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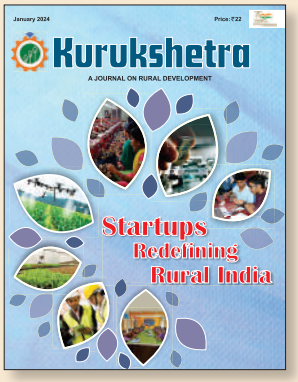
Startups Redefining Rural India





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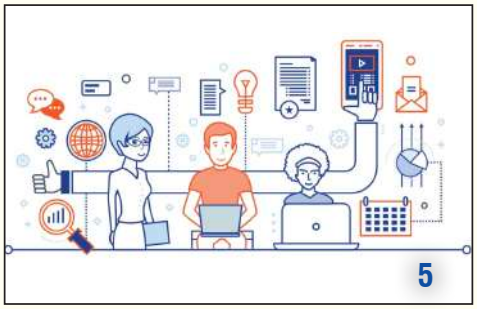
Contents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44

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Editorial

The startups are an exemplar that great things are done by a series of small things brought together. The pulse of innovation in a country teeming with entrepreneurial fervor beats much beyond its urban boundaries. Entrepreneurs are fostering a revolution not only in urban areas but also in rural India's heartlands. The new wave of entrepreneurs and startups has taken upon themselves to lead the way for transforming the Rural India. This transformation, rooted in innovation and resilience, is shaping the contours of progress, underscoring the theme: Startups - Redefining Rural India.

The article **'Reform, Perform & Transform through Agri-Startups'** explains how in the realm of Indian agriculture, startups emerge as beacons of hope for farmers facing challenges. The authors provide insight about the rising proliferation of Agri-Startups and their potentialities in leverage technology and instigate positive reforms. This comprehensive article further discusses about the Government's proactive policies in Rural India fostering the growth and spirit of entrepreneurship.

The food processing sector is extremely vital for an agrarian country like India. The article **'Redefining Food Processing Sector through Startups'** endeavours to evaluate the growth chart of the food processing sector in India and the enhanced contribution of startups to this growth story. The author emphasises that for startups in the food processing sector to flourish, backward linkages with agriculture, fisheries, dairying, animal husbandry, etc. need to be strong.

This issue of Kurukshetra also delves into the inspiring narratives of startups that are not only thriving but also actively contributing to the transformation of rural India in the articles, **'Startups: Towards Rural Water Security' and 'Championing Social Startups for Rural Development'.** These articles examine that there has been a surge in the number of commercial and social enterprises addressing rural India's concerns.

Drones are making headlines for various reasons, including their potential to revolutionise Indian agriculture and rural economies. The author of the article **'Drone Revolution: Changing the Face of Rural India'** elaborates how the Government is actively promoting a drone culture nationwide, and the field is witnessing remarkable innovations, ranging from cost-effectiveness to enhanced manageability and multipurpose functionality. India is about to witness a drone revolution that might change the rural economy and have a significant positive influence on millions of lives.

It becomes evident as we read through these insightful articles from subject experts that entrepreneurs are not only the agents of change but also the designers of a more promising and inclusive future for rural India. Come celebrate with us the spirit of entrepreneurship that is redefining the fundamental fabric of rural life.

With this issue, we wish our readers a very happy and prosperous 2024. Happy reading.

Redefining Rural Landscapes

Startups Paving the Way for Inclusive Development

Riding on the digitisation wave, India has seen growth in startups catering to rural needs. With a customer base of 100 crore, rural India presents a massive opportunity for startups, especially in sectors like agritech, food processing, edtech, skill development, e-commerce, health-tech, renewable energy, handicrafts and traditional arts, and fintech.

*** Rohit Gupta**
**** Ashish Pandey**

Startup ecosystem of India has witnessed remarkable growth in the recent years, with a surge in innovative ventures addressing diverse challenges. India is the 3rd largest startup ecosystem in the world, with more than 1 lakh registered startups (DPIIT – Startup India). Traditionally centered in urban hubs, the startup culture is now permeating the hinterlands, ushering in a new era of innovation and economic transformation. This phenomenon reflects a broader trend of decentralisation and inclusivity, where startups are leveraging technology to bridge the rural-urban divide.

The current scenario witnesses a surge in startups catering to rural needs, ranging from agritech and e-commerce platforms to healthcare and education services tailored for rural communities. These ventures not only address local challenges but also create employment opportunities, fostering sustainable development. The startup ecosystem as a whole, especially in rural areas, has seen unprecedented

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growth with a big Government push since 2014, when the government launched schemes like Startup India, Atal Innovation Mission (AIM), MeitY Startup Hub (MSH), BIRAC, and DST-supported schemes, among others. Many schemes were curated, especially to encourage rural entrepreneurship. Some of these schemes are listed below:

1. **Atal Community Innovation Centres (under Atal Innovation Mission)** – AIM's ACIC initiative was launched in 2020, with the objective of creating community innovation centres for rural entrepreneurs. The initiative encourages grassroots innovation and directly supports community-based entrepreneurs by establishing enabling infrastructure in Academic Institutions and NGOs. Till now, AIM has established 14 ACICs across the country that have cumulatively supported more than 200 community-based startups.

2. **Start-up Village Entrepreneurship Programme** – Ministry of Rural Development is implementing Startup Village Entrepreneurship Programme (SVEP) as a sub-scheme under the DAY-NRLM with the objective of helping the rural poor to set-up enterprises at the village level in non-agricultural sectors. A total of 1,97,168 enterprises across 23 States/UTs have been supported so far.

3. **Skill India Mission** – Under this mission, Ministry of Skill Development and Entrepreneurship (MSDE) has been delivering skills through various schemes viz. the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and the National Apprenticeship Promotion Scheme (NAPS), among others, majorly to rural youths across the country. Third party evaluations of these schemes have shown that 70.5% of PMKVY 2.0 beneficiaries (2016-20) received placement in their desired skill sector.

4. **ASPIRE** – The scheme implemented by Ministry of MSME aims to provide training and incubation support to prospective entrepreneurs in agro-rural sector through Livelihood Business Incubators (LBIs). As of FY 2022, 61 LBIs have become functional in the country. A total of 54,801 people have been trained in LBIs across the country, out of which 15169 trainees became self-employed and 8928 trainees got employed in other entities.

Startsups in Rural India

Life away from Metros

More than 100 crore Indians, or around 65% of India, live in rural areas. A total of 63% of workers in rural areas are self-employed, 1.6 times that of urban areas, mostly in agriculture and allied sectors. This aspect defines the rural community and has huge significance in the rural way of life. The challenge for startups is to understand the intrinsic values of rural India and make products and solutions that build trust among the people, cater to their needs and aspirations, while simultaneously creating employment opportunities for them. While branding and marketing may work for startups in urban areas, trust and word-of-mouth publicity have always worked better for established companies and may hold true for startups operating in rural India as well.

Role of Digitisation

Internet penetration and data accessibility have a huge role to play in developing startup ecosystems. India has one of the cheapest data rates in the world (USD 0.17 for 1 GB). Over 50% of Indians are internet users, out of which around 40 crore people reside in rural areas . By 2025, India will have 90 crore active internet users, and 56% of the new internet users will be from rural areas. Every farmer added to the digital ecosystem presents an opportunity for the application of new agri-based solutions; every rural-based resident added presents an opportunity for financial inclusion; and every Tier 2/3 city resident added presents an opportunity for e-governance and e-commerce platforms. The digitisation of rural areas has been bolstered with government schemes like BharatNet, Common Service Centers (CSCs), Digital India Campaign, Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGdisha), and Digital Finance for Rural India, along with a vibrant private telecom sector.

Riding on the digitisation wave, India has seen growth in startups catering to rural needs. With a customer base of 100 crore, rural India presents a massive opportunity for startups, especially in sectors like agritech, food processing, edtech, skill development, e-commerce, health-tech, renewable energy, handicrafts and traditional arts, and fintech.

Types of Rural Startups

Founders based in urban areas with solutions catering to rural areas: In this category, startups are founded by individuals from urban areas who identify and address the unique challenges faced by rural communities. These entrepreneurs leverage their urban upbringing, access to resources, and exposure to technology to create innovative solutions tailored to rural needs. This approach often involves bridging the gap between urban and rural lifestyles by introducing technology-driven initiatives in areas such as agriculture, healthcare, education, and infrastructure. Examples include online platforms connecting farmers with markets, telemedicine services, and digital learning solutions for rural students. The key trait of these startups is that they tend to disrupt an organised industry and bring efficiency to traditional processes.

Founders belonging to rural areas with solutions catering to rural areas: Startups in this category are founded by individuals who have a deep understanding of rural life, having grown up in rural areas themselves. These entrepreneurs leverage their firsthand knowledge of local challenges, cultural nuances, and community dynamics to develop solutions that resonate with and directly address the needs of rural populations. Their solutions are often rooted in a deep appreciation for local traditions and sustainable practices. Examples may include ventures focused on agricultural innovations, rural craft preservation, and community-centric initiatives that enhance the overall quality of life in rural areas. The key trait of these startups is that they aim at improving earning of rural households, giving them visibility on national and global platforms through increased market access.

Self-Help Groups: Self-help groups (SHGs) represent a unique form of rural entrepreneurship, where individuals within a community come together to create a collective entity. These groups pool their resources, skills, and talents to initiate income-generating activities and address common challenges. SHGs often focus on activities like handicrafts, small-scale agriculture, and micro-enterprises. Startups emerging from SHGs can be collaborative in nature, with a shared sense of responsibility and a focus on community development. The emphasis is on empowering individuals within the group to uplift the entire community economically and socially. Anand Milk Union Ltd. (AMUL) is one of the most successful enterprise built on this model.

Micro, Small, and Medium Enterprises (MSMEs): MSMEs in rural areas encompass a diverse range of enterprises, including manufacturing, services, and trading. These enterprises are characterised by their relatively smaller scale and localised operations, catering to the specific demands of rural markets and also unlocking larger markets through economies of scale. MSMEs contribute significantly to employment generation and economic development in rural areas. They often focus on preserving local craftsmanship, promoting indigenous products, and providing essential services to the community. In India, over 6.3 crore MSMEs are estimated, out of which more than 50% are in rural areas .

Challenges for Rural Startups

1. **Connectivity with Suppliers in Urban Areas:** Rural startups often face challenges in establishing seamless connectivity with suppliers, partners, and other stakeholders based in urban areas. Limited infrastructure, including transportation and communication networks, can hinder the efficient flow of goods and services. This connectivity gap may result in delays, increased costs, and logistical complexities for rural startups, impacting their overall operational efficiency.

2. **Access to Financing:** Access to reliable and affordable financing remains a significant hurdle for rural startups. Financial institutions may be hesitant to invest in ventures located in remote areas, citing higher perceived risks and a lack of traditional collateral. The limited availability of banking services in rural regions exacerbates the challenge, making it difficult for startups to secure the necessary capital for business expansion, technology adoption, and infrastructure development.

3. **Lack of Support System and Ecosystem in Rural India for Startups:** Despite various rural entrepreneurship enabling schemes introduced by the Government of India in the last decade, there remains ample room for improvement in establishing the essential support structure and ecosystem for the development of rural startups. The absence/lack of mentorship, networking

opportunities, and incubation centres can impede the growth of rural startups. The dearth of experienced mentors and business incubators in proximity makes it challenging for entrepreneurs to receive guidance, access resources, and navigate the complexities of scaling a startup in rural India.

4. **Difficulty in Finding Early Adopters in Rural Areas:** Identifying and convincing early adopters is a critical phase for any startup. In rural areas, the challenge is amplified due to limited communication channels, lower income, and lower digital penetration. The traditional methods of brand communication such as word-of-mouth, community engagement, and local events become crucial.

5. **Limited Funding Mechanism in Rural Areas:** Despite gaining a customer base in rural areas, startups struggle with a virtually non-existent funding mechanism locally. The disparity is noticeable in the concentration of startup funding primarily within major urban centres such as Bangalore, Delhi, and Mumbai, collectively accounting for 92% of startup funding over the past nine years. Investors and venture capitalists tend to be concentrated in these urban centres, creating a significant gap for rural startups. This geographical imbalance limits the growth potential of rural startups, hindering their ability to scale operations and compete on a broader scale. This also leads to multiple rural startups with bright founders migrating to the bigger urban centres.

Important Startup Sectors in Rural Areas

S.No.	Startup Sector	Importance for Rural Areas
1.	Agritech	• Agritech startups leverage technology for precision farming, optimising resource use and increasing yields. Prominent examples include *Fasal* and *BigHaat*, which use artificial intelligence and data analytics for providing valuable information to the farmers. • SaaS based agritech startups like *Ninjacart, DeHaat,* and *Cropin* connect farmers directly with buyers/retailers/storage facilities, reducing dependence on intermediaries and ensuring fair prices. • Other agritech startups like *Khetigaadi* provide platforms where one can buy, sell, rent, compare, and review conventional farm machinery.
2.	Food Processing	• Food Processing startups like *Intello Labs* add value to raw agricultural produce, creating marketable products, and reducing post-harvest losses. • Processing enhances the quality and shelf life of products, especially for crops like millets, thus expanding their market reach. • Startups like *Millet Magic, Slurrp Farm,* and *Millet Amma* are actively working in this sector, encouraging farmers to shift from traditional cereals to millets.
3.	E-commerce	• E-commerce platforms provide rural businesses access to a larger customer base, boosting sales and income. • Startups like *Meesho* have partnered with M/o Rural Development to sell products of SHGs under NRLM on its platform.
4.	Edtech & Skill Development	• EdTech startups like *Learning Delight, Hippocampus Learning Centres, Sudiksha Knowledge Solutions, Paathshala Learning Solutions, and Classle* bring education in local languages to remote areas through digital platforms, addressing the rural-urban education divide.
5.	Health-tech	• Health-tech startups like *Medyseva, Gramin Health Care, Blackfrog Technologies, AI Health Highway, Hesa,* and *DigiQure* offer remote consultations, overcoming the lack of healthcare infrastructure in rural areas. • These startups provide health education and awareness programmes, addressing preventive healthcare.
6.	Renewable Energy	• Startups like *AgriVijay* provide renewable energy products for farmers and rural households offering range of products, including solar, biogas, electric, hydro, and wind energy. • Startups like *Agringenium Innovations Pvt. Ltd.* are harnessing agricultural waste for clean energy production, reducing dependence on traditional energy sources.

S.No.	Startup Sector	Importance for Rural Areas
7.	Handicrafts and Traditional Arts	• Startups in this sector contribute to preserving and promoting traditional crafts and arts. These startups also attract tourists, fostering cultural exchange, and economic growth. • Startups like *Peetal, Shilpkaari* and *ThinkGudd* provide training torural artisans, expanding their customer base and increasing income.
8.	FinTech	• FinTech startups facilitate digital banking and financial services, ensuring banking access for rural populations. • Examples include startups like *Aye Finance, BankSathi, BharatPe, KhataBook,* and *Propelld,* which are revolutionising access to financial services through online banking, offering a range of services such as investment platforms, Aadhaar Enabled Payment System (AEPS), digital ledger apps, and digital payment solutions.

Disclaimer: Atal Innovation Mission does not endorse any of the mentioned startups. The names are provided based on research and the success stories within the AIM ecosystem.

Atal Innovation Mission's Rural Startups Support Ecosystem – At a Glance

Established Incubation Centre

Access Livelihoods - promoting women entrepreneurship and digital financial inclusion in North Karnataka

Atal Community Innovation Centre

KL Startups Foundation conducting a Capacity Building Program on Crafts & Decors in a village in Krishna District, Andhra Pradesh

Atal Incubation Centre

Artisans being trained on social media skills by AIC-Catalyst incubated startup ThinkGudd

Conclusion

Migration of startups from rural areas / Tier 2 and Tier 3 cities to innovation hubs is an inevitable phenomenon, and while it cannot be entirely prevented, the key lies in establishing an enabling innovation ecosystem in rural areas. This ecosystem is crucial for sustaining early-stage challenges and overcoming the valleys of death that startups often face. The trajectory of a rural startup may not align with the conventional path to becoming unicorns. However, their significance lies in their potential to evolve into sustainable enterprises, which generate employment opportunities and align with the broader vision of Viksit Bharat. Therefore, fostering an environment that supports and nurtures the growth of startups, particularly in rural areas, becomes imperative for realising the USD 10 Trillion milestone by the year 2030. ❑

Reform Perform & Transform through Agri-Startups

The agricultural domain, encompassing crops, livestock, and fisheries, has experienced the emergence of numerous startups commonly referred to as 'agri-startups'. Enablers such as Incubators and Accelerators play a crucial role as key partners within the broader startup ecosystem, supporting and expediting the successful development of businesses. The Union Budget 2023 demonstrated a commitment to supporting agri-startups through increased allocations and targeted measures in the creation of rural infrastructure and development of agriculture and allied sector.

Shreya Anand and Dr. Souvik Ghosh

Startups are crucial in driving innovation, representing companies, partnerships, or temporary organisations specifically crafted to explore viable and scalable business models. During the startup phase, novel concepts are introduced to the market, evolving into economically sustainable enterprises. These newly established firms serve as vehicles for translating entrepreneurial insights into profitability. In the global context, the success of startups hinges on innovation as a fundamental cornerstone. India has earned a prominent position according to the established number of startups in the global startup community, ranking among the top five countries worldwide. An essential goal pursued by the Indian Government via its prominent 'Startup India' initiative is to integrate the Indian startup ecosystem with global counterparts, employing diverse engagement models. In 2021, India experienced the development of 46 unicorns (denoting new companies valued at $1 billion or more), positioning

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India as the third-largest unicorn hub globally, with a total of 90 unicorns, behind only the USA and China.

In the realm of Indian agriculture, startups emerge as beacons of hope for farmers facing challenges. A new generation of entrepreneurs and startups has undertaken the commendable mission of transforming India's agricultural sector through technological advancements. With the goal of increasing farmers' income, the Government of India consistently seeks avenues to enhance agricultural production, food processing, and marketing by integrating cutting-edge technologies and innovations. This initiative presents substantial prospects for food and agricultural startups in the nation. Regarding the establishment of a startup ecosystem in agriculture and related sectors in India, a total of 799 startups were ultimately selected by different Knowledge Partners (KPs) and Agribusiness Incubators (R-ABIs) as of January 2022, and by December 2022, their count had increased to 1055 startups.

The Department of Agriculture and Farmers Welfare (DA&FW) has released Rs. 6317.91 lakh as grants-in-aid in instalments to the relevant KPs and R-ABIs until December 2022, up from Rs. 3790.11 lakh in January 2022 (MoA&FW, GOI, 2022).

Potentialities of Agri-Startups

Agriculture stands as a crucial pillar in the foundation of the Indian economy. Around 55% of the Indian population relies directly on agriculture (Census 2011), contributing around 18% to the GDP (MoA&FW, 2023a). While the agricultural sector has witnessed steady growth in recent years, the transformative shift began in recent years with the rise of startups, prompting young entrepreneurs to leave traditional roles in multinational corporations to establish their own ventures. These pioneers recognise that investing in agriculture is among the most secure and profitable business avenues. As a critical component of the economy, agriculture continually demands attention, and the need for agricultural products is anticipated to persist. A surge of budding entrepreneurs and emerging startups in the country is leading the charge in agricultural sectoral growth. Their mission is to leverage technology and instigate positive reforms. The pivotal questions at hand are whether technology can truly revolutionise the sector and why these entrepreneurs and startups are choosing to do so now. Thus, agricultural practices have been successfully transformed through a diverse array of technologies, including hybrid seeds, precision farming, artificial intelligence, geo-tagging and satellite monitoring, big data analytics, mobile apps, and farm management software that can be applied at every stage of the agricultural process to enhance productivity and increase farm incomes.

Reforms Facilitating Startups

India has actively fostered a vibrant startup ecosystem. The Government of India, recognising the potential of startups, has undertaken initiatives to nurture this ecosystem and positioned India as a nation of job creators rather than job seekers. Through various policies and interventions, the Government aims to empower startups, fostering innovation, design, and the rapid expansion of the startup movement. The impact of national startup policies is becoming evident on the ground, with multiple supportive measures in place to facilitate the early takeoff and successful operations of startups.

Government's Proactive Policies to Empower Startups

Make in India: This initiative was launched in September 2014, and it aims to position India as a global design and manufacturing hub. Through modern and user-friendly approaches, it has led a substantial overhaul, attracting investments, promoting innovation, developing skills, safeguarding intellectual property, and establishing advanced manufacturing infrastructure.

Startup India: In January 2016, the introduction of a 19-point 'Startup India Action Plan' resulted in the execution of numerous policy initiatives aimed at establishing a strong ecosystem to boost innovation, foster startup growth, and generate employment opportunities. This initiative significantly contributed to a notable increase in the establishment of new companies showcasing innovative ideas across various sectors. The focus of this initiative is on simplification, funding support, incentives, and promoting industry-academia partnerships and incubation for sustainable economic development.

Atal Innovation Mission (AIM): It reflects the Indian Government's commitment to fostering

innovation and entrepreneurship. Since its initiation in 2016, it has been catalysing the development of innovation hubs, address grand challenges, nurture startups, and promote self-employment in technology-driven sectors. AIM consists of two main components, viz., Entrepreneurship Promotion through Self-Employment and Talent Utilization (SETU), and Innovation Promotion, developing a platform for generating innovative ideas. AIM provides a grant-in-aid of Rs. 10 crore to each Atal Incubation Centre for five years, covering both capital and operational expenses.

NewGen Innovation and Entrepreneurship Development Centre (NewGen IEDC): NewGen IEDC has a mission to 'promote knowledge based and technology-driven startups by harnessing young minds and their innovation potential in an academic environment'. This programme is launched by the National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science & Technology (DST), GOI in 2017. It supports up to 20 new projects annually within educational institutions by providing one-time financial aid, capped at Rs. 25 lakh.

Innovation & Agri-Entrepreneurship Programme: In 2018-19, Rastriya Krishi Vikas Yojana (RKVY-RAFTAAR) established a new programme named "Innovation and Agri-Entrepreneurship Development" with the goal of promoting innovation and agri-entrepreneurship by giving financial support and cultivating the incubation ecosystem. Startups in agriculture and related areas are encouraged to contribute directly and indirectly to increasing farmers' income by providing chances and jobs to young people. This Department has appointed five (5) Knowledge Partners (KPs) and 24 Agribusiness Incubators (R-ABIs) to advise on the smooth and effective implementation of this initiative across the country. Approximately 3500 entrepreneurs have been taught under the agri-entrepreneurship initiative from 2019-20 to 2022-23 (as of 31 December 2022). 1102 startups in agriculture and allied sectors have received financial assistance because of these skilled entrepreneurs. An amount of Rs. 66.83 crore is released in instalments for startup finance to the relevant KPs and RABIs (MoA&FW, 2023b).

Numerous agri-tech startups in India predominantly operate in the marketplace segment, where e-commerce companies offer fresh and organic produce sourced directly from farmers. Agri-tech encompasses the application of contemporary technologies in the agricultural sector to elevate crop yields, operational efficiency, and overall revenue. This concept encompasses a broad spectrum, including applications, practices, products, and services that enhance various facets of the agricultural process, whether related to input functions or the final output. Recently, a surge of startups has emerged, introducing innovative and sustainable solutions to address challenges faced by farmers. These solutions encompass biogas plants, solar-powered cold storage, fencing and water pumping systems, weather prediction tools, spraying machines, seed drills, and vertical farming methods. The evolving landscape of agri-tech holds the potential to tackle various issues within the agricultural sector and reshape the trajectory of Indian agriculture. The increasing use of the internet, widespread smartphone penetration, the rise of startups, and Government initiatives in rural areas are facilitating the adoption of technology in farming.

Rising Proliferation of Agri-Startups

The agricultural domain, encompassing crops, livestock, and fisheries, has experienced the emergence of numerous startups commonly referred to as 'agri-startups'. These ventures are further classified based on their specific focus areas, such as agri-tech, fisheries, dairy farming, animal husbandry, food processing, organic agriculture, and more. Similarly, they are categorised according to their developmental stages: Ideation, Validation, Early Traction, and Scaling (NAAS, 2022). Over the past few years, a wave of agri-tech startups has surfaced in India, aiming to resolve issues such as marketing linkage, supply chain, use of outdated equipment, insufficient infrastructure, and limited access to diverse markets for farmers. Notably, advancements in marketing infrastructure have been introduced, addressing these challenges and poised to transform the agricultural sector in India, ultimately contributing to increased incomes for farmers.

The Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry (MoC&I), GoI has acknowledged 58,650 startups as on 10 November 2021. Addressing the issues and obstacles in agricultural progress, numerous startups have played a crucial role in bridging gaps within agri-food value chains. Presently, there are 7,241 agri-startups, with the DPIIT officially acknowledging 2,605 of them. Additionally, there are 2,594 startups

operating in the food and beverage industry (NAAS, 2022). Among the recognised agri-startups, there are currently 1,485 agri-tech startups, with 474 dedicated to organic agriculture, 1,774 in food processing, 48 in horticulture, 130 in animal husbandry and dairying, 22 in fisheries, and 74 engaging in a combination of these activities (Startup India, 2021; NAAS, 2022).

The Startup India initiative aims to develop a healthy startup ecosystem in the country to foster innovation and provide chances to aspiring entrepreneurs. Since 2018, the DPIIT of MoC&I, has been conducting the States' Start-up Ranking Exercise. Karnataka and Maharashtra collectively contribute nearly 50% of all agri-tech startups established in the past five years (NAAS, 2022). Bengaluru (Karnataka) is a well-established hub, alongside Mumbai and Delhi & NCR, constituting 25%, 21%, and 14%, respectively, of the total presence of tech-startups in India (GSER, 2018). Similar trends are evident in the agri-tech startup domain, where these three established ecosystem hubs dominate, contributing to over 50% of startups in India. These leading hubs are trailed by Haryana (8%), Tamil Nadu (7%), and Gujarat (7%). Noteworthy is Gujarat's status as the 'best-performing state' in the Indian startup ecosystem, despite holding only 7% share in agri-tech startups (DIPP, MoC, 2018). According to the ranking of states on support to startup ecosystems, Gujarat and Karnataka emerged as the best performers (MoC&I, 2022).

Agri-tech startups are sprouting up in other states as well. For example, Daybest Research Private Limited, a Chhatisgarh-based startup, has created KRISHAKTI, a fully autonomous, high-precision-enabled spraying drone with an auto-adjusting nozzle and sprinkling system for spraying various types of liquid fertilisers, pesticides, herbicides, and insecticides. The startup is striving to solve the problem of crop loss caused by biotic and abiotic stress, and excessive pesticide use. Over two lakh farmers have benefited from this startup so far, and it is currently employing 243 people (MoA&FW, 2023b).

Ecosystem Supporting Agri-tech Startups: Incubators/Accelerators

Enablers such as Incubators and Accelerators play a crucial role as key partners within the broader startup ecosystem, supporting and expediting the successful development of businesses. In the agri-tech startup ecosystem, it is imperative for accelerators, incubators, and mentors, in conjunction with well-defined policies and schemes, to collaborate closely with startups. This collaboration aims to provide optimal technical support and minimise the gestation period of these ventures. Beyond addressing existing knowledge, digital, and financial gaps in the target demographic (i.e., farmers), agri-tech startups also encounter challenges related to people, processes, and technology.

Few important accelerators and incubators supporting the agri-tech sector in India are indicated below:

a-IDEA: It is an agriculture-focused Technology Business Incubator (TBI) of the National Academy of Agricultural Research Management, Hyderabad (ICAR-NAARM), founded in 2014 and funded by the Government of India's Department of Science and Technology (DST). Through capacity building, mentorship, networking, and advisory support, a-IDEA strives to assist agri-preneurs in ideating, incubating, and accelerating their unique early-stage enterprises that are scalable to become competitive food and agri-business ventures.

AGRI UDAAN: It is India's first Food & Agribusiness accelerator, launched by NAARM, a-IDEA, and CIIE-IIM(A) in 2015, has made a significant impact. Focus areas include sustainable inputs, precision/smart agriculture, innovative food technology, and supply chain technology. Notable incubatees include Gen Agri-tech, Delmos Research, Agricx, Intello Labs, Smoodies, Jivabhumi, and others. It has mentored 100+ startups, accelerated 38 startups, and raised 117 crore investment (a-IDEA, 2023).

Centre for Innovation, Incubation and Entrepreneurship (CIIE): CIIE, originating from IIM Ahmedabad, is a driving force in innovation-driven entrepreneurship in India. It enables and activates startup ecosystems in several Indian locations. Its mission is to help and foster early-stage entrepreneurs by growing the startup ecosystem through partnerships, mentorship, funding, and collaborations. Notably, CIIE collaborates with a-IDEA, the business incubator at the NAARM, Hyderabad to launch a food and agribusiness accelerator.

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT): Partnered with the DST to establish an agribusiness incubator (ABI) with the support of DST's National Science and Technology Entrepreneurship Development Board. ABI fosters technology development and commercialisation through public-private partnerships. ICRISAT's Innovation Hub (iHub) serves as a collaborative platform for agricultural tech entrepreneurs, scientists, and experts to generate cutting-edge ideas across the agriculture value chain.

Agri-Tech Startup Accelerator: The CIE at IIIT, Hyderabad and the National Institute of Agricultural Extension Management (MANAGE) have introduced an accelerator programme tailored for agri-tech startups following a memorandum of understanding. The objective of this initiative is to recognise, assist, and enable early-stage enterprises leveraging cutting-edge technologies and innovations to tackle specific challenges within the realm of Indian agriculture.

The momentum towards agri-startups gained significant traction in 2015-16 with the establishment of ABIs across the country. India hosts over 100 agri-focused incubators, predominantly affiliated with ICAR institutes and agricultural universities. These incubators receive support from Startup India, the Atal Innovation Mission, NSTEDB, RKVY-RAFTAAR, and ICAR. Under the DST's NIDHI scheme, there are 36 agriculture-based incubation centres in India, out of which seven Technology Business Incubators (TBIs) are situated at ICAR-IARI, New Delhi; ICAR-NDRI, Karnal; ICAR-NAARM, Hyderabad; ICAR-IIHR, Bangalore; TNAU, Coimbatore, and ICRISAT, Patancheru. Additionally, there are around 45 NIDHI PRAYAS centers in India, with only one located at NAARM within NARES. The ICAR has established 50 ABIs across various research institutes with an annual budget of Rs. 10 crore (Rs. 20 lakh per ABI). Similarly, 29 ABIs have been instituted at different state agricultural universities (SAUs) under the RKVY-RAFTAAR scheme of the MoA&FW, receiving a grant ranging from Rs. 2-3 crore for each R-ABI, which collectively support over 750 agriculture-based startups and agri-entrepreneurs, including farmer-entrepreneurs and producer companies (FPOs) (NAAS, 2022).

The Union Budget 2023 demonstrated a commitment to supporting agri-startups through increased allocations and targeted measures in the creation of rural infrastructure and development of agriculture and allied sector. The Government's initiatives to integrate rural markets (haats) with eNam and broaden the scope of Minimum Support Price (MSP) for comprehensive coverage of agricultural commodities, is commendable. These measures are expected to lead to improved price realisation for farmers, providing greater opportunities for agri-startups already dedicated to enhancing farm produce prices. Furthermore, the decision to enhance budget allocation for food processing is poised to bolster the food processing supply chain. This move is particularly beneficial for agri-startups operating within this domain.

Agri-Startups Transforming Supply Chain and Market Linkage

Agri-startups function within one or multiple phases of the agricultural value chain. These are categorised into different types, such as a) establishing connections to output markets; b) facilitating input supply; c) enabling mechanisation and irrigation; d) providing financial solutions such as credit and insurance; e) aiding in quality maintenance through monitoring and traceability; f) managing post-harvest processes; g) offering logistic services such as warehousing and cold chains; and h) supporting activities related to animal husbandry. Startups in the agricultural sector are revolutionising the supply chain and market linkage models to address challenges in India's supply-driven agriculture. Companies like *Sabziwala, MeraKisan,* and *Dehaat* have successfully aggregated horticulture products. Technology intervention in the agricultural value chain spans a wide scope.

Farmers can now conveniently acquire agricultural inputs through their phones, access weather forecasts using dedicated apps, make informed decisions on crop selling rates with decision support solutions, manage pests and nutrition effectively, and receive AI-based sowing advisories for improved agricultural practices. Harvesting and transport advancements include GSM mobile-controlled motors, sophisticated irrigation systems such as drip and sprinklers, GPS-powered

auto-steering tractors, crop counting machines, and machine-learning algorithms designed to distinguish between weeds and crops. In the realm of processing and storage, innovations encompass machine-based imaging technology for sorting based on colour, size, and type. Additionally, wireless sensors connected to smart phones monitor crops, and there are moisture content measurement methods for the grains. Distribution, packaging, and handling strategies involve leveraging web and mobile applications for direct sales of farm products, employing price forecasting models to mitigate inflation, implementing dynamic product pricing, establishing online marketplaces for grains, and utilising data for effective tracking.

Conclusion

The Indian Government has initiated the Startup India programme, aiming to consolidate and unite a majority of startups on a single platform. Governments, both at the central and state levels, have implemented supportive policies to aid the early takeoff and successful operations of Agri-startups. Agri-tech startups are actively integrating technology into market linkages. The major sub-sectors witnessing the rise of agri-tech startups include Big Data Analytics, Supply Chain/Market-linked Model, FaaS (Farm as a Service), IoT Enabled solutions. In addition to existing schemes, effective institutional mechanisms are important to facilitate smoother implementation. Sustainability of agri-startups would require provision of market access, growth capital, and digital infrastructure for rural information, pool of mentors and investors, and websites on agri-startups. A comprehensive network of relevant institutions is vital for the transformation of agri-startup intentions into profitable enterprises. ❑

Cabinet Decision

Redefining Food Processing Sector through Startups

In the inaugural event of 'World Food India 2023' held in New Delhi on 03 November 2023, the Hon'ble Prime Minister of India referred to the food processing sector as a 'Sunrise' sector and underscored the role played by the entrepreneurial abilities of startups in its phenomenal growth. Startups in the food processing ecosystem are found at various stages of the value chain and together have the potential and dynamism to complete the value chain and lead to transformational changes in the economy.

Dr. Ishita G. Tripathy

The food processing sector of an economy is the quintessential example of mutually reinforcing primary and secondary sectors in terms of demand-supply dynamics and forward and backward linkage effects. This sector is extremely vital for an agrarian country like India. It not only acts as an effective link between agriculture and industries but also helps in reducing wastages of perishable agricultural produce, ensuring value addition, and diversifying and commercialising agriculture, thereby generating incremental employment and income for farmers.

Socio-economic changes, such as rapid urbanisation, impact the food consumption behaviour of citizens. C onsumption diversity and dietary diversification needs with modified food behaviours prompt demand shifts towards specific food categories, requiring an overhaul in the food demand-supply system too. It is the startups that bring new ideas into the food sector and work on creating innovative products and reinvigorating supply chains.

Importance of Food Processing Sector

Unquestionably, the food processing sector is one of the most important sectors of the Indian economy,

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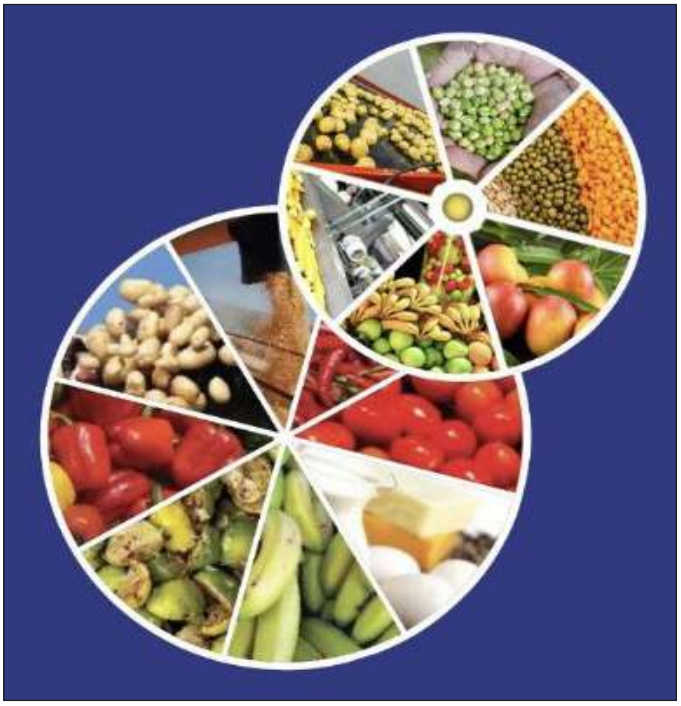
both in terms of its contribution to economic output and also in terms of overall economic growth. From 2012–13 to 2020–21, the Gross Value added by the food processing industries at 2011–12 constant prices grew from Rs. 1.30 lakh crore to Rs. 2.37 lakh crore, as depicted in the Annual Report 2022–23 of the Ministry of Food Processing Industries. This sector is one of the fastest growing sectors in the country, having grown at



10.3% during 2015–16 to 2020–21, vis-à-vis the growth rate of 5.1% in the overall manufacturing sector. This sector is also one of the sectors where consumer dynamism is highly palpable and easy to comprehend.

Startups: Sunrise and Inclusive Growth

The Union Budget 2023–24 stated that India has the third-largest ecosystem for startups, globally. India has the potential to become a global culinary hub and can combat global hunger. In the inaugural event of 'World Food India 2023' held in New Delhi on 3 November 2023, the Hon'ble Prime Minister of India referred to the food processing sector as a 'sunrise' sector and underscored the tremendous inherent entrepreneurial potential of startups in the food sector. In this context, this article endeavours to evaluate the growth chart of the food processing sector in India and the enhanced contribution of startups to this growth story.

A study by NABARD Consultancy Service Pvt. Ltd. estimated in 2022 the percentage of harvest and post-harvest loss of perishable food (Table-1). Tackling such losses, though challenging, is extremely important, considering the broader objective of food security for all. In this context, food processing startups need to be facilitated through specialised interventions that can ensure the presence of new research and development, technology, innovative processes, and products, and thereby enlarging the scope of an improved supply chain, value chain, and demand system in the food sector of the country.

Table1: Estimated Loss of Perishable Commodities

Perishable Commodities	Estimated Loss (in %)
Fruits	6.02-15.05
Vegetables	4.87-11.61
Milk	0.87
Fisheries (Marine)	8.76
Fisheries (Inland)	4.86

Source: Rajya Sabha Starred Question No. 252 answered on 11 August 2023.

The role of women in food processing industrial startups has always been important. Out of more than 3.13 crore registered micro, small, and medium enterprises in the country, as many as 19 lakh are in the food processing sector, of which 33% are owned by women entrepreneurs. As per the Ministry of Food Processing Industries' Annual Report, 2022–23, 11.18% of total 20.32 lakh registered employment is that of women workers and out of 51.11 lakh employees in the unincorporated non-agricultural enterprises in the food processing sector, 25% are women. There is a concentration in the southern States of Andhra Pradesh (14%), Tamil Nadu (12%) and Telangana (10%), which together constitute 36% of all registered food processing factories in the country. Besides, there are food processing products approved under One District One Product which range from coconut-based products of the districts of Andaman & Nicobar Islands and spices of Andhra Pradesh to walnuts of Arunachal Pradesh and bakery products of Chandigarh.

Startups: Growth Facts and Figures

From 2017 to 2021, there have been as many as 2,713 startups set up in the Food & Beverages sector, with the number enhanced every year (Table-2) as per a Press Release of the Department for Promotion of Industry and Internal Trade (DPIIT). In addition to this, there are 1,000 agri-tech startups to aid farmers to improve their techniques and another 500 working in the millet value chain (Economic Survey, 2022–23). Digital infrastructure supports the growth of the agri-tech startups, in particular.

Table 2: No. of Startups recognised by DPIIT in the Food & Beverages Sector

2017	2018	2019	2020	2021
170	357	533	643	1,010

Source: https://pib.gov.in/Pressreleaseshare.aspx?PRID=1881492

Since its launch in 2020, Self-Reliant Fund for MSMEs has provided equity support to growth-oriented MSMEs, including startups. On an average, the Fund has provided Rs. 13 crore equity support to the beneficiary enterprises. Out of the 373 MSMEs, which have benefitted from equity infusion under SRI Fund in the past two years, 15 are from the food processing sector.

Meeting Challenges through Focused Attention

The major challenges faced by a startup are the 4 'A's, viz. Availability, Accessibility, Affordability, and Awareness regarding the three essentials of any business, viz. finance, technology, and markets. These challenges among startups in the food processing sector can be further nuanced as product development and innovation; a strengthened supply chain; linking production and processing; addressing issues related to seasonality; quality and safety standards; and reducing post-harvest wastage.

The notification of a separate Ministry of Food Processing Industries in 2001 by the Government of India highlighted its focused intervention in this sunrise sector. The growing importance of the sector can also be gauged by the enhanced outlays, as evident from Budget of 2023–24. The Budget data indicates that while the actual expenditure of the Ministry of Food Processing Industries was Rs. 1,147 crore in 2021–22, the Revised Estimate for 2022–23 was pegged at Rs. 1,902 crore and the Budget Estimate for 2023–24 is Rs. 3,288 crore.

A number of initiatives are being taken by the Government of India to address the challenges faced by the food processing sector, including those faced by startups. Among these are 'Make in India', which recognises this sector as a priority sector. Resting on the principle of reaping benefits from economies of scale, a cluster approach or a plug-and-play model

on which mega food parks are based would work well for this sector. Recent initiatives also include implementation of schemes of the Government of India such as Pradhan Mantri Kisan Sampada Yojana, Prime Minister Formalisation of Micro Processing Enterprises, Production Linked Incentive, etc.

For startups in the food processing sector to flourish, backward linkages with agriculture, fisheries, dairying, animal husbandry, etc. need to be strong. This objective is strengthened by the Production Linked Incentive scheme, Agri-Infra Fund, etc. Like in all other sectors, the involvement of technology in the food processing sector, especially since the advent of the Covid pandemic in 2020, has been increasing. As one moves towards higher levels of technology, the need for investment rises, and, therefore, foreign direct investment (FDI) is attracted. In the last nine years, the food processing sector in the country has attracted Rs. 50,000 crore of FDI (PIB–5 November 2023).

Promoting Startups

DPIIT recognises entities as startups as per the eligibility conditions mentioned in notification no. GSR 127(E) dated 19 February 2019, which defines a startup in terms of tenure, objectives, and turnover. To elaborate, an entity is considered to be a startup up to a period of ten years from the date of its incorporation or registration, depending upon whether it is a private limited company defined as per Companies Act, 2013; or a partnership firm registered under Section 59 of the Partnership Act, 1932; or a limited liability partnership under the Limited Liability Partnership Act, 2008. The entity should be working towards innovation, development, or improvement of products, or processes, or services, or if it is a scalable business model with a high potential for employment generation or wealth creation. The turnover of the entity for any of its financial years since incorporation or registration should not exceed Rs. 100 crore. The Government of India, vide its notification no. S.O.2119 (E) dated 26.06.2020 defines Micro, Small and Medium Enterprises (MSMEs) in terms of both investment in plant & machinery or equipment and turnover. MSMEs registered on the official Udyam registration portal can be proprietorship, partnership, company, trust, society, etc.

As evident from Table 3, if enterprises satisfy both conditions of investment in plant and machinery, or equipment and turnover, they can not only be categorised as 'micro', 'small', or 'medium', but also as startups, if their turnover is not more than Rs. 100 crore. Further if there is an upgradation in the classification of the enterprise, e.g. from micro to small or medium or large, from small to medium or large, or from medium to large, as per notification S.O.4926(E) dated 19 October 2022, the enterprise can continue to avail of non-tax benefits under various schemes and programmes that it was eligible for under its previous category for three years from the date of such upward change.

Table 3: Criteria for defining MSMEs

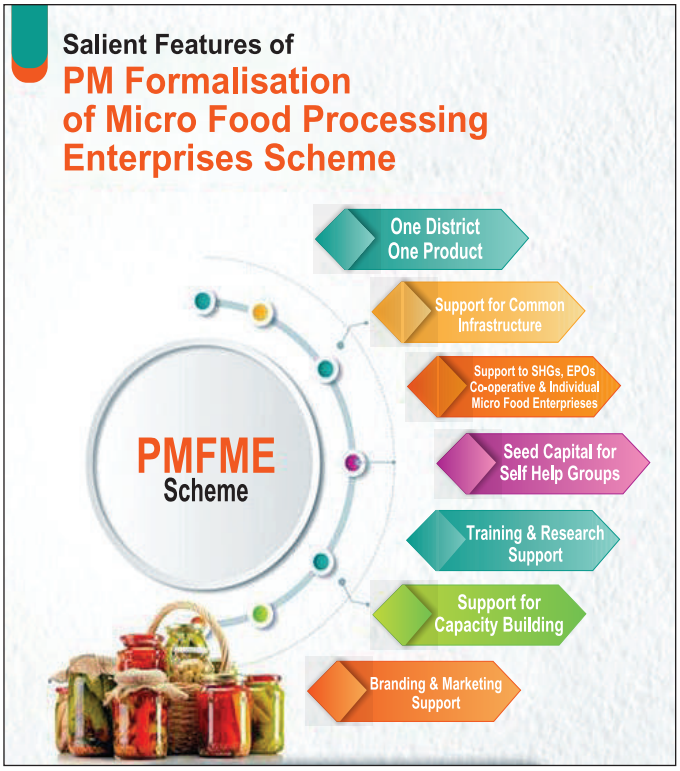
Category	Investment Not exceeding (Rs. crore)	Turnover Not Exceeding (Rs. crore)
Micro	1	5
Small	10	50
Medium	50	250

Source: Ministry of MSME's notification No. S.O.2119 (E) dated 26.06.2020

The startup initiative of the Government has been multi-pronged. It includes a Rs. 10,000 crore Fund of Funds, which aims at making capital available for startups at the early stage, seed stage, and growth stage. There is a separate Credit Guarantee Scheme for loans taken by startups. Central Ministries and Departments have been advised to relax the conditions of prior turnover and experience when procuring from startups. Besides, startups are eligible for fast-tracked patent application examination and disposal. The Startup India Online Hub connects all stakeholders on the same platform, viz., startups, investors, funds, mentors, academic

institutions, incubators, corporations, Government bodies, etc.

To promote startups, there is a 100% deduction allowed for their profits and gains for three consecutive years out of ten years. To tie over the adverse impact of the pandemic, Budget 2023–24 announced that the period of incorporation of eligible startups would be extended up to 31 March 2024 from 31 March 2023. For startups, there is a condition of continuity of at least 51% share-holding for setting off of carried forward losses, which is relaxed for seven years for an eligible startup if all the share-holders of the company continue to hold those shares. Budget 2023-24 proposed to extend this benefit to ten years, instead of seven years from the incorporation of such startups. The Budget also announced the establishment of an Agriculture Accelerator Fund to encourage agri-startups, especially those by young entrepreneurs in rural areas. The objective of the fund would be to bring innovative and affordable solutions for challenges faced by farmers and to bring in modern technologies to transform agricultural practices, increase productivity, and enhance profitability. Further, the Budget proclaimed to promote research by startups by bringing in a National Data Governance Policy to enable access to anonymised data.



Linking Startups to Global Markets

The Central and State Governments promote export-oriented enterprises. The Central Government's Agricultural and Processed Food Products Export Development Authority (APEDA) which was set up under the APEDA Act, 1985, is mandated, inter alia, to aid in the registration of exporters of scheduled products, provide financial assistance to them, fix standards and specifications for the scheduled products, carry out inspection, improve packaging and marketing of scheduled products, etc. Consequently, between 2014 and 2023, the share of processed foods in India's exports has risen from 13% to 23%, with APEDA having linked importers with exporting startups. There is tremendous potential in the food processing sector to collaborate with other countries, as is evident from the recent high-level meetings held with countries like Brazil, wherein discussions were held to facilitate greater exchange of goods and ideas. This is also an affirmative step towards ensuring world food security.

Concluding Remarks

Technological advances, changes in consumer demographics, and tastes and preferences have been pivotal in shaping the journey of startups in the food processing sector. Startups in the food processing ecosystem are found at various stages of the value chain and together have the potential and dynamism to complete the value chain and lead to transformational changes in the economy. The support required by them at different stages is obviously different. If the recent growth in this sector is to be taken as an indicator, then the contribution of this sector to the economy in the immediate future can be expected to be even more rapid. ❑

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Startups Towards Rural Water Security

Rural water security is the key to a nation's journey towards a stronger economy. Technological intervention is essential in addressing the pertinent issues of rural water management. Startups, through their sound technological framework, can solve the challenges at a relatively lower cost and time. We have been witnessing several success stories in the rural Water, Sanitation and Hygiene (WASH) sector through startups.

Arunlal K.

According to World Bank data, India's rural population, stands at 0.91 billion, which is about 64% of the country's total population. Though it is challenging to ensure access to safe drinking water and sanitation facilities for such a large population, the successful implementation of the Swachh Bharat Mission – Grameen, and the Jal Jeevan Mission (Rural) has been instrumental in improving the living standards of the rural population by ensuring sanitation and hygiene, and providing access to safe water. This remarkable progress could be sustained only with seamless supply of water. At the same time, rapid urbanisation and the growth of industries induce stress on water resources. As the resource becomes scarce, the economically weaker rural section is the first sufferer. To tide over this challenge, affordable and innovative water management practices and sanitation solutions are essential. This is where startups can make a difference through their unique strengths.

The Indian startups ecosystem has grown tremendously in the last decade and is in the top five alongside the United States, China, the United Kingdom, and Israel. Their agility to meet changing needs and flexibility for customisation to suit local conditions are boons in addressing unique issues. Water and sanitation

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problems in the country have no single solution owing to the diversity in geography, demography, culture, and climatic conditions. In lines with the Sustainable Development Goals (SDG), goal for Water, Sanitation and Hygiene (WASH) ecosystem is to ensure access to clean water and safe sanitation facilities for every person. Startups, with their unique advantage and position in the ecosystem, help to achieve the goal of inclusiveness through their novel ideas and products. As per the Department for Promotion of Industry and Internal Trade (DPIIT) data, there are about 1500 startups working in the WASH sector, and more than half of them are from tier-3 towns or rural areas.

Elements of Rural Water Security

To ensure water security, it is important to bridge the gaps in water demand management, water treatment and water quality, groundwater management, and effective water governance. Startups have tremendous potential to bring about transformation in these arenas. The first step to improving demand management is 'to measure.' Startups are successful in developing meters at an economical rate using low-cost sensors. Moreover, they could bring the metering data to common dashboards, which help identify the spots that require intervention. At the same time, the installation of water-saving devices also contributes to the effective demand management. Next comes the challenge of providing safe drinking water that meets health standards. Water quality and the high cost of treatment have always been concerns in rural water security. Various departments under the Government of India and State Governments are encouraging startups to invent novel devices and test kits for water quality testing and affordable treatment mechanisms. With the help of IoT, the test data and quality parameters could be shared with all stakeholders for quick and concerted action.

Third, there is the ever-growing concern of overexploitation of groundwater. Borewells are reliable water sources in many parts of rural India, both for drinking and agriculture. However, its sustainable use is a challenge due to the lack of accurate data on groundwater levels. Excessive water consumption associated with subsidised or free supply of electricity is also posing a threat to water security in rural areas. Many startups have come up with useful tools and ideas to tackle these issues. Handheld device, GIS-based dashboards, and data-based advisories are a few examples. Finally, improved water governance is essential to streamlining the integrated approach of resource allocation and management. It is important to address the issue of conflicting water demands in a given geography. For example, the same water source in a village may cater to the requirements of agriculture and domestic needs. Startups have been successful in such situations with tools to save agriculture water and facilitate the scheduling of water supply based on real-time data, which is otherwise cumbersome with manual calculations.

Startup India's Innovation Challenges

Startup India, the Government of India's flagship initiative to catalyse startup culture, has been working with various departments and agencies to promote startups working in the WASH sector. Innovation challenges are the frontrunners in this direction. DPIIT and the National Jal Jeevan Mission, Department of Drinking Water and Sanitation, had conducted an innovation challenge to develop portable water testing devices. The main objective of the exercise was to develop an innovative, modular, and cost-effective solution to develop portable devices that can be used at the household level to test the drinking water quality instantly, easily, and accurately. Startups were shortlisted under the challenge and were facilitated for further support through cash grants worth Rs. 2 lakhs each and seed grants worth up to Rs. 25 lakhs each, along with incubation support.

Further, the Swachh Bharat Grand Challenge was introduced in the fields of waste management, water management, air quality management, and sanitation. Two startups in each sector have been awarded cash grants. The winners of the challenge have brought in many interesting solutions to address the pertinent issues in the WASH sector. Some of them are:

- Intelligent Public Toilets (IP Toilets) with self-cleaning facilities, floor hygiene concept, and an IoT-enabled control board for monitoring usage.
- Created an anaerobic granulated sludge of more than 650 numbers of various bacteria that is used to treat waste water that can directly be used for irrigation purposes.

(To be continued on page no. 28)

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>
> *Prime Minister Narendra Modi*

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- **Free treatment of up to ₹ 5 lakh** for poor under Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY), **28 Crore Ayushman Cards** issued till now
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GROWTH OPPORTUNITIES FOR YOUTH

- **15 AIIMS, 7 IITs, 7 IIMs and 260 medical colleges** established for world-class education
- **India among the top 3 start up ecosystems in the world** with over 1 lakh new startups
- Over **43 crore collateral-free loans** amounting to ₹ 23 lakh crore under Pradhan Mantri Mudra Yojana
- **"Can-Do" spirit of youth** makes history at Tokyo 2021 Olympics & Paralympics

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(Continued from page no. 25)

- E-Waste Exchange to enable people to dispose of their electronic waste while complying with government regulations.
- Odourless, waterless, and chemical-free urinal systems that provides a unique air-lock system that does not allow urine to come into contact with air or oxygen.
- Organic hydrogel, made from biodegradable waste, which could retain moisture, nourish the soil, and even boost crop growth naturally.

In another successful attempt to foster water saving, the Grand Water Saving Challenge was run in association with Hindustan Unilever Ltd. (HUL), Invest India, Startup India, and AGNIi (AGNIi - Accelerating Growth of New India's Innovations is the national technology commercialisation programme). The challenge aimed to address the need for an efficient flush system in public toilets to ensure optimum usage of water while ensuring a clean and hygienic toilet. Winners of the challenge received a cash prize of Rs. 5 Lakh in addition to an opportunity to install and pilot the invention at a Suvidha centre, developed by HUL. (Suvidha is HUL's urban water, hygiene, and sanitation community centre, intended to cater to the needs of urban slum dwellers in Mumbai.)

AIM-ICDK Water Innovation Challenge

NITI Aayog's Atal Innovation Mission (AIM) and Innovation Centre Denmark (ICDK) has introduced an open innovation challenge in water sector to identify and nurture innovative startup ideas. This is as part of the Indo-Danish Bilateral Green Strategic Partnership. Three editions of the innovation challenges have been successfully completed till now with enthusiastic participation of startups and student teams. The winners get an opportunity to showcase their ideas and products in a global event in addition to the cash awards and incubation support. The programme helped innovators to build their skills and apply their technical disciplines, innovation capacity, and catalyse water solutions.

National Startup Awards for Rural Drinking Water

National Startup Awards (NSA), introduced in 2020, seek to recognise and reward outstanding startups and ecosystem enablers under various categories. Drinking Water was included in two of the four editions of the NSA in 2021 and 2022, with an aim to find outstanding startups and innovators coming up with new-age solutions combined with sound business models. The startup winner of NSA receives cash prize of Rs. 5 lakhs, opportunity to present the idea before relevant public authorities and corporates to avail pilot projects and work orders. One of the winners in this category, WEGoT aqua, provided an IoT-based water management solution that enables real-time, data-driven, and automated decision-making to reduce the water demand, and thereby increase the efficiency of water infrastructure in buildings. It tracks the usage at all consumption points, and generates bills as per water usage. The sensor also detects, and notifies leakages, broken pipes, abnormal use in real-time via mobile app and web dashboards. Once reported, the user can shut the leaks remotely, thus saving water from getting wasted in leakages.

Examples of startups in WASH sector

There are many startups which are successful in solving India's water management crisis and sanitation challenges. A few examples are discussed here.

Boon (formerly known as Swajal)

This water-tech startup is striving to make water accessible and affordable, ensuring a reliable supply of safe drinking water. Their proprietary water ATMs are energy-efficient systems that use solar energy for water purification and vending, with easy-to-use user interfaces and payment mechanisms. IoT-based remote monitoring capabilities built into the cloud platforms make repairs and upgrades seamless. They

have installed over 400 water ATMs in railway stations, schools, hospitals, urban slums, rural areas, and bus stations. The startup has currently impacted over 20 lakh people across more than 140 Indian villages by democratising access to clean drinking water. By encouraging people to bring their own utensils and bottles to fill water, it has immensely reduced the use of single-use plastics and carbon footprint.

Vassar Labs

Vassar Labs is a technology-driven social impact startup offering smart water management solutions that leverage IoT, AI, and ML. Their solutions provide real-time data and insights from satellites, sensors, and models to bring end-to-end visibility to all water assets in a given geography/ location (village/ city/ district/ state) and promote smart decision-making about water consumption. Their solutions cover the Water Resources Information System, Water Balance and Water Audit, Village Water Budget, Soil Moisture-based Irrigation and Canal Management, Ground Water Resource Estimation, Reservoir Management, and Watershed Management. Vassar Labs is providing solutions to central government agencies and state governments. It was one of the 10 startups in the Google Launchpad Accelerator programme in 2018.

WaterLab India – Bhujal App and IoT

Measuring the depth of water in a borewell generally requires heavy equipment and is time-consuming. The Bhujal app, the first of its kind Android app, made the process simpler by making it possible to measure the water level within a minute without even opening the borewell. This helps any user, particularly rural farmers, to get an idea about water availability and facilitate better planning. This avoids the early drying of a borewell and thus proves to be a powerful decision-making tool on the demand side. It also helps to save electricity due to the regulated consumption of borewell water. Reputed agencies, including those from the Government, have expressed satisfaction over the performance of the app. The app supports Marathi and Kannada in addition to English and Hindi, which makes it easy for farmers to use.

Genrobotics and the Bandicoot

Genrobotics Innovations, one of the leading robotics companies in India, was founded as a startup in 2018 in Kerala. They invented the world's first ever robotic scavenger, the Bandicoot (name derived from bandicoot rats–a rodent!). This is the first and sternest step towards eliminating manual scavenging. The Bandicoot provides clear and detailed visuals of the inside of manholes, even in low-light or dark situations, to the operator. The advanced robotic legs of the equipment enable seamless and precise movement and navigation within manholes. Now it is being used in 19 States and 3 Union Territories. Genrobotics has also provided skill development training and awareness sessions for sanitation workers, ensuring a safe and clean working environment. Elimination of manual scavenging can impart a different and positive dimension to the lives of sanitation workers in the country, the majority of whom are from rural areas.

Kheyti

Kheyti is a startup working to address water scarcity issues for small farmers. Kheyti's Greenhouse-in-a-Box helps them reduce climate risk and increase yields. According to the founders, the plants in the greenhouse require 90 per cent less water than those outdoors, and yields are seven times higher. Being 90 per cent cheaper than a standard greenhouse, they are contributing to increase farm incomes, helping them invest more in their farms and other social needs like healthcare and education for children. It also contributes to sustainable agriculture practices by using less water and fewer pesticides. Water being a scarce commodity in large parts of rural India, 90% water savings on agriculture is a vital step in ensuring rural water security.

Way Forward

The Government of India and State Governments are keen in providing supportive environment for the Indian startup ecosystem to become the first in the world. It has the power of technology and the novelty of ideas clubbed with the strength of youth. However, the startup ventures must be well connected with the rural population and the government agencies to deliver its full potential. The digital divide, which may pose hurdle to the most deserving categories in accessing the startup tools, must also be bridged. ❑

Startups as the Engine of Growth for North-East India

Startups will play an important role in helping India become the third-largest economy in the world. The last decade has seen an exceptional transformation in the startup landscape in India,which has emerged as the third-largest ecosystem globally, with over 1.12 lakh startups presently recognised by the Department of Promotion of Industry and Internal Trade (DPIIT) across 763 districts. A total of 49% of the startups are from Tier 1 and Tier 2 cities. Along with the rest of India, the entrepreneurial ecosystem in North-East India has also evolved, though not at the same pace as other startup hubs in the country. Each state in the region has come up with its own startup policies, and the ecosystem is evolving. The article highlights the types of startups in the region, the issues and challenges faced, and the way ahead for providing structured support to the startups in the region.

Dr. Sriparna B Baruah

India's huge population, which was once perceived as an albatross, has emerged as its biggest strength. But the demographic dividends would accrue only when the overwhelmingly young population, providing rich human capital, is empowered and cultivated properly.

India needs entrepreneurs for two reasons: one is to capitalise on new opportunities, and the second is to create wealth and new jobs. In the next ten years, 110-130 million Indian citizens will be searching for jobs, and this will include 80-100 million looking for their first jobs. This does not include disguised unemployment of over 50% among the 230 million employed in rural areas. The point here is that there is a strong need for entrepreneurs and startups.

In the past decade, entrepreneurship development in the country has found a new pace through the

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startup movement. Innovative solutions to business and innovative business have both gained momentum in the hands of the country's youth, where technology has played the lead role. Policy reform gave the much-needed push to this through multiple initiatives that seek to create a country of job creators instead of job seekers.

Startups will play an important role in helping India become the third-largest economy in the world. The last decade has seen an exceptional transformation in the startup landscape in India, which has emerged as the third-largest ecosystem globally, with over 1.12 lakh startups presently recognised by the Department of Promotion of Industry and Internal Trade (DPIIT) across 763 districts. Among them, more than 110 are unicorns with a total valuation of around $350 billion. It is interesting to note that 49% of the startups are from Tier 2 & 3 cities. Historically, there was a perception that small towns were difficult places to conduct business. However, with improved internet penetration, vastly better physical infrastructure, road, rail, and air connectivity, and supportive government policies, this is no longer true.

Today, innovation in India is not just limited to certain sectors as startups are solving problems in 56 industrial sectors, with 13% of them in IT services, 9% from health and life sciences, 7% from education, and 5% from food and beverages.

While Delhi, Bangalore, and Mumbai continue to be the startup capitals of India, other cities such as Hyderabad, Pune, and Chennai have emerged as hubs, witnessing a lot of recent startup activity as well. Today, we find entrepreneurs from Tier 2, Tier 3 cities in India coming up with more scalable and investable opportunities. A ripple effect has been created; there is maturity amongst entrepreneurs, their aspirations have grown, and momentum has caught on. As youth returned to their hometowns in 2020 due to the pandemic, the startup scene in Tier 2 and 3 towns got a new boost of energy. With increased digital penetration and new government initiatives, backed by a lower cost of living, a lot of innovative ideas have come up from youngsters from the hinterlands of India in cities like Surat, Jodhpur, Ranchi, Bhopal, etc. These cities have seen a rise in startups and the ecosystem has evolved with the emergence of new co-working spaces, incubators, and accelerators.

Startups in North-East India

Along with the rest of India, the entrepreneurial ecosystem in the North-East India has also evolved. North-East India, known for its many challenges and opportunities, has joined this movement, though not at the same pace as other startup hubs of the country. Although the region does not have a very rich history of entrepreneurship, through the policy intervention of the Government in terms of improved rail, road, air and telecom connectivity, industry incentives, and North East-specific central sector schemes, it is witnessing accelerated growth towards a better economy. Each state has come up with its own startup policy and a clear mandate for promoting startups. Assam and Manipur are the leading states in terms of startup ecosystems in NER.

What is needed is more and more entrepreneurs who are willing to take a risk, capitalise on the opportunities, and overcome the fear of failure. Until recently, the youth of NE India were mainly confined to a job-seeking mindset. However, the past two to three years have witnessed the onset of a paradigm shift in the mindset of the people in the region. Youth have come up with innovative solutions for local problems. While NE may not have many tech innovators, the uniqueness lies in the challenges and the unique society-centric innovations to deal with the challenges.

Startups in North-East are found primarily in the following sectors:

- Agriculture and allied
- Handloom and Textiles
- Tourism
- IT & ITES
- Retail and Logistics
- Health and Wellness
- Edutech
- Waste management and Renewables
- Media and Entertainment

The majority of the startups are in the agriculture & allied sector, followed by ITES, handloom &

textiles, retail & logistics, and education. There is a small percentage of startups in waste management, renewable, media, and entertainment. It is evident that most startups face two major concerns: access to funding and mentorship support.

The region has around thirty incubators, and 80% of incubators are hosted in academic institutions. A few are sector-specific incubators and are at various levels of maturity. Each state has its own provisions under the startup policy to provide grant funds for startups at the idea stage as well as at the proof-of-concept stage. Numaligarh Refinery Ltd. (NRL) has created a NRL startup Ideation Fund and North Eastern Council (NEC) has also funds startups at the idea and POC stages through grant funds through various organisations like the Assam startup incubator. There is also a dedicated fund North-East Venture Fund (NEVF), which is a 100-crore corpus managed by North-Eastern Development Finance Corporation Limited (NEDFi). However, it is seen and observed that a very small percentage of startups and entrepreneurs are fit to access VC funding. Considering the type of startups in NE, there is more need of a seed grant or seed fund.

Apart from NEVF, some other reputed private VC firms have invested in NER-based startups. These VC firms have invested in startups from diverse sectors such as affordable healthcare, eco-friendly products, food processing, etc. Among the startups that have been able to raise VC funds, it was witnessed that food processing, food and beverages, and food tech have highest share in number of deals, followed by AI-based solution, healthcare, and IT. Other sectors include Biotech, service aggregators, animal husbandry, wellness, design, logistics, and edutech.

In NER, owing to the still evolving and growing ecosystem, the challenges faced by the startups are much bigger compared to the startups in more mature ecosystems of the metros. Some of the common challenges are listed below:

- Access to funds
- Access to new markets
- Lack of skilled manpower
- Continued mentorship support
- Access to professional support services like regulatory compliances, liasoning, patent filing, etc.

The startup ecosystem should be viewed as a continuum that supports and incentivises all stages of the life cycle of a startup. This includes intermediaries that support :

i. Innovation and commercialisation in higher education and in small business

ii. Aspiring entrepreneurs via a pre-incubation preparatory phase to build a strong pipeline of emerging entrepreneurs

iii. Idea and early stage startups so that more of them can survive and go to the market

iv. Growth startups and small businesses so that they are able to continue to innovate and build regionally, nationally, globally competitive and scalable business models

The startups from NER are relatively new and cater to a smaller market. It is observed that most of the startups fall in the category of ideation to launch stage and are mostly in the initial stage of the startup cycle. Though the number of startups has grown by leaps and bounds, the number of scalable and innovative startups is only a handful. A total of 80% of the startups are 'me-too' startups, which poses a major challenge in terms of scalability. Mentorship is another area where there is a gap in the north eastern ecosystem. There is a need for mentors to provide general motivation, general guidance, inputs on realignment of business plans, network support, and specific services like marketing, statutory compliance, brand building, packaging, etc. Technical mentoring is also essential in areas like design thinking, design methodology, product development, human-computer interaction, ergonomics, packaging design, and rapid prototyping.

Though startups play an important role in generating employment, it is seen that from the startups in the region, employment generation is still restricted. It is also observed that highly innovative startup ideas using technology in designs and processes are very few. Patents filed by startups from the region are also limited.

The Possible Way Ahead

In the North-East, it is seen that despite their calibre, the majority of the startups face a common set of challenges to sustain and scale. There is a need

to empower startups by integrating design thinking, creative capacity building, and collaborative problem solving. Structured support is needed in terms of raising funds, documentation (often startups have a lot of ideas and bottlenecks in their minds and are not able to structure them in a document), and creating a vibrant and inclusive community of entrepreneurs from the region.

What is needed?

i. Build a wide pipeline of innovative, entrepreneurially skilled young people with inspiration, ideas, application, and confidence to startup with the right opportunity;

ii. Evolve outcome oriented sustainable incubation modes that support competitive businesses that may not be venture-funded. This will be the key to health of local economies;

iii. Build

- Leaders of incubators and accelerators
- Expert mentors, consultants
- Lawyers, accountants and other technical experts and vendors; and

iv. Integrate information, infrastructure, funding, and other efforts across the stakeholder groups that include government agencies, private incubators, and funding institutions.

This will help the startups at various stages to easily navigate the ecosystem and find the right fit for development. There is a need to organise academic programme/courses for startups. Since most of the startup founders are from technology backgrounds, they have very little understanding of consumer behaviour and knowledge of marketing, finance, and organisational development.

Startups and entrepreneurs need to capitalise on the Government of India's thrust on building an 'Aatmanirbharta'. The 'Aatmanirbhar Bharat' is about enhancing the ability of Indian companies to create world-class products, capture the domestic market, and penetrate the global market. It is about being a global champion. Today 'Atmanirbharta' has been a recurring theme across sectors and categories, as a new wave of innovators and entrepreneurs is leveraging this spirit in their startups.

India's robust economic growth and vast market potential provide a promising backdrop for startups across various sectors, be it technology, healthcare, and renewable energy, or other industries. This translates into ample opportunities for expansion and investment, offering a platform for startups to thrive and excel. Moreover, India's remarkable economic growth, technological advancements, and youthful workforce will provide Indian startups with a robust ecosystem, making them more competitive on the global stage. India's commitment to sustainability and its active involvement in global discussions on issues such as climate change, renewable energy, and responsible business practices align with the evolving global SDG (Sustainable Development Goals) priorities. Indian startups with a focus on sustainability can leverage this commitment to shape their business models and engage in international partnerships that emphasise responsible practices. The global landscape is ripe with opportunities for Indian startups, with the potential to drive innovation, growth, and sustainability through international collaboration. This path aligns with North-East India's journey to be the gateway to Southeast Asia through the Act East Policy and offers startups a remarkable platform for success. ❑

Given the global enthusiasm for employing drones in agricultural activities, India is actively exploring and promoting drone technology. This is because these cost-effective, unmanned aerial vehicles hold promise to address various challenges and issues prevalent in Indian agriculture. The Indian Government has initiated several schemes to promote the drone industry within the country, and many of these are especially relevant to agriculture, rural society, and rural economy.

Drone Revolution Changing the Face of Rural India

Balendu Sharma Dadhich

A decade ago, the idea that drones would usher in a transformative revolution in the agriculture industry within the next ten years seemed unimaginable. However, this is now a reality. What's even more surprising is the growing interest in drones in countries like India, which traditionally held onto conventional agricultural practices. Drones are making headlines for various reasons, including their potential to revolutionise Indian agriculture and rural economies. They have the potential to play a pivotal role in modernising farming practices and creating unprecedented job opportunities, especially for youth and women—something considered nearly impossible just a few years ago. The Indian government is actively promoting a drone culture nationwide, and the field is witnessing remarkable innovations, ranging from cost-effectiveness to enhanced manageability and multipurpose functionality. India is on the brink of a drone revolution that not only stands to reshape the rural economy but also has the potential to profoundly impact and improve countless lives.

There are interesting examples of many countries utilising drone technology to revolutionise agricultural practices and boost rural economies. In Africa, drones are being used to support small-scale farmers in Mozambique and agribusiness in Morocco. Japan is one of the most notable countries that has incorporated agricultural drones to help rice farmers maximise their yield. Its scientists have even developed insect-sized drones capable of pollinating flowers, mimicking the role of bees. In Europe, Spain is at the forefront of using drones in agriculture, where drones are being used in activities ranging from crop monitoring to precision farming. Similarly, China and Indonesia are taking steps to boost the demand for drones in agriculture. Malaysia, Singapore, and Australia have implemented laws regarding the use of drones. India, too, is being

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increasingly referred to as a land with huge potential to leverage the power of drones in agriculture and non-agriculture sectors.

A Bright Outlook

Within the realm of agriculture, drones are projected to contribute approximately 7 billion USD to the global economy. This optimistic outlook holds significant promise for the worldwide agricultural sector. The rate of adoption, however, exhibits notable variations across countries. In the United States, a staggering 84 per cent of farmers utilise drones on a daily or weekly basis, with approximately 73 per cent employing them for crop monitoring and 43 per cent for soil and field analysis. In contrast, the adoption rate in developing nations such as India remains considerably lower.

Things are changing fast, however. Given the global enthusiasm for employing drones in agricultural activities, India is actively exploring and promoting drone technology. This is because these cost-effective, unmanned aerial vehicles hold promise to address various challenges and issues prevalent in Indian agriculture. The realisation of their importance is evident from what Prime Minister Narendra Modi said while inaugurating India's biggest drone expo in May 2022. He said, "I want to see a drone in every farm and a phone in every hand."

While the technology is in its early stages in India, numerous companies are making efforts to ensure its accessibility to Indian farmers. They aim to make it readily available for use, with the intention of enhancing efficiency in agricultural production. As per projections from the Ministry of Civil Aviation, the drone industry in India is expected to experience significant growth, reaching a turnover of Rs. 12,000-15,000 crore by 2026.

As of June 2023, there are 333 drone startups in India. This number represents a significant increase from the previous year, as India witnessed a 34.4% surge in the number of drone or UAV startups between August 2021 and February 2022. This growth is a testament to the burgeoning drone industry in the country, with startups exploring various applications of drone technology in sectors, such as agriculture, defense, and more.

Initiatives to Promote the Drone Culture

The bright prospects are not without a reason. The Indian Government has initiated several schemes to promote the drone industry within the country, and many of these are especially relevant to agriculture, rural society, and rural economy. These schemes encompass various aspects of the sector. Here are some of the schemes, initiatives, and incentives that the Government has introduced:

Production-Linked Incentive (PLI) Scheme: The PLI scheme for drones and drone components offers incentives to manufacturers in this domain. Its objective is to stimulate significant growth in the emerging drone sector, potentially generating over 10,000 direct jobs within the next three years. Projections indicate substantial growth in the annual sales turnover of the drone manufacturing industry, from Rs. 60 crore in 2020-21 to over Rs. 900 crore in FY 2023-24. The drone services industry, encompassing operations, logistics, data processing, and traffic management, is anticipated to scale even higher, reaching over Rs. 30,000 crore in the next three years.

Scheme for Women Self-Help Groups (SHGs): With an allocated outlay of Rs. 1,261 crore for the period from 2024-25 to 2025-26, this scheme focuses on providing drones to women self-help groups (SHGs) engaged in agriculture. The drones are intended to assist with crop monitoring, yield estimation, and various other agricultural activities. By empowering women in agriculture, this scheme aims to enhance the drone industry's growth and create employment opportunities.

Ban on Drone Imports: In a move to bolster the domestic drone industry, the Indian Government has imposed a ban on the import of drones and drone components. This strategic measure is anticipated to fuel the growth of the local drone manufacturing industry and subsequently lead to the creation of job opportunities.

Drone Shakti Scheme for Startups: This scheme targets startups within the drone industry, offering financial assistance for research and development, product development, and marketing. By providing crucial support to startups, the scheme aims to foster innovation, growth, and employment opportunities within the drone sector.

The Drone Rules, 2021: To regulate the drone industry in India, the Government has introduced 'The Drone Rules, 2021'. These rules establish a comprehensive regulatory framework for drone operations within the country. Additionally, the Digital Sky Platform serves as an online

registration platform for drones and drone operators, streamlining the regulatory process.

Certification scheme: In tandem with its comprehensive initiatives to boost the drone industry, the Government of India has introduced a certification scheme for agricultural drones. Effective from 26 January 2022, this scheme allows agricultural drones to carry payloads excluding chemicals or other liquids utilised in spraying activities. The application of such liquids is permissible when adhering to relevant rules and regulations.

Drones in Agricultural Research: In a noteworthy development on 16 November 2020, the Indian Government granted the International Crops Research Institute (ICRISAT) permission to utilise drones for agricultural research activities. This strategic move seeks to inspire emerging researchers and entrepreneurs to explore cost-effective drone solutions for more than 6.6 lakh Indian villages, aligning with the broader vision of fostering innovation and technology adoption in agriculture.

SMAM: The Indian Government is also providing financial assistance for the purchase of drones under the Sub-Mission on Agricultural Mechanization (SMAM) for its demonstration on the farmer's field. Under the scheme, farmers are provided with the benefit of subsidies ranging from 50 to 80 per cent for buying agricultural machinery. Under the scheme, priority is given to women farmers.

These initiatives collectively reflect the Indian Government's commitment to nurturing a robust and sustainable ecosystem for the drone industry, ensuring both regulatory compliance and economic advancement.

The Advent of Kisan Drones

Kisan Drones, as part of the Indian Government's initiative to spark a rural drone revolution, are set to revolutionise the agricultural sector in India. These drones are aimed at helping farmers in various aspects of farming, from crop health analysis to pesticide spraying. The advent of Kisan Drones has indeed ushered in a new era in the field of agriculture, transforming traditional practices, and paving the way for a more efficient and safer approach to farming. The conventional method of spraying pesticides and liquid fertilisers, which involves the use of hand-held back-strapped pumps, is not only laborious and time-consuming but also poses significant risks due to the presence of poisonous reptiles and potential threats from wild animals in the fields.

The use of Kisan Drones is being promoted for crop assessment, digitisation of land records, and spraying of insecticides and nutrients. This technology allows farmers to monitor their crops more efficiently, identify issues early, and take necessary actions promptly. Moreover, Kisan Drones can help in enhancing crop yields by providing detailed data on crop health. This data can help farmers in identifying areas that require attention, thereby improving their crop yields and increasing their profits.

In addition to this, Kisan Drones can also help in reducing costs by identifying areas of the farm that require attention, thereby reducing the need for manual labour and the use of pesticides and other chemicals.

Boost for Rural Economy

Drones prove valuable across various industries, yet their influence on agriculture, and consequently, the rural economy, is a subject of significant interest and harbors considerable promise. Thanks to their versatile capabilities, they have the potential to transcend and address challenges associated with the lack of infrastructure and continuous power supply in India's rural heartland.

Enhanced Operational Efficiency: By swiftly covering expansive agricultural landscapes, drones empower

farmers to efficiently gather data and monitor crops, enabling early issue detection, and prompt interventions.

Increased Crop Yields: Utilising drones to collect data on crop health facilitates farmers in identifying areas requiring attention. Addressing these concerns can lead to improved crop yields, ultimately augmenting profits.

Cost Reduction: Drones contribute to cost savings by pinpointing areas needing intervention, reducing reliance on manual labor, and minimising the usage of pesticides and other chemicals.

Job Creation: Initiatives like the NAMO Drone Didi scheme aim to train women in rural areas to become drone pilots, positioning them at the core of economic activity and contributing to rural prosperity.

Use Cases

Drones are multipurpose machines that can be used in various agricultural scenarios, ranging from crop sowing to crop monitoring. Here are some ways farmers can benefit from them:

Precision Agriculture: This has been significantly reshaped by the integration of drones into field and soil assessment practices. These unmanned aerial vehicles, armed with advanced sensors, meticulously collect essential data for soil analysis. Whether it's before the planting season or after crop establishment, the insights gained serve as a foundation for informed decision-making. From selecting the right crop species to planning planting patterns, drones contribute to what is known as precision farming.

Planting and Crop Sowing: These practices have undergone a transformative shift with the introduction of drone technology. Addressing challenges associated with labor scarcity and the labor-intensive nature of these tasks, drones execute precise and efficient sowing across vast agricultural expanses. This modern approach not only significantly reduces planting costs—often up to 85 per cent compared to traditional methods—but also minimises the physical strain linked to on-the-ground planting. Through automated and programmed flight paths, drones distribute seeds with optimal spacing, depths, and patterns, ensuring a uniform crop establishment. Beyond economic benefits, this transformative technology accelerates planting operations, contributing to the overall efficiency and sustainability of large-scale agriculture.

Precision Spraying: In the realm of precision crop spraying, drones have emerged as technological catalysts, revolutionising the targeted and efficient application of agricultural inputs. Equipped with advanced sensors and imaging technologies, drones conduct real-time scans of crop fields, allowing for site-specific spraying of liquids like pesticides and nutrients. This method ensures precise application to specific target areas, optimising resource utilisation and minimising waste. Drones' agility enables swift coverage of expansive fields, completing aerial spraying up to five times faster than conventional methods.

Crop Monitoring: This critical aspect of modern agriculture has found a reliable ally in drone technology. Drones provide a versatile and efficient means of assessing agricultural fields, addressing challenges associated with unpredictable weather and extremes in crop production. They offer real-time, high-resolution data for precise monitoring of crop development. By empowering farmers with comprehensive and timely information, drones enhance the precision and efficiency of crop monitoring, contributing to the overall resilience and productivity of modern farming systems.

Irrigation Management: The role of drones in irrigation management stands out as a valuable contribution to efficient water distribution in agriculture. Equipped with thermal sensing cameras, agricultural drones provide insights into soil moisture conditions, guiding precise water application. Identifying specific areas of the farm facing moisture-related challenges, drones enable farmers to make informed decisions about irrigation, ensuring water is applied precisely where and when needed. By avoiding over-irrigation or under-irrigation, farmers optimise water usage, conserve resources, and improve crop health.

Crop Health Assessment: Drones' impact extends to crop health assessment, offering a sophisticated and efficient method for monitoring crop well-being. The ability to detect potential health issues at an early stage allows for prompt and targeted interventions, safeguarding the crop and minimising the impact of diseases. Drones provide a comprehensive and real-time view of the entire field, enabling farmers to implement preventive measures and optimise crop management strategies. This proactive approach to

crop health assessment, facilitated by drone technology, contributes to improved yields and sustainable agricultural practices.

Pros and Cons

Agri-drones in Indian agriculture bring several advantages, enhancing security, efficiency, and cost-effectiveness. Trained drone pilots operate these devices, minimising the risk of misuse. The high efficiency of drones, working at double the speed of human labor without operational delays, contributes to timely and effective agricultural practices.

Furthermore, the use of ultra-low volume (ULV) spraying technology in agricultural drones leads to significant water savings compared to traditional spraying methods. The low cost and easy maintenance of agri-drones, featuring sturdy designs, detachable containers, low-cost frames, and precise pesticide spraying capabilities, make them accessible and practical for Indian farmers.

However, there are notable limitations to agri-drones in Indian agricultural contexts. Connectivity issues in rural areas, where online coverage may be limited, pose a challenge. Farmers may need to invest in internet connectivity, introducing additional recurring expenses. Weather dependency is another critical factor, as drones are highly reliant on favorable weather conditions. Flying drones during rainy or windy weather is not advisable, affecting their operational efficiency.

Moreover, the knowledge and skill required for using drone technology daily can be a hurdle for the average farmer. Acquiring the necessary expertise becomes essential, and farmers may find themselves dependent on individuals with experience in drone operations, highlighting the need for training and education in this emerging technology. Given the strong government focus, regulatory backing, liberal incentives, and appropriate training programmes, drones have the potential to revolutionise Indian agriculture, playing a pivotal role in uplifting the rural economy. ❑

Championing Social Startups for Rural Development

Farmers seen operating solar dryers to dry their farm produce in Andhra Pradesh.

Over the last decade, there has been a surge in the number of commercial and social enterprises addressing rural India's concerns. These small businesses, which are focused on agritech, dairy, textiles, e-commerce, logistics, healthcare, travel, and hospitality, are critical to addressing rural India's challenges and narrowing the rural-urban divide.

*** Wase Khalid**
**** Priyatam Yasaswi**

India is poised to have its GDP cross USD 5 trillion in 2026-27 and USD 26 Trillion by 2047-48, the centenary of Indian political independence, making it a high- and middle-income country. The role of startups in achieving this cannot be undermined, with the Prime Minister himself calling startups "the backbone of new India" . India has the third-largest startup ecosystem in the world, with as many as 98,000 startups recognised by the Government till April this year and reaching the coveted milestone of 100 unicorns. However, many of these startups cater to the urban and peri-urban populations residing in metros and Tier-I and Tier-II cities of the country.

One of the primary causes for the significant movement of the rural population to urban areas to seek new income-generating activities is the diminishing revenue from traditional livelihoods such as farming, dairy, handlooms, and others. Low productivity, a lack of market access and infrastructure, and a lack of bargaining power, among other reasons, have resulted in decreased incomes from traditional livelihood activities. Although the government's active support, such as providing subsidy support for

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Farmers setting up tomatoes on trays into a solar dryer in Musalreddygaripalle village in YSR Kadapa District, Andhra Pradesh.

technology purchases, delivery of seeds, fertilisers, minimum price support, and insurance, among other things, has addressed these difficulties to some extent, further assistance, particularly from the private sector, is required.

With the rural economy still accounting for 46 per cent of the total economy, there is enormous potential for improving rural livelihoods, incomes, and productivity, hence boosting the rural economy's part of the national economy. Here, startups can play an important role by bringing in innovation to cater to pertinent challenges, thereby helping rural economies realise their potential.

India's Rural Startup Ecosystem is More than just Agri-startups

From determining soil health to using solar energy for yarn reeling, startups in rural India are not just about agriculture. There is a range of work happening on the ground. Farm productivity and farmer incomes have been significant barriers to realising the full potential of the rural economy. To address these challenges, over 450 startups are actively engaged in the agri-tech sector, attempting to solve farmers' problems such as smart agriculture, resilient downstream service supply chains, value addition at the farm level, and farm mechanisation. An individual farmer can now use the power of such innovations to gain insights about soil health in their farm and receive the recommended dosage of fertilisers before harvest, get access to block-level weather data to help plan on-farm activities, and marketplace services, and value addition solutions to sell the produce grown. With the correct amount of support, these innovations can go a long way towards helping farmers improve their incomes.

On the other hand, in the non-farm sector, several startups have effectively created an impact at the ground level through their innovations, specifically in animal husbandry, food processing, textiles and handlooms, and healthcare. Furthermore, several cleantech startups (businesses that provide renewable energy-powered solutions) have been instrumental in bringing the energy transition to rural communities. Such cleantech startups have been working with communities to increase their earnings while also ensuring that their livelihood practices have no negative environmental impact.

Key Value Chains that Startups could Focus on in Rural India

Value addition and food processing activities at the farm level

A variety of technologies, including cold storage, dryers, milling machines, small oil expellers, and food processors, can enable the value addition and processing of farm produce. Of these, cold storage and dryers have long been encouraged for usage by farmers due to their wide variety of benefits, such as increased shelf life and value addition of agricultural produce at the farm level. While the solution itself benefits farmers by preserving their produce through reliable storage and value addition, several startups have gone a step further to solve the farmers' backward and forward market linkages.

Raheja Solar Food Processing, based out of Indore, Madhya Pradesh, is a manufacturer of solar dryers. They have developed a novel buyback programme in which they buy dried products from farmers and sell them to the market without the farmers having to look for consumers. This allows farmers to sell all of their dried produce and receive payment on time. Similarly, New Leaf Dynamics, an enterprise that manufactures biomass-powered cold storage, has taken steps to guarantee farmers a reliable supply of dry biomass to operate its cold storage and connects farmers with purchasers via a mobile application. These are some examples of how technical and digital innovation can benefit farmers and their livelihoods. These initiatives that these startups have deployed are mutually

beneficial for them as well as for the users of their solutions.

Animal Husbandry

The productivity of cattle and rising expenses are two of the primary difficulties confronting the dairy business as demand for dairy products rises. Several startups are tackling the issues with technology and product innovations in this sector, such as through hydroponic fodder-growing machinery, multi-cropping fodder crops, concentrate feeds, and silage.

Hydrogreens, a Bengaluru-based firm, is attempting to address this issue with its vertical fodder growing unit, which can also be powered by solar energy. Farmers can use this approach to grow green fodder with little water and no soil in their homes. This technological innovation, in addition to addressing the issue of fodder scarcity, allows for improved milk quality and quantity, resulting in increased income for the farmer.

Textiles and Handlooms

A few conventional textile-based livelihood activities in rural areas, such as yarning, weaving, and reeling, entail drudgery for their mostly female practitioners and are also less productive. A few startups have mechanised some of these procedures, which not only lowers drudgery and boosts incomes but also preserves the relevance of traditional practices. A study undertaken by 'Powering Livelihoods', a joint initiative between CEEW and Villgro, notes that as many as 70% of female users of silk reeling machines manufactured by Resham Sutra were able to increase their incomes.

Traditionally, women in Chhattisgarh, Jharkhand, and Odisha carry out 'thigh reeling' to reel silk yarns. This method is less productive and laborious, and it puts women at risk of long-term injury. Resham Sutra's 'Unnati,' a solar-powered silk reeling machine, lowers drudgery, increases productivity, and eliminates the risk of injury. Many people and rural businesses involved in silk reeling have begun adopting this technique, which has resulted in higher revenues and extended operations. The study by 'Powering Livelihoods' further notes that users of this reeling machine could work with improved productivity of as high as twice that of their earlier practices.

Employees working on solar silk reeling machines manufactured by Resham Sutra at a reeling centre in Odisha.

Healthcare

Despite improvements in healthcare infrastructure, some ground remains to be covered to ensure healthcare facilities in rural areas are on par with those in urban areas. In rural areas, startups working in telemedicine, supply chain management, and low-cost diagnostic and vaccination equipment, among others, are making a huge impact.

Emvólio, a portable temperature-controlled biological carrier manufactured by Blackfrog Technologies, has enabled considerable progress in last-mile vaccination. In addition to catering to urban population, startups such as CureBay and DigiQure also cater to peri-urban and rural areas providing solutions such as telemedicine and online medical consultations, making trustworthy healthcare accessible to all.

Service-related Digital Innovations

In recent years, a number of startups have emerged that provide farmers with digital solutions, such as market aggregation platforms, e-commerce platforms, digital payments, fintech solutions, AI algorithms for on-farm predictions, and expert advisory support. These companies have ensured that farmers increase their income and do not fall behind technologically.

Rang De, a peer-to-peer lending platform based out of Bengaluru, provides quick and affordable financing to communities that lack access to mainstream financial institutions. Through their lending platform, they have promoted social investing by allowing people to lend to farmers, craftspeople, and rural entrepreneurs without

A farmer arranging sliced brinjal into a solar dryer in Andhra Pradesh. Photos: CEEW

access to mainstream banking to help them start, sustain, grow, and expand their livelihood practices. For example, a small-scale farmer from a town in Telangana can seek support for the construction of a farm pond on his farm by offering to pay the loan, at an 8% flat interest rate. The investor gets paid 6% of this interest rate while Rang De, the platform facilitating this, will charge a nominal 2%. The investee gets his/her credit rating based on the credit bureau's scores as well as the impact partners' assessments, helping investors decide.

India's rural startups remain resilient, but certain challenges could impede progress

Challenge with Scaling up

Many startups are currently established by innovators with technological or service innovations. In many cases, these enterprises are run primarily by these innovators with the help of a couple of administrative staff. Moreover, many startups are unable to hire a senior team member to oversee business operations due to budget constraints. As a result, even if the startup has mastered the product or service to be delivered, it may be lacking in the vision and competencies required to build its business. This lack of entrepreneurial leadership impacts, among other things, business expansion, thereby impacting the formation of collaborations and securing financing or investments.

A Lack of Ecosystem Support

Despite widespread acknowledgement and ambition among governments, financial institutions, and investors to foster the rural startup ecosystem, assistance so far has been limited due to ecosystem players' low-risk appetite. Since most rural businesses are early-stage with limited/no established track record or evidence of success, ecosystem players perceive these startups as high-risk. As a result, most rural startups either struggle to survive or fail without appropriate support. Therefore, it is important to bring all important stakeholders to the same table and foster collaboration and knowledge sharing to help achieve common goals.

Absence of Go-to-Market Strategy

Given that most rural businesses (or startups) are focused on balancing their sheets in the first few quarters, they spend little time and resources on defining their go-to-market strategy and business models, which adds to their difficulties. Many startups, we have interacted with, say they struggle to identify target consumer segments, product pricing and design, and sales and distribution channels without a clear market and business strategy. As a result, they might end up producing a product offering that does not meet the true demands of rural consumers.

Difficulty in Catering to Scattered Demand and Providing after-sales service

Startups have a limited on-the-ground presence due to low working capital, a lack of staff, and other resources. As a result, many businesses, particularly those that rely entirely on offline sales, struggle to meet geographically scattered demands. For example, a startup may be based out of Mumbai or Delhi but have potential users in the remote geographies of Jharkhand, Chhattisgarh, or Odisha. Naturally, it would be difficult for them to navigate these geographies and would need support to make inroads. Furthermore, for the same reason, they face difficulties in offering after-sales service to customers for new technologies powered by renewables, as technicians who could extend such support may not be familiar with the technology. In the long run, this impacts the business's credibility and could affect demand in the long term.

Other External Factors

Apart from the aforementioned challenges, various external factors may impede the growth of social startups in rural India. First, there is competition from low-quality, low-cost goods and services. Because the rural population is wary of overspending, they resort to purchasing low-cost alternatives. Second, natural disasters, pandemics, and climate change can all greatly impact the success of businesses. Recently, the Covid-19 pandemic impacted the operations of several startups within the country. Third, market factors such as increased import/export levies and trade bans, among others, may significantly impact the startup ecosystem.

A Few Recommendations to Foster the Rural Startup Ecosystem in India

- **Social startups should prioritise gathering and analysing evidence to unlock support:** The lack of support from ecosystem players for rural startups stems mainly from insufficient evidence of success. Social startups should consider developing institutional capacity to collect data from sales and user experiences of their solutions and services. The collected data can be synthesised into case studies and impact figures that can be useful for both private players and government departments when considering extending support. Further, they could use the data to help fine-tune their products and go-to-market strategy.
- **Social startups should strive to leverage existing government schemes:** Many Central Government schemes and initiatives, such as the Atal Innovation Mission, Startup India and its Seed Fund Scheme, and ASPIRE (A Scheme for the Promotion of Innovation, Rural Industries, and Entrepreneurship), have aided the growth of many rural Indian startups by helping them chart the initial path with seed capital, incubation, and growth strategy support. Furthermore, the Government has extended schemes such as Pradhan Mantri MUDRA Yojana (PMMY), Agriculture Infrastructure Fund (AIF), and Pradhan Mantri Formalisation of Micro Food Enterprises (PMFME), among others, to help early-stage firms grow faster. This provides much-needed impetus for these firms beyond the initial support provided by the ecosystem.
- **Prioritise a positive overall product experience for rural consumers:** Indian rural marketplaces rely on trust, networks, and word of mouth. A bad user experience can have a substantial influence on the brand's trust in that market. As a result, companies need to ensure that they provide a great user experience throughout the product usage lifecycle to ensure users' profitability. They must ensure timely product installation, give product training if necessary, and provide quick resolutions to user complaints during the warranty and post-warranty period. If startups experience issues offering after-sales support due to their low on-the-ground presence in the early stages, they can explore partnering with local service providers who can service customer requests on their behalf.
- **Social startups should have an explicit focus on gender mainstreaming:** Gender-inclusive strategies make business sense. However, very few social startups are aware of them, and even fewer are willing to try them. This is especially true for early-stage social enterprises that are primarily concerned with their survival. Given that women constitute the majority of the rural workforce in India, entrepreneurs must engage in a variety of activities to attract more female customers, ranging from producing women-friendly products to easing end-user financing, as it is more difficult for women to obtain credit despite lower default rates. A strong push to encourage women from rural backgrounds to create independent businesses is vital to increasing the participation of women-owned firms in rural areas in the economy, resulting in inclusive economic growth.

Conclusion

Rural India startup ecosystem can pave the way for Aatmanirbhar Gaon (Self-Reliant Villages)

Over the last decade, there has been a surge in the number of commercial and social enterprises addressing rural India's concerns. These small businesses, which are focused on agritech, dairy, textiles, e-commerce, logistics, healthcare, travel, and hospitality, are critical to addressing rural India's challenges and narrowing the rural-urban divide. The rural startup ecosystem has the potential to generate jobs, boost rural entrepreneurship, and stimulate reforms in the digital, fiscal, and physical infrastructure sectors. Scaling small-scale businesses (or startups) focused on tackling issues in traditional livelihood practices might thereby pave the path for overall rural economic improvement and achieve the vision of 'Atmanirbhar gaon'. ❑

Supporting Women-led Startups

Flagship schemes such as Stand-Up India and PM Mudra Yojana have helped women-led startups access funds at minimal cost. With a vision to promote the sustainable development of women entrepreneurs for balanced growth in the country, Startup India has been committed to strengthening women entrepreneurship in India through initiatives, schemes, the creation of enabling networks and communities, and activating partnerships among diverse stakeholders in the startup ecosystem. If more and more women-owned business enterprises can play a prominent role in society by generating employment opportunities in the country, it will bring in demographic shifts and inspire the next generation of women founders.

B S Purkyastha

The Startup India initiative was launched by the Narendra Modi-led Government in 2016 to foster an environment that is conducive to the development of innovation and startups in the country. Sustained efforts by the Government under the Startup India initiative have led to an increase in the number of recognised startups from 428 in 2016 to 98,119 in 2023, as on 30th April 2023. The Compound Annual Growth Rate (CAGR) of the number of recognised startups during the period between 2016 and 2022 is 142%, highlighting the continued robust growth of the Indian startup ecosystem. While metro cities such as Bengaluru and Delhi-NCR are correctly recognised as the startup

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hotspots of India, today there are recognised startups in every State and Union Territory (UT) spread across more than 80% of the districts of the country. These recognised startups have created more than 10.34 lakh direct jobs as on 30th April 2023, driving holistic economic growth.

Even as the aim is to build a stronger ecosystem for nurturing India's startup culture that would further drive our economic growth, support entrepreneurship, and enable large-scale employment opportunities, there is also a sharp focus on facilitating women entrepreneurs through policies and initiatives and the creation of enabling networks. The results of these policies can be seen in the increasing presence of women as entrepreneurs. In 2022, the number of startups led by female founders touched 80,000, up from 6,000 in 2017, a whopping 1233% increase. The share of VC funding to women-led startups also went up to 20% in 2022, up from 11% in 2017. Around 47% of the total DPIIT-recognised startups in India have at least one female director. Among the 105 startups that turned unicorns in 2022, 17% were women-led startups. As per a recent study, the last 10 years saw female-led companies perform 63 per cent better than male-led companies in terms of return on investment, with women showing an unparalleled willingness and capacity to organise, develop, and manage a business venture. According to a report by WISER's Women's in India's Startup Ecosystem Report, women-led startups account for 18% of all startups in India in the past five years.

With a vision to promote the sustainable development of women entrepreneurs for balanced growth in the country, Startup India has been committed to strengthening women entrepreneurship in India through initiatives, schemes, the creation of enabling networks and communities, and activating partnerships among diverse stakeholders in the startup ecosystem. Along with the various schemes accessible to all startups under the Startup India initiative, the government has taken the following specific measures to promote women entrepreneurship in the country:

i. To promote flow of both equity and debt to women-led startups, 10% of the fund (Rs. 1,000 crore) in the Fund of Funds for Startups Scheme operated by SIDBI is reserved for women-led startups.

ii. Virtual Incubation Programme for Women Entrepreneurs was conducted to support 20 women-led tech startups with pro-bono acceleration support for three months.

iii. A webpage dedicated to women entrepreneurs has been designed on the Startup India portal. The page includes various policy measures for women entrepreneurs by both Central and State Governments.

iv. Awareness and Capacity-Building Workshops for Women: The department conducts various workshops with a specific focus on women entrepreneurs. The workshops include deliberation on various topics, and successful entrepreneurs share their entrepreneurial journeys. The participants of the sessions conducted comprised many women, including both aspiring and existing entrepreneurs. Startups at all stages -- Ideation stage, Validation stage, Early Traction stage, and Scaling stage -- with full-time female founders, or co-founders, or directors are encouraged to attend these workshops.

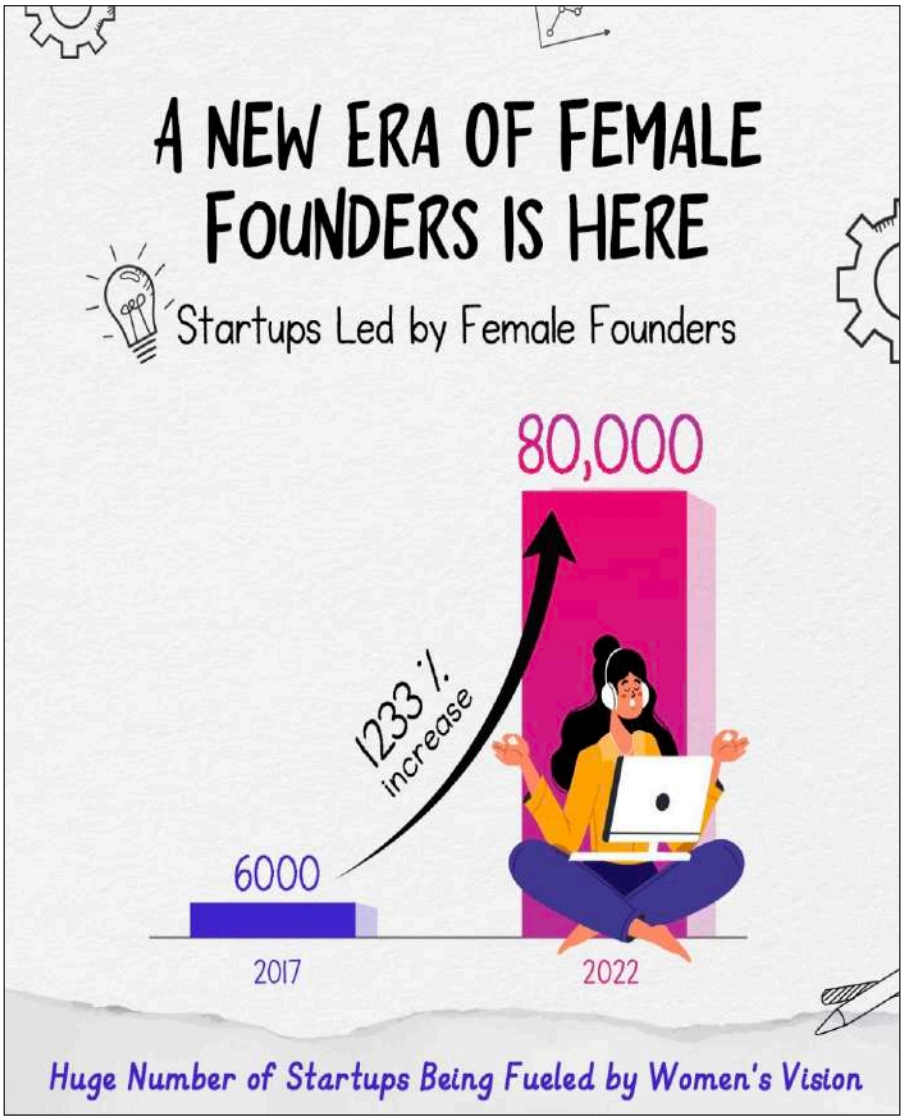
v. WING: It aims to support 7,500 women entrepreneurs in the country per year. As a part of DPIIT's programme WING - a capacity development programme for existing and aspiring women entrepreneurs was conducted in Guwahati, Assam, and Kohima, Nagaland in January 2020 which saw the participation of 114 attendees across two parallel workshops. The participants were given mentoring sessions in the following areas:

    a. Venture Ideation and Business Model Validation
    b. Governance: Legal/ Compliance
    c. Marketing/ Branding: Creating differential
    d. Finance and Financial Decisions
    e. Mastering Customer Acquisition Strategy and Scaling-up

Through its various awareness programmes and capacity-building programmes organised by the Government, and through print media and social media platforms, the Government also creates awareness about the existing schemes that support micro, small, and medium entrepreneurs, including women entrepreneurs.

Access to Funds: The Biggest Challenge

Women-owned MSMEs face challenges in accessing credit due to a lack of collateral and tangible assets, limited avenues to prove creditworthiness, and perceptional biases against lending to female entrepreneurs or women-led enterprises. As most women-owned businesses are home-run, micro, and informal in nature, they have limited exposure to market spaces and marketing skills. Female entrepreneurs need to deal with mobility and logistics challenges, time poverty and unpaid care work, and safety and security issues to manage the business and achieve the required growth for the enterprise. They also lag in terms of digital and technical skills due to low literacy rates and a lack of access to mobile devices and the Internet. Thus, most women-led MSMEs remain subsistence-oriented rather than growth-oriented.



Government Funding Schemes with special emphasis on Women-led startups

Mudra Yojana for Women/ Mahila Udhyami Yojana

One of the most popular programmes is the Mudra Yojana for Women/ Mahila Udhyami Yojana. Under this, women entrepreneurs who are heading and managing any manufacturing or production business are eligible to get loans up to Rs. 10 lakh without any collateral from the Department of Financial Services under the Ministry of Finance. Women artisans, weavers, craftswomen, etc., are eligible for these loans. Other small and micro-scale businesses run by women, that qualify for Mudra loans are phone repairing, auto-repairing, tailoring, photocopying, servicing centres for electronics appliances, spa, and beauty parlour services. The loans can only be allocated for non-corporate, non-farming, and non-agriculture-based businesses that are headed and run by women entrepreneurs. Total tenure for loan repayment for women is a maximum of 5 years, and a minimum of 3 years. Loans under the Mudra Yojana Scheme for women can be used to set up a new business, expand an existing business or modernise existing business with the latest technology and tools. The age limit for women who can avail of loans under the Mudra scheme is 65 years. The minimum age requirement is 18 years.

As on 25 November 2022, more than Rs. 37.76 crore loans for an amount of Rs. 20.43 lakh crore have been sanctioned since the launch of the Pradhan Mantri Mudra Yojana (PMMY), of which over 70% of the loans have been sanctioned to women entrepreneurs.

Stand-Up India (SUI) scheme

Women entrepreneurs can also avail of loans under the Stand-Up India (SUI) scheme offered by the

Small Industries Development Bank of India (SIDBI). The objective of the SUI scheme is to facilitate bank loans between Rs. 10 lakh and Rs. 1 crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch for setting up a greenfield enterprise. This enterprise may be in manufacturing, services, agri-allied activities, or the trading sector. In the case of non-individual enterprises, at least 51% of the shareholding and controlling stake should be held by either an SC/ST or woman entrepreneur. Loans under the scheme are available only for Green Field Projects, i.e., the first venture of the beneficiary in the manufacturing, or services, or agri-allied activities, or trading sector.

Since the inception of the Stand-Up India scheme, Rs. 35,886 crore has been sanctioned to 1.58 lakh accounts (as on 25 November 2022), of which 81% of the beneficiaries are women.

Special Schemes for Rural/Disadvantaged Women

Recognising that women in rural India face a different set of challenges while setting up their own enterprises, the Government has designed some special supportive programmes for less-privileged women. One of the flagship schemes is the Skill Upgradation and Mahila Coir Yojana (MCY), implemented by the Ministry of Micro, Small, and Medium Enterprises, an exclusive training programme aimed at the skill development of women artisans engaged in the coir industry. Two months of training in coir spinning is imparted through this programme. The candidates who undergo this training are given a stipend of Rs. 3000 per month. The trained artisans under the scheme are encouraged to avail assistance through the Prime Minister's Employment Generation Programme (PMEGP) scheme to set up coir units. Under MCY, the Coir Board provides rural women artisans in regions producing coir fibre75% cost of the motorised Ratt/motorised traditional Ratt as one time subsidy, subject to a ceiling of Rs. 7,500 in the case of motorised Ratt and Rs. 3,200 for the motorised traditional and Electronic Ratt.

Mahila Samridhi Yojana

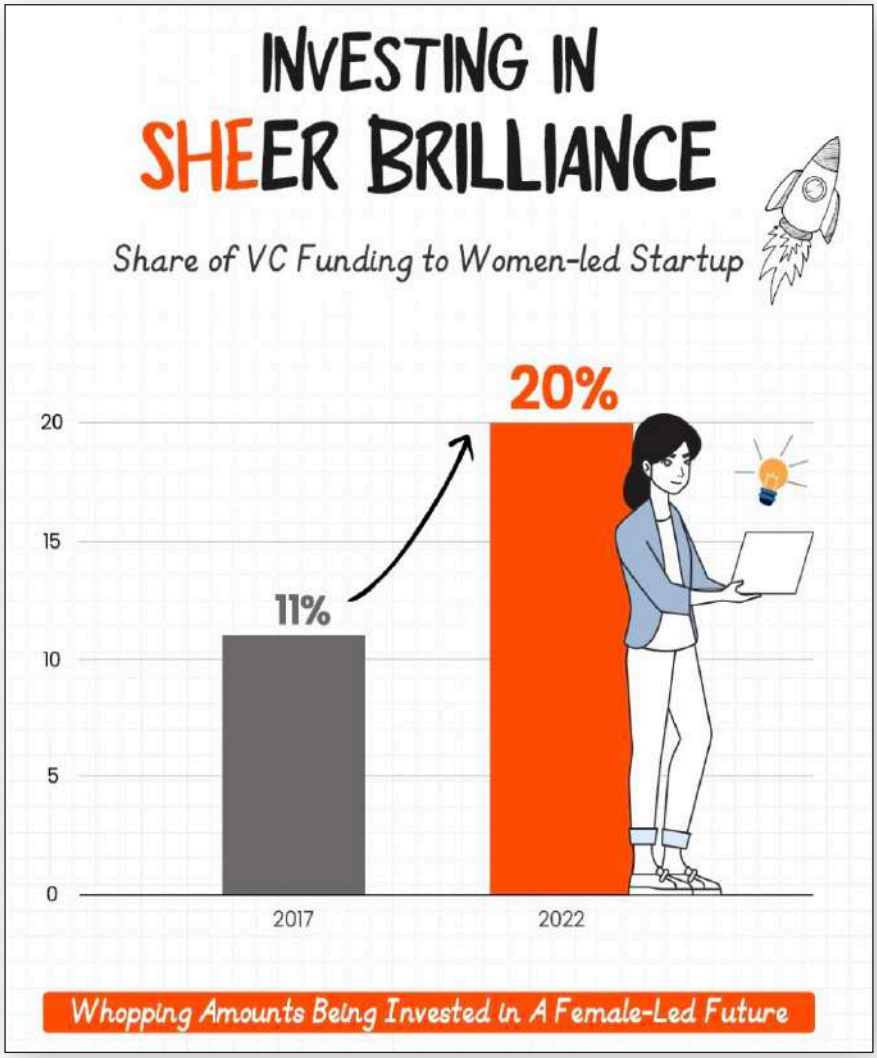
The National Scheduled Castes Finance and Development Corporation (NSFDC) under the Ministry of Social Justice and Empowerment offers financial assistance to women belonging to scheduled castes through the Mahila Samriddhi Yojana. This is a microfinance scheme for women with a rebate in interest. Financial assistance up to Rs. 1,40,000 is provided to women belonging to backward classes, as per the Government norms, and whose family income is less than Rs. 3 lakh per annum.

Table 1: Coverage of women beneficiaries under various schemes of NSFDC in FY 2023-24 (as on 31.10.23)

S.N.	Particulars	Women Beneficiaries Covered	Amount Disbursed (in lakh)
1	Term Loan	1	7.65
2	Micro-Credit Finance	384	267.43
3	Mahila Samriddhi Yojana	1795	932.75
4	Educational Loan Scheme	42	260.90
5	Laghu Vyavsay Yojana	2339	4029.97
6	VETLS Scheme	0	0
7	Aajivika Micro Credit Scheme	667	300.09
8	Green Business Scheme	0	0
9	Stand-Up India Scheme	0	0
10	Mahila Adhikarita Yojana	471	1297.95
11	Udhyam Nidhi Yojana	2222	2000.00
	TOTAL	**7921**	**9096.74**

Source: NSFDC

Again, under the Self Employment Lending Scheme–Credit Line 1–Mahila Samridhi Yojana, training is given to a group of around 20 women in any suitable women-friendly craft activity. The group is formed into a Self-Help Group during the training itself, and after



the training, microcredit is provided to the members of the SHG so formed by the National Minorities Development and Finance Corporation. Credit Line 1 is the existing stream of concessional credit, being disbursed on the basis of income limits of Rs. 98,000 p.a. for rural areas & Rs. 1.20 lakh in urban areas. The maximum duration of the training is six months with maximum training expenses of Rs. 1,500 p.m. per trainee. During the training, a stipend of Rs. 1,000 p.m. is also paid to the trainees. The training cost and stipend are met by NMDFC as grant. After the training, need-based microcredit subject to a maximum of Rs. 1 lakh, is made available to each member of SHG at an interest rate of 7% p.a.

Women Enterprise Development (WED) Scheme

The Ministry of Development of the North Eastern Region (DONER) runs the Women Enterprise Development (WED) Scheme, under which skilled woman entrepreneurs in the age group of 18-50 years engaged in any viable income-generating activity, including small business trade, etc., are provided financial assistance up to a maximum of Rs. 100 lakh for taking up business ventures. Existing businesses are also eligible for expansion, modernisation, and diversification.

To encourage entrepreneurship among women, the Ministry of Micro, Small and Medium Enterprises (MSME) implements various schemes. The Ministry implements the Prime Minister's Employment Generation Programme (PMEGP), which is a major credit-linked subsidy programme aimed at generating self-employment opportunities through the establishment of micro-enterprises in the non-farm sector by helping traditional artisans and rural/urban unemployed youth. For beneficiaries belonging to special categories such as Scheduled Caste/Scheduled Tribe/OBC/ minorities/women, ex-servicemen, physically handicapped, NER, hill and border areas, etc., a higher subsidy is given.

The Credit Guarantee Fund Trust for Micro, and Small Enterprises (CGTMSE), which was jointly set up by the Ministry of MSME, Government of India and Small Industries Development Bank of India has increased the extent of guarantee coverage of credit to 85% for women entrepreneurs. As an additional concession to Women Entrepreneurs, CGTMSE has reduced the Annual Guarantee Fee by 10%.

Trade Related Entrepreneurship Assistance and Development (TREAD)

Under the Ministry of MSME, the scheme provides assistance in the form of a Government of India (GoI) grant of up to 30 per cent of the total project cost, as appraised by the lending agency, to the non-governmental organisations (NGOs) engaged in income generation activities for women entrepreneurs for promoting entrepreneurship among target groups

of women. The remaining 70 per cent of the project cost is financed by the lending agency as a loan for undertaking activities as envisaged in the project. The NGOs can utilise the grant for training, counselling, tie-ups for marketing on behalf of the beneficiaries, etc. besides their capacity-building for assisting women. Selected training institutions and NGOs conducting training programmes for the empowerment of women beneficiaries identified under this scheme can also avail of GoI grant of up to Rs. 1 lakh per programme, for imparting training to women entrepreneurs, provided such institutions also contribute at least 25 per cent of the grant.

Mentoring Women Entrepreneurs

The Women Entrepreneurship Platform (WEP) is a key enabling programme under the guidance of NITI Aayog. As an aggregator platform, WEP hosts information and services relevant to women entrepreneurs. It enables key partnerships to bring crucial content, workshops, campaigns, and other avenues of learning and growth to its users from trailblazers in the industry. Every year, WEP's flagship Women Transforming India (WTI) awards showcase the successful journeys of women entrepreneurs who are at the frontiers of their fields, from manufacturing, handicrafts, health, and wellness to technology and automation.

To inspire women belonging to minority communities to stand on their own feet, the Government has two broad programmes implemented by the Ministry of Minority Affairs. First is the Nai Roshni Scheme for Leadership Development of Minority Women, which aims to empower and instill confidence among minority women, including their neighbours from other communities living in the same village or locality, by providing knowledge, tools, and techniques for interacting with Government systems, banks, and other institutions at all levels. The Nai Roshni programme is run with the help of NGOs, Civil societies and Government Institutions all over the country. It includes various training modules like leadership of women, educational programmes, health and hygiene, Swachh Bharat, financial literacy, life skills, legal rights of women, digital literacy, and advocacy for social and behavioural change.

Special Schemes of Public Sector Banks

Besides Central government schemes for women-led startups, several public sector banks such as State Bank of India (Stree Shakti Scheme), Punjab National Bank (PNB Mahila,Udyami), Central Bank of India (Cent Kalyani) and Dena Bank (Dena Shakti Scheme) have also launched concessional financing options for women entrepreneurs to set up their own micro enterprises or expand, modernise or undertake technology upgradation of existing units in the manufacturing and services sectors or for working capital needs.

The Way Forward

As per the National Sample Survey (NSS) 73rd Round report, 19.5 per cent of the total unincorporated non-agricultural proprietary enterprises were owned by women, employing 22 to 27 million people. As per the report 'Decoding Government Support to Women Entrepreneurs in India' on the NITI Aayog website, women's economic contribution in India accounts for 17% of the GDP. The majority of women-led enterprises in rural India is in the agriculture and allied sectors such as handloom and handicrafts. While the achievements of women entrepreneurs in urban areas typically get highlighted in the media, their counterparts in rural India may not be getting their share of the limelight.

Even as the Government fine-tunes its various schemes to make them more effective, it must pay particular attention to ensuring female entrepreneurs can equally access the benefits of all entrepreneurship support schemes against only those that specifically target women. Also, more schemes that support entrepreneurship in the digital economy are needed. Non-financial support under schemes in the form of technology upgrades, quality assessment support, intellectual property rights (IPR), marketing infrastructure, market access, incubation facilities, skill training, capacity building, etc., needs to be equally available, especially for women. If more and more women-owned business enterprises can play a prominent role in society by generating employment opportunities in the country, it will bring in demographic shifts and inspire the next generation of women founders. ❑

February 2024 issue - Food Storage Infrastructure