direct Investments (FDI), supporting overall growth. These industries must use water wisely, as India's GDP per cubic meter of fresh

water withdrawal is low compared to other nations. Thus, optimizing water use is essential for sustainable industrial growth.

1. Automotive

- The **Automotive Mission Plan (AMP) 2026** aims to make the automotive industry the powerhouse of Make in India, targeting a four-fold growth to USD 300 billion and generating 65 million jobs, contributing over *12% to GDP*. However, this expansion raises water demands, with car production alone consuming 39,000 gallons. Increased paint production further exacerbates water consumption, necessitating industries to select sites with sustainable water resources, potentially leading to conflicts among existing users.
- Major automotive manufacturers are embracing sustainable water management practices. Hyundai's Chennai plant practices rainwater harvesting and 100% recycling, while Toyota's Bidadi facility doesn't use freshwater for industrial purposes. Tata Motors improves water efficiency and introduces waterless car cleaning. These practices are replicable and scalable for India's Make in India automotive growth.

2. Electronics System Design and Manufacturing

- In the era of technology-driven progress and India's Digital India initiative, electronics manufacturing assumes a crucial role across sectors. India is poised to become a global hub for electronics system design and manufacturing. The National Policy on Electronics 2019 aims for a USD 400 billion turnover by 2025, recognizing electronics hardware production as a key pillar of Make in India. The industry relies on **ultra-pure water** for various critical processes, including manufacturing thin-film devices, semiconductors, memory devices, and cleaning semiconductor components, among others.
- Generating ultra-pure water demands multiple units of raw water, varying by quality standards. Making a single integrated circuit on a wafer requires around 2200 gallons, highlighting the link between pure water availability and 'Make in India' success. The electronics industry can innovate to minimize waste, benefiting both industry and clean drinking water.

3. Renewable Energy

- India targets 50% renewable energy in its power mix by 2030, welcoming Foreign Direct Investment. This growth, involving solar, wind, hydropower, and green hydrogen, affects water availability directly and indirectly. Solar plants, for instance, consume significant water for cleaning, although innovations like (Massachusetts Institute of Technology) MIT's electrostatic repulsion method aim to reduce this impact.
- Green hydrogen, produced from water using renewable electricity, is pivotal for a low-carbon future. India's **National Hydrogen Mission** seeks to establish the country as a green hydrogen hub, aiming to generate 5 million tonnes by 2030 while expanding renewable energy capacity.
- The 'Make in India' initiative offers investment opportunities in the hydropower sector, including Large Hydro Power Projects (LHPPs) and Pumped Storage Projects (PSPs) over 25 MW capacity, recognized as renewable energy. Mini and micro generators in canals and small streams can enhance the power supply with minimal investment, benefiting small turbine manufacturers and fostering innovation for increased power generation with minimal resources.

4. Roads and Highways

- India's extensive road network, the world's second-largest at 63.32 lakh km, is vital for a thriving economy.
- Efficient road and highway planning should prioritize water conservation. The 'Make in India' initiative can leverage technology like satellite imagery for better alignment. Advanced equipment can navigate challenging terrain with minimal environmental impact. Collaboration with water conservation efforts, such as using pond soil and silt in construction, promotes resource availability and environmental preservation.

5. Pharmaceuticals

- India's pharmaceutical sector, the world's third-largest by volume, boasts of 3000 drug companies and 10,500 manufacturing units, producing 60,000 generics in 60 therapeutic categories, supplying 20% of global

generics. After success in managing COVID-19 and developing INNCOVACC, it's projected to reach USD 130 billion by 2030, with medical device exports targeting USD 10 billion by 2025.

- The government introduced the Production Linked Incentive (PLI) scheme with USD 400 million incentives for medical device production. The **National Medical Devices Policy**, launched in May 2023, aims for India to lead in medical device manufacturing and innovation, targeting a 10-12% share in the global market over the next 25 years.
- High-quality pure water is vital for the pharmaceutical industry throughout its manufacturing cycle.
- World Wide Fund (WWF) study reveals that 80% of top 30 pharmaceutical firms prioritize water sustainability, with 83% conducting water risk assessments. Yet, just 30% mention water-related efforts in Research and Development, despite water's local importance and lasting societal consequences.

6. Food Processing

- The food processing sector bridges agriculture and industries, boosting farmers' income via value addition and market access. It combats malnutrition with fortified foods.
- 'Make in India' supports **integrated cold chains and Mega Food Parks**, preserving produce and benefiting both farmers and the job market.
- The INR 10,900 crore PLI scheme for food processing spans from 2021-22 to 2026-27, aiming to boost processing capacity, generating INR 33,494 crore in processed food output and employing 2.5 lakh individuals by 2026-27.
- The MoFPI's PMFME scheme allocates INR 10,000 crore to boost competitiveness in unorganised micro food processing enterprises. Water is vital in this sector, with 70% of agriculture water and 20% of total water usage dedicated to food production and processing, highlighting room for water-efficient improvements.

Way Forward

Creating a business-friendly environment is vital for 'Make in India'. While simplifying regulations, water and environmental norms should be approached cautiously. Circular water use promotes recycling, while a water-neutral approach optimizes processes for minimal water use. Innovation will drive water-efficient solutions across industries. NITI Aayog, India's policy think-tank, advocates water-neutral practices in a recent document. It proposes that new industries shouldn't increase water withdrawal within a hydrological unit or watershed, emphasizing innovative processes and cross-sector collaboration. Sustainable growth is vital, ensuring efficient resource use, including water, and adopting a 'produce more with less' mindset is crucial for 'Make in India.'

CHANGING PARADIGM OF FOREIGN DIRECT INVESTMENTS

Industry drives economic growth, job creation, and higher living standards. Developing countries face capital constraints for industrialization due to limited resources and unstable financial markets. Foreign Direct Investment (FDI) plays a vital role in capital formation, technology transfer, and economic growth in emerging economies.

- FDI is pivotal in globalizing emerging economies, with an impact linked to income levels. The 1990s saw a five-fold increase in global FDI inflow. FDI's role in growth lies in technology transfer and spillover effects, and it increasingly promotes economic growth, especially in nations with advanced human capital.
- FDI fuels manufacturing growth by transferring technology and enhancing restructuring. It transformed Hong Kong, Singapore, South Korea, and Taiwan. FDI injects capital, tech, boosts productivity, creates jobs, raises incomes, and fosters innovation.
- The 2014 'Make in India' initiative aims to make India a global manufacturing hub. This article explores FDI's role in the growth of the country's manufacturing sector and its impact on 'Make in India.'

FDI: The Conceptual Background

- FDI, or Foreign Direct Investment, denotes lasting engagement by one country in another, often involving management, joint ventures, and knowledge transfer. The IMF defines it as a 10% or more stake in an enterprise with lasting management interest, including profit reinvestment.
- Investors engage in two main types of FDI: horizontal and vertical. Horizontal FDI expands production of similar goods in the host country, often driven by profit or cost-saving motives, including access to cheap labour or monopolistic advantages.
- Vertical FDI involves seeking raw materials or distribution outlets closer to consumers, aiming for cost-efficiency. It allows multinationals to establish networks and leverage factor price differences between countries. FDI can take the form of greenfield investment, mergers and acquisitions, and joint ventures, creating jobs and value-added output.
- Joint ventures in FDI are partnerships with local or foreign entities, often sharing risk and expertise. One partner contributes technical skills and funding, while the other brings local market knowledge and regulatory expertise (Moosa, 2002).

FDI in India

- FDI flows into India via diverse channels. The automatic route encourages easy investment in most sectors, spurring global investor interest. The government route oversees sensitive sectors in line with strategic interests. Mergers and acquisitions offer foreign investors a swift entry into the market by acquiring existing Indian companies, leveraging their resources and market presence.
- India has experienced substantial FDI growth since 2005, with 2020's inflow exceeding $60 billion, constituting over 2.4% of GDP. In 2022-23, India attracted $70.97 billion in FDI equity inflow. Top contributors in 2022-23 were Mauritius (26%), Singapore (23%), USA (9%), Netherlands (7%), & Japan (6%).

FDI: Change in Policy Paradigm

In recent years, the Government of India has implemented several changes to the FDI policy to promote investment, ease business operations, and enhance economic growth. Here are some significant changes --

Single-Brand Retail Trading (SBRT)

In January 2018, India permitted 100% FDI in single-brand retail trading, allowing foreign retailers full ownership of their Indian subsidiaries without government approval. Local sourcing norms eased for SBRT entities; in the initial five years, they can offset it against increased Indian sourcing.

Construction Sector

November 2019 saw the revised definition of "real estate business" encompassing townships, housing, infrastructure, and construction projects. Minimum capitalization norms for FDI in construction development were reduced from $10 million to $5 million within six months of project commencement.

Digital Media

In September 2019, the Government allowed 26% FDI under the Government approval route for digital media entities engaged in uploading/streaming news and current affairs content.

Contract Manufacturing Under SBRT

In August 2019, contract manufacturing was included in the definition of SBRT, allowing manufacturers to undertake contract manufacturing for entities engaged in SBRT.

Coal Mining and Contract Manufacturing

In Aug' 2019, 100% FDI under automatic route was allowed in coal mining and associated infrastructure activities

Civil Aviation

In March 2016, the Government allowed 100% FDI in scheduled airlines under the automatic route.

Defence Sector

In February 2021, the FDI limit in the defence sector through the automatic route was raised from 49% to 74%, and offset guidelines were relaxed to promote larger investments and ease of business.

Insurance Sector

In Feb' 2021, the FDI limit in the insurance sector was increased from 49% to 74% under the automatic route.

E-Commerce

In December 2018, the Government introduced new FDI norms for e-commerce companies, including restrictions on exclusive deals, control over inventory, and equity participation in vendors. Clarity on marketplace vs. inventory-based models: The Government clarified the distinction between marketplace and inventory-based models to ensure compliance with FDI regulations.

These changes reflect the Government's commitment to liberalising the FDI regime, attracting investment, promoting ease of doing business, and fostering economic growth in India.

The Impact of FDI on India's Manufacturing Sector and Make in India

- The Indian industry is vital, contributing 31% to GDP and employing 12.1 crore people, with manufacturing at 17.3%. Despite global disruptions, 'Make in India' attracted investment, fostered innovation, and improved infrastructure.
- The Make in India campaign promotes FDI, domestic manufacturing, job creation, and exports, reducing import reliance and enhancing competitiveness. FDI is vital for capital and tech. Manufacturing's GDP contribution grew from 13.47% to 13.9% (2019-2021). India's FDI surged, exceeding 60 billion USD in FY 2017-18 due to investor-friendly policies.
- The automobile sector saw remarkable growth, with 25.54% increase from 2017-18 to 2018-19, receiving 2.09 billion USD in FDI equity inflows in 2017-18.
- India is the world's second-largest textile and garment producer. Textiles attracted 1.52 billion USD FDI from 2017 to 2022, contributing over 4% to GDP and more than 14% to annual exports.
- These industries, under Make in India, have grown, boosting India's post-pandemic economic resilience, noted by the World Bank for India's large population and strong economy.

Conclusion

FDI is a crucial aspect of globalization, especially in emerging economies, bridging the gap between capital and technological support for industrial development and economic growth. 'Make in India,' initiated in 2014, has attracted FDI, boosted GDP, and created jobs, contributing to India's resilience post-pandemic.

FOOD PROCESSING: ADVANCING MAKE IN INDIA

FAO roughly estimates food waste at around 40% of the total annual production in India. The stated reasons are an inefficient supply chain and a fragmented food system. To strengthen the supply chain and rectify the food system, India needs mammoth investment and a number of policy interventions. Still, there are some anomalies that can't be cured to the fullest. The most prominent of them is price volatility, as agricultural products are invariably cyclical in nature. So, the foolproof solution to food wastage, along with taming price volatility and securing food security, is supplementing the supply chain strengthening with creating a **strong food processing industry** with deep penetration in the hinterlands.

Food processing is a process through which agricultural produce is turned into food, or one form of food is turned into another. This includes many forms of processing foods, from grinding grain to make raw flour to home cooking to complex industrial methods used to make convenience foods.

On the basis of complexity, food processing is categorised into three broad categories:

- ✓ **Primary food processing:** Food processing is the transformation of agricultural products into edible forms. It involves basic activities like drying, milling, shelling, and butchering, common in rural households.
- ✓ **Secondary food processing:** Everyday food processing involves using ready-to-use ingredients like baking bread. Traditional secondary processing includes fermenting fish, making wine, and brewing, suitable for small-scale industries.
- ✓ **Tertiary food processing:** Commercial processed food production includes ready-to-eat meals like TV dinners. It demands advanced technology, substantial investments, and robust supply chains.

Importance of Food Processing Industry

- The food processing sector plays a substantial role in India's economy, contributing 18.8% to GVA in agriculture, 12.32% of total employment, and 10.4% to exports.
    - Processed food exports grow faster (5-6% CAGR) than unprocessed (1-3% CAGR), highlighting India's emergence as a processed food production hub.
    - The Indian Food Processing market is estimated to grow at a 15.2% CAGR, reaching $535 billion by 2025, with Tier-II and Tier-III cities mirroring the trend seen in metropolitan areas, increasing processed food consumption.
- It attracted $11.79 billion FDI till Dec 2022, with $709.72 million equity inflow in Apr 2021-Mar 2022.
- The Indian food processing industry offers opportunities for domestic and foreign entities due to abundant raw materials, a large consumer base, and favourable government policies. The retail segment constitutes 70% of the Indian food and grocery market, the sixth-largest globally. It accounts for 32% of the country's total food market, ranking fifth in production, consumption, exports, and expected growth. The Indian gourmet food market is valued at US$1.3 billion and is growing at a 20% CAGR.
- India excels in dairy and vegetable production but lags in exports (ranking 46th and 15th, respectively). Cereals, fruits, and nuts production ranks second globally, yet exports rank 5th and 25th.

Schemes Promoting Food Processing

Agriculture is intrinsic to India's way of life, making primary food processing a natural progression, aligning with 'Make in India'. To advance secondary and tertiary processing require industrialization and investment, including domestic and FDI. Food processing has the potential to elevate 'Make in India,' recognized by the government through ambitious schemes.

Pradhan Mantri Kisan Sampada Yojana (PMKSY)

- The objective is to build a modern food processing infrastructure through PMKSY, encompassing efficient supply chain management from farm to retail. It includes 41 Mega Food Parks, 376 Cold Chain projects, 79 Agro-Processing Clusters, 489 CEFPPC proposals, 61 Backward and Forward Linkages Projects, 52 Operation Green projects, and 183 Food Testing laboratory projects nationwide.
- The Central Government initiated SAMPADA (later renamed PMKSY) with Rs 6,000 crore to boost food processing. Extended till March 2026 with Rs 4,600 crore, it aims to boost farmer income, create jobs, reduce waste, raise processing levels, and promote processed food exports.

The following schemes have to be implemented under the PM Kisan Sampada Yojana

- Mega Food Parks
- Integrated Cold Chain and Value Addition Infrastructure
- Creation or Expansion of Food Processing or Preservation Capacities (Unit Scheme)
- Infrastructure for Agro-processing Clusters
- Creation of Backward and Forward Linkages
- Food Safety and Quality Assurance Infrastructure
- Human Resources and Institutions

Pradhan Mantri Formalisation of the Micro Food Processing Enterprises Scheme (PMFME)

- The scheme, launched in June, 2020, under Aatma Nirbhar Bharat Abhiyaan, aims to enhance microenterprises in unorganized food processing sector and formalize it. Implemented in 35 states/UTs, it offers Rs. 40,000 in financial assistance and tools to each SHG member involved in food processing.
- The MoFPI initiated PMFME to establish or upgrade 2 lakh micro food processing enterprises with financial, technical, and business support, requiring Rs 10,000 crore investment from 2020-21 to 2024-25. Over 1 lakh SHG members have been identified, and a total of Rs. 203 crores has been granted.
- The ODOP initiative is concurrent in 713 districts across 35 states/UTs as part of PMFME, promoting 12 brands for various ODOPS under the branding and marketing vertical.
- The MOVCDNER in North East Region offers subsidies to farmers for organic inputs. 1150 agri startups received Rs. 70.30 crore under the Innovation and Agri Entrepreneurship Development program.

Production Linked Incentive Scheme for Food Processing Industry (PLISFPI)

- The PLISFPI scheme aims to boost domestic manufacturing, exports, and support food entities expanding processing capacity and branding abroad. With Rs. 10,900 crore allocation for 2021-22 to 2026-27, it fosters global food champions and Indian brand presence abroad.
- By 2026-27, it expects to increase processing capacity, resulting in a processed food output of Rs. 33,494 crore and creation of ~2.5 lakh jobs. Covered products include RTE (Ready to eat) and RTC (Ready to cook), marine products, fruits and vegetables, honey, desi ghee, mozzarella cheese, organic eggs, and poultry meat. The millet-based products were added in 2022-23 with Rs. 800 crore allocation.

LEVERAGING VOCAL FOR LOCAL

'Vocal for local' has been a focus of policy makers for economic growth and job creation in India. Initiatives like 'Make in India,' 'Start up India,' 'Skill India,' 'Ease of doing business,' and labour reforms aim to boost the domestic economy. States offer incentives to attract investments. Barriers include skill, technology, finance, infrastructure, marketing, and export constraints. The pandemic worsened rural livelihood challenges, with agrarian distress, reduced female participation, youth unemployment, and migrant crises. Families turned to local economies for resilience, especially women-led, SHG-based enterprises. 'Vocal for local' can drive self-reliance and revive rural economies.

The Rationale of Vocal for Local

- 'Vocal for Local' gained prominence after the Prime Minister's speech in May 2020, emphasizing self-sufficiency, local resources, and development planning. Stakeholders including governments, NGOs, and corporations have worked on policies to promote rural development, aligning with Gandhi's vision of self-sufficiency and inclusive growth.
- India is shifting focus from exports to domestic demand while maintaining a strategic balance between self-reliance and openness. The 'vocal for local' strategy aims to boost both supply and demand, with a focus on household income and consumption, given the pandemic's impact on consumption and employment.
- The 'Vocal for Local' strategy promotes local brands, manufacturing, and supply chains to enhance competitiveness. It supports small firms and aims to build an appetite for local products, benefiting small industries, artisans, SHGs, and more.
- The strategy aims to preserve indigenous crafts and uplift artisan communities. Artisans are critical in rural non-farm economies but often operate informally. Multiple central government ministries have schemes, including the Ministry of Textiles, which collaborates with India Post to establish an e-commerce platform for artisans through 4,00,000 Common Service Centres, enabling them to go online and compete.

Framework To leverage 'Vocal for Local'

The 'Vocal for Local' strategy could be an important ingredient of rural development policy to create healthy, environmentally resilient, and economically robust places. A comprehensive profiling or mapping of local resources and demand and supply at the village level should be the starting point of this strategy. The local economy needs to be strengthened by:

a) Efficient planning practices with strong coordination among various line departments working in rural areas,

b) Skill and economic development planning covering the issues and opportunities for strengthening the local economy,

c) Aligning local plan with national and sub-national development strategy;

d) Local institutions like panchayats collaborate with stakeholders to support businesses, addressing their needs, challenges, and enabling access to schemes.

- Local institutions can facilitate participation in business events, networking, and marketing support. They can design procurement policies promoting local products and consider a local vendor program for government contracts.
- The Gram Panchayat Development Plan (GPDP) can identify business potential and allocate resources to aid entrepreneurs and rural artisans affected by the pandemic. Gram Sabhas and panchayat secretariats can connect them with government schemes and IT-enabled support measures, making GPDP a valuable tool for rural development and economic policies. Panchayati raj institutions, with support from stakeholders like SRLMS, NGOs, CSR affiliates, can create an ecosystem to strengthen this strategy.
- A robust **convergence framework** is essential for 'Vocal for Local.' Coordinated efforts across ministries and programs like MUDRA, PMFME, SFURTI, ODOP, CDP, CFCs, OSFCs, PCs, and FPOs are needed to support local entrepreneurs. The **PM Vishwa Karma Kaushal Samman** offers a special package to integrate rural artisans with the MSME value chain, enhancing product quality, scale, and reach.
- **Hunar Haat**, a flagship initiative by the Minority Affairs Ministry, is driving the 'Vocal for Local' campaign. The Prime Minister's Maan Ki Baat episodes showcasing local entrepreneurs have also had a significant impact.
- To support local entrepreneurs, a robust **mentoring and handholding network** is essential, addressing business, technical, and psychosocial needs. Services include digitization, compliance, access to government benefits, and partnerships with digital platforms. Community Resource Persons (CRPs) such as Kisan Sakhi, Pasu Sakhi, Doctor Didi, and others play a crucial role in implementing rural development programs.
- The success of the CRP-led mentorship model depends on the **training methodology and curriculum** for CRPs. Continuous training and capacity development are needed to keep them updated on policies, programs, and new skills.
- Local entrepreneurs need aggressive sensitization about digital tools, IT-enabled portals, and e-commerce platforms. Adequate funding and capacity development for rural entrepreneurs in the digital ecosystem are crucial. Services can be provided in Common Service Centres, M Seva Centres, or Panchayat offices.

To achieve self-reliance, focusing on local business opportunities using local resources is vital. 'Vocal for Local' promotes local markets without stopping imports, contributing to self-sufficiency. It is a key part of 'Make in India,' encouraging investment, innovation, infrastructure development, and making India a manufacturing and design hub, emphasizing the importance of 'ease of doing business' for entrepreneurship.

To conclude, the 'Vocal for Local' initiative has the potential to promote self-reliance, boost economic growth, create job opportunities, reduce dependence on imports, and provide a much-needed boost to small, micro, and SHG-based enterprises in the country. However, to leverage this strategy, we have to focus on:

a) A robust mix of quality, innovation, and pricing;

b) Preserve and promote local skills and products;

c) Generation of employment through localised manufacturing;

d) Establish reliable and independent sources of local raw materials;

e) Think local be global; and

f) Usage of resources in a rational and integrated way.

BOOSTING INNOVATION: TRANSFORMING MANUFACTURING

The 'Make in India' initiative aims to transform India into a prominent manufacturing hub, promoting domestic manufacturing, attracting foreign investments, encouraging innovation, and easing the process of doing business. This has boosted confidence among businesses, both domestic and foreign, to set up manufacturing facilities in the country.

Make in India: Innovators Dream Come True!

- Make in India values innovation, supports entrepreneurs, and taps into India's vast consumer market. It offers financial incentives, tax benefits, and subsidies, making it appealing to innovators and manufacturers.
- Make in India promotes technology transfer and global collaboration, enhancing India's innovation and product recognition on the global stage.

Manufacturing

- India's manufacturing sector, contributing 17% to GDP and employing 27.3 million, is central to economic growth, with the government targeting 25% output share by 2025 through strategic policies.
- GST has unified India's market with a $2.5 trillion GDP and 1.32 billion people, drawing significant investor interest. Investment in the Indian manufacturing sector can drive laptop and tablet manufacturing capabilities to $100 billion by 2025. India's thriving tech industry with $227 billion in revenue and 108 unicorns underscores its commitment to entrepreneurship.
- India's startup ecosystem hit new milestones with 240 M&A deals worth $148 billion by September, cementing its position as a global tech and startup powerhouse.

India Assumes The Chair For Global Partnership On AI

- India's leadership in the Global Partnership on Artificial Intelligence (GPAI) and G20 showcases its growing influence in shaping global AI policies, promoting responsible AI development, and fostering international collaboration.
- The GPAI comprises 25 countries, including prominent nations such as, the US, the UK, the EU, Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, the Republic of Korea, and Singapore. India became a part of this esteemed group in 2020, joining as one of the founding members.
- GPAI is a pioneering initiative fostering responsible AI development through collaboration among industry, government, civil society, and academia.

Sectors Pushing Make in India Programme

Automotive Sector

- The automotive sector plays a crucial role in 'Make in India,' with global giants like Renault, Suzuki, Honda, and Volkswagen setting up manufacturing units, while Tesla is planning its entry.
- The Indian automotive sector is targeting a $300 billion industry in the next five years, creating 65 million jobs and promoting sustainability, aligning with India's commitment to a greener future.

Renewable Energy

- The remarkable growth of India's renewable energy industry, especially solar energy, reflects its commitment to reducing carbon emissions, combating climate change, and enhancing energy security.

- India's extensive geography and favourable climate make it a prime location for solar power generation, with substantial government support leading to significant growth in solar energy capacity, making it a global leader.

Electronics Hardware Manufacturing

- Electronics hardware manufacturing plays a pivotal role in 'Make in India' and 'Digital India,' driving economic growth, self-sufficiency, job creation, and foreign investments, propelling India's journey towards a knowledge economy.
- India's focus on Electronics System Design and Manufacturing positions it as a global electronics production hub, advancing its technological capabilities and digital empowerment goals, aiming for $400 billion turnover and 28 million jobs.

Food Processing

The food processing sector in India, bridging agriculture and industry, thrives under the Make in India initiative, with 135 cold chain projects and 7 Mega Food Parks supported by the Ministry of Food Processing.

AI & Robotics

- AI and Robotics, global sunrise sectors, are revolutionizing industries, with the Indian Government's steadfast commitment to their advancement evident in strategic initiatives.
- In March, India inaugurated its first AI and robotics park in Bengaluru with a Rs 230 crore investment, along with a $100 million venture fund by ARTPARK and AI Foundry.
- This initiative positions India at the forefront of the AI and robotics revolution, fostering innovation, economic progress, and global competitiveness.

Launch of ONDC

- The Open Network for Digital Commerce (ONDC) empowers Indian enterprises and entrepreneurs, ultimately contributing to overall economic advancement and enhancing self-reliance within the digital commerce sector.
- The amalgamation underscores India's dedication to self-sufficiency, innovation, and forward momentum in digital commerce, fortifying its position in the global arena.

Conclusion

In conclusion, initiatives like 'Make in India' underscore India's resolute dedication to nurturing economic progress, fostering innovation, and achieving self-reliance. These initiatives pave the way for India to emerge as a significant global player, spearheading innovation, job generation, and sustainable advancement.

RENEWABLE ENERGY : MAKING INDIA SELF-SUFFICIENT

In Aug' 2022, PM Modi said that India aims for Aatmanirbhar energy in the next 25 years. As the world's 5th largest economy, India seeks to reduce its 80% crude oil imports and cut 1 billion tons of CO_2 emissions by 2030, moving towards net-zero emissions by 2070. To achieve this, India is embracing new technology and striving to integrate 500 GW of non-fossil fuel-based capacity by 2030. India ranks 4th globally in Renewable Energy Installed Capacity, Wind Power, and Solar Power, as per REN21's 2022 report. With COP26's target of 500 GW non-fossil fuel energy by 2030, renewable energy plays a vital role in securing sustainable energy with lower emission. India's government support and favorable economic conditions make it a top player in the renewable energy market, attracting foreign investments and creating domestic jobs.

Why Renewable Energy

1**. Sustainable**: Energy generated from renewable sources is cleaner, greener, and more sustainable.

2**. Employment opportunities**: The Inclusion of newer technology simply means more employment opportunities for the working population of the country.

3.**Market assurance**: From an economic point of view, renewable sources provide the market and revenue assurance that no other resources can provide.

4.**Power supply**: Providing 24*7 power supply to 100% of the households and sustainable forms of transport, are some of the goals that can only be achieved through sustainable power that comes from renewables.

- The Central Government of India has initiated key programs to boost renewable energy adoption. The **National Solar Mission**, launched in 2010, targeted 100 GW by 2022 (later increased to 450 GW by 2030), while a 60 GW wind energy program was launched for 2022. These ambitious goals attracted significant foreign investment, totalling $251 million in Q3 FY 2023, primarily from Singapore, Mauritius, the Netherlands, and Japan. Decreasing solar and wind power costs, down 84% and 49% since 2010, respectively, have propelled India's renewable energy growth, making them cost-competitive with coal-based power.
- India's renewable energy success is bolstered by technological advancements. The country is a pioneer in floating solar technology, with the world's largest floating 500-kW solar power plant located in Kerala. The Pavagada Solar Park in Karnataka, the world's largest, boasts a 2 GW capacity, attracting major investments from Softbank, Canadian Solar, and Adani Green Energy.
- The **Production Linked Incentive Scheme (PLI)** bolsters manufacturing by offering financial incentives in the electronics value chain, including components and semiconductor packaging.
- The **Pradhan Mantri-Kisan Urja Suraksha evam Utthaan Mahabhiyan**, launched in 2019 and revised in 2020, targets 30,800 MW of solar energy capacity by 2023, ensuring financial and water security for farmers.
- Solarizing water pumps offers decentralized power. The Ministry of New and Renewable Energy hosts the Akshay Urja and IRIX portals, facilitating idea exchange on sustainable energy.

Other important steps taken by Government are as under:

- Permitting **FDI up to 100 per cent** under the automatic route.
- **Waiver of inter-state transmission charges** on transmission of electricity generated from solar and wind sources of energy, for projects commissioned up to 30 June 2025.
- Setting up of **Ultra Mega Renewable Energy Parks** to provide land and transmission to renewable energy developers on a plug and play basis.
- Laying of new transmission lines and creating new sub-station capacity under the **Green Energy Corridor Scheme** for evacuation of renewable power.
- **Standard Bidding Guidelines** for tariff based competitive bidding process for procurement of Power from Grid Connected Solar PV and Wind Projects.
- Announcement of **National Green Hydrogen Mission**.
- ESO targets as a % of total consumption of electricity has been laid down for the year up to 2029-30.
- 'Must-run' status to solar and wind power as per clause 5.2(u) of Central Electricity Regulatory Commission Regulations, 2010.

If we look at our government’s key focus for the next five years, India has the twin challenge of providing more as well as cleaner energy to the masses.

Under AtmaNirbhar Bharat, prioritize solar panel manufacturing to generate jobs and provide decentralized energy. Develop supply chains for components. Explore methanol and biomass alternatives. The government aims for 20% bio-CNG in petrol vehicles, reducing pollution and energy reliance through biomass energy conversion with high calorific value.

Hydrogen based FCV: Hydrogen in technology is likely to change the landscape of renewables. Shifting towards Hydrogen Based Fuel Cells Vehicles (FCV) is another area of focus.

Grid Integration: It is the practice of developing efficient ways to deliver variable RE to the grid. Identifying the demands that are in tune with the characteristics of the renewables, focussing on the characteristics of the renewables mainly solar and wind, and considering their variability as a strength rather than a weakness.

- According to the latest International Energy Agency (IEA) report, India's renewable energy capacity will hit 174 GW in 2023, making up 37% of total energy supply. India has already surpassed its 175 GW target by 2022 and is projected to reach 280 GW by 2025. A report by the International Renewable Energy Agency (IRENA) lauds India's remarkable progress in expanding renewable energy capacity.
- Despite progress, India faces challenges with DISCOMs struggling to integrate renewables due to grid limitations and insufficient storage, leading to energy wastage.
- Renewable energy challenges include grid integration and the cost factor. India needs extensive storage solutions to boost renewables adoption.
- **24*7 Power Supply**: A sustainable, round-the-clock power supply, along with the storage system, is a big challenge ahead. Agricultural Sector: Much power is consumed in the agricultural sector. The challenge is to provide sufficient power and energy to every household and to the agricultural sector as well.
- Realizing India's energy independence dream requires a holistic transformation across the energy value chain. Collaboration with private and government sectors, policy development, technology innovation (like green hydrogen), investor-friendly reforms, addressing land acquisition issues, boosting domestic manufacturing, incentivizing rooftop solar, and resolving DISCOMs' debt issues are essential steps outlined in the 'India's Energy Vision 2030' study published in 2022.
- DISCOMS face substantial debt and negative net worth issues. Reducing electricity theft and technical losses can be achieved through high-voltage DC lines, stricter penalties for developers, and faster interstate transmission development. Implementing smart grids enhances reliability, reduces losses, optimizes demand management, supports renewables, and improves grid efficiency.
- India's renewable energy achievements positively impact the environment by reducing coal-based power, cutting greenhouse gas emissions, enhancing air quality, and combating climate change. India's leadership garners international recognition, including the Innovator of the Year Award 2022 from IRENA, inspiring other nations. India shares its experience with developing countries through forums like the International Solar Alliance and the UN Climate Change Conference.
- To address challenges, the Government launched initiatives like the Green Energy Corridor project (2013) to enhance grid infrastructure for renewables and increase capacity. The National Energy Storage Mission targets 40 GW storage by 2025. Innovative technologies like demand response, adjusting power consumption based on grid needs, are also promoted to reduce renewable energy curtailment, and enhance grid efficiency.
- India, a global renewable energy leader, credits government policies, tech advancements, and foreign investments. With 174 GW capacity and surpassed targets, these steps can further expedite progress:
- **Identification of areas**: Renewable resources, especially wind, cannot be set up everywhere, they require specific location. Identification of these specific locations, integration of these with the main grid and distribution of powers; a combination of these three is what will take India forward.
- **Exploration**: More storage solutions need to be explored.
- **Agriculture Subsidy**: Agricultural subsidies should be rectified in order to ensure that only the required amount of energy is consumed.
- **Hydrogen fuel cell-based vehicles and Elect c vehicles**: These are the most suitable options when it comes to shifting towards renewable sources of energy, that's where we need to work upon.

Conclusion

For India to achieve energy security, we require an Energy Revolution akin to the Green Revolution, supported by commitment from all levels of government. It should be a nationwide movement with a positive impact on climate change and global economic growth. India's leadership is crucial for global climate goals. NITI Aayog's Energy Vision 2035 aims for clean energy. A diverse energy mix, including solar, wind, and hydrogen, is vital. Collaboration, infrastructure, and favourable regulations are key to attracting investments. Embracing renewables is essential, as Hermann Scheer stated: "Our dependence on fossil fuels amounts to global pyromania, and the only fire extinguisher we have at our disposal is renewable energy.".