



Status and Challenges of Agripreneurship: Relevance in COVID-19 Pandemic

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Global pandemic COVID-19 severely impacted the agricultural economies of all countries, including India. The paper covers the current status of agribusiness in India and how it has emerged as a major indicator for growth and development during the pandemic. In India, MANAGE has trained 72,806 agri-graduates in agripreneurship, and as of December 2020, there were 30,583 (42%) active agriventures around the world. Majority of farmers have lost their markets as a result of lockdown, and due to travel limitations, lack of training and consulting services resulted in crop loss, high produce prices, and labour scarcity. Agri Bazaar, Harvesting Farmer Network, Agricx Lab, CroPln, Bigbasket, Agrostar, Sickle Innovations, Agrirain, Farmguide, and PayAgri are few Agri-startups that arose in India during the pandemic to address the issues that farmers faced. Reorienting current agriculture towards agribusiness within the existing opportunities has the potential to significantly alter the lives farmers and its stakeholders as agripreneurship has demonstrated the path to farmer growth and sustainability even during the pandemic.

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1. INTRODUCTION

“The Corona Virus Disease of 2019 (COVID-19), which has infected 82.1 M people worldwide and claimed 1.79 M lives, was declared a global pandemic by the World Health Organization on January 30, 2020” [1]. “The majority of the countries took rigorous containment measures, including home confinement, social isolation, and temporary closure of companies, schools, and universities, as a result of the unknown virus' high contagious rate” [2]. Sudden and complete lockdown caused severe travel restrictions, border closures, employment losses, trade restrictions, market closures, food shortages, famine, and an increase in physical and mental sickness among the general public. Lockdown substantially damaged the global economy at all scales, and the agricultural sector was not an exception. Because it serves as the largest employment in the world, agriculture is a key pillar of the Indian economy that is most impacted after COVID [3]. It also pertains to food security and is one of the most significant areas of human development [4].

On March 24, 2020 in India a nationwide lockdown started that entirely shut down human interaction, altered the old working structure, and interrupted economic activity around the world [5]. A global food emergency arose and as a result of the safety precautions, which were essential to stop the spread of COVID-19 had a major impact on agri-food systems and food consumption [6]. Despite having no direct effects on the agricultural production, the disease has highlighted how susceptible the world's food systems were to shock and crises [7]. Amid these, agripreneurship emerged as a beacon of innovation and resilience. Food availability, economic stability, and social support were all made possible by agripreneurs through their use of technology, production diversification, and community participation. Agripreneurs supported long-term resilience and recovery by utilizing sustainable methods, direct-to-consumer business models, and localized production to lessen the pandemic's negative effects on agriculture. Hence, it is mandatory to study the concept of agripreneurship, and its impact during the pandemic on Indian agricultural system in terms of its status, list of start ups, challenges this industry tackled and future prospects in the hope of gaining new insights and understand possible opportunities.

1.1 Concept of Agripreneurship

Agripreneurship is a flexible method of business development in the agricultural industry that adds value while also brings innovation by benefiting rural residents and expands their options for a living and the number of jobs available to them [8]. According to Uplonkar and Biradar's definition of agripreneurship (2015), an entrepreneur is a person who develops models and ideas to address issues in agricultural production and marketing through the process of entrepreneurship, which entails establishing an enterprise in order to grow one's business. “Agripreneurs are risk-takers who intentionally commit resources to a business venture, particularly an agribusiness, in order to capitalize on opportunities in exchange for profit. They are the key decision-makers and are accountable for the success or failure of the businesses” [8].

1.2 Types of Agripreneurship

The following classification has been made based on the number of partners who are participating in owning an agribusiness by Pavan et al. [9]:

- *Individual agripreneurship:* It enjoys complete ownership of the enterprise and is entirely responsible for its success or failure. Independently makes decisions and uses critical thinking to control all operations and is the only one who receives revenue from each business activity.
- *Group agripreneurship:* Divided in three types:- Partnership, Private limited company, Public limited company
- *Cooperatives:* An autonomous association of persons that have come together voluntarily and are working towards the same goals in terms of societal, cultural, and economic demands. The business is democratically owned and run by all parties involved.
- *Cluster formation:* A formal and informal group of people coming together primarily to work towards a common goal. It includes diverse NGO, SHG, and local farmer groups that collaborate peacefully for the upliftment of a disadvantaged class.

The work system of an agripreneur, who operates inside the food system, particularly in

rural areas, was defined by the Montpellier panel in 2013. Agripreneurs are risk-takers who spot market opportunities, assess their potential, and come up with immediate inputs to implement in order to increase the production of food products like vegetables, fruit, dairy, meat, fish, and grains by utilizing innovative and sustainable production methods to meet consumer demands. As a result, an agripreneur carefully considers the variety of agribusiness prospects present in the expanded food system, a sector that is always evolving and encompasses tasks like processing, packaging, logistics, services, cooking, and waste recycling.

2. METHODOLOGY

This paper reviewed and scrutinized secondary sources of data and information to assess the impact of Covid-19 Pandemic on Agro-Entrepreneurship in the developing country like India. The study is descriptive in nature. The literature and data are mainly based on secondary source, which has been collected from various publications, research paper, and various internet sources. Three electronic databases (i.e., Web of Science, Scopus, and Google Scholar) were utilized to explore data and information before the execution of content analysis of recognized literature sources. Proceeding to search the literature, an examination of studies on areas of agripreneurship "entrepreneurship in agriculture," "agri startups," "e-commerce," and "COVID-19 were done." The database searches were completed on April, 2024, and the search results were limited to dates ranging from 2015 to 2020. The following criteria were observed and used for screening the articles: those connecting agripreneurship and COVID-19; free-of-charge and available full-text English articles. After examining for significance and removing duplicates from the two databases, a total of 36 articles were included for further analysis. The comprehensive agriculture and COVID-19 study yielded four themes: status and challenges of agripreneurship, agri-ventures in India, situation during COVID-19, extension methods used and list of agri-start ups in India. On basis of these areas the study has been explained.

3. AGRIPRENEURSHIP DEVELOPMENT MODEL

India is rural and villages are the backbone of its economy. To develop country as a whole the

development of villages is necessary and a pre-requisite. There is a huge gap in rural and urban socio-economic and demographic conditions. The standard of living of the rural population is not up to mark and need to improve. Any industry located in rural area, village or town with a population of 20,000 and below and an investment of Rs. three crores in plant and machinery is classified as a village industry. By developing entrepreneurial and organizational competency, rural farmers will be able to work in an organized manner and develop sustainable competitive advantages in regional, national and international markets. Thus, Indian agriculture needs to convert into agribusiness which is explained in Fig. 1. Agripreneurship are meaningful solution across the agricultural value chain. The allied sectors like sericulture, dairy farming, mushroom cultivation, fisheries etc. have a lot of potential for agripreneurship in agriculture sustainability. According to Thomas and Zacharias [10] agripreneurship is essential because of following reasons:-

- Increasing demand for organic/quality food both in India as well as abroad. Market growth of around 15-25 per cent per year.
- Competitive advantages for many primary production activities in agriculture. Rain-fed farming, tropical fruits and vegetables, livestock, animal husbandry, aquaculture, wild craft, etc. are produced through real low cost production methods.
- Private sector is willing to enter into agri-business at all levels of operations. Changing consumer demand and retail revolution has opened the doors for investment by private sector in agri-businesses like Reliance, Bharati, Pantaloons, Carrefour, etc.
- To reduce malnutrition and decrease food wastage [11].

3.1 Reasons to Promote Agripreneurship Development in India

When the principles of entrepreneurship are applied to the agricultural sector, positive outcomes can be obtained, and well-trained agripreneurs can serve as an inspiration to all discouraged farmers who are having difficulty. The economic system of an agrarian country like India benefits from its position in the economy [12].

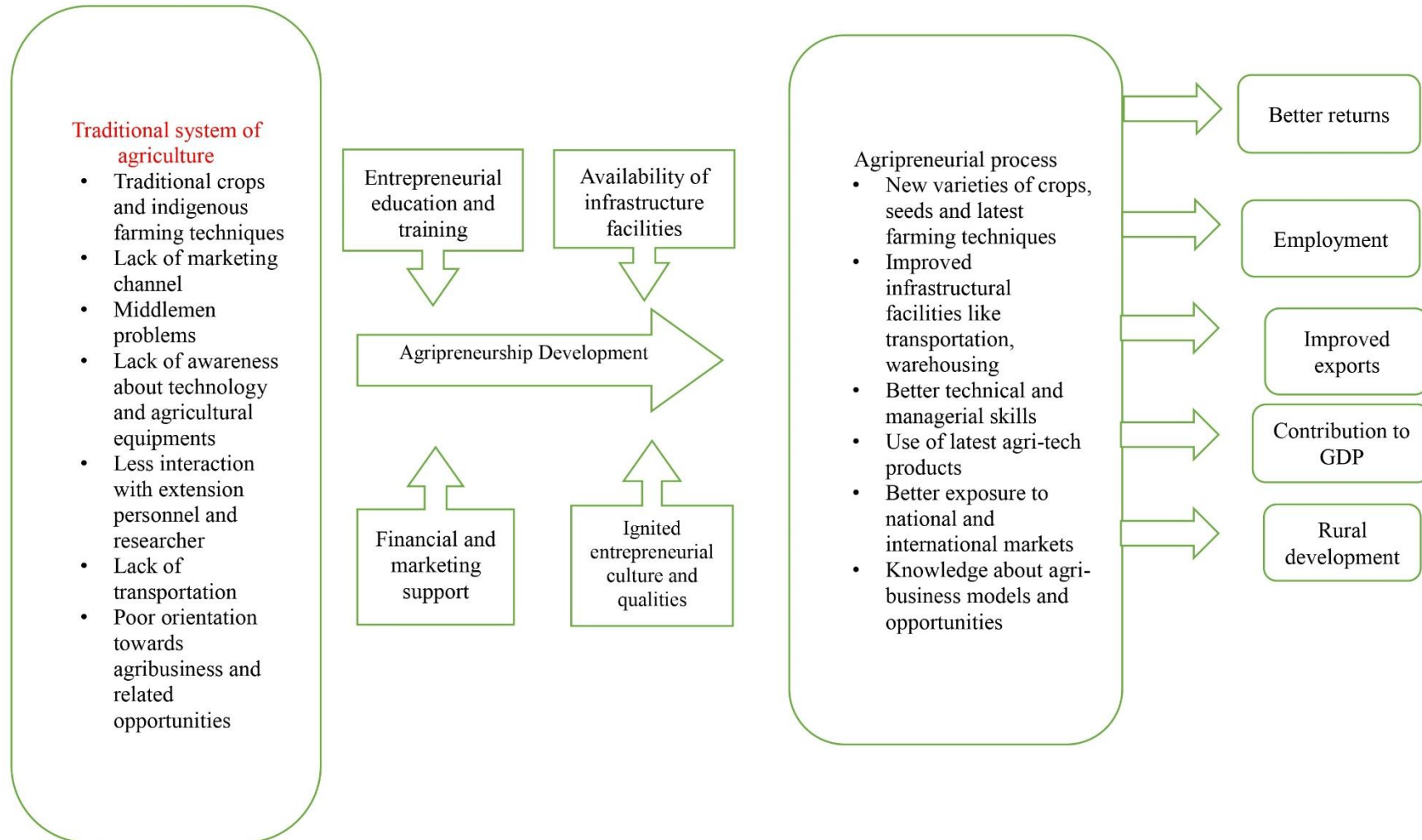


Fig. 1. Model for Agripreneurship Development (Source: After Rao and Kumar [11])

- It can lessen the burden on agriculture
- It can increase national income
- It can increase youth employment opportunities
- It helps in promoting sustainable industrial development in rural areas.
- It can reduce pressure on urban centers from rural-to-urban migration
- It supports smallholder farmers' income growth and integration into regional, national, and global markets
- It helps in reducing food costs, supply uncertainties and improving the diets of the rural and urban poor in the country.
- It provides competitive advantages to many primary production activities in agriculture.

In addition, Bansal [13] provided a thorough analysis of the breadth of agribusiness in India: Food processing enterprises must meet the need of various groups of people in India who seek to maintain a quality of life as consumption patterns have changed.

- Various classes of people in India wants to maintain a standard of living and with consumption pattern has changed and food processing industries has to meet that demand
- Economic growth will be enhanced by harnessing the export of agriculture commodities.
- Huge opportunities for production and promotion of bio-pesticides and bio-control agents for protection of crops.
- Hybrid and genetically modified crops have the highest potential in India in the future.
- Agricultural operations like weeding, transplanting and harvesting, micro-irrigation systems and labor saving farm equipments have huge scope.
- Production of vegetables and flowers under greenhouse conditions can be harnessed for the export maintain the international standard.
- Trained human resources in agriculture and allied sciences will be required
- Employment opportunities have increased in marketing, transport, cold storage and warehousing facilities, credit, insurance and logistic support services

4. STATUS OF AGRIPRENEURSHIP IN INDIA

Travel restrictions on all levels resulted the current pandemic situation. As of 2 December 2020, there were 30,583 (42%) operating agriventures around the world, thanks to training in agripreneurship supplied by MANAGE and partners to 72,806 agri-graduates [5]. According to a report published by Sarvanan *et al* in 2020, the agricultural entrepreneurs kept up with their agricultural ventures throughout the lockdown. More than 75% of agripreneurs have continued their venture activity during this difficult time, and 17% of newcomers have also significantly contributed. Agripreneurs provided the farming community with services during the lockdown, such as crop-based advice services, input services, counseling and farmer motivation, general COVID-19 services, and other services. Because they are immobile, agribusiness owners can now use a variety of online venues to connect with their customers. For exchanging timely and pertinent information, WhatsApp platform (67.4%) and mobile calling (73.5%) were both utilized. The farmers were reached using one-on-one conversations, mobile phoning, print media, WhatsApp, and other ICT techniques. Since the start of the pandemic in March 2020 in India, agripreneurs have experienced a decline in work, particularly between April (56.1%) and May (43.9%) [5]. Even though there was a low capacity, Yara International, a company that collaborated with the Indian local government agencies, its vendors, suppliers, and transporters, assisted in resuming transportation operations. The operations were essential for giving farmers the seeds and materials they needed for the upcoming growing season.

“The central government also allowed the states for amending Agricultural Produce Marketing Committee (APMC) laws which include strengthening the e-NAM platform for providing contactless remote bidding and mobile-based anytime payment which enables traders to market from their places. The Ministry of Agriculture and Farmers' Welfare facilitated bulk purchasers, dealers, and processors' direct marketing to and purchases from farmers, Farmer Producer Organizations (FPOs), and cooperatives. In addition, the government has given farmers more options for products to sell, barrier-free interstate trade, better price realization for agricultural products like all cereals, pulses, oilseeds, onions, and potatoes,

as well as a supportive legal framework for contract farming” [5].

4.1 An Overview of Agripreneurship in India

According to a research by Wanole [14], agricultural entrepreneurship was expanding quickly in India prior to the arrival of COVID as compared with other areas of GDP growth in India (Table 1) due to increase in government money and policies encouraging small, medium, and big farmers in their agricultural business operations. Numerous trainings were offered by the government, agricultural universities, and national institutes to support the agripreneurship sector [15].

Food and related products are currently the top priority due to the pandemic scenario, and the agriculture industry will always stay. The above Table 1 demonstrates that the service sector, which contributes the most to Indian GDP and is followed by the industrial sector, is the foundation of the Indian economy. However, policymakers

are concerned about the diminishing share of the agriculture and allied sector in the Indian GDP since, despite still providing a living for around 60% of the people, this sector is losing ground in terms of its economic contribution.

4.2 Entrepreneurship Ventures in Agriculture

Agri-business activity or launching a risky agriculture-related firm in order to make money is referred to as an agri-venture. Around the world, there are currently various chances in agriculture. Farm to table ventures and mega-ventures like investing in technology to offer free-market opportunities for rural farmers are examples of small agricultural business ventures. Currently, there is a great deal of agricultural investment opportunities in e-commerce. In India, there are many agri-entrepreneurship prospects that are boosting the agricultural economy, creating jobs for young people in rural areas, and enhancing agricultural products. Fig. 2. discusses per cent wise share of various agri-ventures in India.

Table 1. Contribution of various sectors to GDP in India

Sector	2015-16(%)	2016-17(%)	2017-18(%)
Agriculture, forestry & fishing	17.7	17.9	17.1
Industry	29.8	29.3	29.1
Manufacturing	16.8	16.8	16.7
Services	52.5	52.8	53.9

Source: [5]

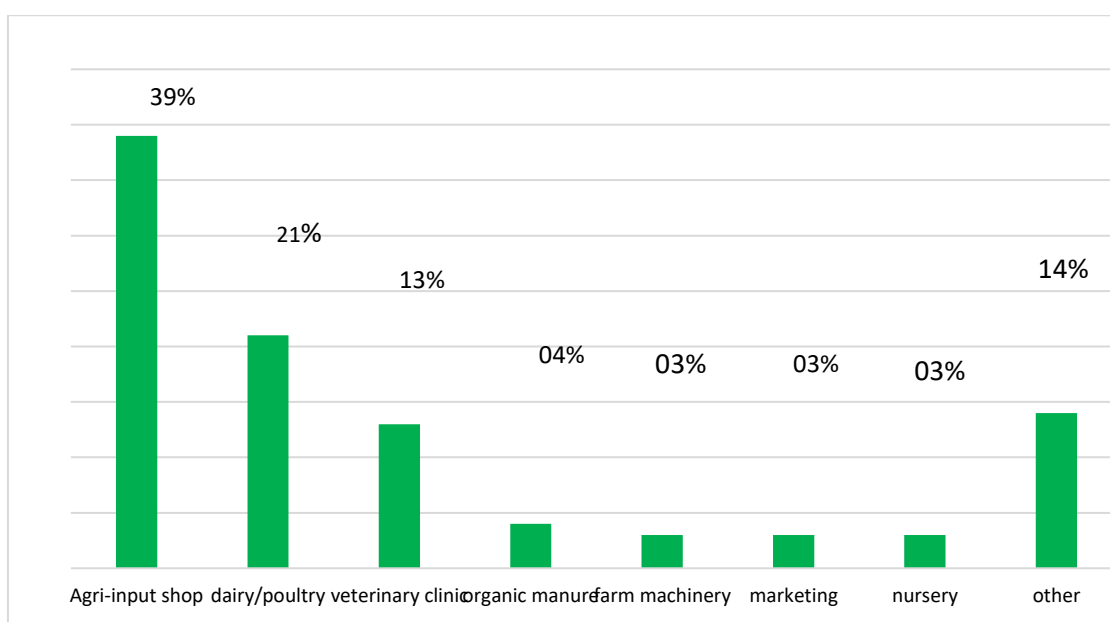


Fig. 2. Per cent share of venture wise agripreneurship in India

(Source: indiastat.com, 2020)

Table 2. Category wise distribution of Enterprises (in lakh)

Sector	Micro	Small	Medium	Total	Share (%)
Rural	324.09	0.78	0.01	324.88	51
Urban	306.63	2.53	0.04	309.00	49
All	630.52	3.31	0.05	663.88	100

Source: [16]

Table 3. Contribution of Micro, Small & Medium Enterprises in Country's Economy

Year	MSME GDP(Crores)	Share in GDP (%)
2013-14	112	29.76
2014-15	124	29.39
2015-16	136	28.77

Source: [17]

4.3 Rural and Urban Micro, Small and Medium Enterprises (MSMEs) in the Country

There are more than 63.3 million micro, small, and medium-sized enterprises (MSME) or businesses in India. Micro businesses made up the majority, and more of them were found in rural than in metropolitan sections of the nation. These were managed by the proprietors with little to no assistance and a focus on generating profits [15]. It serves as the economic backbone of the country, giving it the strength to withstand shocks and difficulties caused by the global economy. Table 2 provides total number of MSMEs existing in the country.

MSMEs make up over 63.4 million units across the entire country, and they contribute 6.11% of the manufacturing GDP, 24.63% of the GDP from services, and 33.4% of the manufacturing output in India [17]. They have been able to provide about 45% of India's total exports and offer jobs for 120 million people. Over 10% growth has been continuously maintained in the sector. Approximately 20% of MSMEs are located in rural area which show the significant rural workforce deployment in the MSME sector and is evidence of the significance of these businesses in promoting inclusive and sustainable development as well as creating significant employment, especially in rural areas. Table 3 provides insight about share of GDP by enterprises in the country.

4.4 Situation during COVID-19

Every country's economy has suffered as a result of COVID, which has also caused an increase in food prices, a shortage of food due to a lack of

imports, major effects on entrepreneurs and other industries, and disruptions in global agri-marketing. Agriculture-related operations such as crop harvesting, transportation, training, and advisory services were affected by the lockdown, which resulted in crop loss, high produce prices, a lack of government assistance, reported deaths of marginalized migrant workers and labourers, a ban on food delivery, starvation, a shortage of labour due to sudden migration, and closure of mills and factories. The agripreneurs provided services like diagnosing pests and diseases, raising awareness of government programmes like PM Kisan, Pradhan Mantri Fasal Bima Yojana (PMFBY), Minimum Support Price (MSP), market facilities, etc., skill-based trainings in industries like vermin composting, mushroom cultivation, etc., encouraging farmer interest groups, setting up soil and water testing facilities, arranging for supply chain management, hiring specialty services to provide farm implements, and value addition facilities.

- **Agro-food chain:** By 2030, India's total food consumption is predicted to get double, and by 2020, consumer expenditure there is projected to exceed US\$3.6 trillion. Consumers are now more likely to make impulsive purchases, and eating habits for meals made and consumed at home have abruptly changed [18]. As a result of the abrupt halt in exports, it was noted in the news report that the prices of agricultural commodities such as perishable vegetables dropped by 20% while those of vegetables with longer shelf lives, such as tomatoes, onions, and potatoes, rose [19].
- **Work style:** In COVID, the majority of the traditional work style has changed, and new consumer expectations for food

consumption, such as those for organic food, door-to-door delivery, high demand for seasonal fruits and vegetables, processed food items, value-added goods, logistical services, etc., have also emerged. By accepting online orders with mobile payments, providing home delivery, marketing products on social media, utilizing ICTs to work from home, enrolling in online courses to learn new skills, and adding value to basic products for growth and innovation, young agripreneurs have quickly adapted their business models using digital tools [20].

- **Agri Trade:** COVID has had an effect on global trade by restricting exports and reducing market access [21]. The top two countries importing Indian agricultural products are the European Union and the United States. The worldwide supply system for agricultural products has been hampered by ports that have decreased the freight capacity on commercial airplanes [22]. It has a significant and detrimental effect on the globalised agri-food trading system. According to Hanashima and Tomobe [23], pandemics have historically had a negative impact on human activity, economic development, and agricultural operations. Malnutrition and hunger often worsen when an infectious illness outbreak occurs [24]. India continued to export even during the challenging period of the pandemic lockdown, taking care not to disrupt the global food supply system. The export of agricultural products increased significantly by 23.24 percent from March 2020 to June 2020, totaling Rs. 25552.7 crore compared to Rs. 20734.8 crore during the same period in 2019.
- **Devlali-Danapur Kisan Rail:** On August 7, 2020, the Ministry of Agriculture and Farmers Welfare flagged off the first run of "Devlali-Danapur Kisan Rail." A seamless national cold supply chain for perishables, including as milk, meat, and fish, is what the Kisan Rail wants to create. It will facilitate inexpensive transportation of farm products across the nation.
- **Vocal for local:** The "Made in Nation" policy is being promoted by some nations. One notable example is the UAE, which imports 85–90% of its food but has surmounted the difficulty by promoting local resources and increasing the consumption of locally produced food to

prevent bringing food from any other country. Farmers are becoming entrepreneurs by using technology to create foods that are not already available in the country. To preserve the number of workers in the food system and to balance the nation's food economy amid difficult times, local producers are turning their existing farms into a commercial model with government backing [1].

- **Government support:** Food loss and waste during the shutdown have a significant impact in India, and things are not expected to get better anytime soon. Because they are unable to harvest due to lack of access to inputs, labour shortages, social isolation, and fuel for machinery, among other factors, the majority of farmers have lost their markets and their products [25]. Following the announcement of the nationwide lockdown, the Indian Finance Minister announced an INR 1.7 trillion package for farmers. The statement included a number of advantages, including the earlier transfer of INR 2000 to farmers' bank accounts as income support under the PM-KISAN plan. The "burden of debt servicing" brought on by the COVID19 pandemic has also been addressed by particular measures that have been issued by the Reserve Bank of India (RBI). Banking institutions have granted agricultural term and crop loans a three-month moratorium (until May 31), with a 3 percent discount on the interest rate for crop loans up to INR 300,000 for borrowers with acceptable repayment behaviour.
- **Cropping season:** "Due to a cash shortage brought on by the Rabi harvest delay, farmers won't be able to plant their Kharif crop. The Indian Council of Agricultural Research (ICAR) has published state-specific instructions for farmers to follow during the lockdown period regarding specific practices during harvest and threshing of different Rabi (winter sown) crops as well as post-harvest, storage, and marketing of the farm products" [26].

4.5 Agri-Start Ups in India

Agripreneurship has been associated with enhanced quality of life and growth, and its significance has grown as a result of the pandemic. With the current potential, agriculture

Table 4. List of Startups that provided solutions during pandemic

S.No.	Start Ups	Operation
1.	AgriBazaar	Provided supply chain platform to the farmers and traders/consumers. The firm has facilitated the transportation of 5000 trucks of farm-produce even in distant places like Lakshadweep.
2.	Harvesting Farmer Network	Provided virtual support group advice on crop and farming practices through the app, SMS, toll-free number, Twitter and WhatsApp.
3.	Agricx Lab	Provided the service of quality inspection of the farmers' produce using artificial intelligence
4.	CropIn	Provided climate-smart advisories in the form of educational videos and training content
5.	Bigbasket	Connected farmers with buyers, including retailers, processors, cloud kitchens, commerce, and also direct to consumers.
6.	Agrostar	Offered solutions for optimum use of agricultural inputs and enable delivery to farmers.
7.	Sickle Innovations	Offering mechanization solutions for harvesting and sowing.
8.	AgriRain	Developed data-driven controlled irrigation models and focused on the accurate and timely assessment of soil moisture.
9.	Farmguide	Offered farmers advisory on institutional credit, crop insurance and crop monitoring.
10.	PayAgri	Specifically working in value chain financing.

Source: [5]

might be transformed into an agribusiness, which would drastically alter the lives of all parties involved in the industry. Agri start-ups and businesses with less manpower in real office spaces have been impacted by the lockdown and the fear of the pandemic. Working from home is not a viable option for startups in the first stages of their development. According to the analysis, if India remains under a partial lockdown at least through the end of May, the economic loss from COVID is predicted to be close to \$234.4 billion or 8.1% of GDP [1]. Agritech start-ups in India are predicted to have combined revenue of less than \$100 million USD, which is less than the market's estimated value of more than 350 billion USD. The government has enlisted the help of numerous large international firms, like PepsiCo, the Tata Group, and food delivery services like Zomato to feed the daily wagers. According to the FICCI survey, there are roughly 450 active agri-startups in India that have garnered \$545 million in venture capital funding since 2014 and have been expanding at a rate of 25% on an annual basis. \$330 million of it arrived in 2019. From the point of collection to the consumption centres, agri-startups can aggregate and distribute farm products. Some major agri-startups during pandemic that offered solutions to farmers are discussed below in Table 4:-

Over 30% of agriculture enterprises have made profit, 35% at breakeven level and remaining 35% have made losses [27]. By 2022 of the total

retail market in the country, food retail is expected to occupy 70% of the market which is indicating that there will be huge demand for ready to eat and ready to cook products [28]. It is estimated that India home based agripreneurs have established around 5000 start-ups, creating more than 1,00,000 employment opportunities. By 2021, the number of start-ups in India is projected to increase to more than 12000 with job creation from these entrepreneurs reaching to 300,000-400,000 in number [29-32].

4.6 Extension Methods Adopted by Agripreneurs during COVID

"In this hardest time, the majority of agripreneurs have been continuing their agri-business activity and offering different services by adopting digital extension methods" [5].

- **Mobile calling:** The limitation of non-movement/travel restrictions has enabled agripreneurs and farmers to widen the adoption of mobile phones to use calling over function and establish a network with information sources. The agripreneurs are making use of this strength for communication [33-35].
- **WhatsApp platform:** The travel restriction has made a drastically increased shift to social media platforms. The stakeholders have embraced the online mode of

interaction and this shift is a new normal. The customized and user-friendly interface of the WhatsApp platform has allowed the Agripreneurs to solve the problems of the farming community.

- **Personal face to face (farm and home) visits:** “Even though there exists a restriction of travel, the agripreneurs visited the farms of farmers. The non-techno savvy farming community needs the advice and motivation the most and the agripreneurs are reaching them by following safety measures. The agripreneurs are creating awareness on how to use the ICT tools for communication” [5].
- **Other ICT tools:** “The agripreneurs are employing various ICT tools like mobile SMS service, WhatsApp and Facebook platforms for circulating videos, zoom platform for video conferencing and participating in webinars, Facebook live posting or chatting, creating YouTube videos & sharing YouTube links, Telegram chat platform, Television program links, WebEx and Skype for video-conferencing, radio/FM programs and email services” [5].
- **Print media:** The agripreneurs are creating leaflets, educational handouts and monographs related to farming practices and circulating them to the farmers. They are also publishing popular articles in news, journals and magazines to create awareness. They are also strategically utilizing them for the promotional activity to ensure a competitive spirit.

5. CHALLENGES OF AGRIPRENEURSHIP

Despite huge potential and prospects of agripreneurship development in the country farmers face challenges in the process of

agripreneurship development as discussed below:-

5.1 Challenges in Agripreneurship before COVID

- **Inadequate Funds:** Major sources of finance in rural areas are loans from regional rural banks or from zamindari but their rate of interest are usually very high.
- **Inadequate infrastructural facilities:** The growth of Agri entrepreneurs is not very healthy in spite of efforts made by government due to lack of proper and adequate infrastructural facilities.
- **Lack of skilled and managerial manpower:** Migration is the main reason in rural areas due to which there is absence of skilled human resource. Also lack of business management and risk taking abilities affects the development of agripreneurship.
- **Problems in Marketing:** Major problems faced by marketers are poor promotional facility and marketing channels.
- **Lack of awareness:** Most of the people are skeptical considering it only a traditional thing like Sindhis, Gujaratis etc. and do not pull out its advantages as they have no idea about opportunities available.
- **Unresponsive Government Policies:** Most of the times the government policies and funds are readily not available because of lack of information, lack of documentation, corruption and non-availability at the time of need.
- **Other Constraints:** Various constraints that restrict youth and farmers to take agri-venture as a full time opportunity are discussed in Table 5 below.

Table 5. Constraints of agripreneurship

Psychological	Socio-cultural	Technical	Economic	Administrative
Lack of motivation, low risk bearing ability, low confidence	Conservative society, No family support, Social norms viz. caste and religion	Lack of equipments, lack of training, lack of labor and input facilities	Lack of subsidy, lack of loan from banks, high rate of interest, farming debt	Problem in certification, lack of support from training institutions, managerial issues

(Source: After Wanole,2020)

5.2 Challenges Faced by Agripreneurs during COVID

- **Labor scarcity:** The pandemic and consequent nationwide lockdown resulted in a mass exodus of migrant labor that has created operational capacity shortages in farming fields, milk processing plants, cold storage units and warehouses.
- **Lack of Export:** European Union and United States are top importers of agricultural produce from India. Lockdowns in these markets have severely impacted India's exports. The months of March to May are the peak season for export of grapes to European nations. Lockdown has delayed the export of this perishable fruit, which is subjected to stringent quality control at the port of import.
- **Inadequate capital:** Amid the lockdown, the qualified agripreneurs who applied for the bank loan were rejected by the banking institutions for different reasons. The practicing agripreneurs were deprived of movement and the farming community denied the payment of consultancy fee. This has affected their regular work and sufficient capital resources to work further.
- **Disturbances among the community due to miscommunication:** The inaccurate and misleading statements on the corona virus outbreak have created a situation of panic and disturbances in the rural areas. The disturbances created by the COVID-19 pandemic have made the public to adopt panic buying and selling.
- **Self-hindrances:** Some of the agripreneurs are also being disturbed due to the panic created about the COVID-19. The fear of contact with the virus and lack of idea about the precaution and treatment has put them in a situation of staying in their homes.
- **Diversified clients:** The evacuation of the migrants from the cities to their homes has created additional duties on the part of agripreneurs. It is a difficult job to grasp the new client system and its specifications during the state of panic.
- **Inadequate responses from the agricultural developmental departments:** The country-wide shutdown has restricted the movement of the extension and research personnel and lack of preparedness from the agricultural developmental departments has affected

the farming community for availing the advisory services.

- **Inadequate government policies:** While the central government announced relief packages via different schemes for the farming community, the needs and interests of the agripreneurs were not addressed. The inadequate reach of policies to the grassroots level has aggravated the situation for negative consequences.
- **Inadequacy of technological tools (gadgets /internet services) with the farmers:** Adapting to a new normal condition of virtual interaction requires the adoption of technological tools by the users. Even though the farmers have adopted mobile phones, the required gadgets for a virtual mode of communication over the internet are not adequate. Lack of networks or poor connectivity, no internet connections, high data charges low network coverage have been detrimental to embrace online communication.
- **Other challenges related to COVID-19:** Lack of awareness on COVID-19, its symptoms and treatment, not following social distance measures, not aware of self-immunization and precautionary measures, not aware of caring vulnerable family members with comorbidity conditions and denying the usage of sanitizers owing to the hazardous nature of chemical composition were the other issues of the functioning of the agripreneurs.

6. CONCLUSION

COVID-19 pandemic has a great impact on the actions and activities of humanity and agriculture is not outside this impact. Food demand and thus food security are greatly affected due to mobility restrictions, reduced purchasing power. Government of India took drastic measures to stop the spread of the virus, also influencing the global food system. The pandemic has created havoc among the farming community in terms of panic buying and selling, market disturbance, return migration etc. The return of migrant labor to home villages is a prevalent phenomenon due to the lockdown. On a positive note COVID-19 has opened a doorway for all its stakeholders to create new ideas and opportunities. With lockdown people has lower dependency on other states for products. The agripreneurs provided

helping hands to the migrants and farmers by providing counseling, information about the local employment opportunities, government services related to agriculture and social welfare, providing agro advisory and input services for practicing agriculture, arranging for employment opportunities, arranging for basic facilities, arranging platform for interaction with other stakeholders, conflict resolution in the villages by legal and democratic means, motivating them to follow farming, and helping them in marketing their produce. It is proved that agripreneurship is the way to growth and sustainability of farmers even during the times of pandemic.

7. RECOMMENDATIONS FOR FUTURE

Agri-business and agri-startups are one of the main pillars of food security in developing nation like India. Besides, agri-tech is considered as one of the remedies for the agriculture problems of India. Due to the COVID-19 crisis, some of the persistent challenges faced by Indian agriculture have been established. Hence there is a need for adaption to these challenging conditions which requires a set of multipronged approaches at various levels [5].

(A) Individual Level

- More young agripreneurs need to be proactively involved in agricultural research and extension organizations as local level support to create a network with the farming community to boost agripreneurship as they are the future entrepreneurs.
- Favourable conditions should be provided to retain the Youth Migrant Entrepreneurs (YMEs) who are educated and comfortable with latest technologies to earn a higher income by helping them set up their micro-enterprise. Also, premier national institutions should mentor them for taking-up social entrepreneurship in rural India.

(B) Organizational Level

- Formulation of effective online media usage policy is the need of the hour. The agripreneurs and farmers must be trained to adapt to the crisis. Efforts are needed to improve their skill set in the utilization of Information and Communication Technology (ICT).
- Nurturing entrepreneurship in agri-tech and food production is also critical for

strengthening the agricultural ecosystem and introducing innovation.

(c) Infrastructural Level

- Basic infrastructure facilities at markets, local mandis and transportation facilities with precautions need to be adopted to ensure the safety of the stakeholders.
- The government should provide free Wi-Fi facilities in public places.
- Special attention and infrastructure facilities should be given to the micro, small and medium enterprises, running with raw materials from the agriculture and allied sector to support the rural economy.

(d) Policy Level

- The policy guidelines of both the central and state governments should be synergistically integrated.
- The government should mainstream the agripreneurs' services along with existing developmental schemes and projects for a better impact by a public-private partnership.
- To meet the demand for agricultural commodities, investments in key logistics must be enhanced. Moreover, e-commerce and agripreneurship, agri-startups need to be encouraged with suitable policies and incentives.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

No AI tool has been used to write or edit the manuscript. Manuscript has been prepared manually.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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