BYJU'S The Learning App

Gist of KURUKSHETRA

May 2021

Promoting Innovation

Promoting a Culture of **Innovation and Entrepreneurship**

India: Growing Market of Innovations

Empowering the **Nation through Nari Shakti**

Innovating Healthy Lifestyle

Ensuring Employment Growth through **Innovations**

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Ajay Jain

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Gunjan Singh

RANK 19
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Abhishek Jain

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Rank 16
Dhodmise Trupti Ankush


Rank 21
Rahul Jain


Rank 24
Anuraj Jain

CSE 2017

5 Ranks in top 50 | **34 Ranks** in top 100 | **236 Ranks** in the final list


Rank 3
Sachin Gupta


Rank 6
Koya Sree Harsha


Rank 8
Anubhav Singh


Rank 9
Soumya Sharma


Rank 10
Abhishek Surana

CSE 2016

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Rank 5
Abhilash Mishra


Rank 12
Tejaswi Rana


Rank 30
Prabhash Kumar


Rank 32
Avdhesh Meena

CSE 2015

5 Ranks in top 50 | **14 Ranks** in top 100 | **162 Ranks** in the final list


Rank 20
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Rank 24
Khumanthem Diana Devi


Rank 25
Chandra Mohan Garg


Rank 27
Pulkit Garg


Rank 47
Anshul Agarwal

CSE 2014

6 Ranks in top 50 | **12 Ranks** in top 100 | **83 Ranks** in the final list


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Vandana Rao


Rank 5
Suharsha Bhagat


Rank 16
Ananya Das


Rank 23
Anil Dhameliya


Rank 28
Kushaal Yadav


Rank 39
Vivekanand T.S

CSE 2013

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Team BYJU'S

Gist of Kurukshetra May 2021 Issue: Promoting Innovation

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Chapter 1: Introduction

India being one of the fastest-growing economies of the world has emerged as an important destination for innovations in various fields.

India is ranked amongst the top 50 countries (48th) by World Intellectual Property Organization in the Global Innovation index 2020, an improvement from 81st rank in 2015.

Global Innovation Index:

- The Global Innovation Index (GII), every year, ranks the world economies based on their innovation capabilities.
- The study is based on the 80 different indicators, capturing the multi-dimensional aspects of innovation.
- GII report mentions that India has shown a consistent improvement in its innovation ranking in the last five years. In the report, India ranks high in knowledge and technology outputs (27th) and market sophistication (31st). However, India has been assigned a relatively lower rank in infrastructure (75th). India has been ranked 2nd for the fifth consecutive year with top positions in the quality of scientific publications (21st globally and the quality of its universities (22nd). Indian Institute of Technology (Bombay and Delhi) and the Indian Institute of Science Bengaluru have been recognised as top 3 universities.

Steps taken by the government to promote innovation:

- The Government of India has taken several measures across sectors to promote innovation.
- The decade (2010-20) was identified as the decade of innovation.
- The Department of Science and Technology, the Department of Biotechnology and the Department of Space are playing important roles in promoting the national innovation ecosystem.
- The government is focused on creating innovation and incubation labs.

The fast-growing $180 billion Information Technology Enabled Services (ITES) and biotech industry in the country over the past decade has shown the world India's scientific, engineering and technological advancement and capabilities. Atma Nirbhar Bharat has now turned the gaze of this world-class innovative talent inwards, to create products and services for the Indian market at par with other countries.

Way Forward:

- In the era of information and communication, technological advancement through innovation has resulted in the creation of millions of new jobs. To ensure employment through innovations, India needs to monetize innovative ideas by unshackling the entrepreneurial spirit.
- Innovation supports economic growth.
- India's demographic dividend with the majority of the population in the working-age group calls for innovation to provide sustainable employment for the youth.
- For addressing gender issues and empowering the women population, it is imperative to promote innovation at grassroots level.

Chapter 2: Promoting a Culture of Innovation and Entrepreneurship

India is considered one of the major scientific centres in the world. Radical technological advancements are transforming the world and giving rise to new technology and business innovations at an exponential rate.

- Indian civilisation has been one of the most active contributors to the global science and technology arena.
- Science and technology play a pivotal role in the development of a nation, be it economic, social, or overall development.
- India has one of the strongest networks of science and technology institutions and a sizeable pool of highly skilled manpower.
- India has been steadily rising in the Global Innovation Index (GII) rankings.
- Also, **India is the youngest country in 2020, with 64 percent of the population in the working-age group.** This provides a huge opportunity for the young, ambitious, and increasingly educated youth to become job creators rather than being job seekers.

Changing Trends and Challenges:

- **Rapid Evolving Ecosystem –** High growth and quick adaptability to customer's changing requirements commonly result in acquisitions and restructuring.
- **Focus on Futuristic Deep Techs –** To drive high value, their focus has been shifted towards next-gen technologies like genetic engineering, IoT, 5G, quantum computing, etc.
- **Digitisation and Democratisation of Information –** As more and more users have started using digital technologies, a huge volume of data are being generated. Now, organisations need to deal with increasing data, maintaining transparency and dissemination of information through their value chain network.
- **Requirement for Specialised Manpower –** The requirement of the workforce is shifting from having non-skilled labour to someone specialised in next-gen technologies.

How can innovation help?

- In recent decades, the focus has been on math, science, technology and innovation.
- The Internet of Things (IoT) links cutting edge sensor technologies to conventional industries from facilitating precision farming to water treatment and maintenance, climate change control, forecasting and disaster management, driverless cars and spacecraft.
- Big data and analysis, as well as artificial intelligence, enable electronic commerce and complex decisions thanks to advanced and user-friendly tools.
- All these technologies accessible today are affordable.

India as the Innovation Nation: Gathering Momentum

- The last few years have seen innovation in India reach a tipping point.

- The government of India is taking major steps to create and promote an ecosystem of innovation and entrepreneurship nationwide.
- One such significant intervention is the flagship initiative Atal Innovation Mission to help transform a nation of job seekers into a nation of researchers, innovators, and job creators.

Atal Innovation Mission

- The Atal Innovation Mission has adopted a holistic framework that can create immediate impact and others that are necessary for the long term.
- The government of India has set up the Atal Innovation Mission (AIM) to promote a culture of innovation and entrepreneurship in the country.
- AIM's objective is to develop new programmes and policies for fostering innovation in different sectors of the economy, provide platform and collaboration opportunities for different stakeholders and create an umbrella structure to oversee the innovation ecosystem of the country.

Brief on activities being carried out under Atal Innovation Mission:

1) Atal Tinkering Labs (ATL) – At School Level:

- AIM has launched the establishment of thousands of Atal Tinkering Labs (ATL) enabling students from grade 6 to grade 12 to have access to and tinker with innovative tools and technologies, thus stimulating a problem-solving innovative mindset.
- AIM has launched a first of its kind Artificial Intelligence Do-it-Yourself learning module in partnership with NASSCOM and several key industry partners of NASSCOM.

Some activities related to ATL Operational Excellence, Proactive Promotion of Innovation and Thought Leadership, Collaborations & Partnerships and New Initiatives by AIM are:

- ATL Tinkering challenges at school level, regional level and national level.
- ATL Student Innovator Program, student internship and ATL Student Entrepreneur Programme.
- National ATL Tinkering Marathons
- Global Student Innovation exchange programmes

2) Atal Incubators – at Universities, Institutions, Industry level:

AIM has been establishing world-class incubators called Atal Incubation Centres (AICs) in universities.

3) Atal Community Innovation Centres – Serving Unserved and Under-served Regions/Communities of India:

- To promote the benefits of technology-led innovation to the unserved/underserved regions of India including Tier 2, Tier 3 cities, aspirational districts, tribal, hilly and coastal areas, AIM is setting up Atal Community Innovation Centres with a unique partnership-driven model.

4) Atal New India Challenges (ANIC) – Stimulating Product and Service Innovations with National Impact

- To create product and service innovations having a national socio-economic impact, AIM has launched over 24 Atal New India Challenges in partnership with five different ministries and departments of the central government.
- AIM has also helped launch 15+ Defence challenges along with Defence IDEX (Innovations for Defence Excellence) program where AIM is the key strategy and operational partner to Defence.

5) Applied Research and Innovation for Small Enterprises (ARISE) to stimulate MSME industry innovation

- To promote innovation in a phased manner in the MSME/Startup sector, AIM has launched 15 ARISE (Applied Research and Innovation for Small Enterprises) Challenges along with five partnering Ministries including the Ministry of Defence, Ministry of Housing and Urban Affairs, Ministry of Food Processing Industries and Ministry of Health.

Chapter 3: India: Growing Market of Innovations

India today is home to around 17 percent of the world population, only next to China, with a growing economy and huge entrepreneurial potential waiting to be tapped. In the last few years, more than 37 unicorns have come from India, which as a number is not only promising but also encouraging. Entrepreneurship is adopting innovation as the economic model which is sustainable for the foreseeable future. Therefore, there is a huge market for innovations. The modern world today at its core has innovations.

- Being one of the fastest-growing economies and an emerging market in the world, India has become an important destination for investments. Therefore, there is an easy opportunity for all and any kind of innovations impacting the large chunk of the population, both for the quality of production as well as scaling-up.
- As such, it has become inevitable to offer cutting edge technologies at affordable prices, thus leading to economic competitiveness, which is one of the major strengths of India as a nation, today.

Frugal Innovations:

- Post the economic reforms of 1991, the growth of Indian origin companies going multinational increased manifold. One of the main pillars of this growth has been innovation.
- One specific phenomenon in the Indian innovation ecosystem has been that of "**Jugaad**", or "**frugal Innovation**".
- Frugal innovations or grassroots innovations are usually the products created by the levels based on the local knowledge, which are not formally connected to any institution. These innovations are mostly incremental change to the existing products available in the market.
- The frugal innovations in India have been an extremely important factor in promoting the culture of innovation in rural spaces and small markets.
    - A large number of these have been in the domain of agriculture, engineering, veterinary sciences and importantly in the social sectors as well.
    - However, most of them have not been able to scale up and do not match the aspirations of the mainstream Indian consumer.

Importance of Research and Development:

- Much heed needs to be paid to the research and development in the field of the social sector where there is a huge market for scaling innovations to break the glass ceilings.
- Since a large part of the Indian economy is in the informal sector, it is important that the innovative ability of these informal sectors is catered to.

Barriers to innovation:

- Financial barrier – the cost of developing innovative products often becomes an endpoint for the product to see the light of the day.
- Non-availability of institutional support to create prototypes of the products.
- Skill deficiencies because of the absence of in-house preparation.
- Excessive government regulation in the industry.
- Inability to move past the first advancement and add to a manageable model for consistent innovation.
- Failure to keep pace with technological advancement.
- Problems in measuring development intensity.
- Insufficient business pressure to advance.
- Existence of conventional hierarchical progressive systems.
- Lack of authoritative concentration on innovation as a system for development and intensity.
- Lack of compelling collaboration with research in colleges and Research and Development organisations.
- Lack of accentuation on modern innovation, critical thinking, configuration, experimentation, and so on in the education curricula.
- Inefficient learning administration frameworks inside of the organization.
- Weaknesses in IPR administration.
- Long-time taken for innovations to achieve market.
- Fear of losing a piece of the pie i.e. losing market.

National Innovation Foundation:

- Organisations such as **National Innovation Foundation** have done tremendous work in scouting ideas and providing a complete cycle of support.
- The organization was set up in March 2000, under the aegis of the Department of Science and Technology.
- The mandate of the organization has been to strengthen the grassroots technological innovations and traditional knowledge across the country.
- They have also created a database of over 3,22,000 technological ideas, innovations, and traditional knowledge practices from across the country.
- However, there still are places that the organization has not been able to reach out to, due to various organizational limitations.
- National Innovation Foundation has so far filed about 1182 patents.

- NIF succeeded in commercializing products across countries in six continents.

Steps taken by the Government to promote Innovation:

- To strengthen the role of industries in promoting the culture of innovation, two Centers for Invention, Innovation, Incubation & Training (CIIIT) in Jammu & Kashmir in collaboration with Tata Technologies have already been set up.
- Make in India was launched on August 15, 2014, to encourage companies to manufacture in India, which have boosted not only the manufacturing capacities of the country but also has had a huge impact on building the innovative culture.
- Ministry of Electronics and Information Technology (MeitY) has taken various initiatives to improve the innovation-led ecosystem with a scheme such as Technology Incubation and Development of Entrepreneurs.
- Centres of Excellence in IoT/FinTech space, as well as technology and theme-based incubation centres, have been set up.
- Programs have been launched to promote technology incubation and also to support start-ups and MSMEs.
- Tremendous work is being undertaken under the science and technology ministry, where the Department of Science and Technology has been particularly promoting innovations across the country. They have launched programmes such as NIDHI program (National Initiative for Developing and Harnessing Innovations) under which grant of around Rs. 10 lakhs for the innovators are provided for 'Proof of concept'.
- This, coupled with the approval of Foreign Direct Investments under the Automatic route including innovation/Research and Development, shall play an important role in strengthening the entire ecosystem.

The potential of innovation, in every sector, private and public is immense, however, for the government sector, it will provide an opportunity to deal with public welfare in much focused and result oriented experiences. The scaling up of these innovations would need a large population, who have the purchasing power. It is time that innovation is talked about and celebrated in the mainstream media, giving it much-deserved recognition for bringing economic and social change.

Chapter 4: Empowering the Nation through Nari Shakti

Indian women have played a very important role in India's independence movement and in ensuring fair and equal constitutional rights for all. Gender inequality in several areas remains a concern in India and across the world. Therefore, achieving gender parity is the fifth Sustainable Development Goal of the Agenda 2030. India aims to bridge these gender gaps through sound social protection schemes, financial inclusion, skill development schemes and the use of new technology.

Political Representation – the Progress so far:

- Father of the Nation Mahatma Gandhi, who was instrumental in empowering women during the freedom movement, endorsed equality for Indian women in his book, **the Constructive Programme**.

- This book laid out Gandhi's vision of a free India and equality of women was one of the main pillars.

- The first wave of the women's movement which started along with the freedom movement resulted in the universal adult franchise and equal rights for all in independent India.
- However, even though the Constitution gave women equal rights, social barriers like child marriage, dowry, widow remarriage, etc. remained.
- Moreover, the political participation of women in the early years after independence was limited.
- A landmark policy change in 1992, the 73rd Amendment to the Constitution of India reserved 33 percent of seats in Panchayati Raj Institutions for women to ensure their participation and representation in the political decision-making process at the grassroots.
    - Currently, 15 percent of states/UTs have 50 percent of more female elected PRI representatives with a national average of 44 percent representation (NITI Aayog, 2020).
- Over the years, female voter turnout and their presence in central and state-level governments have also improved.
- The gender gap in voter turnout specifically has been bridged successfully.
- India is also among the first few countries in the world to have had a female head of government.
- Political representation of Indian women has been identified as one of the targets towards achieving the fifth Sustainable Development Goal of Gender Equality. These numbers are low and have grown slowly over the years. Consequently, political representation is one area where there is scope for improvement at both the central and state levels.

Health:

- According to World Bank data, female life expectancy at birth has increased from 40.5 years in 1960 to 70.6 years in 2019.
- Similarly, the maternal mortality ratio steeply declined from 2000 in the 1940s to 145 in 2017.

Maternal Mortality Ratio is defined as the number of deaths from pregnancy-related causes per 100,000 live births.

- Reduction in the global maternal mortality ratio to 70 per 100,000 deaths is a target under the third Sustainable Development Goal.
- States like Kerala, Maharashtra, and Tamil Nadu have already achieved this target.

The Government of India launched several initiatives to address this specific area of concern.

- The Poshan Abhiyan was launched in 2018 to improve the nutritional outcomes of children, pregnant women and lactating mothers.
    - This scheme works around four pillars.
    - It relies on inter-sectoral convergence for better service delivery; uses technology for monitoring and tracking women and children; provides intensified health and nutrition services for the first 1000 days of a child's life that are critical for development; and aims to convert nutrition into a Jan Andolan.

- The scheme uses strategic partnerships for service delivery.

- Another scheme called the Janani Suraksha Yojana was launched to ensure safe, institutional delivery through cash benefits.
- LAQSHYA, Labour room Quality Improvement Initiative was launched to provide quality maternal care during and post-delivery.
    - At present, 54.7 percent of deliveries in India are institutional.
- In addition to improving the health care facilities for women, and especially pregnant women, the government also introduced cash incentive schemes like the Maternity Benefit Programme, Pradhan Mantri Matru Vandana Yojana.
    - It was launched in 2016 to provide partial compensation through cash incentives to new mothers to allow them enough recovery time and a financial cushion after the delivery of their firstborn.

While the government programmes have helped in improving outputs like the number of institutional deliveries, both antepartum and post-partum care of mothers remain a challenge that must be addressed.

Education

- The Right of Children to Free and Compulsory Education Act 2009 made free and compulsory education a right for all children below the age of 14.
- India's new education policy lays the roadmap to ensure the education system and the research environment in India is catered to equip students with necessary and relevant skills and knowledge.
- Research suggests that the gender divide in education in India is due to several reasons that include:
    - social and cultural practices where women are expected to play a secondary role in society
    - a mindset where marriage and childbirth are considered more important than academic excellence
    - financial decisions where household investments are directed towards the well-being and education of the male child because of a historically higher association with income generation.
- To address these issues, the National Programme for Nutritional Support for Primary Education was launched in 1995 as a centrally sponsored scheme that provided cooked, mid-day meals in government and government-aided schools.
    - Research suggests that this programme had a major impact on improving nutrition outcomes among primary school children and reducing the gender gap in school participation.
- Another significant initiative in recent years has been the Beti Bachao, Beti Padhao campaign of the Government of India.
    - This scheme not only targets the declining trend of child sex ratio; but also aims to eliminate post-birth discriminations by encouraging education and economic participation for the girl child.
- The Total Sanitation Scheme of the Government of India and the School Sanitation and Hygiene Education Programme were introduced to increase the number of gender-segregated toilets in government schools in the late 1990s.

- In 2018-19, the All-India Survey on Higher Education reported an all-India gender parity index value of 1.
    - This implies higher education parity between male and female in the age group between 18 and 23 years.
    - Women's enrolment in higher education was less than 10 percent at the time of independence.
- In the first few decades post-independence, women gained access to higher education through state-sponsored and highly subsidised academic institutions.
- The government also formulated policies to ensure equal access and opportunity for women to pursue education in public sector institutions.
- Post-1980, private institutions were also permitted to enter higher education.
- Gender equity in education is still a challenge when its contribution towards the economic empowerment of women and their subsequent participation in the formal labour force is questioned.

Making a girl's education affordable and accessible will yield higher economic outcomes only when issues around social preferences are also addressed actively.

Towards Empowering Indian Women and India:

- The government of India has introduced several policies, schemes, and initiatives to empower women economically.
- Suppression of Immoral Traffic in Women and Children Act, 1954; Special Marriage Act, 1954; Guardianship Act, 1956; Dowry Prohibition Act, 1961 and 1984; Medical Termination of Pregnancy Act, 1971; Maternity Benefit Act, 1961; Equal Remuneration Act, 1976 are some examples.
- It aims to increase the female labour force participation rate (FLPR) in India which peaked in 2005 at 32 percent and has been declining since then.
    - In 2019, only 21 percent of the female population above the age of 15 years was economically active.
    - The global average was around 47 percent.
    - In comparison, the male labour force participation rate in India was 2 percentage points higher than the global average of 74 percent and stood at 76 percent in 2019 as per ILO's modelled estimates.
- Access to financial services has been a major impediment to the economic empowerment of women.
- The government has also introduced credit schemes like the Stand-Up India scheme for loans between Rs. 10 lakh and Rs. 1 Crore that has lower margin money requirements for female borrowers.
- Similarly, the Pradhan Mantri Mudra Yojana (PMMY) also provides credit to non-corporate, non-farm, micro and small enterprises up to Rs. 10 lakhs.
    - The success of these two programs is reflected in the high share of female borrowers.
- Almost half of the candidates enrolled in the short-term skill development scheme, the Pradhan Mantri Kaushal Vikas Yojana (PMKVY), were women.

- NITI Aayog's Women Entrepreneurship Platform (WEP) connects aspiring and established female entrepreneurs in a digital ecosystem that supports them through skilling, marketing assistance, compliance support, and funding, among other services

Ensuring the safety and security of women:

- Security is a major issue associated with empowering women.
- The government has introduced One-Stop Centers (OSC) across the country to increase access to services like police, legal help, psychological support, and temporary support to women affected by violence.
- A 24 hours Women's Helpline has also been established to provide counselling and guidance on relevant government schemes and provision to women affected by violence.
- The Government of India is trying to improve the security of Indian women through the Pradhan Mantri Awaas Yojana.
- This scheme encourages women to invest in property under their name by providing concessional interest rates.
- Social protection through employment programs like Mahatma Gandhi National Rural Employment Generation Act (MNREGA) and the National Social Assistance programmes have helped Indian women significantly.
    - For instance, MNREGA which requires a minimum female participation rate of 33 percent, had 57 percent participation by women in 2019-20.
- The National Social Assistance programme provides pension to those over 60 years of age, widows, and disabled people, among others.

Chapter 5: Innovating Healthy Lifestyle

A healthy lifestyle should be an integral part of everyone's daily routine particularly in the wake of the current pandemic.

Trans-Fat:

- Fried foods are highly popular in India but the trans-fat (TFA) generated during frying poses numerous adverse health effects.
- With elevated temperatures and an increasing number of frying cycles/increased duration of frying – viscosity, colour and TFA content of the oil increase.
- Thus, food products fried in such oils will have much higher total fat and higher TFA content compared to the food items fried in early frying cycles.
- Hence, innovative approaches are needed to generate awareness among the masses regarding the trans-fat linked deleterious health effects along with innovative strategies for curbing TFA formation during frying procedures – both at the household and the commercial levels.
- COVID-19 pandemic has led to increased food losses/wastage the world over putting people's food and nutrition security at risk.

Traditional Remedies:

- Ayurveda – our ancient system of medicine, highlights the four pillars of life, namely – Aahar (diet), Vihar (lifestyle), Achhar (conduct with the external world) and Vichhar (mental health). According to Ayurveda, like medicine, food can recuperate an individual by establishing a connection between elements of life, food and the body.
- Novelty of Coronavirus disease with an absolute lack of curative measures or vaccination forced people to revisit the traditional remedies.
- Based on Ayurvedic principles, the Ministry of AYUSH released a set of immune-boosting guidelines and recommended several Ayurvedic kadhas (herbal tea/decoctions).
- Health Ministry released the Protocol for the Management of COVID-19, which includes dietary measures, yoga and Ayurvedic herbs/formulations.
- The Morarji Desai National Institute of Yoga (Ministry of AYUSH, GoI) is the nodal agency for developing and promoting yoga culture across the country.
- Since the last few years, although the emphasis is being given and we annually celebrate International Yoga Day (21st June), concerted efforts are needed to universalize the practice of yoga/meditation.

Government Initiatives:

- POSHAN Abhiyaan is the right step by our Government for improving the food and nutrition security of the masses.
- The Ministry of Food Processing Industries has been extending financial assistance for undertaking demand-driven Research and Development activities relating to product/process development, efficient technologies, improved packaging and value addition at the commercial level.
- The Agro-Processing Cluster Scheme encourages entrepreneurs to set up food processing units by linking producers/farmers groups to the food processors and extending marketing facilities through a well-equipped supply chain with modern infrastructure/technology.
- The United Nations Decade of Action on Nutrition and the 2030 Sustainable Development Goals (SDGs) are a once-in-lifetime opportunity to cost-effectively improve diets, eliminate malnutrition, reduce death and disability from Non-Communicable Diseases, and promote sustainable development.

Way Forward:

- The Food and Agriculture Organisation (FAO) has proposed several innovative technologies to improve food production, distribution and consumption; thus, transforming our food systems for betterment.
- The popularity of various Apps for preventing food loss or reducing food waste or promoting food donation has been on a rise.
    - ‘Feeding India App’ focuses on the donation of food for the needy.
- Appropriate actions are needed to improve the food environment which includes effective restrictions on the marketing of unhealthy foods/beverages.
- Dietary diversity is a qualitative measure of food consumption patterns reflecting a household’s access to a variety of foods.

    - High amounts of antioxidants, phytochemicals and dietary fibre impart numerous therapeutic benefits.
- Bio-fortification is a feasible and cost-effective approach to delivering micronutrients to populations having limited access to diversified diets and various micronutrient interventions/supplements or commercially fortified foods. Therefore, newer avenues of bio-fortification need to be identified and worked on.
- There is a need for innovating strategies to minimise the disruption of food supplies so that people, particularly the needy, have easy year-round access to healthy diets.
- To sum up, we need to innovate and promote nutritionally wholesome diets and healthy lifestyles both during – as well as in the post-COVID-19 pandemic period.
- Policy measures need to be put in place for improving food environments in the country, particularly in the context of a current pandemic.
- Healthcare systems need to be revamped and the health programmes reprioritised – both at the national and the sub-national levels.

Chapter 6: Ensuring Employment Growth through Innovations

It is the universal assumption that support for innovation for entrepreneurship development is a prerequisite for accelerating the economic development of any country. In the present age of Information and Communication Technology (ICT), technological advances have been constantly innovating the Indian job sector, giving rise to millions of new jobs.

Effects of emerging technology and innovation on employment:

- The new-age jobs are envisioned to spawn in emerging technology areas such as the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML), big data, blockchain, Augmented Reality (AR) and data science, among others.
- While these technologies add greater efficiency to enterprise operations by reducing human hours and increasing productivity levels, the new jobs also call for skilled professionals adept at handling digital tools, which most Indian enterprises apparently lack at present.
- The instances evidencing the impact of innovation on employment growth are numerous.
    - The country's first biotech startup Biocon was started in 1978 as a garage start-up, with just 3 employees in an era where innovation and entrepreneurship were unheard of.
    - Today, it is an innovation-led global biopharmaceuticals company that is catering to the unmet global need for affordable life-saving medicines.
- Robotic automation has emerged as their biggest worry as it significantly replaces low-skilled jobs.
- Automation is anticipated to execute over 40 percent of such jobs as per an International Labour Organisation (ILO) report.
- It is a matter of satisfaction that the government realised the importance of incentivising innovation and Intellectual Property (IP) creation for India's future growth prospects.

- The faith that enables entrepreneurs to propel ideas into sustainable businesses will add value to our economy in the long run and help the country achieve self-reliance – resulted in the launching of the 'Aatma Nirbhar Bharat' programme.

The initiatives taken by Government of India for promoting innovation so far:

- Make in India launched by the Central Government in 2014 to attract foreign investors and industrialists to manufacture here in India, represents a comprehensive and unprecedented overhaul of outdated processes and policies.
    - The scheme aimed at creating an ecosystem and environment for manufacturing with the protection of intellectual property, that encourages innovation and skill development, gives tax benefits, lowers excise duty, and gives access to the Indian market.
- The Ministry of Electronics and Information Technology (MeitY) has approved a Technology Incubation and Development of Entrepreneurs (TIDE 2.0) Scheme being implemented by its Innovation and IPR Division.
- To support tech start-ups, seven select thematic areas were identified to address societal challenges based on national priorities particularly in the realm of:

(i) Healthcare

(ii) Education

(iii) Agriculture

(iv) Financial inclusion including digital payments

(v) Infrastructure and transportation

(vi) Environment and clean tech

(vii) Clean Energy Solutions

- Multiplier Grants Scheme (MGS) was launched with a view to encouraging collaborative Research and Development between industry and academics/Research and Development institutions for the development of products and packages.
- The Department of Science and Technology launched the NIDHI programme in 2016 (National Initiative for Developing and Harnessing Innovations).
    - Under this, programmes for setting up incubators, seed fund, accelerators and 'Proof of concept' grant for innovators and entrepreneurs have been launched.
    - Under NIDHI, PRAYAS (Promoting and Accelerating Young and Aspiring innovators & Start-ups) programme has been initiated.
    - Under PRAYAS, established Technology Business Incubators (TBI) are supported with PRAYAS grant to support innovators and entrepreneurs who are supported with grants for 'Proof of Concept' and developing prototypes.
- Atal Innovation Mission (AIM), the Atal Incubation Centres (AICs) scheme supports the setting up of greenfield incubation centres that nurture innovative start-up businesses in their pursuit to become scalable and sustainable enterprises.

Way Forward:

- A national innovation ecosystem that puts in place a financing cycle-academia generating ideas (especially those based on science and technology) which are incubated to proof of concept through government-sponsored seed & incubation funding and then taken to market through business interventions backed by venture funding, is needed.
- By encouraging technopreneurs to grow from small and medium enterprises to large industrial-scale operations, India will be able to create a compelling opportunity to take innovative ideas to global markets.
- Active collaboration between the government, the private sector and civil society to understand the likely impact of innovations and technological changes and to respond with corresponding adjustments to the business, policy and educational landscape will be crucial.

Chapter 7: Taking Allied Sector to Newer Heights

Agriculture plays a vital role in India's economy. According to the Economic Survey 2019-20, the share of agriculture and allied sectors in Gross Value Added (GVA) of the country at current prices is 17.8 percent for the year 2019-20. The same survey has noted that India's agricultural sector has shown its resilience amid the adversities of COVID-19 induced lockdowns.

- India, through the decades, has witnessed many milestones in agricultural development.
- This has been in the form of the Green Revolution way back in 1968, followed by Blue Revolution, White Revolution, Yellow Revolution, Bio-Technology Revolution and the ICT Revolution (Information and Communication Technology).
- The allied sector has a very important role in doubling farmers' income – a major promise of the government.
- The Government has advocated a seven-point strategy for it that includes:
    - special focus on irrigation with sufficient budget, with the aim of "Per Drop, More Crop"
    - provision of quality seeds and nutrients based on soil health of each field
    - large investments in Warehousing and Cold Chains to prevent post-harvest crop losses
    - promotion of value addition through food processing
    - creation of a National Farm Market, removing distortions and e-platform across 585 Stations
    - introduction of a New Crop Insurance Scheme to mitigate risks at affordable cost
    - promotion of ancillary activities like poultry, beekeeping and fisheries.
- Accordingly, it has launched various schemes and missions.

Horticulture

- The cultivation of gardens or orchards leading to the cultivation of fruits, vegetables, flowers and ornamental plants is known as horticulture.
- Indian Horticulture sector contributes 33 percent share of the total value of output in the agriculture sector.

- India has emerged as a world leader in the production of a variety of fruits like mango and banana and is the second-largest producer of fruits and vegetables.
- Besides, India has maintained its dominance in the production of spices, coconut and cashew.
- Kiwi, gherkins, kinnows, date palm and oil palm have been successfully introduced for commercial cultivation in the country.

Food Processing Sector

- This sector is involved in enhancing the shelf life of food along with making it more digestible and nutritious.
- The Indian food processing industry accounts for 32 percent of the country's total food market.

Animal Husbandry

- This sector, dealing with animal production, is largely a part of the mixed crop-livestock farming system.
- The animal husbandry sector provides large self-employment opportunities.
- Animal husbandry deals with the agricultural practice of breeding and raising livestock.

Fishing Sector

- India contributes 7.73 percent of global fish production.
- India today has attained the status of the 2nd largest aquaculture and 4th largest fish exporting nation in the world.

Sericulture

- Sericulture refers to the mass-scale rearing of silk worms in order to obtain silk for weaving into clothes.
- Silk is part of only 0.2 percent of total textile production in the world and India ranks 2nd in major raw silk production in the world.

Schemes and Programmes launched by the Government:

Pradhan Mantri Matsya Sampada Yojana (PMMSY):

- Pradhan Mantri Matsya Sampada Yojana (PMMSY) was launched to boost production and exports in the fisheries sector as part of the government's aim to double farmers' income.
- The PMMSY aims at enhancing fish production by an additional 70 lakh tonne by 2024-25, increasing fisheries export earnings to 1 lakh crore rupees by 2024-25.
- PMMSY is designed to address critical gaps in fish production and productivity, quality, technology, post-harvest infrastructure and management, modernization and strengthening of the value chain, traceability, establishing a robust fisheries management framework and fishers' welfare.
- The scheme aims to consolidate the achievements of the Blue Revolution Scheme.

Silk Samagra:

- The Government of India through the Central Silk Board has been implementing a Central Sector Scheme “Silk Samagra”.
- It is an Integrated Scheme for Development of Silk Industry (ISDSI) with aims and objective to scale up production by improving the quality and productivity and to empower downtrodden, poor and backward families through various activities of sericulture in the country.

North East Region Textile Promotion Scheme (NERTPS):

- Under NERTPS, 38 Sericulture projects are being implemented in all North Eastern States.

Rashtriya Gokul Mission:

- Rashtriya Gokul Mission has been initiated by the Government of India in December 2014 with the aim of the development and conservation of indigenous bovine breeds, genetic up-gradation of bovine population and enhancing milk production and productivity of bovines thereby making milk production more remunerative to the farmers.
- The objectives of the Scheme are:

1. to undertake breed improvement programme for indigenous cattle breeds so as to improve the genetic makeup and increase the stock;
2. to enhance milk production and productivity of indigenous bovines;
3. to upgrade nondescript cattle using elite indigenous breeds like Gir, Sahiwal, Rathi, Deoni, Tharparkar, Red Sindhi;
4. to distribute disease free high genetic merit bulls of indigenous breeds for natural service.

- As digital support to the mission, the government has also launched an app named e-Gopala.
    - The e-Gopala app is an online digital medium that helps the farmers to choose better quality livestock and get freedom from middlemen.
    - This app gives all the information related to cattle care, from productivity to its health and diet.

Pradhan Mantri Kisan SAMPADA Yojana:

- The main objective of this scheme is the creation of processing and preservation capacities and modernisation/expansion of existing food processing units with a view to increasing the level of processing, value addition leading to reduction of wastage.
- Schemes to be implemented under PMKSY are:
    - Mega Food Parks
    - Integrated Cold Chain and Value Addition Infrastructure
    - Creation/Expansion of Food Procession/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

Mission for Integrated Development of Horticulture (MIDH)

- MIDH is a Centrally Sponsored Scheme for the holistic growth of the horticulture sector.
- Under it, the Government of India contributes 60 percent of the total outlay for developmental programmes in all the states except states in North East and Himalayas, and its 40 percent share is contributed by State Governments.
- In the case of North-Eastern State and the Himalayan States, GOI contributes 90 percent.
- In the case of the National Horticulture Board (NHB), Coconut Development Board (CDB), Central Institute for Horticulture (CIH), Nagaland and the National Level Agencies (NLA), GOI contributes 100 percent.
- MIDH also provides technical advice and administrative support to State Governments/State Horticulture Missions (SHMs) for the saffron mission and other horticulture-related activities under Rashtriya Krishi Vikas Yojana (RKVY).

Read more on the MIDH in the linked article.

Chapter 8: Innovation: Key towards Making Youth and Women Empowered

Innovation holds key to economic empowerment. In economics, the concept of innovation was initially addressed by Adam Smith, the father of modern economics, in his acclaimed book 'The Wealth of Nations'. He conceptualised output as a function of labour and capital. However, the economic growth or the growth in economic output could not be fully attributed to the proportional rise in labour and capital.

- In 1957, Professor Solow introduced a new concept of technological change. He opined that technological change is the key factor that enhances the productivity of labour and capital which in turn leads to higher economic output or growth.
- Later, Professor Romer in his model brought in concepts such as Research and Development (R&D) and human capital as the main factors of technological change.
- So, economic growth was no longer a product of only labour and capital, but much more than that.

Both Research and Development and human capital are identified as key enablers for innovation and economic growth. Innovation is catalysed through an innovative ecosystem which provides the environment for innovation and technology advancement.

Technological Innovation: A crucial force that Drives Economic Growth

- It is a proven fact that technological innovation is a key factor that drives economic growth.
- Technological innovation i.e. innovation driven by modern and new technologies aims at improving productivity and improved delivery of goods and services to the common people.
- However, technological innovation is often accompanied by long gestation period. The benefits of such innovation are seen after a certain period of time.
- Another important aspect of such innovation is its inclusivity i.e. the benefit is being enjoyed by the entire population.
- Reduction of time and cost are other crucial advantages of technological innovation. Cost and time reduction results in improved business efficiency.

Innovation and Youth:

- India has one of the youngest population in the world. Since 2018, India's working age population has grown relative to its dependent population. This demographic dividend is expected to continue till 2055-56.
- Historically, it is seen that demographic dividend contributed up to 15 percent of the overall growth in major economies. However, there are challenges as well.
- The most important challenge is to provide gainful employment to the vast young population. For this, it is imperative to explore and open up other avenues for employment. This is only possible with innovation.
- For this, the skill sets of youth needs to be enhanced and improved before they start searching for jobs, as such a step would improve their employment opportunities.
- An important aspect for entrepreneurship is access to finance.
- Innovation in the form of financial technology has been instrumental in providing easy access to finance for budding entrepreneurs.

Innovation and Women Empowerment

- As per a United Nations analysis, the economic impact of achieving gender equality in India is substantial and is estimated to be USD 700 billion of incremental GDP by the year 2025.
- The IMF in its study has estimated that equal participation of women in the labour force will increase India's GDP by 27 percent.
- Women spend 90 percent of their income on their families, and economically empowered women boost demand and have healthier and better-educated children, and raise human development levels.
- The role of innovation in challenging male centric social norms and eventually transforming them is catalytic as women's empowerment requires substantial change in inequitable gender attitudes, harmful or malpractices, which more often involves child marriage, female genital cutting, and deprivation of education in female members of the family.
- Also, innovations address women's mobility and their rights to health, work, civic participation and financial prowess in a positive way. Innovations advance women's economic resilience and support women in overcoming livelihood barriers and produce a more equitable flow of financial and non-financial opportunities.
- These innovations include products and services such as micro finance, including credit, savings and insurance; legal and social strategies to increase women's access to productive assets; and viable employment opportunities.

Global Gender Gap Index 2021:

In the recent report on Global Gender Gap Index 2021, India has secured an overall rank of 140 out of 156 countries.

- In economic participation and opportunity parameter India's rank is even worse and it stands at 151.

- In the health and survival parameter, India stands at 155.
- Even in South Asia, countries like Bangladesh, Nepal, Bhutan and Sri Lanka have fared much better than India in this particular index.
- In 2006, India's overall rank in the same index was 98 and in 2020, India's rank was 112.

Conclusion:

- India is an emerging global super power. The country regularly clocks one of the highest growth rates among major economies of the world.
- The main aim of the policies that have been undertaken is to offer the citizens of the country especially the youth and women a vibrant innovation ecosystem where they can thrive.
- The efforts undertaken by the country to provide an innovation driven economy will go a long way in cementing India's position from a regional power to an emerging world leader.
- As such, there has been a substantial thrust toward science, technology, and innovation in recent past, and many initiatives have been undertaken in that direction. However, there is still a long way to go, as the investments in science, technology, and innovation are yet to achieve the desired outcomes.

Chapter 9: Rural India's Innovation Pipeline

In January 2020, for the first time in the 107-year history of the Indian Science Congress, a Farmers' Science Congress was organised to celebrate and promote innovations emerging from Indian farms and village life.

- To fast-track the process of innovation in rural India, the Indian Council of Agricultural Research (ICAR) is setting up a Farmers Innovation Fund and Innovation Centres across villages to tap into the innovations emerging from India's village economy.
    - Such breakthrough work also includes research in nano-pesticides and non-fertilisers to support organic farming.
    - ICAR is also supporting more than one hundred start-ups in processing and marketing rural produce and has brought in the energies of more than five hundred young men and women to work on such projects.
- According to latest data from Start-up India, the start-up initiative of the Indian government, there are more than five thousand six hundred agricultural start-ups in the country.

India Agricultural Platform (IAP):

- As the use of new technologies like artificial intelligence flows in, new ideas of combining a host of existing technologies to create a unified India Agricultural Platform (IAP) is emerging.
- As an example of what can be achieved using an IAP, India AI describes a farmer logging into the IAP platform (securely using retina scan), and the platform, using the digital Aadhaar identification system, geolocation and other such data matrices is able to evaluate the credit potential of the farmer, connect the farmer to state and private credit agencies, and facilitate the loan – the entire process completed digitally without the agriculturist having to travel to various offices to pitch their case.

- An IAP brings together all the benefits of artificial intelligence and data analytics to help tactical and strategic decision making, leveraging multi-layer, multi-source information, aggregated from the farms to state/national levels.
- It processes huge data flows, and using tools like video, voice, vernacular translation, facilitate farmer engagement.
- In essence, a platform like the IAP is likely to be the new frontier in fuelling rural innovation because it will transform the use of technology in agriculture like Aadhaar changed the identification process in the country, and UPI (United Payments Interface) transformed digital payments.
- An IAP is likely to assist in everything from real-time purchase and sale of raw materials, produce and equipment, provide real-time relevant information such as weather patterns and track a timeline of the consumption and production history of the farmer, and make the cultivation process more data-driven and accurate.
- Such a system would help farmers scale in a far more systematic fashion than current processes.

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