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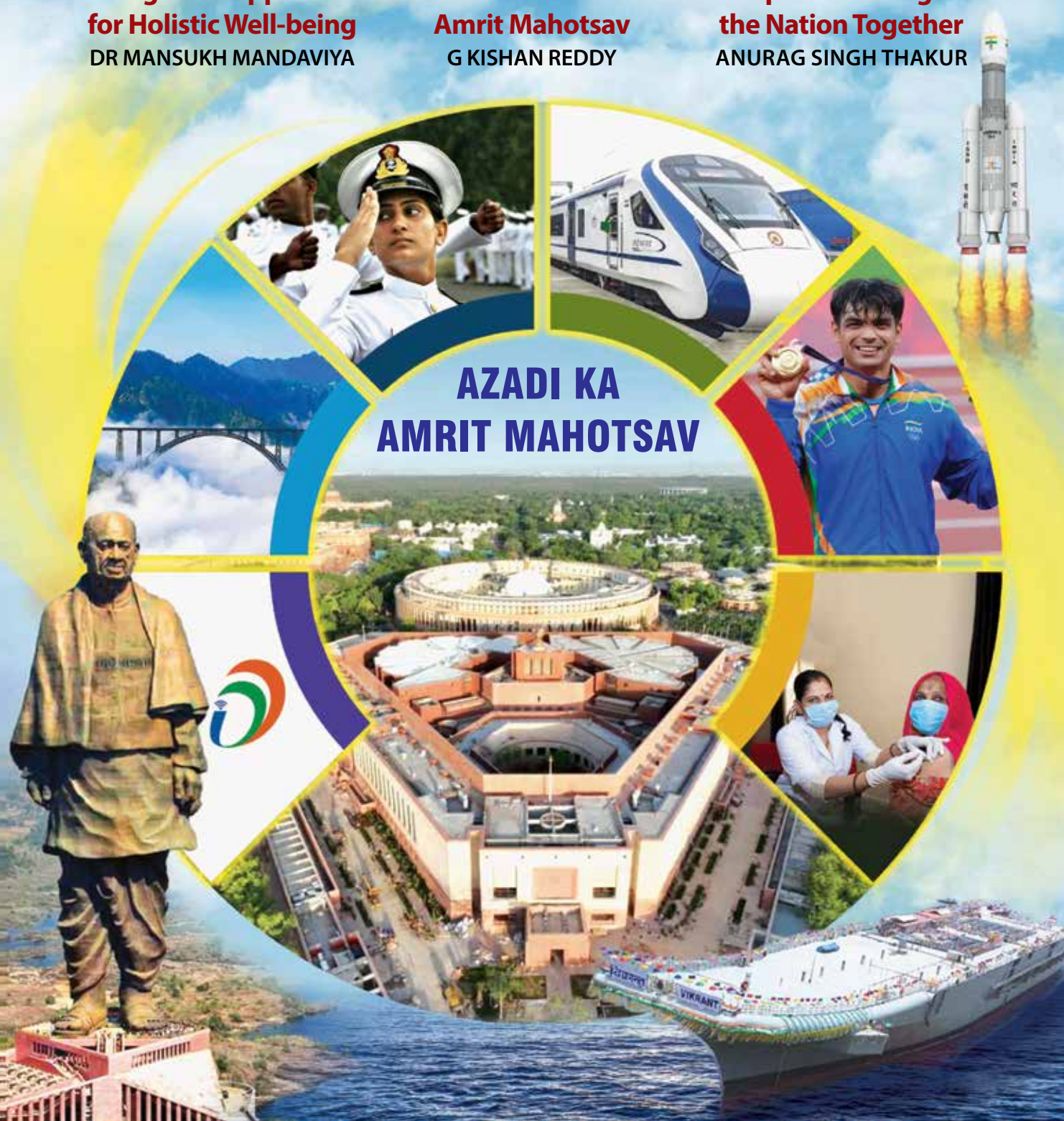
SPECIAL ISSUE

AUGUST 2023 | A DEVELOPMENT MONTHLY | ₹ 30

Integrated Approach for Holistic Well-being
DR MANSUKH MANDAVIYA

Azadi Ka Amrit Mahotsav
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SPECIAL ISSUE
AUGUST 2023
Volume-67
No. 08

YOJANA

Since 1957 A DEVELOPMENT MONTHLY

Let noble thoughts come to us from all sides.
Rig Veda

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YOJANA is published in Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu, and Urdu.





Highly Appreciated Content

'Cooperation to Prosperity' was my first pick of Yojana. The magazine is deserving of high praise. The magazine dealt with the theme remarkably. The collection of articles, along with regulars, provides comprehensive and in-depth knowledge. The edition was enough for a reader to develop an insight into the topic of Cooperative Societies. The philosophy of cooperation as a central tenet of Indian work culture dates back to ancient times. Crippled during colonial times, the philosophy has regained importance in post-independence years and received a fresh impetus with the set-up of the Ministry of Cooperation in 2021. Thus, the choice of theme for this edition was totally apt. The edition has now made me a regular reader of the magazine. I look forward to reading something insightful on an intriguing topic next month!

– Serena, New Delhi

An Issue on Mental Health

I am a regular reader of Yojana, and the June issue on yoga was very insightful and gave me a complete understanding of yoga and traditional medicine. I also got clarity about the value of Indian ayurvedic medicine and traditional medicine. I just want to request that you please bring up a separate issue for mental health. Thank you.

– Md Wahid Sarwar, Jharkhand

Synthesis of Old Wisdom with Modern Science

The spotlight is on AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) in the June 2023 issue of Yojana Magazine, highlighting its tremendous impact on holistic health and well-being. The focus of Ayurveda on preventive healthcare and lifestyle management has permeated society. A growing number of people are turning to Siddha, Unani, and homoeopathy for accessible healthcare solutions. The creation of hospitals, dispensaries, and wellness centres demonstrates the government's support for AYUSH by making it widely available. This acceptance of AYUSH as a beneficial healthcare method works in conjunction with western medicine. The June 2023 issue of Yojana Magazine emphasises the importance of AYUSH in achieving holistic health and well-being. AYUSH provides a comprehensive approach to well-being by combining ancient wisdom with modern technology.

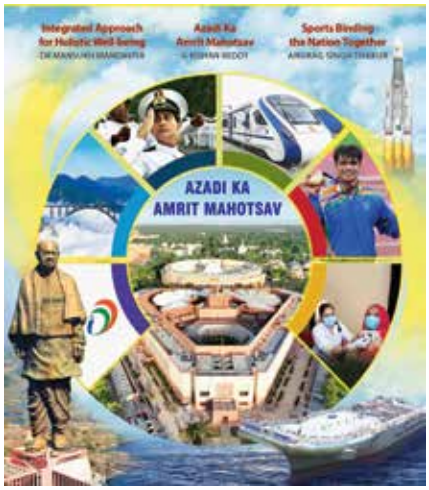
– Dr Jinu Bala, Rajasthan

Compelling Perspective

The piece 'The Role of Meditational Approaches in Mental Well-Being' offers a thorough analysis of these age-old techniques and emphasises their applicability in the present. The author powerfully highlights the transforming effects of yoga and mudra on fostering mental well-being. The article sheds insight on mudra, an ancient practice of hand movements that is frequently employed in connection with yoga and meditation. Mudras are thought to channel and direct energy within the body, aiding physical and mental healing. The writer emphasises the importance of mudras in boosting concentration, cognitive capacities, and emotional stability. The author acknowledges how these meditational techniques have a wider impact on society than just individuals. The article's conclusion emphasises how accessible these practises are to people of any age, gender, or physical ability. Anyone eager to begin this transforming path can reap the rewards of yoga and mudra through guided sessions, internet tools, or self-practice. Overall, the article in Yojana gives a compelling perspective on the relevance of meditational practices for mental well-being, with a specific emphasis on Indian traditional yoga and mudra.

– Awanish Kumar Gupta

Celebration of Life



India is a land of festivals. Throughout the year, its people engage in myriad festivities based on their faiths, various calendars, faces of the moon, for gods and goddesses, great saints, people and days, regional customs, and rather all aspects of life. These festivals reflect the diversity around and bring together people across the country. Celebrations and rituals in India start even before the birth of a child. Truly, India is a land where celebration is the way of life.

Giving this celebration and the festive spirit of India a nationalist cause and bringing together all Indians for a common festival, the grand celebration of Azadi ka Amrit Mahotsav (AKAM) commenced on 12 March 2021 with a 75-week countdown to the 75th anniversary of independence on 15 August 2023. Based on the five pillars focusing on freedom struggle, unique ideas, achievements, actions, and resolve, this Mahotsav celebrated the spirit of *Jan Bhagidari*. It showcased the country's achievements of last 75 years to the world and also give a framework for resolve for the next 25 years. Over a lakh events have been organised under AKAM, including several mega events, such as *Har Ghar Tiranga, Vande Bharatam Nritya Utsav*, and *Kalanjali*. Amrit Mahotsav aims to further boost peoples' movement through collaborative campaigns and outreach across India and the world. They were on the lines of nine themes aligned with the *Panch Pran:* Women and Children, Tribal Empowerment, Water, Cultural Pride, Lifestyle for Environment (LiFE), Health and Wellness, Inclusive Development, Atmanirbhar Bharat, and Unity.

During the period, a number of monuments and structures of national importance were dedicated to the nation including the *Pradhanmantri Sangrahalaya* that tells the story of India after Independence through the lives and contributions of its Prime Ministers, statue of Netaji Subhas Chandra Bose and *Kartavya Path* near India Gate, and the state-of-the-art new Parliament Building.

Each sector made a vital contribution to this celebration, making it truly a people's movement through participative governance. Take for instance, the *Mahila Samman Bachat Patra* launched to further empower women financially, or promoting healthier lifestyle choices for all through millets and yoga, or bringing together the stories of great freedom fighters, lullabies from across the country in different regional languages, Stories of Change, a digital district repository of their respective unique heritages, and many other initiatives. These were dedicated to the people of India who have not only been instrumental in bringing India thus far in its evolutionary journey but also hold within them the power and potential to enable the vision of the *Kartavya Kaal*, the era of action, fueled by the spirit of *Atmanirbhar Bharat*.

This issue of Yojana is a tribute to great works done in the past that have built the foundation of where we stand today. Various sectors and initiatives that have made monumental contributions to the growth story of India. It also delves into the road ahead for the recently announced Kartavya Kaal—the period of duty, determination, and firm resolve.

Let us strive to contribute to this cause in our own small ways of kindness, compassion, goodness, and dedication. Let this celebration continue to be a part of our lives. Let us resolve to make India a better place for the generations to come. ❑

AZADI KA AMRIT MAHOTSAV

'Azadi Ka Amrit Mahotsav' (AKAM) is a flagship initiative of the Government of India, which has been launched to commemorate 75 years of India's independence. AKAM is one of the largest celebratory initiatives anywhere in the world and has seen enthusiastic and a wide range of participation that has served as a unifying force to become a 'whole of society' initiative.

G KISHAN REDDY

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Since its launch in March 2021, more than 1.7 lakh events have been conducted jointly by the Central Government, States and UTs, departments, and private organisations under AKAM. These events have been conducted across urban and rural settings and in the faraway border villages of India. AKAM has become a people's movement wherein the nation has united to celebrate the wonder that is India!

FIVE PILLARS OF AKAM

The journey of AKAM began with five pillars– *Freedom Struggle, Ideas@75, Actions@75, Resolve@75,* and *Achievements@75*, under which the events were conducted. Each pillar encompassed the story of India and narrated the nation's evolution. Freedom Struggle commemorates milestones in our history and our unsung heroes, Ideas@75 celebrates ideas and ideals that shaped our nation, Actions@75 highlights the strides that have been







made towards actualising commitments for a new India, Resolve@75 reinforces our commitments towards achieving specific goals and targets, and Achievements@75 showcases India's progress and evolution in various sectors.

INITIATIVES AND CAMPAIGNS

Special initiatives taken under AKAM include – ***Mera Gaon Meri Dharohar,*** which entails the cultural mapping of 6.5 lakh villages in India, including the profiling of the geographic, demographic, and creative characteristics of each village. The **'Unsung Heroes'** initiative recalled and remembered lesser-known, unknown, and forgotten heroes of our freedom struggle, resulting in 8858 stories published on the AKAM website. The **'Digital District Repository (DDR)'** endeavoured to discover and document stories of people, events, and places linked to the freedom struggle of India at the micro level of the district, creating 11,935 stories being published on the AKAM website. All this culminated in the ***Har Ghar Tiranga*** initiative, perhaps the largest campaign under AKAM, which encouraged people to bring the Tiranga home and







hoist it to mark the 75th year of India's Independence. The campaign reached over 23 crore households, where people physically hoisted the National Flag in their homes, and over 6 crore people pinned the flag online.

OVERVIEW OF EVENTS ORGANISED UNDER AKAM

The events organised under AKAM witness jan bhagidaari at staggering levels. The **'Unity in Creativity'** initiative was launched to showcase the distinctive talent from the streets of India on a global platform, under which a total of 5,16,885 entries were received by the Ministry of Culture. The winners of the competitions were felicitated at the Grand Finale event. The **Kalanjali** events that are organised every weekend at Kartavya Path invite thousands of visitors to relish cultural programmes at the amphitheatres of India Gate. The events highlight the socio-cultural nuances of Indian heritage.

Vitasta highlighted the influence of Kashmiri culture on the nation. Three editions of Vitasta have been successfully conducted in Tamil Nadu, Maharashtra, and Jammu and Kashmir, which has drawn parallels between Kashmir and the respective locations.

The journey of AKAM began with five pillars– Freedom Struggle, Ideas@75, Actions@75, Resolve@75, and Achievements@75, under which the events were conducted. Each pillar encompassed the story of India and narrated the nation's evolution.

Another event under AKAM – **Dhara,** an Ode to the Indian Knowledge System, has underlined India's ancient scientific knowledge in the fields of medicine, mathematics, astronomy, chemistry, etc.

The other major events organised under AKAM include Janjatiya Khel Mahotsav, Madhavpur Ghed Festival, Swadeshi Scientists series, Frontiers of India, Amrit Samagam, Spiritual Leaders Conference, Rashtriya Sanskriti Mahotsav, Kalinga Utsav, Kashi Tamil Sangamam, and many more. Through these events, the feeling of *Ek Bharat Shreshtha*

Bharat has been mustered in the hearts of the people and they came together to celebrate this Mahotsav.

The various commemorations during our 75th year of independence reinforces our commitment to honouring those who laid the foundations for this great nation over the last millennia. ***Veer Bal Diwas*** was celebrated to honour the martyrdom of Baba Fateh Singh and Zorawar Singh, the sahibzade of Guru Gobind Singh Ji. The **125th birth anniversary of Netaji Subhas Chandra Bose** was celebrated through a series of events organised across India and culminated with the installation of a bronze statue at Kartavya Path. Similarly, the **150th birth anniversary of Sri Aurobindo Ghosh**, the **125th birth anniversary celebrations of Alluri Sitarama Raju,** the **350th birth anniversary of Raja Ram Mohun Roy** and the **200th birth anniversary of Maharishi Dayanand Saraswati** were celebrated vibrantly across the country. These events were attended by the Prime Minister, various other dignitaries, and general public.

CAMPAIGNS 2.0

In this second phase of AKAM, nine new themes have been identified which are inspired by the *Panch Pran* articulated by the Prime Minister during his Independence Day address



on completing our 75th Independence Day. These themes include Women and Children, Tribal Empowerment, Water, Lifestyle for Environment (LiFE), Health and Wellness, Inclusive Development, Atmanirbhar Bharat, Cultural Pride, and Unity. These campaigns are being organised with the support and involvement of all stakeholders, such as the Ministries, Departments, States, UTs, NGOs as well as private organisations, and will form the bedrock of future campaigns and will chart India's glorious journey in the Kartavya Kaal. ❑





INTEGRATED APPROACH FOR HOLISTIC WELL-BEING

DR MANSUKH MANDAVIYA

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Integrating traditional medicine and allopathy in India signifies a transformative step towards holistic well-being. This synergistic approach combines the respective strengths of both systems, providing patients with comprehensive care that addresses their physical, mental, and spiritual needs. The healthcare system in India is designed to maintain a continuum of care through the primary, secondary, and tertiary levels of care. There is a significant functional relationship between all three levels of care, and their interdependency is inevitable to ensure health for all.

India's healthcare landscape has witnessed a remarkable transformation since 2014, as the Government headed by Narendra Modi shifted its focus from healthcare as a luxury to assured universal healthcare for all. There has been a strong emphasis by the present Government to improve public health facilities through ongoing systemic reforms and provide free of cost quality services at people's doorsteps, following the philosophy of *Antyodaya*- leaving no one behind and providing services to the last person in the queue.

Over the last decade, the aim has been to strengthen the health sector holistically, following the 'token to total' approach. Befittingly, the Prime Minister has called for adopting a comprehensive approach in our healthcare system and focusing on both health and wellness. In his own words, "Our vision for wellness is as global as it is domestic. The world is looking at health and wellness seriously, especially after Covid-19. India has much to offer in this regard. Our yoga and Ayurveda can contribute to a healthy planet."

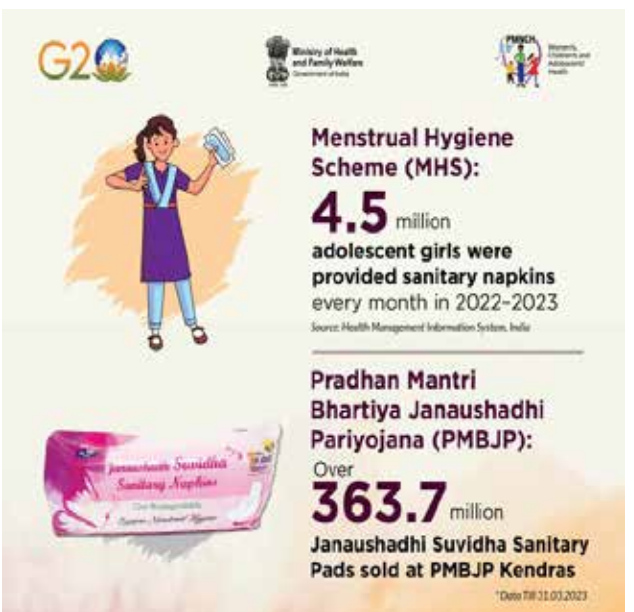
The health of a nation depends on the health of its people of all ages. Any effort towards nation-building sees much success when the population is healthy, which in turn contributes to healthy societies and national productivity. However, political, economic, demographic, and epidemiologic transitions in the nation have far-reaching impacts on the population's health. To continually keep pace with the changes, evidence-based health policies and strong health systems are crucial to ensuring the provision of efficient, equitable, accessible, affordable, and quality healthcare to our citizens. In this regard, the nation has been standing by its commitment to create a responsive health system that enables its citizens to live productive lives and build healthy societies.

The healthcare system in India is designed to maintain a continuum of care through the primary, secondary, and tertiary levels of care. There is a significant functional relationship between all three levels of care, and their interdependency is inevitable to ensure health for all. For instance, the National Rural Health Mission (NRHM), now known as the National Health Mission (NHM), was initially steered with a selective primary care approach focusing on Reproductive and Child Health and Communicable diseases, especially among vulnerable groups. Notwithstanding major gains, a shortcoming was that the selective package could no longer address the changing population needs and the growing burden of mortality and morbidity due to non-communicable diseases.

Ayushman Bharat

The Ayushman Bharat initiative, launched in 2018, comprising Health and Wellness Centres (AB-HWCs) and the Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), has been instrumental in addressing healthcare challenges and reducing healthcare costs. AB-HWCs deliver comprehensive primary healthcare services and wellness activities to the community, while PMJAY offers free hospitalisation and inpatient services to the poor and vulnerable. These initiatives have successfully brought quality healthcare closer to people, with an increased focus on women, children, and the elderly.

AB-HWCs were operationalised closer to the community to deliver Comprehensive Primary Health Care (CPHC) and promote wellness activities. The rollout was intended to be achieved in a time-bound manner by operationalising 1.5 lakh AB-HWCs by December 2022. True to its commitment, the nation has successfully brought 1,59,859 AB-HWCs closer to the community and provided free healthcare services with an increased focus on women, children, and the elderly. Since its launch, the AB-HWCs have had a cumulative footfall of 172.13 crore, screened over 35.67 crore for diabetes, 41.26 crore for hypertension, 24.46 crore for oral cancer, 11.32 crore for breast cancer, 7.74 crore for cervical cancer, and conducted over 2.08 crore yoga or wellness activities. AB-HWCs are now being recognised as the first port of call for healthcare and wellness in the community.





Under the Pradhan Mantri Jan Arogya Yojana (PMJAY), financial protection is provided to 40% of the eligible population across 33 States and Union Territories. Over 23 crore Ayushman cards were created, and it has empanelled over 28,368 hospitals to provide a higher level of care. The scheme has evolved substantially to now encompass services for 1,949 procedures, including diagnostics, organ and tissue transplant procedures, and palliative care. Since its launch, PMJAY has successfully authorised over 5 crore admissions, amounting to over Rs 61,807 crore; thus saving lives and easing the financial burden of the poor.

The healthcare system in India is designed to maintain a continuum of care through the primary, secondary, and tertiary levels of care. There is a significant functional relationship between all three levels of care, and their interdependency is inevitable to ensure health for all.

Digital Transformation

The Ayushman Bharat Digital Mission (ABDM) was launched to develop and support the integrated digital health infrastructure of the country. Significant investments of over Rs 200 crore were made in expanding the health infrastructure under ABDM. The Mission facilitates the nation's participation in the digital health ecosystem through the creation of Ayushman Bharat Health Accounts (ABHA). The ABHA ID intends to establish a unique identity across different healthcare providers, link all healthcare benefits ranging from public health programmes to insurance schemes to the ID, facilitate ease of registration in healthcare facilities across the country, and create longitudinal health records for health data sharing. Over 40.22 crore ABHA IDs have been created, and over 27.48 crore health records have been linked as of June 2023. Earlier, patients had to travel long distances to avail themselves of specialist care or go to private providers. Now, e-health initiatives like eSanjeevani services available at over 1.11 lakh AB-HWCs have reduced the gap in care access and brought specialist care closer to home. eSanjeevani has catered to 9 crore teleconsultations, where over 57% of beneficiaries were women and 12% were senior citizens.



Pandemic Response and Preparedness

India's response to the Covid-19 pandemic showcased its global leadership and resilience. The nation rapidly expanded its testing capacity to over 3388 labs, 821 government and 1,487 private RT-PCR labs, 1,115 cartridge labs, and 53 genome sequencing labs by 2022. The Atmanirbhar Bharat initiative facilitated competition in the diagnostic market and brought down the cost of diagnostic



commodities from Rs 1,727 in 2020 to Rs 72 in 2021. Health infrastructure like Covid centres, ICU beds, ventilators, oxygen concentrators, and PSA plants for oxygen generation were made available in an expedited manner.

Based on the learnings from the pandemic, the country opted for a 'whole of society' approach to develop a holistic health ecosystem across levels of care through the largest pan-India infrastructure scheme—the Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PMABHIM).



PMABHIM focuses on expediting the capacities of health institutions across all levels of care to strengthen infrastructure, surveillance, diagnosis, management, and research. So far, PMABHIM has provided support to 7808 building-less sub-health centres, established over 264 urban health and wellness centres (UHWCs), 485 block public health units (BPHUs), 216 integrated public health laboratories (IPHL), and 166 Critical Care Blocks (CCBs) hospital. Re-emphasising the role of decentralisation, an additional resource of Rs 70,051 crore was allocated to rural and urban local bodies through the XV-Finance Commission Health Sector Grant.

Tapping on the gains, redressing deficiencies, and instituting innovations and best practices for preparedness is the way forward in creating a resilient and self-sufficient India. Ayushman Bharat, as a game changer, comes across as a much-needed booster to reinforce the public health functions for optimal crisis management while safeguarding the delivery of routine and essential health services across the levels, thus making our districts and states self-reliant, and our country totally self-dependent.

The Ayushman Bharat Digital Mission was launched to develop and support the integrated digital health infrastructure of the country. The Mission facilitates the nation's participation in the digital health ecosystem.

Human Resources for Health (HRH)

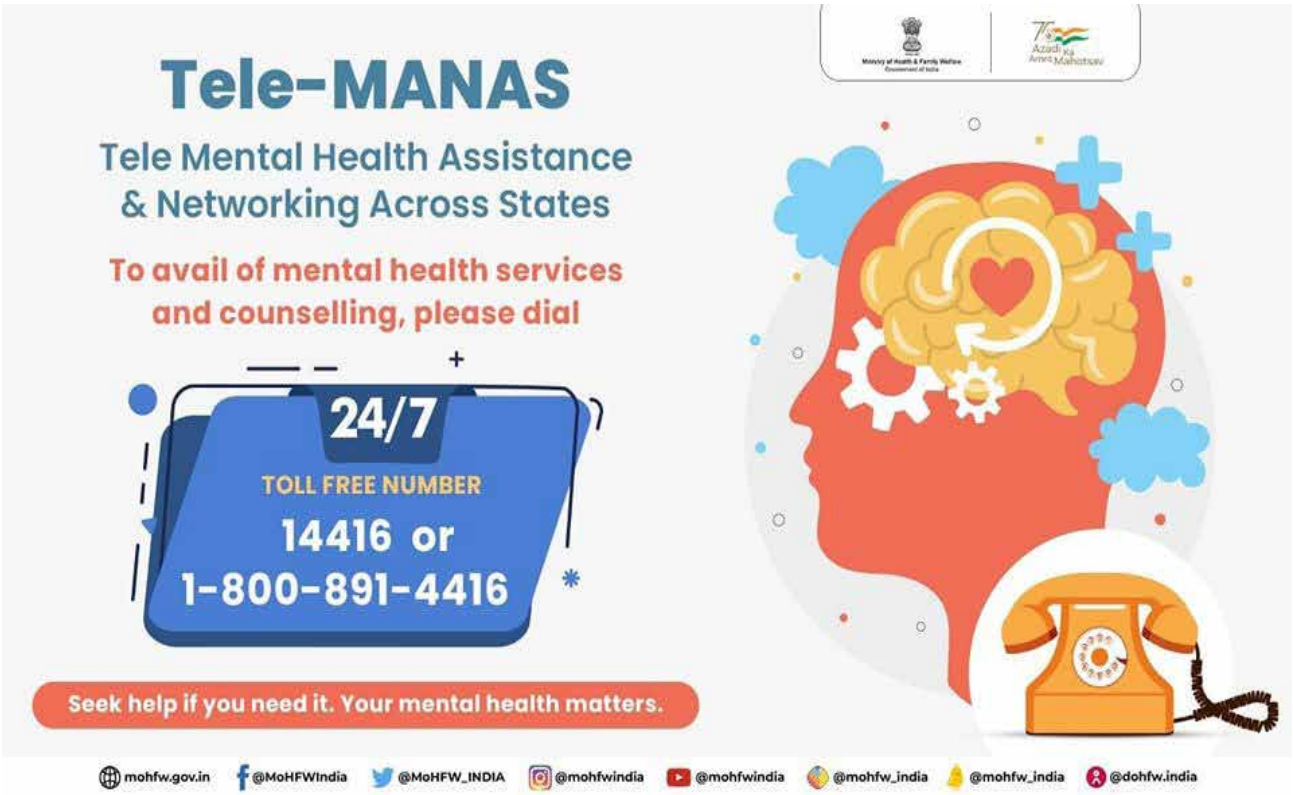
Recognising the importance of skilled healthcare professionals, the Government has made significant strides in increasing medical and nursing education capacities. The number of undergraduate and postgraduate medical education seats has grown substantially. Since 2014, key strategies undertaken by the Government of India have resulted in increased availability of skilled HRH in the public health system. The country currently has over 1.07 lakh undergraduate seats for medical education. There has been a 67% increase in medical colleges, a 93% increase in undergraduate seats, and a 105% increase in postgraduate seats. Distribution, availability, and accessibility of HRH, especially among doctors, continue to vary across the country, yet there is an increase in overall in-place

HRH. The Government has also recognised nursing institutions for various programmes, and now almost 1.25 lakh nursing graduates are entering the healthcare workforce annually. In a significant move towards strengthening nursing workforces in the country, the Cabinet Committee on Economic Affairs, chaired by the Prime Minister, has approved the establishment of 157 new nursing colleges in co-location with the existing medical colleges established since 2014. The step will add approximately 15,700 nursing graduates every year.

Immunization and Disease Control

The Government has always taken a keen interest in improving service delivery. For instance, the Universal Immunization Programme has converted immunization into a people's social movement. Through Mission Indradhanush, many additional vaccines were delivered through routine immunization services, improving the immunization coverage from 62% (2015-16) to 76.4% (2019-21). Additionally, consistent efforts to reduce the burden of communicable diseases have yielded 85.3% reduction in malarial cases between 2014 and 2021, and a decline in Japanese Encephalitis cases from 1661 in 2014 to 787 in 2021. The extensive resources and infrastructure for routine immunization made the largest Covid-19 vaccination drive in the country a phenomenal success across the globe, with over 100 crore doses administered in 9 months, and doubling it to over 200 crore doses in another 9 months. Additionally, over 291.5 million doses were supplied to over 100 countries and two United Nations entities under the Vaccine Maitri initiative. This made India shine as an emerging leader on a global platform.

Pradhan Mantri TB-Mukt Bharat Abhiyan reflects the citizen-centric policies of the Prime Minister, aiming to raise awareness about free-TB treatment available at Government health facilities. Despite the challenges posed by the Covid-19 pandemic, India remains committed to eliminating Tuberculosis by 2025. TB case notifications have surpassed pre-pandemic levels, showcasing the nation's resilience. In line with the spirit of *Jan Bhagidari* (people's participation), the Government has introduced Ni-kshay 2.0, a unique platform that enhances patient support and community engagement. These reforms also leverage Corporate Social Responsibility (CSR) opportunities and establish a pioneering global crowd funding model. Together, we are working towards a TB-free India



under the visionary leadership of the Prime Minister.

Mental Health and Well-being

The National Mental Health Survey of India highlighted a 70-92% treatment gap for various mental health disorders. The Covid-19 pandemic further emphasised the need for a digital mental health network. In response, the Government introduced Tele-MANAS, the digital arm of the District Mental Health Programme. With 42 established Tele-MANAS cells, the initiative has already received over 1.5 lakh calls. Providing anonymous support helps individuals seek assistance for their mental health concerns while reducing the associated stigma. Together, we are bridging the gap and fostering a healthier society.

The enhanced capacity of the healthcare system for both routine and emergency services is a clear outcome of the heightened prioritisation given to the healthcare sector. In the past decade, there has been a significant increase in per capita Government health expenditure, witnessing a growth of 74%. Additionally, Government-financed health insurance has experienced a substantial rise of 167%. Moreover, there has been a notable decline of 16 per cent points in out-of-pocket spending on health since FY 2013-14. These statistics demonstrate concerted efforts to strengthen the healthcare system and alleviate the financial burden on individuals seeking medical services.

Acknowledging the Benefits of Traditional Medicines

Traditional medicine systems offer a unique approach to healthcare, focusing on prevention, natural remedies, and mind-body-spirit balance. Recognising the effectiveness of traditional medicine in managing chronic conditions and promoting well-being, the Government has taken steps to integrate these practices into the mainstream healthcare system. This integration of knowledge and expertise has led to the development of standardised protocols, evidence-based guidelines, and safe and effective traditional medicine formulations.

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The Ministry of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) is vital in promoting traditional medicine in India. It collaborates with allopathic institutions, research organisations, and healthcare professionals to facilitate an integrated approach to healthcare delivery. Establishing AYUSH Wellness Centres across the country has made traditional medicine accessible to a wider population, complementing allopathic healthcare services.

Integrating traditional medicine and allopathy in India signifies a transformative step towards holistic well-being. This synergistic approach combines the respective strengths of both systems, providing patients with comprehensive care that addresses their physical, mental, and spiritual needs.

India's G20 Presidency is centered around a deep commitment to the people. The guiding principle of *Jan Bhagidari*, emphasising people's participation, has sparked tremendous enthusiasm across the nation. Diverse G20-related events, such as seminars, conferences, and festivals, have been thoughtfully designed to engage the people as stakeholders in India's Presidency actively.

The spirit of India's G20 Presidency is exemplified in the theme of 'One Earth, One Family, One Future,' encapsulated in the ancient Sanskrit ethos of 'वसुधैव कुटुंबकम्'. In line with this, there is a strong belief in fostering inclusivity and ensuring the involvement of all individuals in the journey towards growth and prosperity. Our unwavering commitment is to provide affordable, equitable, and safe quality healthcare for every citizen, guided by the mantra: "सर्वे भवन्तु सुखिनः, सर्वे सन्तु निरामयाः". ❑

National Integration to National Pride

SPORTS BINDING THE NATION TOGETHER

ANURAG SINGH THAKUR

The author is the Union Minister for Information & Broadcasting and Youth Affairs & Sports, Government of India. Email: minister.inb@gov.in

The role that sports have been playing in building a New India is as diverse as it is unique. The growing importance of sports in India in the past few years, is owing to the extraordinary vision of the Prime Minister who has given shape to various schemes including the 'Khelo India Scheme', ' Target Olympic Podium Scheme', 'Fit India Movement', and others that have transformed the role of sports in India, making it a catalyst of national integration, empowerment of women, health and fitness of citizens, nurturing life skills among the youth, and inculcating a deep sense of national pride.



India's performance in sports has witnessed a remarkable surge in the last few years. India had its best-ever Olympics in Tokyo 2020 - with 7 medals, including an Olympic Gold in athletics, which is a first in the history of India. We also had our best ever Paralympics and Deaflympics with 19 and 17 medals, respectively. This was followed by the Thomas Cup win for the first time in 72 years, and the current World Boxing Champion, Nikhat Zareen, is from India.

More recently, the young shuttler duo of Satwik and Chirag's win in the 1000 Indonesian Super Series as the first Indian men's doubles team, fencer Bhavani Devi's bronze as the first Indian in the Asian Championship - just two days within each other, and the Junior Asian Cup hockey golds both for boys and girls, a week before that - are just a sample of India's growing power in the world of sports. And every time an Indian athlete wins a medal, no matter where in the world it is, the sense of pride that engulfs every Indian is unparalleled. One medal and the National Anthem playing on a



sporting podium bind the entire country together in a manner that very few other things can.

However, the beauty of sports lies not just in the immediate results but in how it has the ability to shape the mindset of an entire generation and create an India where the youth set out with the goal of putting in their best and winning! Like our Prime Minister Narendra Modi says, "*Kheloge, Toh Khilogey*." Indeed, whether one wins or loses is not important, what is important is for the youth to play, because it is in sport that lessons of life are so intrinsically included that it helps create a future generation that can contribute to nation-building





with the focus, dedication, and a never-give-up attitude that sports teach us.

The role that sports have been playing in building a New India is as diverse as it is unique. The growing importance of sports in India in the past few years, is due to the extraordinary vision of the Prime Minister, whose personal interest in sports has not just motivated athletes to give their best performances but has also given shape to various schemes. These include the 'Khelo India Scheme', 'Target Olympic Podium Scheme', 'Fit India Movement', and others that have transformed the role of sports in India, making it a catalyst of national integration, empowerment of women, health and fitness of citizens, nurturing life skills among the youth, and inculcating a deep sense of national pride.

Regional Diversity Bridged by Sports

It was in 2016 that the Khelo India Scheme was envisaged by the Prime Minister, and subsequently revamped in 2017, to identify and nurture grassroots-level sporting talent from across the country. The scheme is the key to giving athletes from all across the country, a chance to showcase their sporting skills on a national platform and to be identified for further training. The scheme supports more than 2500 athletes with a scholarship of Rs 6.28 lakh each annually. The athletes are trained in state-of-the-art facilities, given boarding, lodging, equipment, and education from this scholarship, and are also given a monthly cash allowance of Rs 10,000. These athletes have one thing in common - they are the best sporting talent available at the grassroots level. But this is where the commonality ends. Khelo India athletes come from diverse geographic locations and different socio-economic backgrounds and train at the Khelo India Academies in various parts of the country. Not only do they train in sports, but they actually imbibe multiple cultures from each other, developing a deep respect and love for the diversity that is India. The same is true for the Khelo India Games, where athletes, coaches, and officials come from every state in India and stay, train, and compete together for more than 10 days. The concept of *Ek Bharat Shreshtha Bharat* is exemplified through these games. Commencing in 2018, a total of 8 editions of the Khelo India University Games and the Khelo India Youth Games have taken place, in which 59,833 participants have witnessed this exchange of culture through sports.

Sports Infrastructure Towards Nation Building

There has also been a consistent effort since 2014 to increase sports infrastructure across the country through the Khelo India Scheme to ensure that youngsters from across the country have access to playfields and training centres. The launch of 1000 Khelo India Centres (KICs) in every district in the country with employment generation for local coaches has been a significant landmark in the sports ecosystem in India. The Central Government's partnership with various states has resulted in 31 Khelo India Centres of Excellence that are primed to be state-of-the-art training centres for senior and elite athletes with a focus on specific sporting disciplines. Besides, 266 Khelo India accredited academies, 500 private academies, and 27 adopted schools where Khelo India athletes train have added to the strength of the sporting infrastructure. While athletes who have taken up sports as a career are being given ample facilities, to ensure the development of sporting culture in the country, close to 17,500 playfields have been geo-tagged so that parents can easily find a place for their children to play around their residential area.

Just one statistic makes the larger picture of the sports infrastructure building, leading to nation-building, clear. Between 2010 and 2014, only 38 sports infrastructure projects were completed, while between 2014 and 2023, a total of 293 projects have been sanctioned under the aegis of the Khelo India Scheme, of which 146 are already



complete. The building of this infrastructure has not only helped athletes and sports enthusiasts to pursue their dreams, but it has also added a significant amount to the country's GDP and generated employment for numerous people. The role of sports in *Atmanirbhar Bharat* has indeed been significant.



Inclusivity Propelled by Sports

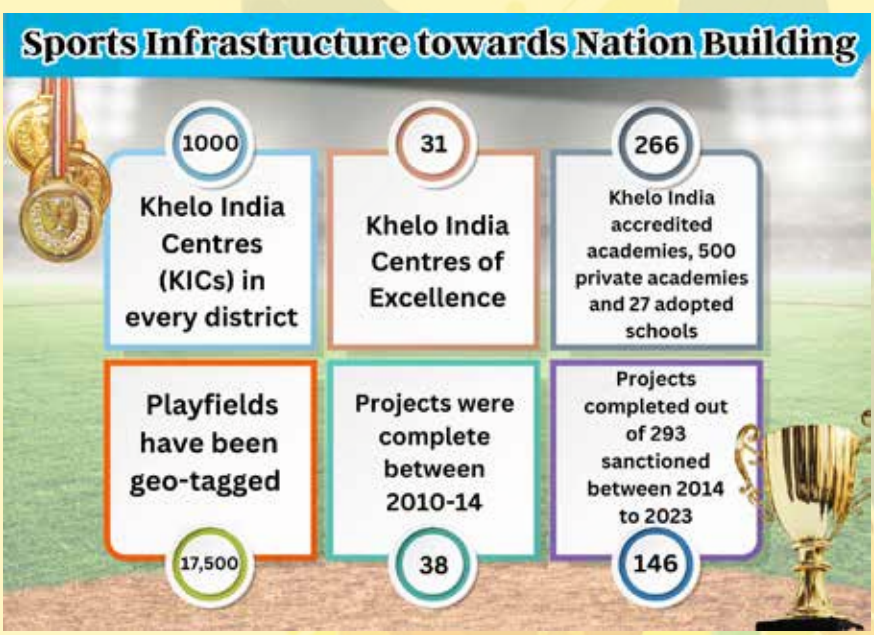
Just like bringing athletes from different regions together, sports have also served to empower women and youth from economically and geographically marginalised areas. Special provisions are made for women athletes, such as organising the Khelo India Women's Leagues to promote their participation in sports. More than 1.25 lakh women have participated in over 27 sporting disciplines in 50 countries across the city in the last year since the Khelo India Women's League was launched. In fact, stories abound in the sports ecosystem of incredible women athletes who have fought through economic and social hurdles to make their mark in the field of sports, and they agree that sports have changed their lives. The



story of Boxing World Champion, Nikhat Zareen is indeed intriguing. On several occasions, she has said that her father, who supported her career in the sport, had to fight back against resistance from various sections of his immediate society for allowing his daughter to take up boxing as a career. But Nikhat was relentless. Today, she says that after her success, several other young girls from her community have been motivated to take up sports to change their lives.

These are real stories from the heart of India that speak of the role that sports have played in creating a New India which is confident and not daunted by immediate hurdles. I take great pride in the fact that close to 50% of athletes in the Tokyo Olympics were women, and almost 50% of the medals were won by them - Mirabai Chanu, Lovlina Borgohain, and PV Sindhu.

Women in Sport is a growing community that will further change the way women are viewed by various sections of society. Along with women, constant efforts are on to ensure that sports can act as a catalyst to include youngsters from all parts of the country, with special emphasis on Jammu and Kashmir and the LWE-affected areas. Rs 50 crore has been sanctioned to develop infrastructure in J&K, while Rs 10 lakh per district is given to organise sports events and competitions for children in the LWE-affected areas. These initiatives have proven to be game changers for these regions. In J&K, for instance, children who were once misled into stone pelting are today ace footballers in their areas. Regions where people could not think of venturing out at night because of extremist activities have now become hubs of night football. That is the magic that sports can create, and is creating.



There is also a special space of inclusion being created for divyang athletes. In June 2023, a contingent of 198 divyang Indian athletes participated in the Special Olympics Summer Games 2023 in Berlin. The Government extended financial

support of Rs 7.7 crore towards the participation of the Indian contingent and also held a preparatory coaching camp at the Sports Authority of India's JLN Stadium, New Delhi to prepare for the world event. While the financial support from the Government is the highest amount ever sanctioned for this event, I am also confident that our special athletes will bring home the largest medal haul so far.

A Fit India Inspired by Sports

Sports is a career for athletes and a passion for sports enthusiasts, but sports and fitness need to be a way of life for every citizen because only fit citizens can contribute to the overall growth of a nation. It was with this thought that the PM envisioned the Fit India Movement in 2019 to make fitness a way of life for every citizen, not just for athletes or fitness experts. His clarion call of "*Fitness Ki Dose, Adha Ghanta Roz*", echoed across the country, with citizens participating in various fitness activities such as marathons, cyclothons, runs, and more, throughout the year, making it a People's Movement. Be it the Fit India Freedom Run in which 7.08 crore citizens have participated over two editions across the country, or the Fit India Quiz, the only quiz on fitness and sports for schoolchildren, where 1.74 lakh students have registered to participate in the quiz - the interest in fitness has grown among all age groups. The Fit India Quiz is unique because it creates awareness among students about the importance of fitness and sports in their lives and motivates them to spread the message among their peers, teachers and parents. To motivate students further, the Fit India School Week is held every year, in which more than 2.5 lakh students have participated so far in various fitness-related activities. Surely, from school students to youngsters to senior citizens, the participation of Indians of all age groups in the Fit India Movement has shown that citizens of a New India are committed to making India a FIT INDIA.



Economic Growth Fuelled by Sports

India is today the 5th largest economy in the world and is on an unprecedented growth path. In this economic growth story, the sports goods industry has had a significant role to play. According to an Invest India report published in February 2023, India is today the third largest sports goods manufacturer in Asia, in a highly competitive global market. Moreover, 60% of all sports goods manufactured by Indian companies are exported, and the industry generates employment for over 5 lakh people. The report also states that India's exports, which include exercise equipment, inflatable balls, bicycles, cricket gear, sportswear, etc., have catapulted India to becoming a powerful sports goods exporter. Exporting to 200 countries, including China, the USA, the UK, and Australia, India became the second-largest producer of bicycles globally in the financial year 2022, with exports amounting to over $461 million. Going forward, with steps like setting up of the Sports Good Exports Promotion Council, the value of the Indian sports manufacturing industry is only going to improve. The Indian sports-goods market is expected to grow to $6.6 billion by 2027 from $3.9 billion in 2020-21. That is the power of sport in nation building.

Indeed, in the last 9 years, sports in India have come a long way, where Indian athletes are not only dominating in various sporting disciplines in international competitions across the world, but India is also being seen as a power to reckon with in the sporting world. It is therefore not without reason that several elite international sports bodies have chosen India as the host country in recent years. The 44th FIDE Chess Olympiad, the U-17 FIFA Women's World Cup held in 2022, the AIBA World Boxing Championship, and the ISSF Shooting World Cup held in 2023 across various Indian cities are proof of the status that India enjoys today as an emerging sports superpower. ❑

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INDIAN ECONOMY HISTORICAL PERSPECTIVE AND THE WAY FORWARD

As nations progress and evolve, their economies play a crucial role in shaping their trajectory. The journey of the Indian economy, as it commemorates 75 years of independence, reflects the resilience, challenges, and opportunities that define India's youthful, dynamic, and progressive nature. Over time, the Indian economy has experienced various highs and lows, navigating through obstacles and capitalising on opportunities to establish itself as the world's fifth-largest economy.

V ANANTHA NAGESWARAN | The author is the Chief Economic Adviser, Government of India. Email: cea@nic.in

India's economic journey traces back to the early years, post-independence, when it adopted a mixed economy model, combining socialist policies with elements of a market economy. The focus was on nation-building, industrialisation, and achieving self-sufficiency through the establishment of public sector enterprises and import substitution. While these policies laid the foundation for industrial growth, they also led to unintended consequences such as bureaucratic inefficiencies, limited competition, and stifled innovation.

The 1990s (some think it started early in the Eighties) marked a significant turning point for India's economy. The country faced macroeconomic imbalances during the late 1980s and early 1990s, prompting the government to introduce structural reforms in 1991. High combined deficits of the central and state governments, elevated inflationary pressures, and an unsustainable current account deficit triggered a balance of payments crisis. In response, India embarked on a path of economic liberalisation and reforms.

The government implemented policies to dismantle the license raj, encourage foreign direct investment, and promote privatisation. The exchange rate was made flexible, allowing for depreciation as necessary to maintain competitiveness. The rupee became fully convertible on the current account and partially convertible on the capital account. This shift towards a market-oriented economy opened up avenues for growth, fostered entrepreneurship, and attracted global investments. The real growth rates increased from an average of 5.5 per cent in the 1980s to 6.3 per cent between FY1993 and FY2000. External trade experienced a significant boost, with the total goods and services trade-to-GDP ratio rising from 17.2 per cent in 1990 to 30.6 per cent in 2000.

The new millennium saw the continuation of these reforms, albeit with intermittent progress. Foreign direct investment was further liberalised in the early 2000s. The New Telecom Policy of 1999 catalysed the IT sector boom in India, generating widespread benefits for other sectors as well.



The country faced macroeconomic imbalances during the late 1980s and early 1990s, prompting the government to introduce structural reforms in 1991. High combined deficits of the central and state governments, elevated inflationary pressures, and an unsustainable current account deficit triggered a balance of payments crisis. In response, India embarked on a path of economic liberalisation and reforms.

The policy on disinvestment and privatisation gained momentum during this period, with the establishment of a dedicated Ministry to drive these initiatives. Structural policies were formulated to address macroeconomic imbalances. The Fiscal Responsibility and Budget Management (FRBM) Act was passed to address the government's historically high combined gross fiscal deficit. The banking system, burdened by bad debts accumulated during economic resurgence following the 1991 reforms, was supported through the deregulation of interest rates and the enactment of the SARFAESI Act 2002, and these years of structural reforms strengthened the macro-economic foundation of the Indian economy to enable a high growth period in the coming years. While global growth averaged 4.8 per cent in 2003-2008, the Indian economy achieved an average growth rate of over 8 per cent. Sustained momentum in domestic economic activity, improved corporate performance, a healthy investment climate, and favourable global liquidity conditions and interest rates resulted in substantial capital inflows to India from 2004 to 2008. Domestic credit growth, especially bank credit, doubled as a share of GDP. Chapter 2 of the government's Economic Survey for 2022-23 has more details on this.

This unsustainable credit boom in the millennium's first decade increased banks' non-performing assets. As companies' investments turned sour, their ability to repay bank loans declined. This triggered a prolonged period of repairing financial and non-financial sector balance sheets for which the government and the RBI implemented several policy initiatives to assist the financial sector in recovering from balance sheet stress. Amendments to the SARFAESI Act 2002, the implementation of the Insolvency and Bankruptcy Code (IBC), the introduction of the 'Asset Quality Review', the adoption of the prompt corrective action framework, recapitalisation of Public Sector Banks (PSBs), and the merger of PSBs were among the measures that helped resolve the issues in banks' and corporations' balance sheets.

New-age Reforms

The balance sheet repair in the millennium's second decade dampened India's growth potential and dynamism. Consequently, the government's economic policy focus since 2014 has been to restore India's growth potential by easing business conditions and significantly enhancing physical and digital infrastructure. These efforts aim to improve the overall business climate and strengthen the competitiveness of India's manufacturing sector. Diverse economic reforms have been implemented to facilitate ease of doing business and improve the quality of life while enhancing governance systems and processes.

Simplification of regulatory frameworks through reforms such as the Insolvency and Bankruptcy Code (IBC) and the Real Estate (Regulation and Development) Act (RERA) has enhanced the ease of doing business and thereby improved investor sentiment. The IBC has helped clean up companies'

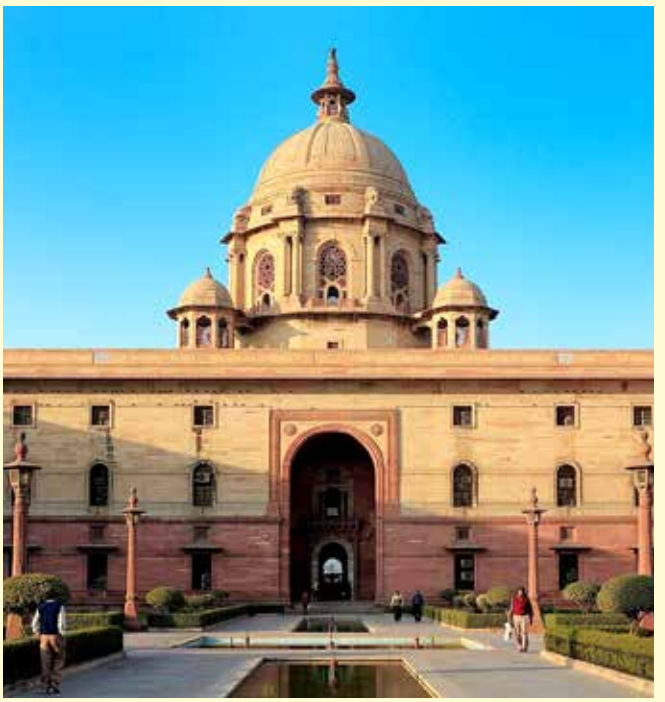
finances. Out-of-court settlements in cases of loan default are increasing to avoid the procedures of IBC. RERA has transformed the real estate sector by making it more organised, resulting in increased new launches and sales of houses.

Additionally, significant changes have been made to the taxation ecosystem in India since 2014. Tax policy reforms, including the adoption of a unified Goods and Services Tax (GST), reduction in corporate and income tax rates, exemption of sovereign wealth funds and pension funds from taxes, removal of the Dividend Distribution Tax, and the abolishment of the retrospective tax, have reduced the tax burden on individuals and businesses. The implementation of GST has broadened the tax base, reduced compliance requirements, facilitated the free flow of goods across state borders, and contributed to the formalisation of the economy. The GST system has exhibited improved buoyancy compared to the pre-GST regime, with average monthly gross collections consistently rising from INR 0.9 lakh crore in FY18 to INR 1.5 lakh crore in FY23 and INR 1.7 lakh crore in the first quarter of FY24. The number of GST taxpayers has also significantly increased, with a larger number of smaller businesses entering the GST regime.

Large-scale public spending has also been undertaken since 2014 to address the long-standing infrastructure gaps and logistics bottlenecks. The effective Capital Expenditure by the Union Government has risen from 2.8 per cent of GDP in 2013-14 to 3.8 per cent in 2022-23. This investment has aimed to improve connectivity and modernise infrastructure in areas such as road connectivity (Bharatmala), port infrastructure (Sagarmala), electrification, railways, and airports/air routes (UDAN). The National Logistics Policy 2022 supports these initiatives by establishing an overarching logistics ecosystem.

Recognising the need for consistent and long-term efforts to improve infrastructure in a country as vast as India, the government has established the National Infrastructure Pipeline (NIP). This forward-looking approach to infrastructure investments projects around INR 111 lakh crore of investments spread over five years until 2024-25. Currently, more than 9,000 NIP projects, with a total investment of over INR 108 lakh crore, are at various stages of implementation across different sectors.

In addition, there have been many reforms and governance initiatives over the past nine years to improve the investment climate. Programmes such as 'Atmanirbhar Bharat' and 'Make in India'



The government's economic policy focus since 2014 has been to restore India's growth potential by easing business conditions and significantly enhancing physical and digital infrastructure. These efforts aim to improve the overall business climate and strengthen the competitiveness of India's manufacturing sector. Diverse economic reforms have been implemented to facilitate ease of doing business and improve the quality of life while enhancing governance systems and processes.

have aimed to enhance India's manufacturing capabilities and promote exports across various industries. Production Linked Incentives (PLIs) have been introduced to attract domestic and foreign investments, fostering the development of global champions in the manufacturing sector. Strategic sectors, including defence, mining, and space, have been opened up to enhance business opportunities for the private sector. The government has further liberalised the Foreign Direct Investment (FDI) policy, with most sectors now open for 100% FDI under the automatic route. Moreover, the New Public Sector Enterprise Policy has been implemented to limit the government's presence in public sector enterprises to only a few strategic sectors.

Significant reforms have also been undertaken to reduce policy uncertainties. Decriminalising minor economic offences under the Companies Act of 2013 has greatly improved the ease of doing business. As a result of this reform, over 1,400 default cases have been resolved without resorting to court proceedings, and more than 400,000 companies have voluntarily rectified past defaults to avoid penalties. Additionally, around 25,000 unnecessary compliances have been eliminated, and over 1,400 archaic laws have been repealed in the past nine years.

The emphasis of the reforms for the private sector has been on more than just the large businesses. Sustained reforms have also supported smaller businesses in recovering from the impact of the pandemic and have facilitated their growth. Initiatives such as the Emergency Credit Line Guarantee Scheme (ECLGS), revision in the definition of MSMEs under the ambit of Atmanirbhar Bharat, the introduction of TReDS to address the delayed payments for MSMEs, the inclusion of Retail and Wholesale trades as MSMEs, and the extension of non-tax benefits for three years in case of an upward change in the status of MSME, have all contributed to the sector's resilience.

Integrating technology and digital platforms has been a common theme throughout these reforms. Studies have shown that India's core digital economy has grown 2.4 times higher than the overall economic growth between 2014 and 2019. This digitalisation has had significant positive effects on the economy, strengthening its potential for growth through various channels such as higher financial inclusion, greater formalisation and increased efficiencies.

Digital infrastructure has facilitated the creation of digital identities, improved access to finance and markets, reduced transaction costs, and enhanced tax collection. Recent digital initiatives, such as the Open Network for Digital Commerce (ONDC) and the Account Aggregator framework, hold the potential to enhance economic growth further. The ONDC will provide greater market access for e-commerce businesses, opening up new opportunities for growth and expansion. The Account Aggregator framework will also enable more accessible credit for smaller businesses, promoting development and overall economic growth.

Way Forward

The new age reforms undertaken in the Indian economy form the foundation of its resilient growth during *Kartavya Kaal*. The sound and healthy financial sector developed over the previous few years will ensure efficient credit provisioning, contributing to robust economic growth in the coming years through higher investments and consumption. A restored credit cycle and enhanced public sector capex will rejuvenate the Indian private sector capex cycle. The digitalisation reforms and the resulting efficiency gains in terms of greater formalisation, higher financial inclusion, and more economic opportunities will be essential drivers of India's economic growth in the medium term. A sustained pace in the expansion of digital infrastructure, significant upscaling of R&D in both the public and the private sector, and higher availability of skilled workforce will be required to ensure an overarching ecosystem for the rapid growth of high-end manufacturing and high value-added services in the medium term.

Contextually relevant and appropriate economic reforms, considering India's demographic profile and understanding of strategic challenges – political and economic – that technological developments such as advances in Artificial Intelligence and energy transition motivated by climate change considerations pose for the country, will pave the way for bright and steady growth prospects for the country, leading up to 2047. Through this approach, India can chart its path towards sustainable and inclusive economic development in the future. ❑

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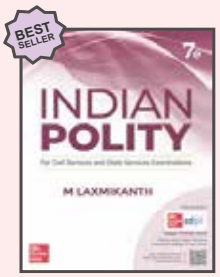
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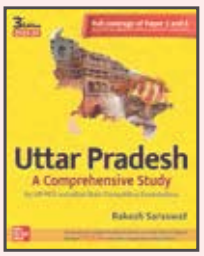
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VISION FOR INDUSTRY

Over the last decade, India has made significant progress in strengthening the competitiveness of its domestic manufacturing, especially under the Atmanirbhar Bharat and Make in India initiatives. Manufacturing has the highest potential of all sectors to propel job growth, with the potential to create 60-70 million jobs by 2030. The future of manufacturing is sustainability. Through a number of initiatives, the Indian Government is enticing businesses to adopt sustainable manufacturing, including 'Zero Defect-Zero Effect', 'Digital India', and many others. Over the past seven years, India has made substantial improvements in its policy and regulatory environment, making it much easier for enterprises to establish themselves and flourish.

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The road to 75 years has not been easy, yet India has come a long way — from a country that saw its wealth drained by its colonial masters to a major player in the global economy. As India enters the *Kartavya Kaal*, it is time for the country to realise its potential and emerge as a world leader in this post-Covid New-World Order. More importantly, it is imperative to foster sustainable and inclusive economic growth while protecting people and the planet.

According to a FICCI-McKinsey report, by 2047, a growing India is expected to become a high-income nation with six times its current per capita income and to create 60 crore jobs to gainfully employ its growing workforce. Achieving



this potential will make India an approximately Rs 1500 lakh crore ($19 trillion) economy in real terms by 2047, with the economy growing at a real GDP growth rate of 7.7%.

Industry will be the key lever to propel the economy towards this goal. Recent policy reforms have created a favourable environment in which Industry can grow. These include the introduction of the goods and services tax, the launch of the National Single-Window System, and a steadily expanding production-linked incentive scheme, which is expected to drive growth in strategic sectors, such as electronics and capital goods, chemicals, textiles, auto and auto components (including electric vehicles), solar modules, batteries, and pharmaceutical and medical devices. The Centre's other key initiatives, like the PM-Gati Shakti and National Logistics Policy, have also provided a facilitating environment for India's manufacturing ecosystem to boom.

Overall, manufacturing has the highest potential of all sectors to propel job growth, with the potential to create 60 million to 70 million jobs by 2030. India could also aspire to boost its real GDP growth rate for manufacturing to 9–10% (from 7–8% in 2022). At the same time, India could aim to boost overall manufacturing productivity fivefold by 2030 (by tripling labour productivity and doubling capital productivity), achieve 70–80% digital adoption by MSMEs, and increase the number of World Economic Forum lighthouses tenfold to drive IoT and automation adoption and boost productivity. These goals cannot become a reality unless even the smallest manufacturing MSME becomes a part of the entire chain.

Focusing on the following areas will be essential for India to realise its full potential in manufacturing:

New-age Factory of the World: India's chance to shine amid shifts in global supply chains

With the Covid-19 pandemic highlighting the challenges of concentrated supply chains, companies worldwide are looking for alternatives to their primary suppliers that will ensure greater resilience. India could capitalise on this emerging opportunity and capture an increased share of key global supply chains valued at between $800 billion and $1.2 trillion by 2030.

India is well positioned to leverage Global Value Chains (GVC) for higher economic growth and job creation. In labour-intensive sectors like textiles and apparel, India is well integrated into global value



chains, though there is scope for greater expansion. In some of the capital-intensive sectors too, like electronics, India has good GVC linkages.

The Government has selected a diverse set of sectors for PLI incentives. It has selected multiple new-age sectors such as mobile phones, Advanced Chemistry Cell (ACC) batteries, high-efficiency solar PV modules, drones, wearables, semiconductors, and specialty steel. To be sure, a significant portion of the government's incentives are directed towards these new-age sectors. These new-age sectors would help India gain prominence as a manufacturing hub. The results are already evident. From just two mobile phone factories in 2014, India has now become the second-largest mobile phone producer in the world, supported by the policy thrust on the sector. In fact, India's exports of smartphones today are worth more than US$11 billion, and India has emerged as a leading exporter in the global mobile device market. Also, smartphones are now the fifth-largest export item in India's export basket.

The future of manufacturing is sustainability. Customers are looking for products and partners who follow eco-friendly practises, adopt green policies, and share a commitment to sustainability.

The aim should be to further increase India's presence in five to six specific global value chains (e.g., electronics, chemicals, medical devices) by developing port-proximate clusters like the Mumbai—Thane—Raigad cluster for electronics and chemicals. State governments could support efforts by creating plug-and-play cluster zones based on their manufacturing strengths. For example, multi-modal logistics parks are being set up in several cities under the government's road-development programme, 'Bharatmala', and these could become world-class, efficient logistics zones for manufacturing (for example, electronics and aeronautics in Nagpur). Solapur, meanwhile, could become a hub for textiles and apparel. Additionally, adopting contract manufacturing to raise capacity utilisation to over 80%, launching supplier development programmes (e.g., innovation grants), and facilitating single-window clearance could raise India's presence in these specific global value chains.

Embracing the Digital Revolution in Manufacturing

As per a recent NASSCOM report, the Indian manufacturing industry spent between US$ 5.5 and US$ 6.5 billion on Industry-4.0 solutions in FY21. Government regulations and private sector investments are pushing Indian manufacturing to adopt digital technology. Manufacturing enterprises, both large and small and medium-sized, can develop a new paradigm of production by leveraging 4.0 technologies (IoT, AI, big data analytics, and robotics) to digitalise some or all levels of business operations and become forerunners in this new Industrial Revolution.

Digitisation could improve reliability and value chain resilience. For example, by leveraging advanced analytics such as telemetry, manufacturers could optimise their delivery networks and better forecast demand at the stockkeeping and distributor levels. Technology grants and international joint ventures could help secure technology expertise that would help propel manufacturing into the digital future. The ongoing 5G rollout would also play a key role in their transformation to 'smart manufacturing.' The key 5G use cases for Industry 4.0 include Connected Asset Monitoring, Connected Warehouses, Predictive Maintenance, Logistics and Fleet Management, and Quality Management.

Focusing on technology development to support manufacturing industries is going to be an important area to strengthen. Besides that, a workforce with the right skills and capabilities would also be essential to bringing technological advancements to the manufacturing sector. Support for skilling and upskilling initiatives will be the need of the hour for manufacturing MSMEs to advance in the future. India needs to invest in robust skill development programmes and collaborate with educational institutions and industry bodies to bridge this skills gap. At-scale manufacturers could upskill or reskill their employees with the latest manufacturing technologies through



tie-ups with academic institutions and digital training platforms. Additionally, the government must incentivise technological investments, boost R&D, and expand institutional capacity. These elements, if implemented successfully, could speed India's industrialisation.

Leaping towards Sustainable Manufacturing Future

Manufacturing has a significant impact on environmental issues because it is a major source of GHG and other pollutants. The future of manufacturing is sustainability. Customers are looking for products and partners who follow eco-friendly practises, adopt green policies, and share a commitment to sustainability. Another critical reason for manufacturers to undertake initiatives in sustainability and include them as a key goal in their strategy and operations is their substantial financial benefits and global competitiveness. It is pertinent to pursue industrial expansion while still being conscious of how production adversely affects the environment. Manufacturers will need to continue changing and improving their methods and seeking out new solutions to make sustainability happen.

Through a number of initiatives, the Indian Government is enticing businesses to adopt sustainable manufacturing, including 'Zero Defect-Zero Effect', 'Digital India', and many others. To complement these initiatives, manufacturers across the value chain need to prioritise the creation of green alternatives, such as bio-based feedstock and sustainable packaging, green building materials, aligning industry standards for green labels, and setting up recycling hubs. The industry should get together to help define a standard for 'green' labels and establish a robust auditing process for green products. Product development merged with digital technologies can help reap the true potential of sustainable manufacturing and achieve environmental conservation goals. With its integration of cutting-edge technologies and digitisation, Industry 4.0 offers a special chance to match industrial procedures with sustainability objectives. The key to generating long-term economic benefits is leveraging innovation and technology to establish a green, lean manufacturing system that can enable sustainable businesses.

Strengthening Infrastructure

India has inefficiencies in terms of the large amount of goods transitioning within an industrial value chain, as well as the high cost and lengthy time for the transition. The country is already solving these challenges with a variety of interventions, such as the Industrial Corridor Development Programme, the PM Gati Shakti National Master Plan, and the National Logistics Policy. Additionally, state and central governments could strengthen infrastructure in key manufacturing hubs through public-private partnerships (PPPs) and special-purpose vehicles and expand smart-city coverage. They could also use new technologies to provide essential utilities, such as off-grid rural market electrification via solar infrastructure. Further, the sectors being considered for import localisation (including electronic components) could be incentivised by providing plug-and-play infrastructure. Besides hard industrial infrastructure, Indian industry also needs widespread State-sponsored urban infrastructure development to be able to capitalise on the window of opportunity provided by the strategic decoupling between China and the West.

Way Ahead

Over the past seven years, India has made substantial improvements in its policy and regulatory environment, making it much easier for enterprises to establish themselves and flourish. FICCI is confident that as we move ahead on the path towards India@100, the process of reforms will further gather pace and strengthen the foundation on which India will have a world-class industrial sector that is efficient, productive, sustainable, and will imbibe a major export orientation. ❑

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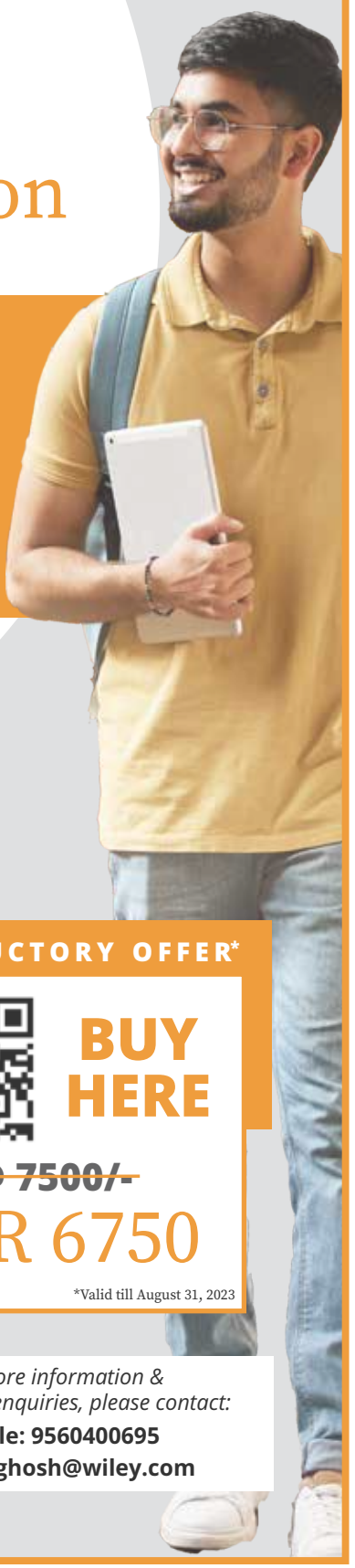
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LEVERAGING TECHNOLOGY FOR ACCESSIBLE QUALITY EDUCATION

The National Education Policy 2020 envisages many sweeping reforms in the education sector to create accessible, equitable, and high-quality education for all. New tools such as Augmented Reality, Virtual Reality, Extended Reality, Animation, Visual Effects, Gaming, and Comics (AVGC), with the power of Artificial Intelligence and Machine Learning, have catapulted the quality and enhanced the experience of the learners.

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Technology has revolutionised our lives from the 17th century onwards, starting from Industry 1.0 to Industry 4.0, from the invention of the steam engine to the space shuttle, from the telephone to mobiles, from the internet and 2G to 5G, and from PCs to supercomputers. The rate of technological change has been mind-boggling, and it is becoming difficult to keep pace. The changes in technology are not just in various aspects of our daily lives, such as housing, water, sanitation, energy sources, communication, transport, etc., but also, importantly, in education, healthcare, and agriculture. The changes that have happened in the delivery of education from blackboards and chalk, pencils, pens, and paper to overhead projectors, LCDs, PCs, laptops, CDs, DVDs, and TVs to Smart White Boards, the Internet, Online courses, and MOOC platforms have made education at doorsteps possible. Education is today available anytime, anywhere, from any person on any device. There are a wide variety of choices for courses and programmes, making the choice a difficult task at times.

The new tools such as Augmented Reality (AR), Virtual reality (VR), Extended Reality (XR), Animation, Visual Effects, Gaming, and Comics (AVGC), with the power of Artificial Intelligence (AI), Machine Learning (ML), and AI-based chatbots, have catapulted the quality and enhanced the experience of the learners.

The National Education Policy 2020, which was adopted on July 29, 2020, envisages many sweeping reforms in the education sector to create accessible, equitable, and high-quality education for all. This involves making GER 100% in school education and 50% in higher education. This is difficult to achieve only through the brick-and-mortar buildings of schools, colleges, and universities. Technology and its use are the only enablers that will reduce the gap and divide and pave the way for access, equity, quality, affordability, and accountability. Moreover, from the Government's perspective, this is cost-effective with a high Return on Investment (RoI).

The technologies mentioned hitherto are not completely new; they have existed in some form or another for about two decades. However, its utilisation was limited. The Covid-19 pandemic disrupted the education sector worldwide like any other sector and came to a near-complete grinding halt overnight in March 2020. There was no alternative but to go digital, leverage technology, and continue the education of the masses in online mode. India was no exception, albeit one of the best-performing nations in all domains, be it education,



healthcare, or the economy. It is worth mentioning here that thanks to technology, fibre connectivity, the internet, and DTH delivery of content through satellites, our education continued uninterrupted, although admissions, examinations, and results were delayed by a couple of months and are now on track. Many other nations lost a full academic year. Our vaccination of all citizens and online delivery of vaccination certificates through the Co-WIN Application on mobile instantly was another great achievement thanks to the national digital infrastructure. The same was the case in the economy, with 40% of the financial digital transactions in the world happening in India.

Does this mean there were no challenges and everything was hunky dory? Certainly not. Some studies say learning outcomes during the Covid-19 pandemic period were poor, there was a digital divide between rural and urban areas, and there were psychological issues and strained health conditions because of being encapsulated in a small dwelling. Multiple children did not have equal access to the internet and device time. Nevertheless, it was better than most other countries, thanks to our deep reach through satellite Direct-To-Home communication and the lowest cost of data rates.

Let us look at how technology is being leveraged for accessible, quality education. The video-recorded engineering courses in the classrooms or institute studios of IITs started way back in 2005 as NPTEL (National Programme on Technology Enhanced Learning) courses and were made available on CDs and by downloading from the NPTEL website of IIT Madras, thus providing access to high-quality lectures by the best professors of IITs in remote tier-2 and tier-3 colleges. This was the first phase of empowerment. Subsequently, in 2008, virtual labs were created with simulation-based experiments available to all colleges where some of the high-end equipment was not available. Learning through virtual labs was another empowering moment. The 1 Gbps internet connectivity provided to major educational institutes to access this content was another important milestone.

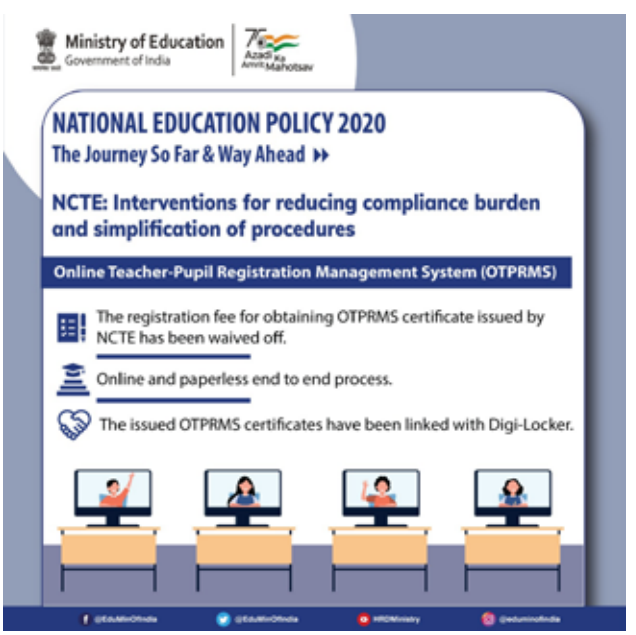
While these efforts were ongoing at the national level through institutes of national importance, there were efforts at the state level, university level, and even college level by several enthusiasts to create or engage in online learning platforms (LMS), making education accessible to those who missed classes due to personal or health issues. The



spread of Open Education Resources (OER) and their availability free of charge worldwide have been further empowering.

Teacher training has been very important to creating impactful teaching and learning, and the dearth of well-trained teachers in many state-level tier-2 and tier-3 colleges has been a great handicap. Training programmes arranged in physical mode had limitations in terms of leave from the institute, travel, and accommodation costs. Some female teachers and faculty had the additional problem of not being able to move out given family and young children's commitments. A simple A-View platform created by Amruta University with the support of MHRD to deliver online training was a great success. The T10KT programme run by IIT Bombay and IIT Kharagpur had roaring success in training a huge number of faculty, many of whom were women, thanks to technology and internet availability. AICTE's ATAL Academy programmes, in which 1.5 lakh faculty were trained in high-end emerging technologies like AI, ML, Robotics, Drones, Cyber Security, Cloud computing, Data Analytics, and Quantum Computing year after year, are another success story. AICTE also created





8 faculty induction modules, starting with the roles of engineering, teaching pedagogy, curriculum development, use of technology, examination paper setting, research, innovation, and institute administration, empowering the young inductee teachers.

While these developments were happening, the first-ever MOOC (Massive Open Online Course) came into existence in 2011. Coursera from Stanford University, EdX from MIT, and many others became popular. Not to be left behind, India created its own indigenous MOOC platform, SWAYAM, through AICTE with funding from the MHRD. Today, this enhanced SWAYAM 2.0 MOOC created by IITM has more than 3000 courses and 3 crore registered users from not only every nook and corner of the country but also from many developing nations. Courses ranging from arts, commerce, sciences, engineering, and management are available free of charge. This has further empowered students.

The students' employability has been an issue often raised by industry bodies. Hands-on experience, experiential learning, and practical application-based training are felt to be necessary. Hence, to provide students



with a connection to the industry, a specialised internship portal is created where industries, small and large, MSMEs, and startups post internship opportunities, and students wanting internships upload their biodata, capabilities, and interests. Through AI-based matchmaking, students get internships ranging from two months to six months, enhancing their skills, knowledge, and, in turn, employability. Another platform called the National Educational Alliance For Technologies (NEAT) has onboarded several AI-based personalised learning products to enhance programming skills, high-end emerging technology training modules, language skills, communication skills, etc. from small and big companies and startups. This too has helped in enhancing employability and building a spirit of entrepreneurship amongst students.

The language and cost of education have been barriers for many students in rural, remote areas of the country who have had their education in their respective mother tongues, with the incomes of their parents being meagre and not being able to send their bright sons and daughters to towns and cities for higher education. Permitting higher education in the Indian languages and providing books in those languages by translating high-quality outcome-based books using the AI-based translation tool Anuvadini is making high-quality education available in remote areas in their mother tongue. Several technologies to empower Divyang PwD children are also ongoing.

Technologies such as AR, VR, XR, and Metaverse help create high-quality engaging content that makes understanding the subject easy.

The National Digital Library Project, funded by the MHRD and established by IIT Kharagpur, provides free access to millions of books and documents. Similarly, INFLIBNET provides access to research journals, theses, and reports.

A couple of new digital and technological initiatives underway include the Academic Bank of Credits (ABC) for storing all credentials and credits earned by students in Digilocker/Edulocker; Student and Faculty Registry Project under which each student and teacher shall get a Unique lifelong APAAR ID that would get linked with that individual's ABC record, thereby certifying and authenticating the credentials online; One Nation One Data portal, through which information of all educational institutes shall be available for making informed choices by students and parents; and the Study In India Portal to showcase India's strengths for attracting foreign students.

Technology has been changing rapidly. We are keeping abreast of all the latest trends providing informed choices to the education sector's stakeholders be it students, teachers, educational institutes, or state governments through the National Educational Technology Forum, and thus leveraging technology for accessible, equitable, affordable quality education for all and creating an empowered new India of the 21st century. ❑


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Innovation has been the cornerstone of human development since time immemorial. Right from the discovery of fire to controlling it to the invention of the wheel and its myriad uses, innovation has led to revolutionary transformations since pre-historic times.

PRAMIT DASH | The author is a Program Director at Atal Innovation Mission, NITI Aayog. Email: pramitdash.aim@govcontractor.in

"The best way to foresee the future is to create it". – Anonymous

With the industrial revolution and especially in the last century, the impact of innovation has been far more pronounced. It has led to tectonic changes in technology and significant improvements in all sectors of the economy across the world. It has not only sustained the needs and wants of a growing population but has also made our lives better, more connected, and increasingly prosperous.

But what exactly is innovation?

Innovation is the process of creating value by applying novel solutions to meaningful problems. It is about creating new applications for an invention or an established technology.

Conventional GDP estimates suggest that the real GDP of the world grew at less than 0.1% per annum until up to 1700 AD, as it was only linked to consumption growth led by population increase. The exponential growth of world GDP came into

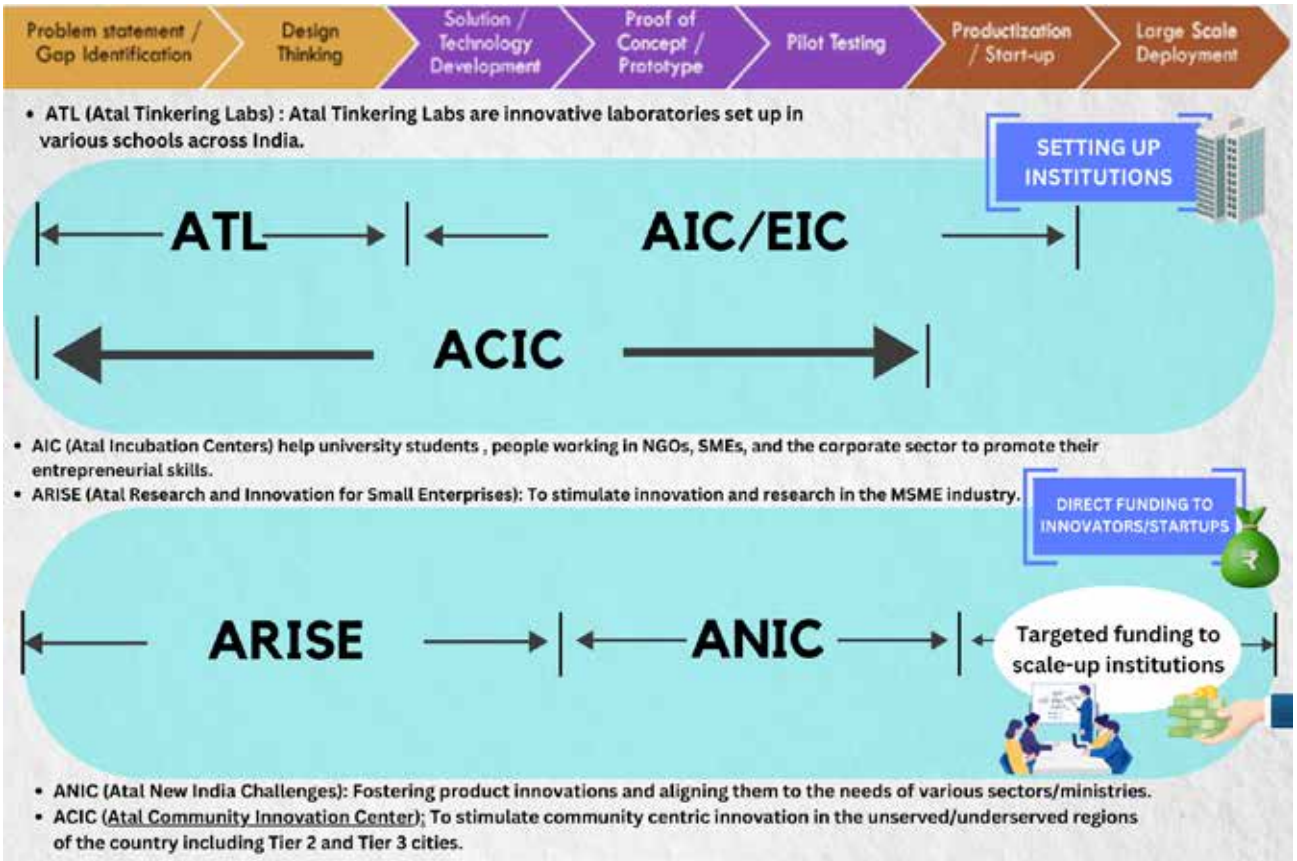


Illustration: AIM's interventions in the journey of an innovator

play after the 1750s. This shift can be attributed to the advent of technology and technology-led innovations during the industrial revolution. A classic example of this is the development of steam engine technology in the 18th century. It enabled the creation of smaller and more efficient engines, leading to the mass production of goods and revolutionising the transportation of goods and people.

The game of the entire global economy went up several notches with just one solution.

Innovation thus plays a critical role in shaping the economy of a country.

Taking an economic view, the theory of growth suggests that the Total Output is defined as a function of Labour, Capital, and Total Factor Productivity of economy.

Simply put, total output, or GDP, is increasingly proportional to TFP, where innovation, technology growth, and efficiency gains are the biggest sub-sections of TFP.

Empirically, we see that the most developed nations of the world – the USA, UK, France, Germany, Japan, etc. – have traditionally been the most technologically innovative ones.

This substantiates the vital role of innovation in determining the growth story of a nation. But how does a country imbibe innovation into its DNA?

Historically, across the world, it has been the government that takes the first step to seed it.

Be it Israel with its Israel Defence Forces (IDF) as the epicentre of innovation or the USA with the SBA and Small Business Innovation Research (SBIR), the role of the government is of paramount importance. It becomes much more pronounced when we think about building a culture of innovation in a country as large and diverse as India.

At the turn of the millennium, India established the National Innovation Foundation (NIF) under the Department of Science and Technology to strengthen grassroots technological innovations and traditional knowledge. Almost a decade later,

in 2013, the Science, Technology, and Innovation Policy was launched. The Policy aspired to position India among the top five global scientific powers with the goal of establishing a strong and viable Science, Research, and Innovation system for a High Technology-led path for India (SRISHTI). Following up on the Science, Technology, and Innovation Policy 2013, to promote a culture of innovation and entrepreneurship across the length and breadth of the country, the Government of India, in 2016, set up the Atal Innovation Mission (AIM) under NITI Aayog, the apex public policy think tank of the country.

AIM's mandate has been to create a culture of innovation and entrepreneurship in India. However, creating a culture is a long-haul mission that requires sustained and targeted interventions across the lifecycle of an innovator and ought to cover the whole value chain of innovation. AIM has adopted a holistic approach to fulfil its mandate. It has developed programmes, policies, and institutions that cover the whole spectrum from ideation to deployment, from school students to established start-ups. This continuum of interventions ensures that an innovator is not lost in the way due to a lack of support.

At an early stage, when the seeds of innovation are sown in young minds, Atal Tinkering Labs (ATL) in schools promote the concept of tinkering among children, which stimulates a problem-solving, innovative mindset while understanding and making things.

At a slightly later stage, when these young minds enter college and want to develop their ideas into concepts and a start-up, Atal Incubation Centres (AIC) established in higher education or research institutes are up to give all necessary ecosystem support and nurturing, just like an incubator does to babies. To move beyond the usual clusters of innovation in major cities and to promote individual innovators and microentrepreneurs, the Atal Community Innovation Centres (ACIC) in tier-2 and tier-3 cities make innovation geographically and linguistically inclusive. Through the Atal New India Challenge (ANIC) programme, AIM directly funds start-ups and MSMEs working to solve sectoral challenges of national importance and societal relevance - right from idea to commercialisation.

Mentor India is a strategic nation-building voluntary initiative to engage leaders ('Mentors of Change') who can guide and mentor students in the 10,000+ Atal Tinkering Labs that AIM has established across India.

Let us try to understand the programme pillars of the Atal Innovation Mission:

There are multiple pillars of AIM through which the vision of creating *Atmanirbhar Bharat* is being turned into reality. Over the years, AIM has launched Atal Tinkering Labs (ATLs), Atal Incubation Centres (AICs), Atal Community Innovation Centres (ACICs), Atal New India Challenge (ANIC), and Mentor of Change to support innovators in their innovation life-cycle and massively influence the innovation story of India.

Atal Tinkering Labs (ATL)

With a vision to 'Cultivate one million children in India as Neoteric Innovators', AIM has established ATLs in schools across India. ATL is a state-of-the-art space to foster curiosity and innovation in young minds between grades 6th and 12th and stimulate a problem-solving, innovative mindset. ATLs house 21st-century tools and technologies such as IoT, 3D printing, rapid prototyping tools, robotics, miniaturised electronics, DIY kits, etc. Here, young minds can give shape to their ideas through hands-on and do-it-yourself activities.

The ATLs provide an inhibited space where students create with the idea of *"tod-fod-jod"* – the liberty to create while innovating. There are multiple curriculums and modules that ATL releases from time to time to build the capacity of students for 21st-century skills. The flagship initiatives of ATL, the ATL Marathon, and Tinkerpreneur, give the students a platform to create products and pitch them to the world as young business tycoons. The best students then get an opportunity to experience industry exposure through the 'Student Innovator Programme', wherein they develop their projects further under the guidance of various industry experts and make

them more market viable. The ATLs aim at providing the skill sets that are required of the innovators of tomorrow.

Today, 10,000 schools have Atal Tinkering Labs covering 700+ districts of the country, spanning over 35 States and Union Territories. 60% of these ATLs are established in Government schools and cover a total of 75 lakh+ students who have created 12+ lakh innovation projects.

AIM's mandate has been to create a culture of innovation and entrepreneurship in India. However, creating a culture is a long-haul mission that requires sustained and targeted interventions across the lifecycle of an innovator and ought to cover the whole value chain of innovation.

Atal Incubation Centres (AIC)

AIM has been supporting the establishment of incubation centres called Atal Incubation Centres since 2017 to nurture innovative start-ups in their pursuit to become scalable and sustainable enterprises. The AICs are world-class incubation centres across the country with suitable infrastructure in terms of capital assets and operating facilities, coupled with the availability of sectoral experts for mentoring the start-ups, business planning support, access to seed capital, industry partners, trainings, and other relevant components required for encouraging innovative startups.

The AIC programme of AIM creates and supports cross-sectoral incubators. AICs have been operationalised in Higher Education Institutions – both government and private, research institutes, corporate bodies, etc. The idea behind setting up AICs was to develop incubators in varied sectors –much larger in scope than traditional science and technology incubators— and in institutes beyond IITs and NITs. Untouched sectors of textile, dairy, coffee, etc. to the need of the hour sectors of agri-tech, ed-tech, med-tech, clean-tech, etc. to cutting-edge mobility, space-tech, nuclear-tech, etc. have been covered.

This has resulted in the growth of successful start-ups and a pipeline of future start-ups. So far, 70 AICs have been established, which have incubated 3000+ startups and created 30,000+ jobs, taking India a step closer to the dream of self-reliance.

Atal Community Innovation Centre (ACIC)

AIM envisions creating an innovation ecosystem that is geographically and linguistically inclusive. ACIC is designed to create a thriving ecosystem of innovation and entrepreneurship in regions that have not yet been a part of the growing culture of innovation and lack the systems to support it —tier 2/3 cities, rural and tribal areas, the North East, J&K, and the Ladakh region.

ACICs aim to reach innovators from the grassroots and give them equitable opportunities by providing them with infrastructural, financial, and learning support to ideate and design novel solutions for the upliftment and sustainable transformation of the community. For any innovation to change the world, it is important to involve the community, and ACICs is on that mission of revolutionising grassroots innovation.

AIM has setup 14 ACICs across 10 States and Union Territories, which have incubated 50+ start-ups and supported a cohort of 20+ innovators under the Community Innovator Fellowship.

Atal New India Challenge (ANIC)

The Atal New India Challenge is a national initiative to seek, select, support, and nurture technology-based innovations that solve sectoral challenges of national importance and societal relevance. The primary goals of the ANIC programme are to incentivise innovations in areas critical to India's development and growth – Education, Health, Water and Sanitation, Agriculture, Food Processing, Housing, Energy, Mobility, Space Applications, etc.

The startup journey needs to traverse through the valleys of death at the early stage and at the commercialisation stage before taking innovations to market. ANIC aims to address the commercialisation valley of death by supporting early-stage startups to scale over the risks associated with access to

resources for testing, piloting, and market creation through funding and other associated support from AIM's innovation ecosystem.

AIM has directly funded and supported 50+ startups, with another 100+ startups selected.

Mentors of Change (MoC)

Mentor India is a strategic nation-building voluntary initiative to engage leaders ('Mentors of Change') who can guide and mentor students in the 10,000+ Atal Tinkering Labs that AIM has established across India.

Today, 6,000+ Mentors across the country are supporting the dream of AIM to nurture young minds. These mentors from across industry and academia volunteer their time regularly in one or more such labs and enable students to experience, learn, and practise future skills such as design and computational thinking, critical thinking, and applying what they have learned in classrooms in a more hands-on setting.

Over these years, AIM has supported a lot of young tinkerers and start-ups who have gone on to design solutions for various problems specific to their geography and regions.

It is through this continuum of interventions that AIM is inflicting a mindset change and a cultural shift that India will steer towards *Atmanirbharta*.

Case Study

Have you ever imagined how peaceful it would be if each day was a 'No Horn Day'?

Imagine that vehicles will be moving on the road at peak hours, with red lights and traffic snarls, but no shrill horns piercing our eardrums. While there have been multiple steps taken in the direction of reducing noise pollution on the roads, limited efforts have been made by citizens. But an 18-year-old student from Rajasthan took charge to address the problem.

This student innovator - currently pursuing a B.Tech. - so resolved to work on solving noise pollution that he created a device to address it. He worked on the Vehicle Horn Control Assembly (VHCA), which blocks the horn in certain areas and also reduces its intensity in horn-prohibited



areas. VHCA is a state-of-the-art system that helps entirely regulate noise pollution caused by the horns of vehicles. This innovation targets Sustainable Development Goal 11: Sustainable Cities and Communities. The innovation is patented and provides solutions that are cost-efficient and scalable. The system is portable and economical to implement in automobile manufacturing units to drastically reduce noise pollution and fatality rates in road accidents. How amazing is this!

Perhaps more intriguing is the journey that led up to it. The seed for this innovation was sown in an Atal Tinkering Lab. It was during ATL sessions at school that his curiosity was fueled, and he worked on developing his prototype. In his quest to provide innovative solutions to solve social problems, this student innovator participated in the ATL Marathon 2017 and deservedly made it to the top. He went on to bag the Student Innovator Programme (SIP) through AIC. After attending an *Ideathon* organised by ACIC RISE, Mohali, he got incubated at ACIC RISE where he built his business plan. This is perhaps the epitome of being supported by a continuum of AIM interventions. His curiosity and imagination were invoked at an ATL – a place to mould and shape the thought process of young tinkerers through a hands-on *do-it-yourself* model. His idea was nurtured through the SIP at AIC – centres, which aim to foster and support world-class innovation and dynamic entrepreneurs who want to build scalable and sustainable enterprises, and was incubated at ACIC-centres to encourage a spirit of entrepreneurship in the underserved and unserved regions of India by providing enabling infrastructure, pre-incubation support, and a facilitating environment for grassroots innovation. Finally, his start-up working in a nation-critical area also bagged a grant under the Atal New India Challenge (ANIC).

AIM's vision has been to instill the light and hone the passion of innovators and entrepreneurs across India to build better and brighter solutions to societal or community challenges. The different initiatives and programmes have been conceptualised to provide efficient support at different levels of innovation, with a larger vision to enable organic collaboration amongst the different initiatives through the stakeholders themselves.

Conclusion

This real-life journey is not merely an isolated event but an evolving process that is growing exponentially with each passing year. More innovators are taking the path of AIM's innovation continuum and making it big - creating sustainable ventures and solving national problems.

Over the years, the adoption of innovation has been more rapid and strategic at the same time. With India's growth story standing at an inflection point and its ambitious goal of USD 5 trillion by FY 2025, a well-nurtured innovation ecosystem is a must.

India is taking rapid strides in nurturing its innovation ecosystem. Sustained efforts over the past decade have moved India in the Global Innovation Index ranking - from 57th in 2018 to 40th in 2022. India is delivering innovations at a global scale with deep impact; it houses 100+ unicorns and has given the world a stack of digital public goods like Aadhaar, UPI, ONDC, and more.

However, the country is still evolving in terms of the number of startups per lakh of the population – when compared to the innovation powerhouses – USA, Israel, etc. – there is potential to go over 9X the current number. A lot of work remains to be done in the deep-tech space.

In the past, it was through great minds that India has been able to contribute to the world. However, today, India - with the ability of its people to think outside the box and institutional support from missions like AIM — is creating disruptive technologies at optimal cost and playing a key role in the future of innovation. Young Indians and startups are bestowed with opportunities like never before. It is through these small steps taken over the years that India has paved its way towards building an innovation ecosystem that is collaborative, agile, and inclusive. It is now our duty to engage in a collective *sabka prayas* to realise New India's economic potential and lead the way for New India's decade of technology. ❑

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INDIA'S G20 PRESIDENCY

As a nation that wants to be a 'leading player' in the global order, India is keen to address what it sees as the world's pressing issues through its leadership, including climate change, food security, health care, and technology. With the G20 Presidency, India is striving towards a more equitable world. The G20 is unique in so far as it brings together the developed and the developing nations to discuss and create solutions to global governance challenges. India can effectively bridge the divide by forging consensus on key global issues.

PROF HARSH V PANT

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India took on the Presidency of the G20 in a tumultuous global environment. But for New Delhi, this was an opportune moment, as India's economic growth story was coming into its own. India became the world's fifth-largest economy, displacing the United Kingdom, and emerging as the fastest-growing major economy in the world. For a grouping that accounts for more than 80 per cent of global GDP, 75 per cent of global trade, and 60 per cent of the world's population, this has been a moment to underscore its relevance, marred by multiple challenges. With a new international order in the making and a fluid global milieu, India's credibility is at an all-time high. Not only as a rising economic power but also as a nation that remains committed to upholding the rule of law and promoting global peace and security through its longstanding



commitment to global multilateralism and its growing ability to deliver global public goods. New Delhi was at the forefront of providing medical supplies and vaccines at the height of the Covid-19 pandemic, ensuring that the world remained connected at a time of such great crisis.

In a world that is getting increasingly fragmented, with extant powers focused inward and revisionist powers getting more assertive, India's G20 leadership has sought to make the Global South the centre point of global conversations. The global order is passing through an inflection point with the balance of power in flux and a normative shift becoming more evident than ever before. The post Second World War order is truly over and, in its place, there is a vacuum that is causing turmoil all around. Major powers are internally focused, trying to cope with their domestic issues at the expense of their global obligations. International institutions need to re-strategise to respond to the emerging challenges. The advent of Covid-19 accelerated the above trends as the world became more aware of the underlying fault lines and responded by first turning inward and then ushering in new models of engagement and disengagement. Older norms are out of favour, while consensus on new norms eludes the world. The reality is a world disorder that few are able to comprehend, and so policy responses remain inadequate. The crisis of multilateralism has been made worse by the lack of a broader representation of developing countries and emerging economies in multilateral institutions.

Economic globalisation also came under stress, with nations demanding a political stress test before venturing into economic cooperation. From 'let's trade and become friends,' the mantra became 'let's trade among friends.' Gone was the optimism of Francis Fukuyama's 'end of history,' as history came back with a bang. De-globalisation emerged as a credible option as nations moved towards decoupling and de-risking. Economic interdependence, which was once seen as a global public good, emerged as a challenge as it created vulnerabilities that could be exploited. Nations moved rapidly towards diversification of their trade partners, and restructuring of global supply chains emerged as a priority area.

It should not be surprising, therefore, that the theme India selected for its G20 presidency is *Vasudhaiva Kutumbakam*, that means 'The world is one family.' While unveiling the 2023 G20 logo, Prime Minister Narendra Modi underlined that the world is currently experiencing conflict, the aftereffects of a 'once-in-a-century pandemic,' and economic uncertainty, thereby underlining the need for greater global cooperation.

During its year-long presidency, New Delhi, through different initiatives, has made an intense effort to showcase India's claim to global leadership. A visible dimension of this exercise is reflected in its participatory nature. The push for participatory diplomacy was evident in the speech delivered by Prime Minister Modi while inaugurating the










17th Pravasi Bharatiya Divas Convention in Indore on 9 January 2023 where he noted that India has 'to make the G20 not just a diplomatic event but a historical event of the people's participation.' A similar sentiment was echoed by the Ministry of External Affairs (MEA), wherein it reiterated New Delhi's objective of making the G20 'truly a people's G20'. India has envisaged *jan bhagidari* (people's participation) in the G20 through various civic engagements and its hosting of more than 200 meetings, ranging across 50 cities and 32 working streams. Another significant aspect of this participatory diplomacy is the prioritisation of provinces and regions and the showcasing of cultures that weren't given due attention earlier.

The traditional models of global cooperation are under stress because of the complex challenges of the 21st century. As a nation that wants to be a 'leading player' in the global order, India is keen to address what it sees as the world's pressing issues through its leadership, including climate change, food security, health care, and technology. New Delhi has historically raised concerns on behalf of the global south within multilateral forums, and its G20 presidency has provided it with a new platform to showcase its growing heft on the global stage.



As part of this, New Delhi has highlighted issues that matter for emerging economies: digital public infrastructure, entrepreneurship and innovation, climate justice, and affordable access to health care.

But India's G20 presidency hasn't been without its set of challenges, as rising tensions among major powers in the G20 and the credibility crisis facing multilateral institutions have made the task of bringing nations together even more difficult. By focusing on the priorities of the Global South, India has hoped to bring major stakeholders together and revive the faith of the international community in multilateralism. It is a tall order, for sure, but New Delhi's diplomatic manoeuvering has ensured that its G20 presidency elevates the conversation on global governance. It is fair to say that India's G20 presidency has managed to provide some order to an international system veering towards disorder and disruption.

Today, nations around the world are increasingly prioritising their own interests, building ad hoc interest-based coalitions even as transnational challenges such as terrorism, pandemics, and climate change continue to demand greater cooperation. New Delhi has tried to revive global faith in the ability of multilateral formats to deliver. The G20 is an interesting platform that brings together the developed and developing worlds in ways that no other platform does. India's G20 Presidency is aiming to move the world towards a greater sense of solidarity. Its own reality of being a multicultural democracy should guide it well in bringing together highly diverse stakeholders to cogitate, and act, on global challenges. India@75 is well positioned to take on an ambitious role on the global stage, and its G20 presidency has underlined its credentials as a credible global interlocutor. ❑

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AGRICULTURE
A JOURNEY FROM SHORTAGE TO SURPLUS

Struggling with hunger and poverty, the nation drafted its first Five-Year plan (1951-56) for development, with the highest priority being to increase agricultural production and eliminate hunger. Consequently, agricultural production increased, prompting the Government to shift its focus from agriculture to industrial growth in the second Five-Year plan. Today, India stands tall in the global arena of agriculture with many meritorious positions. It is noteworthy that India's foodgrain production has outpaced its population growth. Rising from self-reliance, Indian agriculture is now moving forward to become a global powerhouse of agriculture.

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Over the last 75 years, Indian agriculture has scripted a remarkable and momentous success story of transformation. Beginning with an acute shortage of food commodities at the time of independence, we are now a proud food surplus nation with a rising trend of agri-exports. Looking back, India gained freedom under the shadow of the devastating Bengal famine (1943-44) in which nearly three million people perished due to malnutrition or disease. India's population was subject to an acute food shortage, frequent droughts, and famines, and suffered from pervasive malnutrition. Even though nearly 85 per cent of the population lived in villages and derived their livelihood from agriculture, the country was abysmally short of food grains, mainly due to the aversive policies of the British towards



farming. During 1950-51, India produced only 50.82 million metric tonnes of food grains, which was not enough to adequately feed the growing population and compelled India to beg for food grains from the USA and other developed economies. Successive wars in 1948, 1962, and 1965, together with recurrent droughts, further deteriorated the situation. This grim scenario pushed the country into an unprecedented 'ship-to-mouth' existence and also defamed India as a 'begging bowl' nation. The USA donated large quantities of wheat under the PL-480 Scheme to save millions of Indians from hunger. But soon, it diminished to a very low level due to strained international relations. During this period, a famous book, Famine 1975, by William and Paul Paddock predicted that millions of Indians would starve to death in the years to come.

Tales of Transformation

Struggling with hunger and poverty, the nation drafted its First Five-Year Plan (1951-56) for development, with the highest priority being to increase agricultural production and eliminate hunger. Nearly one-third of total plan funds were allocated to agriculture, which drove growth in irrigation facilities and fertiliser production in the country. Consequently, agricultural production increased, prompting the Government to shift its focus from agriculture to industrial growth in the Second Five-Year Plan (1956-61). Allocation to agriculture were also curtailed by 20 per cent. During the Third Five-Year Plan (1961-66), self-sufficiency in food grains was one of the priorities, but it failed miserably due to Chinese aggression (1962), the Indo-Pak War (1965), and a severe and prolonged drought during 1965-66. This led to a colossal food crisis in the country. that led to an appeal to people to observe a fast once a week. People were also advised to widen their food basket by including tubers and millets.

Meanwhile, in Mexico, a scientist, Dr Norman Borlaug, made a breakthrough by developing unique wheat varieties that were semi-dwarf, high-yielding, disease-resistant, fast-growing, and highly responsive to fertilisers. The Government of India allowed the import of 18,000 metric tonnes of new wheat varieties in 1966. These seeds were distributed to farmers in Delhi, Haryana, and Punjab in 5-kg packs; and simultaneously, more than 1000 national demonstrations were conducted in farmers' fields under the leadership of Dr MS Swaminathan. Farmers could successfully harvest 4-5 tonnes per hectare, in contrast to the earlier one tonne per hectare. Farmers adopted the new varieties wholeheartedly. In 1968, the nation reaped a bumper harvest of 17 million metric tonnes of wheat, up from 11 million tonnes in 1966. This was the largest leap in wheat production ever recorded in the world. This was termed as the 'Green Revolution'. This was followed in rice, and subsequently, production jumped in other crops like sugarcane, cotton, and fruits and vegetables. This laid the foundation for self-sufficiency and now we have moved further as a surplus foodgrain nation and a net agricultural exporter. To attain this unique distinction, scientific skill, political will, and farmers' toil all acted synergistically on a single platform.

India embarked upon a new era of farming driven by the application of science and technology in the fields. Simultaneously, the Government provided policy support, fund allocations, and subsidies to the agriculture sector through various specific schemes. As a result, today India stands tall in the global arena of agriculture with many meritorious positions. India is the world's largest sugar-producing country and holds the second position in the production of rice only after China. As the second-largest producer of wheat, India had a share of around 14.14 per cent in global wheat production in 2020. India is also the largest producer and consumer of pulses, with a rapid pace

towards self-reliance. As per second advance estimates (2022-2023), production of foodgrains in the country is estimated at 323.5 million metric tonnes, which is 7.9 million metric tonnes higher than 2021-22. As per the third advance estimate, a record 342.33 million metric tonnes of horticultural production are estimated in 2021-22, which is 7.73 million metric tonnes higher than the production of 2020-21. The total production of sugarcane during 2022-23 is estimated at a record 468.8 million metric tonnes, which is 155.3 million metric tonnes higher than the average sugarcane production. Being deficit crops, oilseeds were given a special thrust by launching the National Mission on Oilseeds and Oil Palm during the 12th Five-Year Plan period. A breakthrough was realised in oilseed production by introducing the latest crop production technologies and expanding its fields in new areas. Consequently, oilseed production grew to 400 lakh metric tonnes in 2022-23 from 108.30 lakh metric tonnes in 1985-86. From the years 2015-16 to 2020-21, the compound annual growth rate of production was 7.7 per cent. The special mustard programme, initiated during rabi 2020-21, brought the most spectacular result: mustard production registered an increase of 40 per cent from 91.24 to 128.18 lakh metric tonnes and productivity saw an 11 per cent increase from 1331 to 1447 kg per hectare. The area under rapeseed and mustard increased by 29 per cent, from 68.56 lakh hectares in 2019-20 to 88.58 lakh hectares in 2020-23. The quantum jump in oilseed production is often referred to as the 'Yellow Revolution' in the annals of agriculture in India.

To make Indian agriculture future-ready, the Government has taken initiatives like National Mission on Sustainable Agriculture, Agri-Tech Infrastructure Fund, Paramparagat Krishi Vikas Yojana, Rashtriya Krishi Vikas Yojana on a national platform.

It is noteworthy that India's foodgrain production has outpaced its population growth. From 1951 to 2022, foodgrain production recorded a compound growth rate of 2.61 per cent per annum, whereas the population growth rate remained at 1.95 per cent. While the production of cereals has surged by almost sevenfold, the production of pulses has increased by 3.25 times during the same period. The per capita per day availability of food grains has increased from 395 grams in 1951 to 514.5 grams in 2022. The production of horticultural crops (60% vegetables, 31% fresh fruits) has recently outpaced the production of food grains, thus making a strong contribution to the nutritional security of the country. Being a food surplus nation, the Government is promoting agri-exports in the interest of farmers and 'agripreneurs'. As a result, agri and allied exports have increased from 41.86 billion USD in 2020-21 to 50.24 billion USD in 2021-22, that is, an increase of nearly 20 per cent. While celebrating the International Year of Millets (2023), India is set to become an international hub for millets, which have been recently named '*Shree Ann*'. Its various promotional strategies have increased its production to 159 lakh metric tonnes in 2022-23, while the Government has set its target to produce 170 lakh metric tonnes in



2023-24. During the Covid-19 pandemic, Indian agriculture exhibited its best by producing record foodgrains, which enabled the country to supply food to pandemic-hit poor nations.

Spectrum of Revolutions

There are many parallels between the Green Revolution and the White Revolution, both of which have played seminal roles in bringing self-reliance to food grains and milk, respectively. Just like food grains, India was struggling with the availability of milk at the time of independence, with a mere production of 17 million metric tonnes. As our population grew, per capita milk availability declined, further pushing the nation into a milk crisis. The Government had set up dairy schemes in metro cities, but a large part of their supply was met with commercial imports of milk powder. However, a successful milk cooperative was functioning in Anand, Gujarat, set up on the advice of Sardar Vallabhbhai Patel. In 1964, the National Dairy Development Board (NDDB) was set up with Dr Verghese Kurien as its chief. NDDB launched an ambitious programme, Operation Flood (OF), during the 1970s to make India self-reliant in milk production. The OF programme started a movement to create a network of village-level milk cooperative societies with a robust infrastructure for collection, processing, and marketing of milk. It introduced modern liquid milk processing plants and created a national milk grid for moving milk from surplus to deficit areas. The movement soon gathered momentum, and very quickly, milk production jumped to satisfactory levels. By 1976, regular commercial imports of milk had ceased. Since then, India has never looked back on milk production.



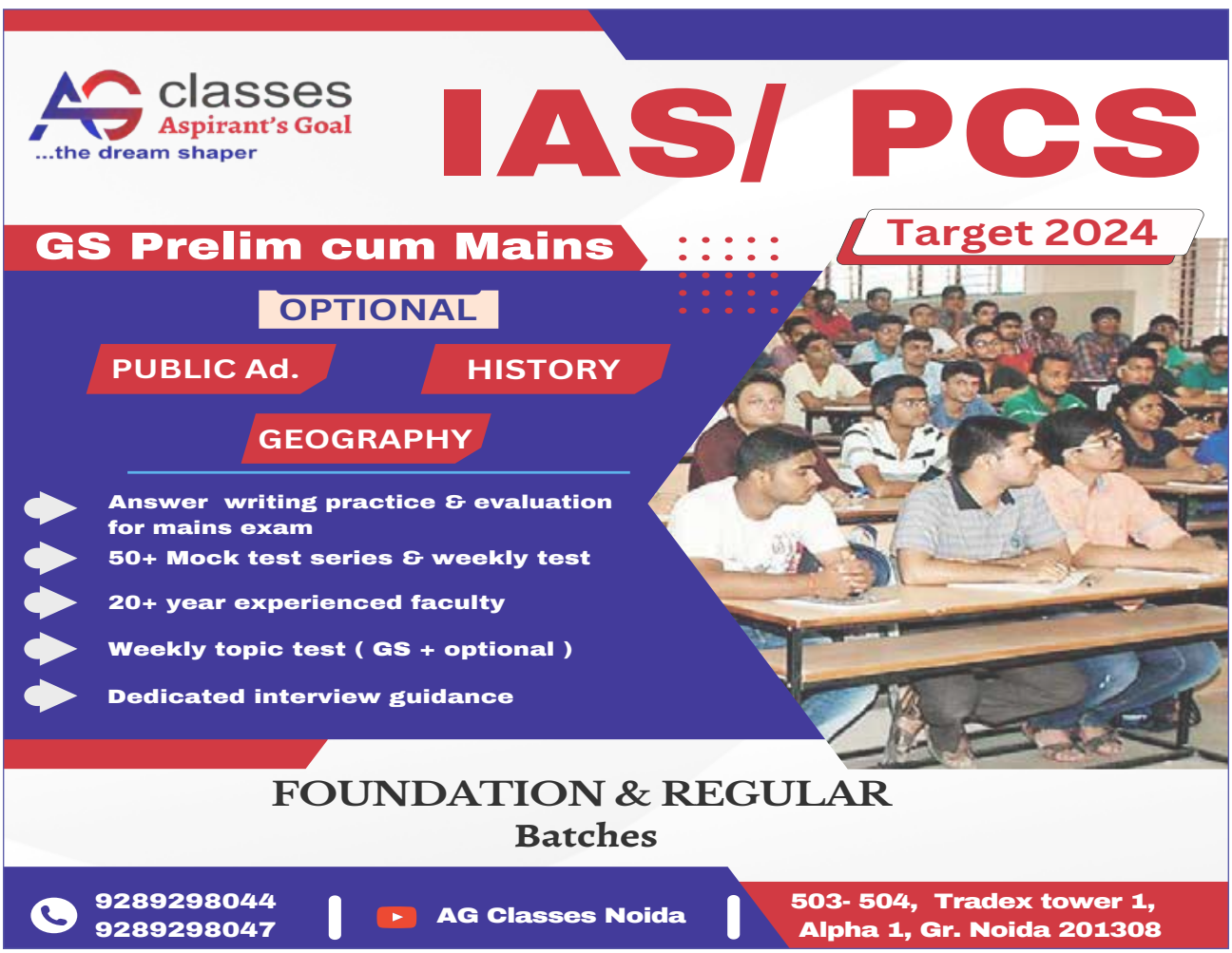
Besides self-reliance, India is the global leader in milk production for over a decade, with a total production of around 222 million tonnes in 2021-22. It makes up about 24 per cent of the total milk produced worldwide (931 million tonnes), while it was only six per cent of world milk production way back in 1973. Currently, India's milk production is growing at the rate of six per cent, whereas the global growth rate is around two per cent. The average per capita availability of milk worldwide is 308 grams, whereas in India it was 444 grams in 2022. This success, often referred to as 'White Revolution', has transformed the dairy sector into a most economically relevant enterprise, especially in rural areas. Around 80 million families are getting employment directly from the dairy sector, the majority of whom are small and marginal farmers, and landless households. Milk production in India is expected to reach 628 million tonnes in 2047, while demand for milk and dairy products is also expected to reach 517 million tonnes, which leaves 111 million tonnes of milk as surplus for export.

Moving to another colour of the spectrum, the 'Blue Revolution' signifies a surge in fisheries production attained after independence. Due to consistent efforts and promotional policies, India now stands as the second largest fish-producing country in the world, accounting for 7.58% of global production. In 1950-51, the total fish production was 0.752 million tonnes, which has now reached 16.3 million tonnes (2021-22) with an annual compound growth rate of 4.42 per cent. Currently, India is also a leading seafood exporter in the world. The fisheries sector provides livelihood to about 16 million fishermen and fish farmers at the primary level. The Government of India implemented a notable scheme called – 'Blue Revolution' —Integrated Development and Management of Fisheries for a period of five years (2016-16 to 2019-20). It focused mainly on increasing fisheries production and productivity in the inland and marine sectors of the country. The country has witnessed another revolution in the poultry sector by becoming the third-largest producer of eggs in the world. Often referred to

as the 'Silver Revolution', the country is currently producing 1,29,600 million eggs (2021-22), while it was 1,832 million during 1950-51.

Way Forward

The agriculture sector is experiencing several challenges in the form of climate change, deteriorating natural resources, low fertility and low productivity, and increasing demand for quality produce. To address such challenges and make Indian agriculture future-ready, the Government has taken initiatives like National Mission on Sustainable Agriculture, Agri-Tech Infrastructure Fund, Paramparagat Krishi Vikas Yojana, Rashtriya Krishi Vikas Yojana on a national platform. Such initiatives are promoting the application of science and technology in fields and farms with infrastructure support and market linkages to increase productivity and profitability. While natural farming is the new mantra, emerging technologies such as drones, remote sensing, precision agriculture, and IT applications are also finding their way into modern agriculture. As a recent phenomenon, agri-startups are providing farm solutions to farmers, mostly on a real-time basis, by employing digital tools and innovations. Various digital initiatives are also supporting farmers in the fields to increase efficiency and lower the cost of cultivation. To enhance the income of farmers, the Government has taken several initiatives across the agriculture and allied sectors spectrum. From direct financial support to crop insurance and institutional credit, farmers are at the core of income-enhancing schemes. Under the National Agriculture Market National Agriculture Market (eNAM) initiative, markets across the nation are now enabling farmers to get the best prices for their produce. Rising from self-reliance, Indian agriculture is now moving forward to become a global powerhouse of agriculture. ❑



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SWEET REVOLUTION A BOOM IN HONEY PRODUCTION



Sweet Revolution is an initiative of the Government of India, which is aimed at promoting apiculture, popularly known as 'beekeeping', for accelerating the production of quality honey and other related products. Beekeeping is a low-investment and highly-skilled enterprise model, in which technology application has emerged as a great enabler for socio-economic growth. To provide a booster shot to Sweet Revolution, the Government launched the National Beekeeping and Honey Mission, for the overall promotion and development of scientific beekeeping in mission mode.

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India has witnessed the exemplary fast-paced growth of beekeeping as an agro-based subsidiary occupation. In India, beekeeping is practised in mountains, foothills, forests, agricultural lands, mangrove forests, etc. The technique involved in beekeeping varies from region to region. The main harvest is from *Apis dorsta*, *Apis cerana,* and *Apis mellifera*. *Apis mellifera* was successfully introduced in the Northern and Eastern plains of India. Management technology schedules have evolved for specific locations in the country. The emphasis is given in the context of changing conditions of vegetation and climate. Besides the seasonal management for each agro-climatic region, suitable management technologies have been adopted to improve colony productivity and the production of honey, beeswax, pollen, royal jelly, etc. Today, beekeeping is an important, sustainable, and integral agricultural activity under the rural development programme in India since it provides nutritional, economic, and ecological security and balance. The knowledge of agro-climatic conditions, the diversified flora, the changing agri/horticultural pattern of the crop, the



types of bees, the management practices, etc. play a pivotal role in transforming the beekeeping industry in the country.

Apiculture is the practice of keeping and managing honeybees for the production of honey and other related products. Honey is a natural sweetener that has a variety of health benefits. The product is also used for manufacturing other products, such as beeswax, royal jelly, propolis, and pollen. The components of apiculture include bee colonies, beekeepers, beekeeping equipment, and the products produced from the bee colonies. Bees also play a crucial role in pollination, which is essential for growing crops and fruits. In comparison to other forms of agriculture, apiculture requires less land and water and has a lower carbon footprint. Bees are accommodated in artificial hives where they live comfortably within easy reach of the beekeeper for examination and extraction of surplus honey, after keeping sufficient in the combs for the bees. Honey is a product of bees, which gather sugar-containing nectar from flowers. Honey should be processed as soon as possible after removal from the hive. Honey processing is a sticky operation, in which time and patience are required to achieve the best results. Careful protection against contamination by ants and flying insects is needed at all stages of processing. Several small-scale industries depend on bees and bee products.

History of Beekeeping

Primitive people used to rob bee colonies found in the cavities of hollow trees, on rocks, and in traditional mud houses, and this is still being followed by some tribes. There was no development in beekeeping until the 16th century. Proper beekeeping started only when man started giving protection to colonies found in nature. The idea to keep bees in log hives has been reported to have come from fallen trees that were nested by cavity-nesting bees. The development of modern beekeeping has its origins between 1500 and 1851, when many attempts were made to domesticate bees in different types of hives but were not successful because bees attached their combs together as well as to the walls of the hive, and the combs required had to be cut for honey. The discovery of the principle of bee space in 1851 by LL Langstroth in the USA resulted in the first truly movable frame hive. This was followed by subsequent innovations like the comb foundation mill, honey extractor, smoker, etc., which helped in the development of modern beekeeping we see today.

Beekeeping in India

In India, the first attempt to keep bees in movable frame hives was made in 1882 in Bengal, and then in 1883-84 in Punjab. In South India, several beekeepers were trained during 1911-1917, and a hive for the indigenous bee *Apiscerana was* devised based on the principle of bee space. Beekeeping was also started in the then Travancore State in 1917 and in Mysore in 1925. In Himachal Pradesh, modern beekeeping with the indigenous honey bee *A. cerana* started in 1934 at Kullu, and in 1936 at Kangra. The exotic bee *A. mellifera* was successfully introduced for the first time in India in 1962 at Nagrota Bagwan (then in Punjab and now in Himachal Pradesh) because this bee has the potential to produce more honey. At present, both hive bee species are being used in modern beekeeping, and a lot of honey is also being collected from the wild bees, viz. *A. dorsata* and *A. florea*. India produces approximately 70000 metric tonnes of honey annually from all four species of honey bees.

Honey is rich in nutrients and antioxidants, has antibacterial properties, and can play a role in diabetes management as part of a balanced diet. The product also has several potential health benefits and plays a role in many home remedies and alternative medicine treatments. Apart from being

delicious, there are other ways raw honey is good for everyone. Beekeeping is a significant, sustainable, and environmentally sound activity involving the integration of forestry, social forestry, and Agricultural supporting activities since it provides nutritional, economic, and ecological balance while providing employment and income. India has good potential for beekeeping and to become a major honey-exporting nation. Honey production provides a sustainable income source, requiring only low-cost investment and using the natural resource base. Honey is among the most popular and widely used sweeteners, with enormous health benefits. Besides, it is used by several cultures around the world as a base for many traditional medicines, especially in Ayurveda.

The major geographical regions facilitating beekeeping development are classified into the Southern peninsular region, the Northeast region, Indo Gangetic plains, and the Northern Hill region.

Sweet Revolution

Sweet Revolution is an ambitious initiative of the Government of India, which is aimed at promoting apiculture, popularly known as 'beekeeping', for accelerating the production of quality honey and other related products. Beekeeping is a low-investment and highly skilled enterprise model, in which technology application has emerged as a great enabler for socio-economic growth. The demand for good quality honey has grown over the years as it is considered a naturally nutritious product. Other apiculture products such as royal jelly, beeswax, pollens, etc., are also used extensively in different sectors like pharmaceuticals, food, beverage, beauty, and others. Scaling up beekeeping will increase farmers' income, generate employment, ensure food security and bee conservation, and increase crop productivity and pollination. To provide a booster shot to Sweet Revolution, the Government launched the National Beekeeping and Honey Mission, for the overall promotion and development of scientific beekeeping in mission mode.



Government Initiatives

The Prime Minister called upon a farmer's gathering on 17 September 2017 at Amreli (Gujarat) to take up honey farming at a massive scale to bring 'Sweet Revolution' in the country along the lines of the White and Green Revolution. Keeping in view the importance of beekeeping and achieving the goal of 'Sweet Revolution' the need for holistic development of beekeeping was felt. Accordingly, a new Central Sector Scheme National Beekeeping and Honey Mission (NBHM) for the overall promotion and development of scientific beekeeping and production of quality honey and other beehive products is approved by the Government of India. The scheme is being implemented through the National Bee Board as a Central Sector Scheme (100% funded by the Govt. of India). The main objective of the National Bee Board (NBB) is the overall development of Beekeeping by promoting Scientific Beekeeping in India increasing the productivity of crops through pollination and increasing honey production for increasing the income of beekeepers/farmers.

The National Beekeeping and Honey Mission (NBHM) is having following Sub-Schemes/three Mini Missions-

A. **Mini Mission-I:** Under this mission, the thrust will be given to the production & productivity improvement of various crops through pollination assisted by the adoption of scientific Beekeeping;

B. **Mini Mission-II:** This mission will concentrate on post-harvest Management of beekeeping and beehive products including collection, processing, storage, marketing, value addition, etc., with a thrust to develop requisite infrastructural facilities for these activities; and

C. **Mini Mission-III:** This mission will concentrate on Research and Technology generation for different regions/States/Agro-climatic and Socio-Economic conditions.

The NBHM will work in coordination with other Governmental programme and scheme relating to the promotion of beekeeping, viz., MIDH RKVY, Honey Mission of WIC, MSME, NLRM/SLRM, M/o rural development, M/o EF&CC, M/o Tribal Affairs, M/o Commerce & Industries, AYUSH, ICAR, etc., for overall promotion and development of scientific beekeeping in the country. It will provide technical guidance/advice and administrative support to the implementing agencies at the National and State Levels for an effective and smooth implementation of the scheme. Concentrated efforts through NBHM increase honey production by about 1,33,200 Metric Tonnes as per 2021-2022 and advanced estimates. India has exported 74413 Metric Tonnes of natural honey to the World, worth Rs 1221 crore during 2020-2021. As a result, India is among the world's top five honey producers. The Madhu Kranti Portal for ensuring the source of honey was launched in April 2021. It's a result of the best implementation of NBHM. More than 10,000 beekeepers and honey societies/farms/companies with 16 lakh honey bee colonies are registered with National Bee Boards and linked to the Madhu Kranti Portal.

Till now, 16 integrated Beekeeping Development Centres (IBDCs) & 3 regional honey testing labs (at IARI, New Delhi, IIHR Bangalore IIVR, Varanasi) and 28 mini labs in the different agroecological regions have been established. ICAR, New Delhi, also promotes location- and situation-specific research on important issues through all India-coordinated research projects on honey bees and pollinators (26 centre spread over different agro-ecological regions of the country).

The scientific technology is being adopted for increasing production and testing of honey



by maintaining quality standards for National and International markets and promoting the production of other beehive products, viz., bee pollen, bee bags, royal jelly, propolis, and bee venom. This has facilitated the beekeepers to increase their income and increase demand for honey and beehive products both in domestic and international Markets.

Technology Application

The intervention of technology in bee farming will help scale up the sector and promote entrepreneurship. The development of an organised bee-farming sector, from local to high-tech apiaries, can play a significant role in this regard. IoT, AI, mobile sensors, and smartphone apps can help beekeepers raise healthy bee colonies and extract quality honey and other products. Algorithm-based predictive models could be designed for commercial beekeepers to provide operational support for large-scale apicultural practices. The development of cost-effective indigenous technology that enables farmers to raise healthy bees on farms and assess their hive fitness through sensors or cloud information can also be introduced to this sector. Technology will preserve and support bee conservation, prevent diseases, or the loss of bee colonies, and provide bumper quality and quantity of apiculture products. Hi-tech apiaries for commercial bee farming will lead to the manufacture of high-volume marketable products. Good farming practices will yield superior-quality honey and other products for domestic as well as international markets. Research in the fields of beekeeping, bee behaviour, etc., will increase the scope for commercial rearing of healthy bee colonies and apiculture products.

Over the years, the traditional beekeeping business has evolved in terms of technology. One example is the usage of the 'super' chamber for extracting honey. We can take around 70-80 kg of honey from a single hive if we use the super chamber. Usual hives without the super chamber yield only about 10-15 kg. There is also a new queen bee-rearing technology.

An organised and tech-driven bee-farming sector is an excellent way to generate employment opportunities, through skill-building projects. It will also help attain Sustainable Development Goals 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being), and 15 (Biodiversity and Vibrant Ecosystem). ❑

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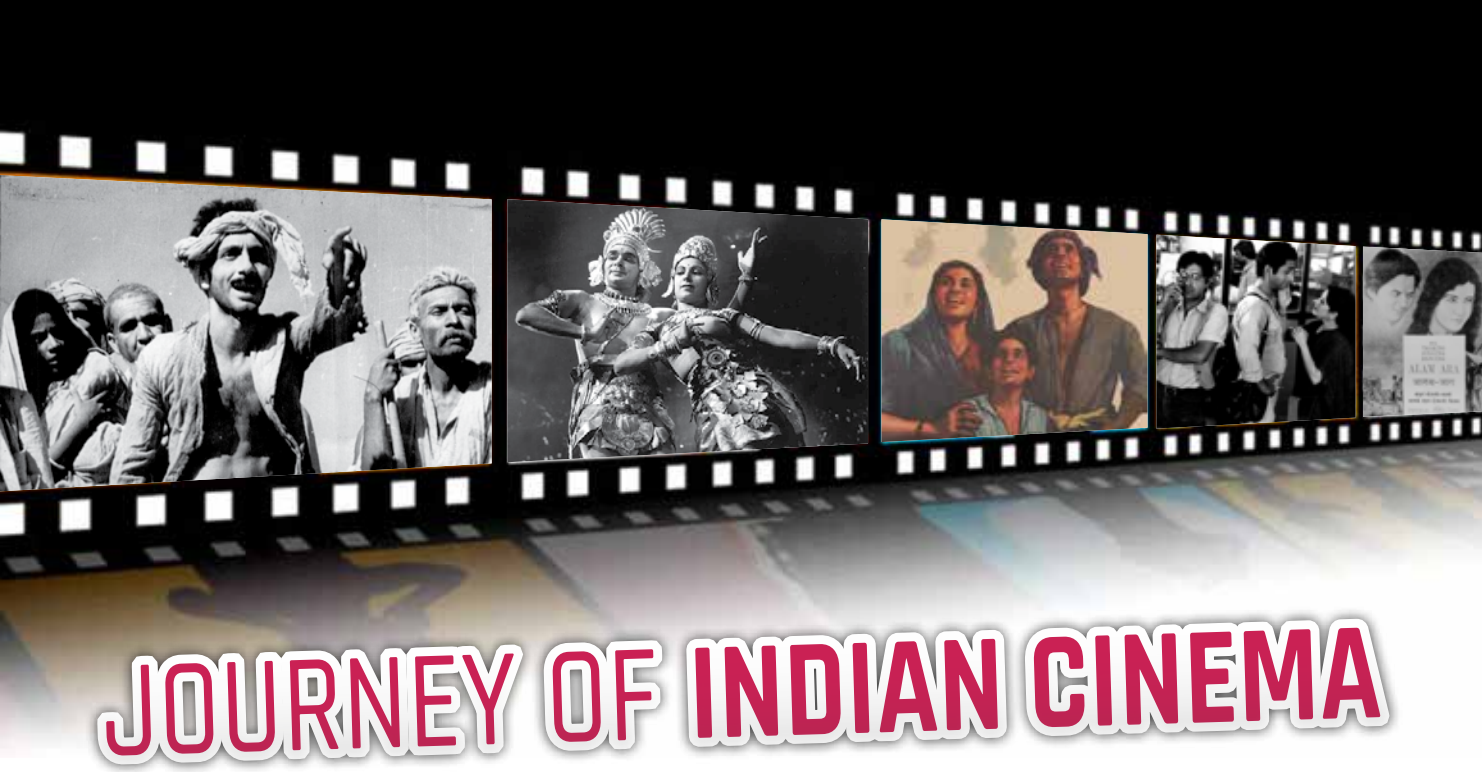
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YE-2398/2023



JOURNEY OF INDIAN CINEMA

Mainstream Indian cinema since its inception has been deeply impacted by India's theatre tradition of Bharat Muni's *'Natyasastra'*. Due to its spread since the early '40s, Hindi cinema started to establish itself as the biggest representative of 'Indian' cinema. Satyajit Ray's Bengali film Pather Panchali is, to date, the biggest landmark of Indian cinema. The 1950s show a flurry of Indian films making entry in foreign film festivals, bringing laurels to the country, which heightened in 1957. Based on the recommendation of the S K Patil Film Enquiry Committee set up in 1951, the Film Finance Corporation (later the National Film Development Corporation) was set up in 1960 to encourage artistic talent in filmmaking. After seven and a half decades, Indian cinema is reinventing itself to embrace technology and explore OTT platforms.

AMITAVA NAG

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On 22 March 1895, for the first time in the history of mankind, a film screening was organised. It was in Paris that the Lumière brothers, Auguste and Louis, privately screened a single film, *La Sortie de l'usine Lumière à Lyon,* in front of a small audience. They followed that up with a commercial screening of ten short films on 28 December the same year. The films travelled the world, and within six months, 'cinema' reached India. The films were screened in Bombay first, followed by Calcutta and Madras. The Indian film industry, mainly in the metropolitan cities, flourished, and the first feature film, expectedly a silent one, *Raja Harishchandra* by Dada Saheb Phalke, was released in 1913. Indian cinema since then has grown steadily, and in 1931, with Ardeshir Irani's *Alam Ara,* the reign of talkies took over.

Mainstream Indian cinema since its inception has been deeply impacted by India's theatre tradition of Bharat Muni's '*Natyasastra*'. This form of music and dance is vastly different from Western



theatrical forms. As a result, Indian mainstream cinema, from its inception, thrived on elaborate and intricate music and dance numbers – sometimes even going to absurd proportions. JJ Madan's 1932 film *Indrasabha*, for instance, had around 70 songs in a film that ran close to four hours. As the studio system developed, the 'star' was born on the Indian screen.

During World War II, when the majority of Europe was reeling, the Indian market was flooded with cash. Overnight producers came into the mix, production increased, and the mainstream was trying to come up with a magic 'formula' for commercial success that included a liberal usage of songs, dances, and soon, fight sequences. The '*masala*' Indian commercial film was soon to be born.

Due to its spread since the early '40s, Hindi cinema started to establish itself as the biggest representative of 'Indian' cinema. Panna Shah's book 'The Indian Film' (1950) mentions that in 1945, out of a total of 99 films, the number of Hindi films was 73 (74%), followed by 12 Tamil, nine Bengali, four Telugu, and 1 Kannada film. In the three previous years as well, the number of Hindi films was 99 out of 165 (60%), 98 out of 149 (66%), and 88 out of 124 (71%) in 1942, 1943, and 1944, respectively. In 1947, after the Partition, though Punjab didn't have a thriving, prominent film industry, Bengal did. The Partition meant that the Bengali film industry's market was reduced to less than half of its original size. Technicians and directors, including the likes of Bimal Roy, Salil Chowdhury, and Hrishikesh Mukherjee, among others, moved to Bombay in search of greater opportunities and a wider circulation of their films.

The growth of the pre-independent Indian film industry was disorganised and haphazard. For a heavily technique-oriented medium, only an elite few had the luxury of acquiring training on foreign shores. In a popular English daily, Satyajit





Ray wrote in 1948, "What the Indian cinema needs today is not more gloss, but more imagination, more integrity, and a more intelligent appreciation of the limitations of the medium... What our cinema needs above everything else is a style and idiom, a sort of iconography of cinema, which would be uniquely and recognisably Indian." Ray, along with his friends Chidananda Dasgupta, RP Gupta, Harisadhan Dasgupta, and others, founded the Calcutta Film Society the year prior. It was India's first film society for feature films, although one founded by documentary filmmakers was set up in Bombay in 1942. In the next three decades, film societies were set up all across the country with the aim of discussing cinema as an art form and thereby making the audience aware of its potential and creative possibilities. That most such societies soon limited their discussions to foreign language films, ignoring the Indian ones, is a misfortune for which they lost relevance thereafter.



Chetan Anand's *Neecha Nagar* and KA Abbas's *Dharti ke Lal*, both made in 1946, were not attempting more 'gloss', they were indeed striving to be 'uniquely and recognisably Indian', as per Ray. Incidentally, *Neecha Nagar* became the first Indian film to gain recognition at the Cannes Film Festival – it shared the Best Film award with several other films at the first Cannes Film Awards in 1946. In 1948, Uday Shankar's graceful yet somewhat chaotic *Kalpana* opened the possibilities of dance-musical as a genre of Indian cinema instead of endless dance numbers to titillate the audience. However, India's biggest moment of triumph came in 1955 with Ray himself, but this time as a film maker. Satyajit Ray's Bengali film *Pather Panchali* is, to date, the biggest landmark of Indian cinema. It is the tallest international milestone whose films were and continue to be made in India.

The 1950s show a flurry of Indian films making entry in foreign film festivals, bringing laurels to the country, which heightened in 1957.



Ray's second film, *Aparajito* (a sequel to *Pather Panchali*), won eleven international awards, including the Golden Lion and Critics Award at the Venice Film Festival - the first film to win both. Amit Maitra and Sombhu Mitra's Bengali film *Ek Din Ratre* bagged the Crystal Globe Grand Prix at the Karlovy Vary International Film Festival the same year. Another Bengali film, Tapan Sinha's *Kabuliwala,* won the Silver Bear Extraordinary Prize of the Jury for music, also in 1957! V Shantaram's Hindi venture, *Do Aankhen Barah Hath,* won the Silver Bear - Extraordinary Prize of the Jury at Berlin the following year. Undoubtedly, it was Bengali cinema of the 1950s whose deep sensitivity and commitment to artistic awareness were pivotal in Indian cinema's quest for creative excellence.



In parallel, there were a few essential and critical initiatives taken by the Government of India. Based on the recommendation of the SK Patil Film Enquiry Committee set up in 1951, the Film Finance Corporation (later the National Film Development Corporation) was set up in 1960 to encourage artistic talent in filmmaking. In the same year, the Film Institute of India was established in the premises of the former Prabhat Studio, Pune. Four years later, the National Film Archive of India was founded with the primary focus of tracing and preserving the heritage of Indian cinema.

The importance of these governmental agencies is monumental. Two films produced by the Film Finance Corporation, Mrinal Sen's *Bhuvan Shome* and Mani Kaul's *Uski Roti,* heralded the New Wave of Indian cinema in 1969. Incidentally, Kaul was a graduate of the Film Institute which soon presented India, in the form of Kumar Shahani, Adoor Gopalakrishnan, Girish Kasaravalli, and others, with an array of daring and expressive filmmakers who extended the country's cinematic boundaries. While the film societies were engaged in nurturing the audience, albeit only a privileged section, the Film

Institute was the platform for technical training that was non-existent earlier, and the Film Finance Corporation funded several such off-the-mill initiatives of not only the Film Institute graduates but other filmmakers committed to a different aesthetic expression in cinema.

These three, in tandem, though not through conscious agreement, converted the ripples sporadically present in Bengali and Hindi cinema to a mass wave of national cinema since 1969. Important films started being made in several other languages, which until that time were mostly engaged in commercial ventures alone. New cinematic endeavours in Marathi, Kannada, Malayalam, Manipuri, Assamese, and Odia started gaining prominence. Aribam Syam Sharma's *Imagi Ningthem* (1981), for example, first placed the cinema of northeast India on a world stage. Along with the explosion, through the next two decades, the subject of cinematic exploration widened as well.

In the mid '70s, popular mainstream cinema saw the emergence of the 'angry young man,' who was there to reclaim justice for him and his likes. The terms 'underworld' and 'gangsters' found their place in the vocabulary of Indian cinema. Over time, from the likes of 'Mogambo, khush hua' in *Mr India* (1987) to Bhikhu Mhatre's 'Mumbai ka king kaun?' in *Satya* (1998), Indian mainstream cinema travelled from the unreal to the parareal.

While the cinema of the '50s to a large extent symbolised the migration from the rural to the urban space, in parallel throughout the decades, Indian cinema also evolved in its representation of women. From the uncertainties faced by the working woman in Satyajit Ray's *Mahanagar* (1963), the docile heroine in Bimal Roy's *Sujata* (1959), to a more self-assured Savitri in Umbartha (1982), or later, Rani in *Queen* (2014).

The Elephant Whisperers (2022) is the first Indian documentary to win the Academy Award for Best Documentary Short Film at the 95th Academy Awards. In a country that has produced the highest number of films worldwide for decades, an attempt to recognise a trend across geographies and languages is a difficult task.

India also has a long history of progression in documentaries, short films, and animation.

In the last seventy-five years, the representation of nationalism has also evolved significantly. Apart from the patriotic films before and after Independence, a few others, e.g., *Mother India* (1957), wished to portray the developmental efforts of an emerging nation. With the turn of the millennium, the spirit of patriotism was rekindled through sports, with Hindi films addressing a pan-Indian audience in *Lagaan* (2001), *Chak De! India* (2007), and through biopics of eminent sportspersons. ❑

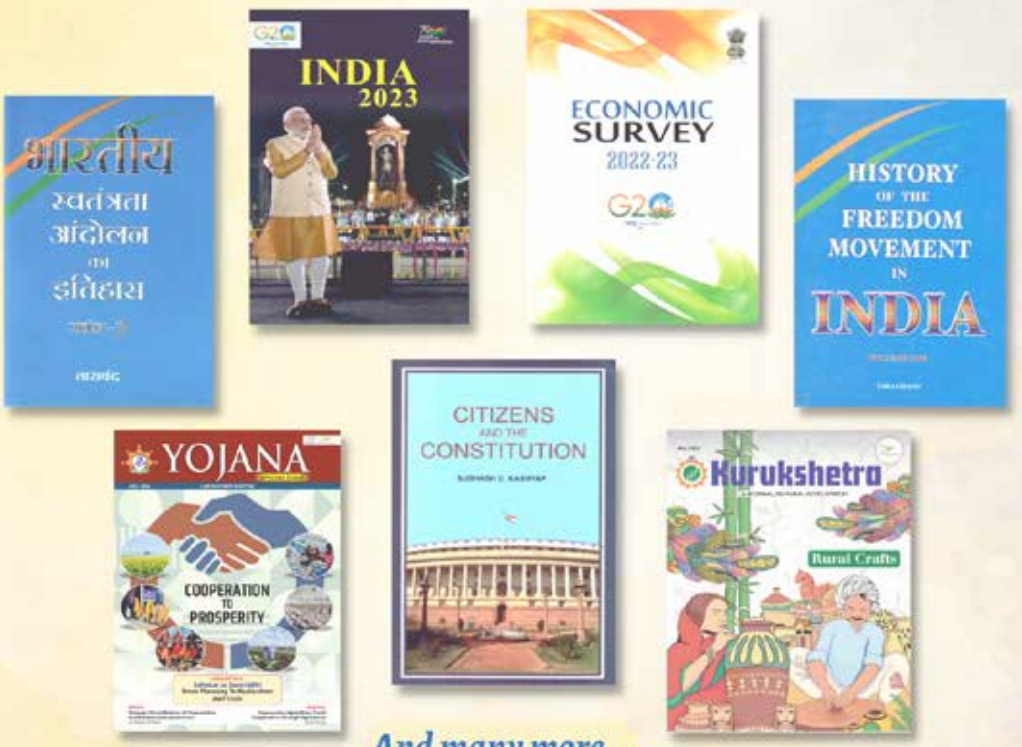
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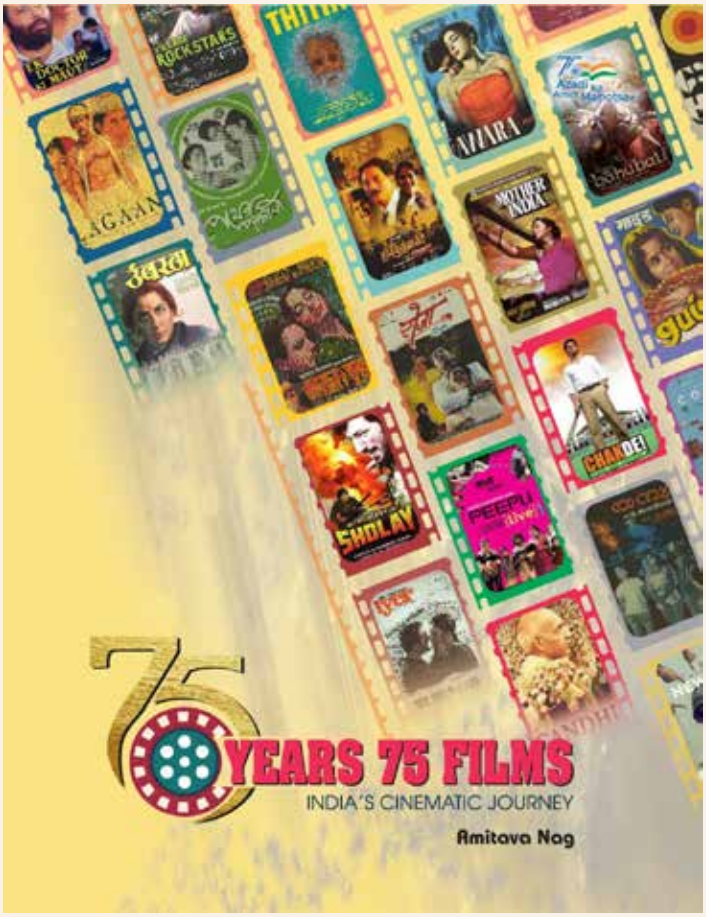
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Author: Amitava Nag
Price: Rs 820, Language: English



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ISSN-0971-8400
Total pages - 72
Published on 23 July, 2023
Posted on 25 & 26 July, 2023

RNI No. 949/57
U(DN)-56/2021-23 licenced to post without pre-payment at RMS, Delhi.
Postal Registration No. DL(S)-05/3230/2021-23.
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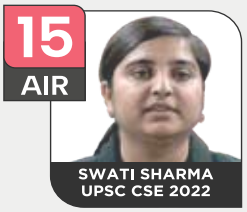
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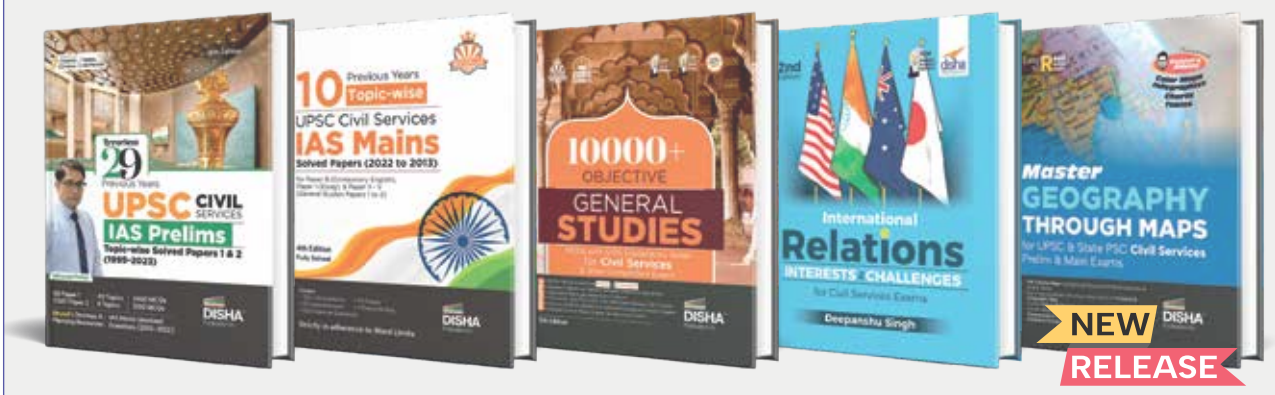








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