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AGRIPRENEURS

Architects of Agricultural Evolution



announces

Telangana AgriVision 2022

9th to 11th June, Hyderabad



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Hon'ble Agriculture Minister



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Hon'ble Chief Minister



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Celebrating Agripreneurs

Agriculture in India is transforming. As the sector emotionally appeals to the masses, young and charged-up entrepreneurs are joining the fray. Commodities are being turned into value-added products, demanding premium prices. With the same available resources, young entrepreneurs are modifying their business-models by exploiting market opportunities. This is not only helping the entrepreneur but also encouraging farmers to shift to a better world.

Agripreneurship is the concept of entrepreneurship in agricultural sector, brought in by people with innovative ideas to develop the existing practices for a better productivity.

AGRIPRENEURS are regarded as the new tribe of businessmen or entrepreneurs who can drive change through innovations. They can easily adapt to constant dynamics of markets and the farm enterprise. With this comes the assurance of profitability, sustainability and competitiveness, as high value crop and livestock production juxtapose with food processing and other value-adding ventures.

The technological milieu, policy environment and evolving entrepreneurship present an opportunity for a productive shift in Indian agriculture that incorporates indigenous farmer knowledge and optimises the value chain. Many young engineers in India are quitting their flourishing careers in MNCs, ditching their business suits and opting for farming as a profession – not for lack of jobs, but in search of a more sustainable lifestyle.

Developing Agripreneurs can effectively

- Trim down the burden of agriculture
- Create employment opportunities for rural youth
- Control migration from rural to urban areas
- Increase national income
- Sustain industrial development in rural areas
- Cut down the pressure on urban cities

Showcasing a few Agripreneurs who have created exemplary success stories, I feel delighted in extending my gratitude to **Dr P Chandra Shekara, Director General, MANAGE** for triggering a thought of a special edition on these Architects of Agricultural Evolution.

Happy Reading

Manula



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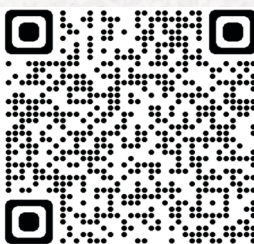
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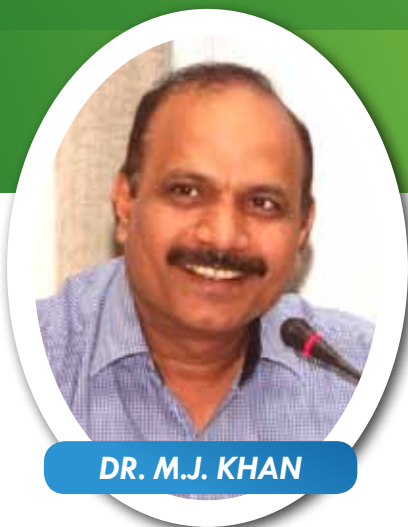
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DR. M.J. KHAN

AGRIPRENEURS – HERALDING NEW AREAS OF GROWTH AND PROSPERITY

In India, agriculture and entrepreneurship are slowly merging, creating a new segment that speaks of profitability. The new technological developments taking place in the agriculture sector together with supporting schemes from the government have opened up immense possibilities for entrepreneurs to flourish.

The past few years have seen sweeping changes in India's rural area. The digital divide is reducing and digital technologies are penetrating into the hinterlands. Smart phones and the services that are now available at lower costs have changed the rural landscape. This has led to the development of agritech startups. Funding in the agritech sector is seeing a phenomenal rise. Government support is further buoying up the sector.

Apart from the Start up India Programme, Agricultural and Processed Food Products Export Development Authority (APEDA) has initiated a programme for agripreneurs to bring about a revolution in agriculture exports and use it as a key driving force for Aatmanirbhar Bharat. It aims to boost agriculture exports by promoting budding startup agri-preneurs. This in turn contributes to the growth of the very basic unit of agriculture, the farmers, by facilitating the startups to source the products directly from agricultural areas.

Agripreneurs today have made their presence felt in input segment, farming segment, value chain, output processing, marketing stage and related services. Globalization and interconnected markets have widened the scope and potential of agripreneurial opportunities. An emerging sector is organic farming. There is a lot of scope for research and development in this area.

Agripreneurs can play vital role in the growth and development of the national economy through entrepreneurship development. This shall increase income levels and employment opportunities in rural as well as urban areas. Agripreneurs can effectively address problem of smallholder farmers and help

in integrating them into local, national and international markets. Their interventions can be crucial at some junctures in reducing food costs, addressing supply uncertainties and improving the diets of the rural and urban poor in the country.

Agripreneurship is not only an opportunity but also a necessity for India. It can address many gaps in the production programmes, technology dissemination and marketing. It is heartening to find many young minds leaving their white collar jobs and turning into crusaders of agribusiness. Their modern outlook, enthusiasm, innovation and most importantly passion are heralding new areas of growth and prosperity for Indian agriculture.



BRAND AMBASSADORS OF THE DYNAMIC AND PROGRESSIVE INDIA

There is something so heartening writing about some of the successful agripreneurs of the country, like we have done for the April edition of Agriculture Today.

These are the emerging success stories in diverse sectors of agriculture. They belie all the naysayers who don't believe in the India growth story. Yes, as a nation we have our challenges. All dynamic and progressive societies find new areas of growth when they encounter challenges.

The pandemic opened up hordes of opportunities, and our enterprising youth are capitalizing upon it. A couple in Karnataka is developing highly attractive products after using fallen areca leaves to produce vegan leather. This is so promising. We are killing such a large number of animals each year to procure leather. What a beautiful shift it will be globally if humankind decides to develop vegan leather products. This shall also effectively address the issue of global warming.

Many successful agripreneurs are using cow dung and cow urine to make a wide range of products. Other successful entrepreneurs are promoting the use of millets by making delicious things to eat. One only needs ideas and an innovative mind. The pandemic has given a major fillip to our love for the greens. Many agripreneurs are enabling city dwellers to develop green spaces in the balconies and terraces, and delightful green walls. Others have developed delightful spaces in rural areas as homestays, where the city-weary folks love to get away for a weekend.

I have mentioned only a few. Agripreneurs are carving new spaces for themselves across the length and breadth of our nation, and in all sectors of agriculture. They are the brand ambassadors of the dynamic and progressive India, and are transforming our agricultural landscape.

For the development of more and more agripreneurs, it is not just the State Agricultural Universities (SAUs) or the ICAR institutes that shall play a pivotal role. Those manning our KVKs across the nation must stay connected to the rural innovators in their areas of jurisdiction. A large number of agripreneurs answer local needs and challenges. Their ideas and the products developed by them can be game-changers in resolving the problems faced by farmers in their respective areas.



RAJNI SHALEEN CHOPRA



AGRIPRENEURSHIP DEVELOPMENT INDIAN EXPERIENCES AND LEARNINGS



National Institute of Agricultural Extension Management (MANAGE) is the nodal agency for implementation of Central Sector Scheme of Agri-Clinics and Agri-Business Centres. The scheme aims at transforming job seekers into job providers in agriculture. Two decades of experience and learning in promotion of agripreneurship is shared in this write-up.

Vibrant Extension Is Must For Agricultural Development: Agricultural Extension connects farmers to technologies and markets. Ever changing farming needs to be supported with resourceful extension. The focus of agriculture is shifting from ensuring food security to enhancing profitability

About the **AUTHOR**

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(MANAGE), Hyderabad**



at farmer's level. This requires an ecosystem where agriculture is treated as Agribusiness and farmers take up the role of agripreneurs. Vibrant Agricultural Extension is prerequisite for this transformation.

Challenges in Agricultural Extension: Agricultural Extension in developing countries is impacted by lack of approach roads, inadequate manpower, resources and limited use of ICT in Agricultural Extension. In India, extension worker to farmer ratio is 1:1162, which is highly inadequate to address all the problems of farmers.

On other hand, 76 Agricultural Universities are producing more than 40,000 agricultural graduates every year who are available for extension services. Less than 20% of the graduates obtain jobs. The rest are unutilized or underutilized. Hence to promote Agripreneurship, using these graduates shall solve both the problems of unemployment and extension gaps.

Agripreneurship Is An Opportunity: In order to professionalize Agricultural Extension by promoting Agripreneurship among unemployed agricultural graduates, Ministry of Agriculture and farmers' welfare, Government of India launched a programme titled "Agri-Clinics and Agri-Business Centres Scheme" during 2002. The scheme aimed at providing 45 days residential free training on agripreneurship development, loan up to Rs 20 lakhs, 36 to 44% subsidy, post training one year hand holding support and refresher programmes to upscale business plans. National Institute of Agricultural Extension Management (MANAGE) was given the responsibility as the nodal implementing agency, financially supported by National Bank for Rural & Agricultural Development (NABARD).

Achievements: More than 79,636 unemployed agricultural professionals were trained, out of which 34,183 agri-ventures have been established covering 32 areas. Some of the important agri ventures established by agripreneurs are Advisory, Agri input supply, Dairy, Poultry,



Currently agripreneurship orientation is not important component in agriculture curriculum. It is important to institutionalize agripreneurship development by introducing the topic in agriculture curriculum



Piggary, Goatary, Custom hiring units, Aquaculture, Nursery, Value addition, Seed production, Marketing, Vermi-composting, Veterinary clinics etc.

However, support from the banks has not been encouraging. 2,610 trained graduates obtained loan whereas 20,204 projects are pending with the banks. Subsidy uptake is also not encouraging. The government has introduced "One Branch One Agri-clinic" concept to push financial support to agripreneurs.

Impact of The program On Agricultural Extension: Established agri-ventures are providing value added extension services to more than 1.94 crore farmers. Research studies have indicated that each Agripreneur provided jobs to another 6 rural youths i.e. 2.05 lakh. Impact on the yield of the farmers was 17.4% and impact on the income of the farmers was found to be 28.8%. Besides, these agripreneurs brought





agricultural technologies and innovations to the doorstep of the farmers. They are also playing important role in attracting and motivating rural youths to take up agriculture.

LEARNINGS FOR THE FUTURE

Twenty years of implementation of the scheme has given several valuable learnings to policy makers and implementers. These learnings are important for India to strengthen the implementation of the scheme, and for other developing countries to initiate similar programmes. The important learnings are as follows:

* **Involve Family:** In traditional and rural societies, family elders play important role in deciding the future profession of children. Hence, it is important to sensitise family members regarding agripreneurship, its advantages, challenges, support expected from family and success stories. Whenever selections are made for agripreneurship development programme, the family members' sensitisation may be made part of selection process.

* **Revise Agriculture Education Curriculum:** Agripreneurship orientation is not important component in agriculture curriculum. It is important to institutionalize

As the agripreneurs grow in their business, they require different skill sets to handle the business magnitude. This may be noted by capacity building Institutions. The manpower which supports agripreneurs also requires different set of skills, which are critical for the success of business

the agripreneurship development by introducing the topic in agriculture curriculum.

* **Agricultural Universities To Have Agripreneurship Development Departments:** Like other professional disciplines, agripreneurship development may be considered as another discipline. Universities may establish agripreneurship development departments offering supportive academic programmes and evolving innovations. These departments, over a period of time, develop as single window delivery points for agripreneurship programmes.

* **Experiential Learning Based Training:** Agripreneurship development programmes must adopt "less theory more practical concept". The training programmes are not limited to awarding certificates. They play an important role in shaping the lives of agripreneurs. Hence, learning in field conditions,

learning with practitioners, learning from experiences, learning from success or failure stories may be made integral part of agripreneurship programmes. More and more practitioners may be used as resource persons and mentors.

* **Preparation Of Practical DPR Is The Key:** Detailed Project Report (DPR) indicates existing problems, treating problem as an opportunity to evolve a business model, resources required, market availability, competition in the market, CB ratio, IRR etc. which every agripreneur should know about his proposed project. Hence, potential agripreneurs may be made to undergo rigorous exercise while preparing DPRs. Completion of this process make agripreneurs convinced about their own project and enhance the confidence level which is very critical for success of any business.

* **Understanding Banking:** Only

some trained graduates obtain bank loan. This may happen due to their inability to convince the banker, or communication gap between the banker and the agripreneur. Hence, with the help of bankers, agripreneurs may be sensitised to understand banking thoroughly so that they can create confidence among bankers and obtain financial support.

*** Proactive Banks:** Agripreneurs are critical for transforming agriculture into agribusiness. They will be an asset to the nation if they are successful. Hence, the support given by bankers agripreneurs is very vital to initiate agripreneurial activity. Therefore Banks need to be proactive in identification of agripreneurial opportunities, agripreneurs and ensuring necessary support for their success.

"One Branch One Agri-clinic" concept of India is appropriate, where each branch of the bank is supposed to advance financial support to at least one agripreneur in a year. Over a period, this approach shall result in establishment of a large number of agri-ventures. Sensitization of bankers in this direction will be very meaningful.

*** Orientation Of Capacity Building institutions:** Universities and other agriculture development organizations involved in agripreneurship development programmes must be thoroughly oriented

on all aspects of agripreneurship development. They play an important role in motivating budding agripreneurs. Institutions may be well equipped in terms of networking with mentors, bankers, successful agripreneurs and farmers. Institutions may be incentivized based on their performance, in terms of number of agriventures established, number of farmers served, impact on the yield, income and sustainability of agriventures.

*** Intensive One To One Hand Holding:** Post training support to agripreneurs at their place of work is very decisive in determining the success of agripreneurship development programmes. Some visits and frequent calls will help in sorting out day to day problems in the initial period of establishment of agriventures. Contact with bankers, refinement of DPR, liaisoning with public and private organizations, Business support through linkage with Agribusiness Companies, Farmers Organizations and Markets – all these help.

*** Broad basing the programme:** Agripreneurship development programmes may cover not only qualified agricultural graduates but also sons and daughters of farmers. Similar training, post training support, loans, subsidies, networking support may be ensured. The programme

may be designed based on "District Agribusiness Plans".

*** Public Extension Programmes To Use Agripreneurs:** Public extension efficiency is limited by inadequate manpower and resources. Trained agripreneurs may be used to fill this gap. Public extension programmes like training, demonstration, exposure visit, promoting groups, exhibitions may be implemented through PPP model involving agripreneurs. The products and services produced by agripreneurs may be used in public extension programmes. PPP models may be evolved to attain conversance between various public institutions and agripreneurs.

*** ICT for Agripreneurs:** In order to regulate quality of services provided by agripreneurs, agripreneurs may be aggregated on ICT Platform. It would help public extension to use the services of agripreneurs. It would strengthen networking among agripreneurs and between agripreneurs and farmers. It would help agripreneurs to provide cost and time effective extension services.

*** Skill Training For Expansion:** As the agripreneurs grow in their business, they require different skill sets to handle the business magnitude. This may be noted by capacity building Institutions. The manpower which supports agripreneurs also requires different set of skills, which are critical for the success of business. Refresher programmes on emerging areas may be rigorously conducted for agripreneurs.

*** Awareness And Recognition:** Agripreneurs may be provided opportunities to participate in exhibitions to showcase their products and services. Awards may be instituted for recognizing outstanding agripreneurs. Wide media publicity may be provided to success stories to motivate other budding agripreneurs. Agripreneurship education may be initiated at early stage of education may be in the form of young farmers clubs. Potential agripreneurs may be identified at the early stage and mentorship may be provided to nurture the agripreneurs.



ICAR NANO FERTILIZER CONCEPT



Innovations developed by Prathista by way of licensing agreement to usher in the Organic Nano Fertilisers Revolution in India and globally.

Nano technology has gained attention in recent years with application potential in a wide spectrum of domains ranging from medicine, industry and even agriculture. Leveraging particles of size in the nano meter range, scientists have created products that bear high reactivity due to their large surface area-to-volume ratio and novel physicochemical properties. Nanomaterials for controlled-release of nutrients, pesticides and fertilizers as well as nanosensors for agricultural practices, food quality and safety are ways in which nanotechnology is finding use in agriculture.

improve soil quality and plant growth performance and enhance crop production with quality fruits/grains. They have the potential to increase nutrient uptake by the plants by regulating the availability of fertilizers in the rhizosphere. They are also found to show increased

stress resistance by improving nutritional capacity and increased plant defense mechanisms. The biggest advantage of them is their capacity to replace synthetic fertilizers by at least 50 per cent. As they are required in much smaller quantities than the conventional fertilizers, they can

The Nano Fertilizer Advantage

Nano-fertilizers significantly



Dr S Ayyappan, former DG, ICAR releasing ICAR Nano Technology products developed by Prathista in 2014

Extensive Research revealed that, there is no water / land pollution after using Prathista Organic Fertilizers / Manures with excellent organic carbon residual effect to reduce Traditional Fertilizers Consumption for subsequent crops. and Research Proceedings are published in an International Conference at United States of America (USA)

Prathista honored with BEST GREEN FIELD COMPANY AWARD, consecutively for two years by POLLUTION CONTROL BOARD, Andhra Pradesh, India.



Asia's largest industrial fermentation plant to manufacture various Organic Fertilizers / Manures with world class Quality Standards

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substantially increase farmers' income by cutting down on input and storage cost. It is proven to increase the crop yield along with improving the quality of farm produce by providing better nutrition to crops. They provide higher nutrient efficiency for crops while reducing soil, water and air pollution. As the fertilizers are designed as ultra-small particles they offer higher surface-mass ratios, and help in the controlled delivery of plant nutrients, thereby preventing leaching and excessive losses. Even their release inside the plants are controlled, thereby reducing usage by the plants.

Nano Fertilizers in India

Under the National Agricultural Innovation Project (NAIP), Indian Council of Food and Agriculture has invested nearly Rs.47 crores over a period of 61 months on basic and strategic research in the frontier area of nanotechnology in agriculture. India has also started offering Nano fertilizers along with the conventional fertilizers commercially. Department of Agriculture & Farmers Welfare (DA&FW) has provisionally notified Nano Urea as Nano Nitrogen Fertilizers in Fertilizer Control Order, 1985. Use of Nano Urea is being promoted through different activities such as awareness camps, webinars, nuked nataks, field demonstrations, kisan sammelans and films in regional languages etc.



First international conference on Bio Tech based Nano Nutrients at Hyderabad

Organic Nano Fertilizer Revolution through Agripreneurs

Getting good grade organic fertilizers in requisite amounts for organic farming is not easy in India. Even though organic farming and natural farming is encouraged in the country, we seldom calculate the amount of organic products required to materialize this. But Dr Sairam has long nestled an idea that can easily convert this dream into a reality. Around five years ago he had conceptualized a rural development programme that intended to make the educated rural youth agripreneurs. He was ready to part with the technology that he had developed for the production of organic nano fertilizers to rural youth who in turn can produce them in their villages supplying fertilizers to the farmers. In the current scenario, the rural youth after getting educated migrates to urban centers in search of better income. When Sri Chandra Babu Naidu was the Chief Minister of Andhra Pradesh, Dr Sairam had broached the idea and they even signed an agreement to take up this as 'Rural Development Project'. The concept was to turn educated rural youth and make him/her into an entrepreneur.

An Investment of around Rs 10 crore with potential employment to 100-120 people was expected. Eighty percent would be women beneficiaries in the project. Unfortunately the project did not take off, but Dr. Sairam is hopeful. He intends to replicate this project nationwide. "Each district if we set up two plants of organic nano fertilizers, atleast 200 people will get employment. In every state if we consider setting up these plants, imagine the number of entrepreneurs and production plants emerging. All these plants will be producing organic fertilizers, which means natural farming concept can be easily adopted across India. The production plant uses locally procured raw materials especially non edible grade carbohydrates. Farmers do not get price for these grade commodities. Usually these are disposed off or sold at paltry prices to trader to be used up by the feed industry. If these plants procure these commodities, farmers would get additional income. So we will be recycling food waste back into agriculture. Employment, organic farming, rural development and retaining rural youth in villages itself can be achieved in one stroke," says Dr Sairam.



Dr S Ayyappan, former DG, ICAR releasing ICAR Nano Technology products developed by Prathista in 2014

Nano Fertilizers and Organic Agriculture

Indian agriculture system as a whole is undergoing a transformation. At one end we are too keen to use the emerging technologies, while on the other end, we are moving away from the conventional agriculture system that relies on chemicals to meet the nutrient demands and pest management. India's agriculture policy is drifting towards organic agriculture and natural farming, where no chemical based products are tolerated. Many states are showing allegiance to organic forms of agriculture. India is rank 8th in terms of World's Organic Agricultural land and 1st in terms of total number of producers. The total volume of export of organic products during 2020-21 was 888179.68 MT. which translates to around 1040.95 million USD. In this narrative, where does an inorganic based nanofertilizer find space? The potential of nanotechnology in agriculture is large, but a few issues are still to be addressed as the risk assessment. While the available nano fertilizers in India are based on inorganic substrates, their relevance in organic agriculture is limited. In this respect, there is space for nanoparticle derived

Telangana-based Prathista Industries has launched India's and the world's first organic nano fertilizers. Prathista Industries Ltd entered into a licensing agreement with Indian Council of Agriculture Research for commercialization of nano nutrients for crops which are developed under the NAIP program

from biopolymers such as proteins and carbohydrates with low effect on human health and the environment.

Organic Nano Fertilizers for Organic India

Telangana-based Prathista Industries has launched India's and the world's first organic nano fertilizers. Prathista Industries Ltd entered into a licensing agreement with Indian Council of Agriculture Research for commercialization of nano nutrients for crops which are developed under NAIP program. Scientists have developed nano nutrients technology through biological process after extensive research both in lab and fields, involving consortium of ICAR institutions and Agricultural Universities. Prathista is the first company

to commercialize the ICAR nano nutrients innovative technology.

Research data reveals that the nano nutrients doses are just in ppm level to meet nutrient requirement for crops, against to 150 to 200 kgs traditional fertilizer dose per acre. In order to have acceptance of ICAR innovation, Prathista incorporated the nano nutrients technology with their 3G lacto-gluconates technology. The cost of these nutrient fertilizers is at par with subsidised fertilizers and computable to use with all traditional fertilizers. The scalability of technology is commercially and economically feasible and nano nutrients are 100% safe to human / livestock and 100% eco-friendly.

By using them farmers would gain an average of 20 per cent additional

yields coupled with an increase in micro organism levels in soil by shifting to these nutrient fertilisers, while they can totally avoid using the traditional murate of potash (MOP) and diammonium phosphate (DAP) fertilisers.

“ICAR has developed the nano technology based on chemicals. The Nano Nitrogen developed by them has its origins in urea. Prathista took that concept and instead of inorganic source of nitrogen we are using vegetable protein to develop nano nitrogen. In the case of potash, we are using organic sources of potassium gluconate or potassium lactate developed by fermentation technology instead of potassium chloride or any other inorganic source. Potassium gluconate and potassium lactate has been classified as organic by Indocert in 2008. In order to prevent the copying of the technology we have chelated product with amino acids, lactic acid and gluconic acid -3 organic acid i.e., 3G to make potassium proteno lacto gluconate. Similarly, Magnesium proteno lacto gluconate, Manganese proteno lacto gluconate, Phosphorous proteno lacto gluconate etc.,” explains Dr. KVSS Sairam, CMD Prathista.

Prathista has developed organic Nano Nitrogen, Nano Potash, Nano Phosphours and Nano NPK. They are all required only in very small quantities. Therefore it is cost effective for the farmers. They can effectively replace chemical fertilisers. From 2000 onwards, Prathista is working on replacing the chemical fertilizers. Nation Centre for Organic Farming Ghaziabad have reported that on using fifty per cent of Prathista's Organic fertilizer and fifty per cent of chemical fertilizer, forty per cent increment in yield was recorded.

“Unfortunately the nano fertilizers released in India has not undergone any clinical trials to assess the potential



Organic Nano Nutrients are Safe for Human Consumption

ICAR has developed safety assessment/clinical trials on “Organic Nano Fertilisers” in collaboration with Prathista Industries Limited, with huge investment, to develop safety data on “organic nano fertilisers”. Reports have proved that Prathista’s “Organic nano fertilisers”, developed with basic concept from ICAR which are nano meter size particles, are safe for human consumption for food items cultivated from all crops using “organic nano fertilisers”. The safety data sheets will be released soon.

harmful effects of them on humans. Prathista on the other hand had made its products undergo stringent trials for more than three years. We started the trials in 2014 and it is still going on. The report has been presented to ICAR. “says Dr. Sairam. The products have been adjudged as safe to the plants, environment, other organisms and humans.

Prathista’s “4G nano fertilisers based Proteino lacto Gluconates concepts were launched in 2014 by DG - ICAR at Hyderabad.

Organic Nano Polysaccharides Powder for Soil Health

Prathista has also developed “organic nano polysaccharides powder”, a heat stable and 100% water soluble product that can improve soil health. 1.00 kg of “organic nano polysaccharides powder” is equivalent to 4 truck / tractor loads of any manures like cow dung which are sources of soil borne diseases. Organic nano polysaccharides can be mixed with water for flood irrigation and they provide

bio available carbohydrates and proteins for the soil to improve soil health thereby soil micro-flora.

Prathista “organic nano polysaccharides” powder is already being used by few pesticide companies in India to provide organic carbon along with pesticides for improving soil health and also being supplied to few ASEAN countries to coat with chemical fertilisers (like urea / DAP) to provide organic carbon for the soil health while improving efficacy of chemical fertilisers / pesticides.

Prathista Organic nano nutrients are 100% water soluble and totally bio available for all crops / plants / horticulture / species and medicinal plants and all type of crops where chemical fertilisers can be partly replaced. Prathista never advocates 100% replacement as it could be detrimental to our food security. Prathista Organic nano innovations are totally compatible with any chemicals or pesticides. Prathista’s mission is to popularise this innovative and patented concept for rural development activities across India.

Lab to Land

KEEPING FARMERS FIRST

Inspired by my idols, I always wished to be in academics. All other things happened in the process, says Dr AK Singh, Agriculture Commissioner, GOI and Deputy Director General (Agricultural Extension), ICAR

A long illustrious career in teaching, research and extension best outlines the magnificent journey of Dr Ashok Kumar Singh, Agriculture Commissioner, GOI and Deputy Director General (Agricultural Extension), ICAR.

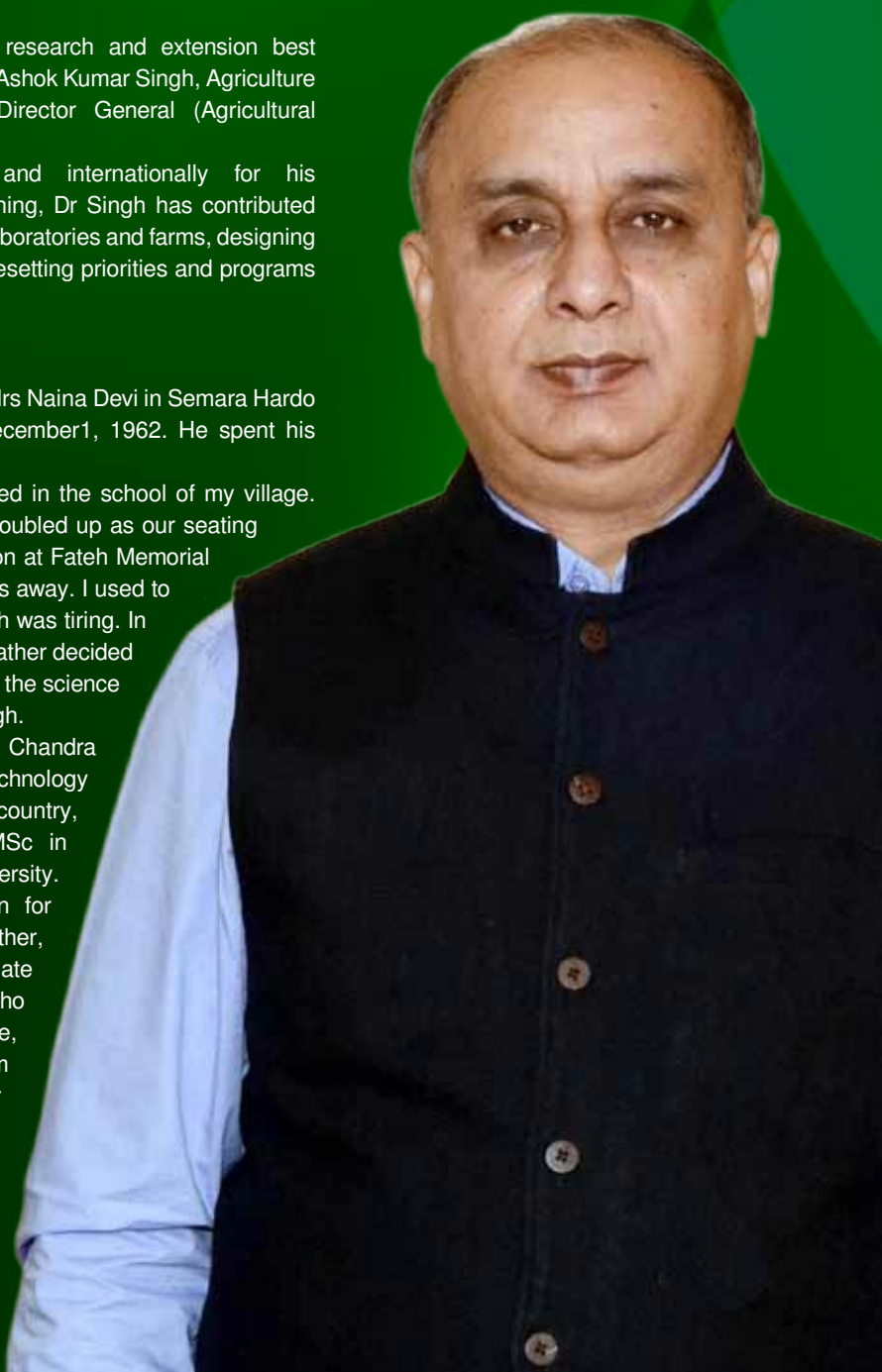
Widely acclaimed nationally and internationally for his achievements in extension management and training, Dr Singh has contributed extensively to institution building, development of laboratories and farms, designing extension education and outreach programs and resetting priorities and programs to keep pace with emerging challenges and goals.

DEEP, POSITIVE INFLUENCE OF PARENTS

Dr Singh was born to Sri Satya Narain Singh and Mrs Naina Devi in Semara Hardo Patti village, Kushinagar in Uttar Pradesh on December 1, 1962. He spent his formative years in the village.

"My primary education up to Class 8 happened in the school of my village. We had to carry a gunny bag from home which doubled up as our seating cushions in the classes. Thereafter, I got admission at Fateh Memorial Inter College, Tamkoshi Raj, which was about 6 kms away. I used to go every day by bicycle to attend the school, which was tiring. In Class 9 and 10, I studied science. Thereafter, my father decided that I should take up agriculture in Intermediate, as the science college was far from my home," reminisces Dr Singh.

He pursued his Graduation in Agriculture in Chandra Shekhar Azad University of Agriculture & Technology (CSAUA&T), one of the first four colleges of the country, which was established in 1906. "I did my MSc in Agricultural Extension and PhD from the same university. Every decision of my life up to my admission for graduation program was taken mainly by my father, who was a lecturer of Hindi in the same Intermediate college. My guide and teacher was my father, who shaped my life. My mother, who was a housewife, also had a large role to play in the person that I am today. My father was also the Village Pradhan for more than 15 years."



FORAY INTO AGRICULTURE EXTENSION

Dr Singh was an industrious student and excelled in his studies. He was the first rank holder in Msc and PhD. He held several positions of repute in his career of 18 years in the Agricultural University and 13 years in ICAR. "During my stay at Kanpur as a student (1979-1986) and as a scientist and also holding various positions in CSAU Kanpur (1987-2005) and ICAR (2005-2013), I was highly impressed and influenced with the towering personality of Dr Daulat Singh who was Professor and Head and also Director Extension, CSAU Kanpur for almost two decades. I was mesmerized by his vast knowledge, positive attitude, hard work and action oriented approach. After joining services, he proved to be a true guide and mentor for my growth".

Dr Singh started his career in 1987 and looked after the extension services of CSAUA&T, Kanpur. He joined as Zonal Director, ATARI, Kanpur in 2005. It has been a highly rewarding and illustrious journey. As DDG (Agricultural Extension), Dr Singh leads the frontline extension system of ICAR including 731 KVKs.

He also served ICAR as Assistant Director General (Agricultural Extension) in 2014; Deputy Director General (Agricultural Extension), 2014 till date; Deputy Director General (Fisheries Science - Additional Charge), 2015-16; Deputy Director General (Horticultural

tête-à-tête with Anjana



Science - Additional Charge), 2016-17; Director & Vice Chancellor (Additional Charge), ICAR-IARI, New Delhi, 2017 to January 2020. Dr Singh has been recently (2022) entrusted with the responsibility of Agriculture Commissioner, GOI.

Dr Singh focused on research areas of extension system, models, approaches and technology adoption. He played a crucial role in reforming ICAR Lab-to-Land Program by introducing three major outreach programs viz., Farmer



AWARDS/HONOURS

- Swami Sahajanand Saraswati Best Extension Scientist Award, 2013 of ICAR
- Excellence in Science Award, 2018 by Society of Agricultural Professionals
- Lifetime Achievement Award, 2018 by Society for Agricultural Innovation & Development
- Member, Farmers Commission, Uttar Pradesh, 2018
- Award of Excellence, 2017 Chandra Shekhar Azad University of Agriculture & Technology
- Extension Leadership Award, 2017 by Participatory Rural Development Initiatives Society Harit Ratna Award, 2016 by All India Agricultural Students Association
- Daulat Singh Memorial Extension Scientist Award, 2011 by Society of Extension Education
- Young Scientist Award, 1999-2000 by Indian Society of Extension Education
- O.P. Dahama Memorial Award, 2007 by Indian Society of Extension Education
- Krishi Bhushan Award, 2005 by Chandra Shekhar Krishak Samitee



FIRST, Attracting and Retaining Youth in Agriculture – ARYA and Mera Gaon Mera Gaurav program.

FARMER FIRST Initiative

This one of a kind initiative was designed to provide a platform to farmers and scientists for creating linkages, capacity building, technology adaptation and application, on-site input management, feedback and institution building. It aimed at enriching the Farmers–Scientist interface, technology assemblage, application and feedback, partnership and institution building and content mobilization. Currently, the project is under operation in 48 centers spread over 20 states of the country. The scientists involved in this project are working with 50,000 farm families in 250 villages. The project has resulted in 1.5 to 2 times growth in farmers' income.

Mera Gaon- Mera Gaurav

Mera Gaon Mera Gaurav (MGMG) program was initiated to effectively promote direct interface of scientists of ICAR Institutes and State Agricultural Universities with the farmers to hasten the lab-to-land process. The approach involves a group of four scientists, each adopting five villages. The reach of the project is staggering. It is being implemented by 117 institutes/ agricultural universities involving 1,286 groups of 5,091 multidisciplinary scientists covering 9.76 lakh farmers of 9,000 villages.



Dr Singh steered the establishment of three new ATARIs (Agricultural Technology Application Research Institutes) at Patna, Guwahati and Pune, and more than 100 KVKs

Attracting and Retaining Youth in Agriculture (ARYA)

Having the next generation ready to undertake agriculture is an important area that requires due attention. Dr Singh is the architect of ARYA - Attracting and Retaining Youth in Agriculture program. He has steered the implementation of

the program in 100 districts. A total of 7,251 enterprises were established by 16,707 youth in India, which has resulted in 53.86% rise in their income growth.

Making the Villages Climate Smart

Under the project "National Innovations in Climate Resilient Agriculture" of ICAR, Dr Singh steered the establishment of 121 Climate Smart Villages to address vital challenge like drought, flood, soil related problems, etc. These climate smart villages are weather smart (weather forecast, seeds for needs, crop diversification and agro-forestry), water smart (direct seeded rice, precision land leveling), carbon smart (zero tillage,



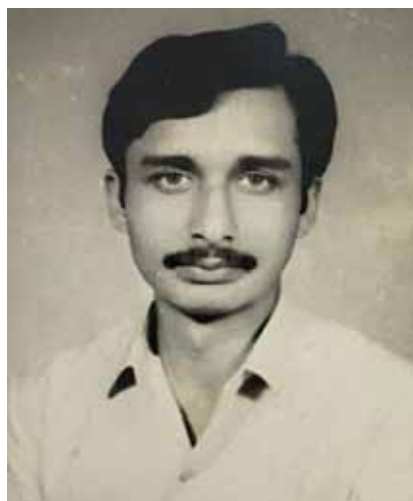
residue management (legumes), nutrient smart (site specific nutrient management and legume integration), energy smart (zero tillage, residue management, precision water management, direct seeded rice) and knowledge smart (ICT, capacity development for women and youth).

Harnessing Pulses and Oilseeds Production through Frontline Demonstration

Under Dr Singh's leadership, focused and specialized programs were started with funding support from Department of Agriculture, Cooperation & Farmers Welfare for demonstrating the production potential of pulses and oilseeds through cluster frontline demonstrations. A nationwide program was conceived under the Special Mission on Pulses and Oilseeds – on-farm demonstration across the country. This involved

534 KVKs on pulses and more than 600 KVKs on oilseeds. As part of the initiative, advanced technologies were demonstrated on farmers' fields from 2015-16.

Initiation of Pulses Seed Hubs, large scale demonstrations and policy



decisions led to record pulses production in the country which has reached to 26.96 million tonnes in 2021-22. The technology demonstrations exhibited about 40% gain in the yield of pulses.

Addressing Gender and Nutrition, Incubation And Tribal Areas

VATICA was initiated to minimize the post-harvest losses through development of entrepreneurship in the field of processing and value addition.

Knowledge System and Homestead Agriculture Management in Tribal Areas (KSHAMTA), Nutri-Sensitive Agricultural Resources and Innovations (NARI) and Farm Innovation and Resource Management are other major initiatives for technology driven growth of agriculture. ICT initiatives including mobile based agro-advisory through mKisan portal covering more than five crore farmers and recently developed Kisan Sarthi platform are some of his other major contributions that has led to the enhance out reach of ICAR across the country.

Dr Singh steered the establishment of three new ATARIs (Agricultural Technology Application Research Institutes) at Patna, Guwahati and Pune, and more than 100 KVKs.

Today KVKs have become a vibrant organization for taking technology to farmers, giving feed back to research system and converge with different stakeholders for awareness creation on various issues and implementation of programs.

Dr AK Singh is Fellow of NAAS, ISEE, SEE, CHAI, ISHRD, International Society of Noni Science, Andaman Science Association, Society of Agricultural Professional, Uttar Pradesh Academy of Agricultural Sciences. Member-Farmers Commission, Uttar Pradesh.

"There was no one from my family or relatives in agricultural services anywhere. I was fortunate to be guided and supported by Dr J P Yadav, Director Extension at CSAU Kanpur. The journey has been satisfying and fulfilling. Inspired by my idols, I always wished to be in academics, and I got beyond expectations in my life. There was only a wish to be in academics and all other things happened in the process," says Dr Singh with humility.

Dr Singh leads a happy and content life with his wife, Smt Tara and his sons, Shailesh and Nitesh. They are both computer engineers and are doing well in their respective careers.

CCS NATIONAL INSTITUTE OF AGRICULTURAL MARKETING

TRANSFORMING THE LIVES OF FARMERS & STAKEHOLDERS



About 60% of India's population is still engaged in agriculture and allied activities, but the contribution of the agriculture sector in GDP is still around 17-18% only. This is far lower than the percentage of population dependent on it. Currently, India is the world's fourth largest producer of agrochemicals and accounts for nearly one-third of the global tractor production. While the country's production, productivity and exports have been notable in the last decade, it is also imperative to keep pace with global trends in the agriculture and food sector through rapid implementation of R&D, budding technologies, and innovations.

Ch. Charan Singh National Institute of Agricultural Marketing (CCS NIAM) is a premier national level institute set up by GOI in August, 1988 to offer specialized training, research, education and consultancy in the field of Agricultural Marketing. The institution is engaged in organizing training programmes in the field of agricultural marketing and allied

About the **AUTHOR**

Dr. Vijaya Lakshmi Nadendla, IAS, is Joint Secretary (Marketing), Ministry of Agriculture & Farmers Welfare, Government of India and Director General, CCS NIAM



- India has built a strong name for itself in the global AgriTech start-up ecosystem and has more than 700 AgriTech start-ups that are providing customised solutions
- The year 2021 has been a fantastic one for Indian AgriTechs. Indian agri start-ups raised investments to the tune of almost USD 1 billion
- A study shows that 70% agripreneurs are from non-agri field as they find greater opportunities of business and impact in agriculture and allied activities.

areas for senior & middle level officers from various line departments of state governments, cooperatives, marketing boards and agri-business entrepreneurs besides running the PGDM course in Agriculture Marketing.

The premier institution has also been recognized by the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Ministry of Agriculture and Farmers Welfare (MoA&FW), GOI as a Centre of Excellence for implementation of RKVY-RAFTAAR project for promoting agripreneurship. The project is one of the front-runners in the country when it comes to bringing technology and innovation in the field of agriculture, supported by MoA&FW. The scheme aims to highlight the Startup ecosystem and give platform to the agri-innovators to bring out their innovations for the aid and support of agri-stakeholders.

As a part of the project, NIAM also extends hand-holding as Knowledge Partner to RKVY-RAFTAAR Agri-business Incubators (RABIs) spread across the country including Sri Karan Narendra Agriculture University (SKNU), Jobner, Rajasthan; Bihar Agricultural University (BAU), Sabour, Bhagalpur, Bihar; National Rice Research Institute (NRRI), Cuttack, Odisha; and IIT, Kharagpur, West Bengal.



Handing over of Grant Fund cheque to Startup

Enterprising Young Entrepreneurs Of Urban India

In the last few years, we have seen young entrepreneurs come up with ideas, innovations and business models to support farmers and help them achieve scale and sustainability. Enterprising young entrepreneurs of urban India as well as from rural backgrounds are now coming up with innovations to turn around the rural and agriculture landscape through their startups in recent years. A substantial number of them are from non-agri field as they find greater opportunities of business and impact in agriculture and allied activities.

With schemes like RKVY-RAFTAAR, early detection of potential agri-startups has become feasible with more and more agripreneurs are coming-up with innovations to setup agri based businesses to create an ecosystem for impacting farmer's income.

NIAM Agri-Business Incubator

NIAM Agri-Business Incubator (NABI) was established in 2019 under RKVY-RAFTAAR. It has proved itself as the flag-bearer of innovation, entrepreneurship and has established itself as a "Friend of Farmer" in the field of Agri-Startup ecosystem by fighting all the odds in the difficult Covid times. NIAM is promoting, nurturing and flourishing the business of the agribusiness startups to provide social and economic benefits. In the last three years of its operation, NABI has not just trained and funded agri-startups but has created a safe haven for innovative agri-business ideas to grow and bloom as an agri-venture.

The incubator is running two programmes under RKVY-RAFTAAR. These are Agri-preneurship Orientation Programme (AOP) and Startup Agri-Business Incubation Programme (SABIP)

IMPACT CREATED

- 10 lakhs + farmers/ stakeholders benefited direct/indirectly
- 18 States covered
- 15000 + employment opportunities created directly or indirectly through incubated startup companies
- 430+ innovative social impact startups incubated and supported with approx. Rs.16 crores funded to pre-seed and seed stage incubatees
- 300 + No. of events/webinars to enhance the entrepreneurial ecosystem
- 19 Patents applied by Startups (Exclusive Legal Cell for support)
- 25+ Women led startups working in all thrust areas



NIAM Agri Business Incubator (NABI) awarded

- "Best Agri Incubation Centre in India" award by MIT World Peace University, Pune for its contribution in the field of development of Agri-Business Startups and entrepreneurs.
- Awarded by ISGF (Indian Smart Grid Forum) Innovation Awards 2022 in Gold category under the Smart Incubator category for playing a pivotal role in aiding start-up ecosystem and promoting innovation in diverse fields and other allied activities.

that provide two months of training and funding up to Rs 25 lakh. The programme aims to support existing and budding ventures, enterprises and startups in agriculture by training, mentoring and financing.

Matching with the pace of ever changing Startup ecosystem, NABI has incubated some revolutionary startups under its wings. Startups and Agripreneurs incubated here are becoming game changers of agri-innovation regime of Indian startups ecosystem. These agripreneurs and startups are the strength and pride of NIAM Agri-Business Incubator (NABI) and they pledge to serve the agricultural economy of the country by fulfilling their business milestone set by them under the guidance of CCS NIAM.

NABI has incubated 152 startups in the last three years of incubation and has conducted five cohorts in each type of programme i.e. five batches of AOP and SABIP each. 62 startup ideas (35 seed stage and 27 pre-seed stage) have been recommended with grant-in-aid of Rs 7.52 Crore from MoA&FW. NABI has successfully disbursed fund

Highlights of NABI

- Smart startup innovations having social impact in agriculture and allied areas
- Financial support upto 25 Lakhs to startups in the form of Grant-in-aid
- Mentoring to startups by Industry, Academia, Successful Startups, Government Officials, Industry bodies like FICCI, CII
- Connect with experts of all domains
- Investor Meets, Market assistance through buyer-seller meets, national & international exhibitions
- Exposure visits to National Innovation Foundation, Agri Universities, R&D Institutions, Tech Developers and other incubatees



Awarded by ISGF (Indian Smart Grid Forum) Innovation Awards 2022 in Gold category

amounting to Rs 292.20 lakhs to the recommended startups by executing Memorandum of Agreement (MoA) with all the recommended startups. The rest are in process.

NABI serves as a platform to the agri-innovators and offers help to startups with advisory in finance, legal, innovation management, marketing strategies to further explore the business ecosystem. NABI offers a one stop shop for every need of an agri-startup and prepares startups for market competition and expanding further.

The Startups ideas incubated by NIAM are making a great difference in the lives of farmers & stakeholders with technology intervention making a great difference in agri supply chain management; mobile fruit processing machine for value addition to fruits at farm-gate; focusing on empowerment of tribal


women; naturally biodegradable water retention polymer for soil conditioning by using fruit waste; products like hand-held commodity assaying machine which can provide results within 2 minutes; tech based services to detect the water and shelf life of bore wells and with many other innovative products & services.

NABI organizes Investors meets and Buyer Seller meets for incubatees to accelerate the funding opportunities and promoting the products, services and technologies developed by the startups. Investor meets have been organized with Rural Economic and Educational Development Society (REEDS), Hyderabad; Yes Bank; Rajasthan, Venture Capital Fund; Morarka Foundation; Omnivore, and Villgro for channelizing the funding opportunities for the incubated startups.



Health for All

Hunger for None



What drives us is creating a better life for everyone. Guided by our vision: "Health for All, Hunger for None", we promote inclusive and sustainable growth through innovation. We have been advancing agriculture and healthcare in India for the last 125 years and will continue to create a better future for all.

FEED INGREDIENTS QUALITY STANDARDS

SHOULD THESE BE REVIEWED & ENFORCED IN FARMERS' AND PUBLIC INTEREST?

Pricing of feed material, mainly soymeal, is based on protein content. In absence of other vital parameters in quality norms, use of adulterants to create fake protein levels is a very common concern



Meat, egg and milk must always be processed and stored under safe and hygienic conditions. Otherwise these can be high-risk products for consumers. Unsafe and adulterated feed is a source of health risk for both animals and consumers. Farmers suffer because of increasing cost of managing the animals and reducing revenue from the produce. It is important for the farmers to keep track of their suppliers and ingredient suppliers to ensure safe and hygienic balanced feed. Reliable and rigorous testing is needed to ensure safety for consumers.

To protect farmers, livestock and consumers from unsafe and adulterated feed material, it is high time that the quality of feed materials must be regulated and monitored closely to ensure safe and healthy feed and food.

Why do farmers lose money in the livestock business?

Due to unsafe and unhealthy feed material, many farmers are forced to adopt medication to protect

About the AUTHOR

Mr Vijay Sardana is an expert on techno-legal matters. He is an Advocate and practices at the Delhi High Court, the Supreme Court and the National Green Tribunal. He is an Independent Director on Corporate Boards. Mr Sardana is Techno-Legal Advisor at Shriram Institute For Industrial Research, New Delhi



MAJOR ISSUES OF CONCERN

- FSSAI, BIS, Ministry of Animal Husbandry, Dairying and Fisheries and Ministry of Consumer Affairs must enforce quality norms on all feed items
- Laboratories issuing fake quality certificates must also be checked and controlled. Always visit the laboratory facilities to verify the facilities and capabilities.
- Always demand latest photographs with dates and GPS coordinates of the laboratories as part of a quality certificate with every lot to check fake certificates. Every mobile phone has this feature. There is no extra cost or time required to enforce this. Where there is a will, there is a way to enforce quality norms.

livestock from sickness. The medication adds to cost. More dangerously, it adds to the Antimicrobial Resistance (AMR) risk in the society at large. This is also hurting the image of India in the world market.

Due to the high cost of soymeal, the incidence of adulteration in soymeal has gone up. This is not only hurting farmers but also the health of the poultry birds and also the consumers.

It is high time we must check the quality of feed and feed material in India.

Processing of Soybean meal

Variations in soybean meal (SBM) quality can be caused by uneven cooking, undercooking and overcooking. This can result in anti-nutritional factors such as trypsin inhibitors and low-quality diets.

To get the best out of soya products which are used as a protein source, they should be heat-treated. Varying the degree of heat treatment of soya products progressively and simultaneously raises the protein efficiency or quality,

Need to change soybean meal to ensure quality Livestock Feed

Parameters	Existing	Proposed	Justification
Crude Protein content (Min. %).	44%	45%	Good quality raw material and proper processing can be ensured easily.
Moisture (max. %)	12%	11%	Advisable because Proper processing can ensure this.
Sand and Silica (Maximum %)	2.5%	Less than 1%	This should be modified because every factory can easily remove sand and silica from soybean.
Crude Fat (min.%)	0.8%	0.5%	Proper processing can ensure this.
Crude Fibre (max.%)	6.5%	6.5%	Good quality raw material and proper processing can be ensured easily. This will also check adulteration like hulls, groundnut shells, saw dust, guar, etc.
Adulterants like Urea, melamine, Guar, saw dust, other grains and foreign materials	No parameter is defined	All these should be absent. This must be mentioned in the standard.	This should be included to check manipulation of the quality at any stage in the supply chain.
Anti-nutritional factors and toxins	No mention in standards	This should be mentioned in soymeal standards	This will ensure safe feed and safe food.
Important: Any other parameters can be added to enforce quality norms			

inactivates such enzymes as trypsin inhibitors, urease and lipoxigenases and lowers the nitrogen solubility index.

Such heat treatment can be applied to all soya protein products, whether full-fat, medium fat, low fat soybean meal.

Moist heat treatment destroys the several anti-nutritional enzymes present in soybeans and reduces their activity. Dry heat treatment raises the quality of the protein present, but overheating lowers it. The optimum kind and degree of heat treatment to be applied to soya protein for use in any particular food product, depends therefore, on the nature and extent of heating which subsequent manufacture of that food product entails if good protein quality is to be ensured.

What should be done?

Pricing of feed material, mainly soymeal, is based on protein content. In absence of other vital parameters in quality norms, use of adulterants to create fake

protein levels is a very common concern. The other parameters as proposed will ensure that no adulterants are used to give fake and manipulated results in the name of protein. The proposed parameters will act as counter-balance and cross-verification parameters to ensure quality of feed and feed materials for farmers.

All the concerned departments dealing with oilseeds and oil meals must play an active role to procession consumers and livestock health.

Poor quality feed will always lead to poor quality livestock products. Public health, food safety and farmers' livelihood are at risk due to poor quality feed ingredients. Urgent action is expected on this issue because every passing day, suffering of farmers, consumers and society at large is increasing. The only beneficiary of inaction and delay on this vital point is that fraudsters are doing adulteration and manipulation in the economy.

FLYING HIGH IN



AGRICULTURE



Stellar Role of Acharya NG Ranga Agricultural University, Andhra Pradesh



as world-class agricultural drone Pilots through it's well equipped Agricultural Drone RPTO named ADITI (Agricultural Drone Incubation & Training Institute).

Acharya N G Ranga Agricultural University has completed its agricultural drone research program on "Performance

Drones have flown into India's fields pretty fast to revolutionize its agricultural sector and to reduce drudgery in farming. GOI has given due impetus to create and accelerate the drone ecosystem in India. The agriculture sector is the largest potential beneficiary of drone technology, enabling spraying of pesticides, fertilisers, dispensing of seeds and farm scouting for crop health, soil health and to scout for many other biotic and abiotic stresses which cause huge economic losses to the farmer.

The purpose of creating the agricultural drone eco-system in India is to create "agricultural drone pilot" human resources for small category drones (up to 25 kg all up weight) with well knitted agri-drone pilot curriculum in lines with Director General Civil Aviation (DGCA), Ministry of Civil Aviation & Ministry of Agriculture & Farmer's Welfare SOPs for drone applications in agriculture.

VITAL EXPERIENCE AND EXPERTISE

At the ANGRAU Centre for APSARA (Research Wing of ANGRAU on Drones), a well-knitted Agricultural Drone Pilot Training Curriculum of 15 days has been designed and developed. It is taught to Agricultural / Agricultural Polytechnic students of ANGRAU as a part of their regular curriculum and also the rural youth of Andhra Pradesh under the Skill Development Programs to transform them

About the AUTHOR

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Evaluation of Agricultural Drone Spraying” on 10 major crops like Paddy (DSR & TPR), Blackgram, Bengalgram (Chickpea), Redgram (Pigeonpea), Sugarcane, Maize, Sorghum, Groundnut, Cotton and Chilli during 2020-21 and 2021-22, and tested on 100 chemical pesticides, 5 foliar nutrients, 11 types of formulations like SC, SL, EC, WG, WP, WDG, SP, SG, ZC (CS +SC), DC and OD. This has been done using its own assembled and standardized agricultural drones (24.8 kg all up weight- small category) called “ANGRAU-PUSHPAK” drones (10 L material carrying capacity).

TRAINING IMPARTED TO STUDENTS

Total 50 Diploma in Agriculture / Agricultural Engineering students have been trained at ANGRAU to be Agricultural Drone Pilots for in-house utilization. They have exhibited the potential to train rural youth, SAUs and other Research & Development Institutes across India. The course curriculum includes the following.

- 1) Theory (drone + agriculture)
- 2) Laboratory Work (assembling,

Resilient Policy, Curriculum

To keep Indian agriculture ready to accommodate the most advanced and highly useful technology solutions like drone technology, a resilient policy and curriculum for agricultural drone pilot training embedded into Indian the agricultural education system is a must. Creation of the agricultural drone ecosystem in India becomes a reality with vibrant Indianised agricultural drone manufacturing and highly proficient and vast Remote Pilot Training Organisation (RPTO) network. The involvement of State Agricultural Universities and ICAR Institutes is going to play a vital role. GOI through DGCA should authorize these state run RPTOs and identify Acharya N G Ranga Agricultural University as a nodal agency for creating a proficient Agricultural Drone RPTO Network across India.





disassembling, software tuning, calibration, testing, repairs and maintenance)

3) Simulator Training & Testing

4) Field training (With instructor and Solo flying) in real-time conditions

RECOMMENDATIONS

ANGRAU has developed a set of recommendations for GOI and the state governments:

* Every SAU should have one Agricultural Drone Remote Pilot Training Organisation (RPTO)-ADITI in the lines of ANGRAU and permissions and other requirements may be Co-ordinated with DGCA and provided by the respective governments.

Such SAU RPTO's should breed the sub-RPTO's in their respective states in PPP (Public-Private Partnership) mode and incubate them to be the proficient and successful trainers of Agricultural Drones.

Institutions, via inculcating entrepreneurial skills in agricultural students, can play an integrative role in producing innovation-oriented, yet practical solutions to various agricultural challenges

This assures drone training quality and training price control – a kind of mixed economic model, which is in lines with the basic nature of Indian economy, i.e., through healthy competition, goods & services quality and price is controlled.

The infrastructure (Lodging, boarding, training drones, trainees, simulators and field area for practical flying sessions etc.) required for RPTO should have

a minimum capacity to accommodate atleast 20 members per batch @ 5-10 small drones for training @ 1 drone / 2-4 trainees with 4-7 sets of batteries in circulation per batch.

The content, curriculum, modes & methods of training, pricing of agricultural drone training shall be updated regularly by SAU's in lines with DGCA updates and guide the Sub-RPTO's accordingly.

The Agricultural Drone RPTO curriculum must include the knowledge sets on pesticides and their targeted group of weeds, pests and diseases and pesticide product stewardship and compatible combinations etc. to assure safe, secure and scientific plant protection.

The Agricultural Drone RPTO curriculum must also include the Integrated Pest Management (IPM) knowledge set for imparting balanced and selective plant protection to safeguard the environment and food chain as well.

Green Drone Army

Diploma in Agriculture/Agricultural Engineering with Agricultural Drone Pilot Training program can take drone agricultural technology to the farmers. These human resources can be transformed into the Green Drone Army of the country/state. We will need at least 40,000-50,000 agricultural drone pilots to handle 59.68 lakh ha of net cultivated land of Andhra Pradesh. Meticulous planning with training quality is all-important.

ANGRAU has started imparting agricultural drone piloting skill and knowledge to its students of Diploma in Agriculture/Agricultural Engineering as a part of PAMP (Participatory Agricultural Management Program). This shall be useful for enabling them to take up wider demonstrations of drone technology through the R&D wings of ANGRAU. These human resources will be the potential future agricultural drone entrepreneurs. They shall be the successful carriers of agriculture & drone technology to farmers, and help them realize the goals of precision agriculture.



**BENDING THE ARC
OF AGRICULTURAL
INNOVATION**



*Contributing with unique solutions to the
EcoAgriculture Revolution*



All AlgaEnergy
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certificated

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AGRIPRENEURSHIP

FROM AGRICULTURAL EVOLUTION TO ENTREPRENEURSHIP REVOLUTION

"An entrepreneur is one who always searches for change, responds to it, and exploits it as an opportunity. Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or service"- Peter F. Drucker

Entrepreneurship is blooming as a broad and multi-faceted concept referring to the capacity to develop and manage a new business venture in order to make a profit while bearing the risks. Development of entrepreneurship seems the best plausible way to increase employment opportunities, reduce poverty, improve health and overall food security while maintaining the national economy. Particularly in agricultural sector, only 2-3% farmers come under the entrepreneur or commercial farmer category. A large portion of world population is engaged in smallholder agriculture and depends on agriculture for food, income and livelihood, and the commercial prospect for these millions of poor smallholders remains challenging.

Agriculture has covered a long distance from being the low-tech industry dominated by small family firms to the main economic activity contributing to overall wealth of the country.

The demands of the market changed over time with the changes in consumer habits, exacting environmental regulations, food sustainability needs and others. These factors have coerced agricultural companies to adapt to erratic demands which spur new innovation, and skilful entrepreneurship in agriculture.

Agricultural Entrepreneurship

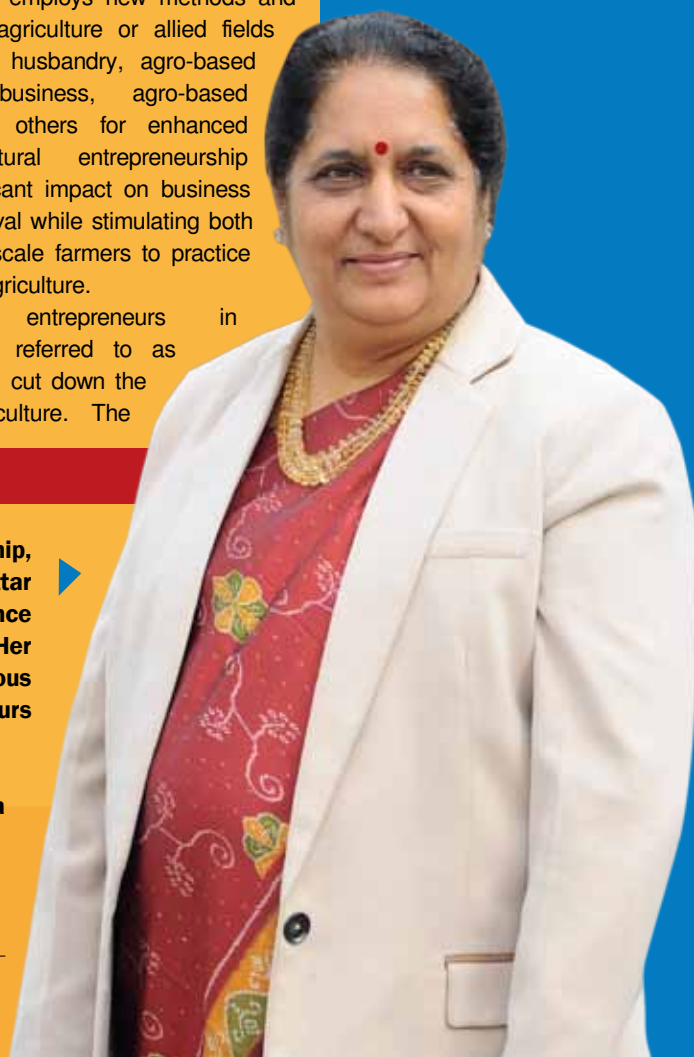
Agricultural Entrepreneurship, also known as Agripreneurship, relates to production and marketing of different agricultural products, as well as agricultural inputs. It also deals with entrepreneurial activities performed within and across the agricultural value chains. It is a process which employs new methods and technologies in agriculture or allied fields such as animal husbandry, agro-based industries, agribusiness, agro-based enterprises and others for enhanced output. Agricultural entrepreneurship can pose significant impact on business growth and survival while stimulating both small and large-scale farmers to practice entrepreneurial agriculture.

Developing entrepreneurs in agriculture, also referred to as agripreneurs, can cut down the burden of agriculture. The

About the AUTHORS

Prof (Dr) Balvinder Shukla is Professor of Entrepreneurship, Leadership & IT and Vice Chancellor, Amity University Uttar Pradesh. She has over three decades of rich experience in Industry, Academia, Research and Administration. Her contributions are widely acclaimed and recognized with numerous prestigious awards and honours

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other associated benefits include the creation of employment opportunities, reduction in the pressure on cities by controlling migration from rural to urban areas, and promotion of industrial development. The utmost important aspect is the increase in national income to which agri-entrepreneurship can contribute significantly.

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Role of agricultural institutions in building agripreneurs

Entrepreneurship education is a key factor in developing entrepreneurial skills in individuals who want to present their idea successfully into the market. The educational institutions can assist these individuals by nurturing and inculcating necessary capabilities and competencies. The guidance provided by the institutions can allow for routines to develop and subsequently decrease the uncertainty of social interaction. Emerging global interest in entrepreneurship and innovation for economic growth and regional development have compelled



Institutions, via inculcating entrepreneurial skills in agricultural students, can play an integrative role in producing innovation-oriented, yet practical solutions to various agricultural challenges

education policy makers to make requisite changes to academia for incorporating entrepreneurship. Indeed, across the world, many institutions are assuming new roles and responsibilities towards development initiatives and engage actively in educating students about entrepreneurship and in providing innovation support infrastructure.

Despite having origin in the economics and business disciplines, entrepreneurship has attained significance in the agriculture sector. Teaching entrepreneurship in the agricultural field has slightly moved from teaching the science of entrepreneurship to teaching the art of entrepreneurship as well. Where science refers to the theoretical concepts of business, and the art of entrepreneurship includes the ability to practical application of the theoretical knowledge creatively.

Institutions, via inculcating entrepreneurial skills in agricultural students, can play an integrative role in producing innovation-oriented, yet practical solutions to various

agricultural challenges. By integrating entrepreneurship in agricultural education through regular or specialized courses, the institutions cater understanding of multiple disciplines to students including planning of new venture, strategy formulation for business, innovation and technology management, leadership and finance among others.

Institutions also hold the potential to frame the behaviour of individuals, as a consequence, they also structure the incentives that individuals face in their activities. Institutions imparts the knowledge regarding stabilizing market prices of agricultural commodities, generating assured income by utilizing farm produce, utilizing additional revenue or surplus money to develop a viable business, and generating adequate income to sustain farmers' livelihood. Initiation and commencement of entrepreneurial programs in institutions, especially in backward areas of developing countries like India, are essential for improving quality of life as these areas are majorly dependent on agriculture for employment.

There is still a scope for educational institutes to re-design the curriculum to provide better scope of creativity and innovation, especially in India. The motivation and awareness of entrepreneurship education, provided at a very beginning stage of individual's development, can provide better opportunities for creativity and innovation.

DIGITAL LENDING ECOSYSTEM

Enabling The Farming Community To Reap The Benefits By Use of Agritech

Agricultural finance and agricultural insurance are crucial for eliminating widespread poverty and fostering shared prosperity.

Nearly 500 million farming households, representing 2.5 billion dependents, rely on agriculture for their livelihood. Farmers throughout the world seek finance to meet their consumption needs. It enables them to have the choice to store for better returns and the liberty to decide whom and when to sell a product. Timely and adequate finance in agriculture helps farmers weigh global as well as local factors impacting their operations, handle debt and manage cash flows.

Finance is one of the fundamental needs of agriculture and its value chains. But most countries struggle with effective financial inclusion. Most small and marginal farmers continue to depend on non-institutional sources of finance.

Today we are seeing a surge in agritech start-ups across the world, and especially in India, looking to replace these traditional sources of finance with exorbitant interest rates. These start-ups are looking to embed finance

About the **AUTHOR**

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seamlessly into the value chain activities to optimise value for both sellers and buyers. Their tech-enabled value proposition is challenging conventional business models while allowing for leapfrog in efficiency. The eventual outcome is that these agritech players are gaining the highest levels of trust of immediate stakeholders in the process.

CHALLENGES FOR FARMERS

Lack of information related to the demand-supply mechanisms as well as access to the formal sources of credit leads to challenges for farmers both in pre-and-post-harvest. This is where agritech start-ups leverage their technological capabilities to ensuring a seamless flow of operations spanning finance, control over pricing, aggregation of demand, and uniformity in quality & testing and fulfilling the working capital requirements of the farmers.

Take for instance a typical problem statement of majority of farmers in a conventional set-up. A major post-harvest challenge that farmers face is volatility in pricing. With the absence of a controlled estimate on pricing, farmers are bound to be at the mercy of the local traders. This, at times, also opens up the risk of manipulated control over pricing from the buyer's side.

With technology, agritech start-ups are providing better price discovery of the farm produce through aggregation of demand. If there is an increasing demand for any product, say wheat, in one place and the local production could not meet the demand, the buyers would look to procure wheat from another place. In such a condition, agritech start-ups can leverage technology to help the buyers and sellers with better price discovery related analytics. This ensures an intelligent demand and supply matching and with the widespread geographical scale of operations, the stability and uniformity in prices gets restored.

SITE-SPECIFIC CROP MANAGEMENT PROCESS

Agri-tech start-ups make use of new-

BLOCKCHAIN TECHNOLOGY

One such technology which has gained prominence in ensuring secured and safe transactions is that of blockchain. It ensures the traceability of the farm produce across various levels of the supply chain. With IoT devices and sensors being introduced by agritech start-ups, blockchain technology can be used to consolidate data on a variety of topics, including seed quality, crop tracking, and the path of crops from the farm to the market.

Already over 14 million farmers have derived benefits by use of agritech services. This figure is expected to rise further through targeted outreach with farming communities through use of big data. As an example, the Warehouse Receipt System (WRS) offered by agritech players, can improve access to institutional loans while also serving as a trade facilitator for farmers. Collateralization of agricultural produce with legal backing in the form of a negotiable warehouse receipt (NWR) has the potential to increase credit inflow to rural areas, lowering credit costs and stimulating other agricultural-related activities such as standardisation, grading, packaging, and insurance services.

Many start-ups are looking to embed finance seamlessly into the value chain activities to optimise value for both sellers and buyers. Their tech-enabled value proposition is challenging conventional business models while allowing for leapfrog in efficiency

age digital technologies such as Artificial Intelligence (AI), Machine Learning (ML) and Internet of Things (IoT) to enable a site-specific crop management process where it ensures that the crop and the soil receive exactly what they need for optimum health. By setting certain crops as standards to measure the health of the other crops, precision farming techniques can be used to ensure homogeneity in the quality of the goods produced.

Farmers now receive timely updates, relevant information, and monitor their crops using something as easy as their smartphones. More farmers are seeing

how utilising solutions that use cutting-edge technologies as stated earlier which can help them improve climate resilience, crop output, and price control.

However, it is imperative to acknowledge that 86% of Indian farmers fall in the 'small and marginal farmer' category and hence the solution to any problems in the Indian Agricultural system needs to be inclusive of their needs. And among the needs, access to finance plays a crucial role. And agritech start-ups by continuously leveraging technology has ensured seamless finance into the sector.

These platforms not only ensure quick and simplified credit access to the farmers but also check the inefficiency in the management of its supply chain by appropriate use of technology.

The establishment of Agri Stacks will be enabled by the digitization of farms combined with an integrated plan to create electronic balances for commodities, bringing much-needed transparency to value chains. This would not only provide seamless credit facilitation but also help the farmers de-link from non-institutional sources where they are forced to borrow at exorbitant interest rates.

GOING GLOBAL WITH BIO-TECHNOLOGY



I did post graduation in Economics and Commerce from Aston University, UK. I also did an exchange program with an Australian University and a dual MBA with specialization in finance from an Indian university and continue to do with another UK university.

In June 2021, I took over Vaishnavi Bio Tech Limited and turned it into Vaishnavi Bio-Tech International Limited. The proposed capital investment for our fermentation-based biotech company is Rs 90 crore approximately. The core plant machinery cost will be less than Rs 5 crore.

Vaishnavi Bio-Tech International Limited is a 100% EOU with more than 500,000 litres fermentation capacity. We will manufacture clean, natural and plant (vegan) based non-GMO food ingredients with USFDA, Kosher, Halal and all global certifications. Our products are patented in seven countries.

I am the co-patent owner along with my father Dr MVSS Sairam for eight patents. Six of them have been patented in developed countries like USA, Brazil, Mexico, UK & EU and Australia and New Zealand.

I got the opportunity to choose PR status in UK and the USA. But I opted to settle in India because I feel that our nation has great potential and capabilities.

Bio technology has immense scope for growth. Many students wrongly feel that there is no potential

About the **AUTHOR**

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for bio technology in India. Even though my educational background is economics, commerce and finance, I took the challenge to venture into the bio technology segment. My objective is to provide value addition for non-edible agricultural commodities to increase farmers' income.

We want to encourage farmers to cultivate industry-relevant crops to convert carbohydrates into glucose, and then into various active pharma & food ingredients for global market requirements.

I have a passion for life sciences. This is why I signed some PPP model MoUs with global universities to promote science and technology, and also promote our youth, who are hungry to do something for the nation.

I signed contracts for buy-back arrangements with two US-based companies in October 2021. From October 21 to March 22, I exported products worth \$3.00 million to the US. I want to be a role model for the youth who believe that there is no scope for bio technology, for chemical engineers or for life sciences subjects.

I signed a licensing agreement with Prathista, an India-based MNC for technology transfer to produce multiple products in order to provide value



I believe in providing employment to local people. This ensures rural area development. My dream is to make Vaishnavi Bio Tech International Limited a truly global company. I have created a subsidiary company in Europe (Germany) and will set up more subsidiaries in US, Mexico and Brazil

addition to agricultural commodities.

The PMO office is focusing on doubling the farmers' income by enhancing productivity with natural farming. Vaishnavi Bio Tech International Limited will work in tune with the PMO vision to provide industrial value addition for agri commodities and buying directly from farmers.

We want to develop a range of anti food commodities like baking products, processed meat, cheese/paneer and other food items. Often, these items get spoiled due to lack of quality care which leads to fungus/mold, bacterial infections etc.

We shall sell domestically too, but our major focus is on exports. Vaishnavi Bio Tech International Limited, a 100% EOU is situated in a rural area called Vadiya village, Sihor Taluka in Bhavnagar district of Gujarat.

I believe in providing employment to local people. This ensures rural area development. My dream is to make Vaishnavi Bio Tech International Limited a truly global company. I have created a subsidiary company in Europe (Germany) and will set up more subsidiaries in US, Mexico and Brazil. Ultimately, it is not the educational background which matters. The passion to grow in any area and the attitude to succeed are the real factors which mark success.



Hydroponic Farming

MAKING FOOD PRODUCTION ECONOMICALLY EFFICIENT, ENVIRONMENTALLY SUSTAINABLE



Agriculture is the backbone of the Indian economy and is fearlessly facing all the challenges. Just like Fintech, EdTech, and Healthtech sectors are providing innovative solutions to meet the ever-rising demands, Agri-tech startups are introducing ingenious techniques to offer economically efficient and sustainable solutions to meet the rising food demand.

A recent study by Deloitte estimates that the expenditure on food of an average Indian household is expected to increase by 35.4% by 2025. Hydroponic farming with its technological innovation can help meet the multifold rising demand and ensure affordability and sustainability.

The Need for Alternative Farming Techniques

Traditional farming methods face many challenges to meet the exponential rise in demand and to address uncertain climatic conditions. Excessive use of pesticides and chemical fertilizers is a serious health concern. It has also adversely impacted soil fertility, leading to alarm globally.

The high dependency of conventional farming on external factors like climate, water, natural disasters like floods and droughts, etc., has led to failed crops and

About the **AUTHOR**

Mr Pravin Patel, the founder of Brio Hydroponics, is an agripreneur turned modern farmer. He believes strongly in sustainable farming with the right use of technology and innovation

considerable losses to farmers.

Groundwater is one of the most critical resources for farming in India. Statistics suggest that groundwater supports over 26 crore farmers and accounts for 63% of irrigation water. The depleting groundwater levels are major concern for traditional farmers.

The World Water Development Report by the United Nations Educational, Scientific and Cultural Organization (UNESCO) states that India is the largest extractor of groundwater globally. It is also predicted that the country's water demand will be twice the supply, leading to severe water scarcity and potential loss of around 6% of the GDP.

Alternative techniques like hydroponic farming are the need of the hour for making food production more economically efficient and environmentally sustainable.

Optimal Use of Modern Farming Technology

Hydroponics is a process in which plants are grown without soil. The nutrients are supplied using mineral nutrient solutions in aqueous (water-based) solvents. The roots of the plants are immersed in nutrient-rich oxygenated water, thus providing them perfect nutrition to thrive. In aggregate hydroponics, the inert media like coco peat substrates is used to grow a range of crops by doing the precision fertigation.

The dependence on external factors like erratic rains or extended winter is limited since plants are grown indoors under protected cultivation.

Innovation Is Always Key

With hydroponic systems, plants are produced around the year by providing a controlled environment that mimics the natural daylight and darkness and suitable temperature for the growth of various crops. The pressure regulated drip emitters directly provide the requisite amount of nutrients to the roots and use almost ten times less water than open field farming.



Advantages

Hydroponics systems have proven to reduce water consumption substantially, which is the primary concern in the conventional farming method. The water consumption in the traditional farming method is greater as water needs to penetrate through the soil to the roots. A large amount of water evaporates in the process, and only a fractional percentage reaches the roots.

Using intensive farming, one kilogram of tomatoes requires 400 liters of water, while the hydroponic method requires only 70 liters. Hydroponics farming has proved that the water consumption is 80-90% lower since water immediately reaches the roots with minor loss due to evaporation.

Though the hydroponic system's initial setup is expensive, it has incredible benefits that make it economical to address farmers' woes. Farmers are turning successful agripreneurs with this technology-led disruption.

Meeting the New-Age Consumers' Demands

The younger generation has become health conscious and prefers non-toxic and antioxidant-rich dietary trends. To meet the new-age demands, exotic fruits like blueberries are imported at a hefty

price of Rs 3,000 – 3,500 per kg. Tropical fruits like blueberries, strawberries, cranberries, raspberries, grapes, cantaloupe (a variety of muskmelon), and watermelon can now be grown cost-effectively in India. They grow much better with controlled PH levels with hydroponics systems compared to organic soil settings.

High grade water soluble Hydroponics fertilizers are not harmful. The food from hydroponics farms is almost chemical-free and well within permissible MRL (Maximum Residue Limit), leading to the rise in popularity of these agri-products.

Sustainable Environment-Friendly Farming

In traditional farming, stubble burning - an age-old practice of burning farm residue to hasten the crop rotation process continues despite witnessing harmful air pollution effects. A sustainable environment is a gift for our future generation. The rapid adoption of eco-friendly hydroponic farming techniques along with global GAP (good agricultural practices) can help save exploitation of natural resources to meet humankind's demands. NASA in its research on hydroponics has predicted it to be the "Future of Farming" not only on earth, but probably on the moon, and Mars too.

Fruits and Vegetables

CHANGING MARKET DYNAMICS IN INDIA

The pandemic has changed the manner in which we purchased everything, especially basic consumables. There has been a boom in digital penetration in India with the Internet user base being on a high growth trajectory. Consumers have increasingly begun using online methods of shopping for groceries and fresh produce. Food delivery apps and e-commerce platforms are growing. Farm estate is perhaps the new IT of India, taking the overall economy towards a healthier growth trajectory.

There has been a transition in trends of consumers buying fresh produce. Fresh produce mandis (F&V) will no longer be an offline experience. People have started depending greatly on online fruit and vegetable apps. Shoppers have more choices online and can get the delivery comfortably at their homes. Last-mile delivery is getting formalized faster with home delivery. Self-service kiosks based on applications, various types of mobile shopping vans and the farmers' supermarkets are getting normalized gradually, at least in Tier I & II cities.

CHALLENGES AND OPPORTUNITIES IN DELIVERING FRESH PRODUCE

Contrary to traditional thinking, fresh produce has a unique problem and opportunity alike. It is conveniently masked under the category of grocery when in reality it's not. Fresh produce demands distinct process lines and timed operations. Traditional inventory models can never support the fresh produce industry at a scalable level. It is opposite to FMCG products, but the way conventional online and offline players have been handling fresh produce hasn't yielded any innovation yet. That's where the problem is and also the opportunity for the rise of Agri-tech companies.

MEETING FOOD SAFETY CONCERNS

Urban and educated consumers are particular about food safety. Not only have they begun looking for fruits and vegetables virtually, but have also have



About the **AUTHOR**

**Mr Vinay Prasad Yadav is
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started seeking reliable channels for so. Thus, there has been a shift from localised cart vendors to organized modern retail format stores and online shopping models via apps. Food safety and traceability are some of the causes of emerging changes in fresh produce shopping.

The demand for immunity-boosting foods like Ginger, Garlic, Turmeric, Papaya, Oranges and Amla has grown manifold due to the pandemic over the last two years. The demand for high-value fruits and vegetables too, like strawberries, bok choy, basil, iceberg lettuce, etc. have gone up considerably. Many meat substitutes or vegan substitutes for non-vegetarian food items like Soya and Jackfruit demand is surging too. Many farmers through 'collaborative farming' models have started growing multi-crops which has enabled them to have lesser dependency on mandis, sustained source of income and opportunity to understand new technology brought about by agri-tech companies like Atomaday.

The demand for organic food items is increasing. The cumulative customers' addition to consumption of organic produce has increased by 50 per cent. Consumers are looking for long-term immunity results. Many cancer patients have permanently shifted to consuming organic foods. Organic vegetable washes and fruits and veggies' cleaners were introduced during the pandemic to promote fruit and vegetable hygiene.

Several agriculture start-ups sprouted during the pandemic. India has over 1000 start-ups in the Agri-tech

Higher digital penetration, rising digital literacy, outbreak of the pandemic, mushrooming of Agri-tech start-ups, revolutionizing of farming techniques and substantial government regulations and policies in this realm have together caused a robust paradigm shift in fruits and vegetables shopping in India. The bottom-line is that only technology can solve the inefficiencies of the fragmented agri sector, to bring it on par with the world. Agriculture in India needs technology adoption at every stage for it to translate into an industry.



The Ministry of Agriculture has established a call-centre service to reduce the troubles in agri-logistics, especially the inter-state movement of perishable fruits and vegetables. Many of these changes are likely to remain and lead to opportunities and alternatives as middlemen are done away with

space. Agri-tech businesses had initially co-existed with the traditional farming ecosystem, but the pandemic has helped bring about a shift in their operations across the agricultural economy. From conventional, non-formal, and analogue markets these start-ups have become more creative, formal and digital, reaching out to a larger set of audience.

QUALITY, FRESHNESS, FAST DELIVERY

The biggest challenge in the fruit and vegetable production and sale process is the quality and freshness of the produce, which includes timely delivery. The quality of fruits and vegetables includes the elimination of unwanted substances

such as chemicals, pesticides, bacteria and other materials used during the growing and harvesting process. To ensure this quality of agri-food products, a lot of standards have been formulated and used at the national level. All these legislations guarantee the safety and quality of the fruits and vegetables and are taken into account by firms that are in this sector.

Secondly, the time taken for this produce to travel from the place of production to the actual plate of the consumer plays a critical role in maintaining the nutritional benefits of these fruits and vegetables. From the logistical point of view of a corporation or a producer of fruits and vegetables, a big issue has always been to bring quickly the perishable produce to the consumer within good time, without damaging the quality of the products. There are few companies including brands like Atomaday who are taking relevant steps to ensure that fresh produce is being delivered to the consumers as soon as it is harvested.

The Ministry of Agriculture has established a call-centre service to reduce the troubles in agri-logistics, especially the inter-state movement of perishable fruits and vegetables. Many of these changes are likely to remain and lead to opportunities and alternatives as middlemen are done away with. The E-NAM or the Electronic National Agriculture Market, which is a pan-India electronic trading forum for farmers is extensively being used for agricultural knowledge and services about commodity entrances, quality, price and online payments directly into farmers' accounts.

SHAPING AGRIPRENEURS THE MANAGE WAY

Giving Wings To Agri Entrepreneurship Development



About the AUTHOR

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The Ministry of Agriculture & Farmers Welfare, Government of India established MANAGE in 1987 as the National Centre for Management of Agricultural Extension in Hyderabad as an autonomous Institute, from which its acronym 'MANAGE' is derived. In 1992, its status was elevated to that of a National Institute in recognition of its importance and expansion of activities throughout the country, and it was renamed the National Institute of Agricultural Extension Management.

MANAGE is the Indian response to agricultural extension challenges in a rapidly growing and diverse agriculture sector. The economy's liberalisation and globalisation policies, as well as the sophistication and complexity of agricultural technology, necessitated major initiatives to reorient and modernise the agricultural extension system. Effective methods of managing

the extension system needed to be developed, and extension organisations needed to be empowered to transform the existing setup through professional guidance and critical manpower training. MANAGE is the solution to this pressing need. MANAGE provides services in five areas: management training, consulting, management education, research, and information services.

Agri-Clinics and Agri-Business Centres Scheme

The Ministry of Agriculture and Farmers Welfare (MoA&FW), GOI, conceived and launched the Agri-Clinics and Agri-Business Centres (AC&ABC) scheme on April 9, 2002. The scheme's goal is to supplement public extension efforts by providing extension and other services to farmers on a fee-for-service or free-of-charge basis, depending on the agripreneur's business model, local needs, and affordability of the target group of farmers. It also emphasizes the creation of gainful self-employment opportunities for agricultural graduates, agricultural diploma holders, intermediate in agriculture, and biological science graduates with agri-related courses who are currently unemployed. The scheme is curated by MoA&FW, which provides the policy framework and funding.

MANAGE Hyderabad is the nodal agency for training, monitoring, and implementation of the scheme through a vast network of 127 Nodal Training Institutes (NTIs) spread across the country (as on 09.03.2022). The National Bank for Agriculture and Rural Development (NABARD) is the scheme's third major stakeholder, managing the subsidy component, while the loans for established agripreneurs are handled by the country's nationalized and cooperative banks.

Agri Clinics

Agri-Clinics are envisaged to provide expert advice and services to farmers on various aspects to enhance the productivity of crops/animals and

TELANGANA MODEL FOR IMPROVING CREDIT SUPPORT SYSTEM FOR THE AGRIPRENEURS

To counter the issue of credit support, the AC&ABC Telangana model is playing an important role in strengthening the credit linkages among Agripreneurs in the Telangana State. The significant features of the model are as follows;

- The Telangana model is a product of the tripartite agreement between MANAGE, the regional headquarter of SBI, and NABARD.
- Telangana State Agro Industries Development Corporation Limited (TSAICDL) has established a network of 1000 Agro Raythu Seva Kendram-ARSK (Farmers Advisory Centers) at different Mandal of Telangana State to supply of Agri-Inputs to the farming community.
- ARSK is manned by unemployed Agricultural and Biological sciences graduates.
- To build up the Agri-entrepreneurship skills among ARSK entrepreneurs TSAICDL has tie-up with MANAGE and allowed ARKS entrepreneurs to be trained under AC&ABC Scheme through existing Nodal Training Institutes in Telangana State.
- After 30 days of training program ARSK entrepreneurs prepared their DPR and sent for appraisal to the respective Bank branch of SBI of their locality.
- Within a span of 15 days, a bank loan appraisal was done.
- On the 45th day of the training program, trainees were given in principal loan sanction of ₹10 lakh from SBI.
- Subsequently after completing the formalities loan was disbursed within a period of 2-3 months and NABARD also released the subsidy.
- In the financial Year 2020-2021, a total of 6 batches has been completed with 164 AC&ABC trainees, out of 113 are male and 51 are female under this model.

Every year, NTIs are scrutinised to determine whether they should remain in the scheme or be delisted based on their performance. In addition, new NTIs are inducted into the scheme each year, making it better equipped to handle and improve the initiative

increase the incomes of farmers. Agri-Clinics provide support in the following areas:

- Soil health
- Cropping practices
- Plant protection
- Crop insurance, post-harvest

technology, clinical services for animals, feed and fodder management, Prices of various crops in the market, etc.

Agri-Business Centres

Agri-Business Centres are commercial agri-venture units founded by trained agriculture professionals. These

ventures may include farm equipment maintenance and custom hiring, the sale of inputs and other services in agriculture and related fields, including post-harvest management and market linkages for income generation and entrepreneurship development.

Centre for Agri Entrepreneurship Development

In order to effectively implement and monitor AC&ABC scheme, a separate Centre called Centre for Agri Entrepreneurship Development (CAD) has been functioning at MANAGE. In



order to give a further boost to the scheme and to improve quality and quantity of the Training programmes, handholding activities, resolving problems of Agri Entrepreneurs etc. an exclusive centre has been established. The centre is headed by the Principal Coordinator and assisted by Consultants and Tele-Advisor to look after PAN India for effective implementation and monitoring of the scheme. CAD is responsible for the following tasks:

- General awareness, publicity, coordination and overall implementation and monitoring of the Scheme liaison with NABARD, Banks, State and Central Govt. Agencies in scheme implementation
- Selection of Nodal Training Institutes
- Selection of Candidates for Training
- Monitoring of the Training programmes during and after the Training
- Guiding the Nodal Institutes in Hand holding
- Funding of Training and Handholding activities
- Documenting the Success Stories

Studies have revealed that the major problems in establishing agri-ventures are lack of own money to start business, lack of proper support from NTIs, lack of family support, lack of business and field experience, high rate of interest on loan, and lots of formalities in getting bank loans

- Taking measures for replicating the success models.
- Identification of Training centres
- Monitoring training content quality and methodology
- Document innovative approaches of training Institutes.
- Participation/Organisation of Bankers sensitization programmes.
- Develop and recommend a broad course outline to the Nodal Training Institute.

- Provide a lump-sum grant to the Nodal Training Institute on a per trainee basis at the rates fixed by Scheme guidelines.

- Provide timely clarifications regarding Policy, Academic Inputs and any other necessary information to the Nodal Training Institute
- MANAGE is also responsible for providing the certificates to the eligible candidates meeting all the requirements for the completion of the training.

SALIENT FEATURES OF THE SCHEME

Eligibility

Graduates in agriculture and related subjects from universities recognized by ICAR/UGC, SAUs, other agencies approved by DA&FW, MoA&FW, GOI. Graduates of biological sciences with a post-graduate degree in agriculture or a related field. UGC-recognized degree programme with more than 60% of the course content in agriculture and related subjects. After completing a B.Sc. in biological sciences from a recognized

college or university, students can pursue a Diploma/Post Graduate Diploma course with more than 60% of the course content in agriculture and allied subjects. Agricultural intermediate (Class 12) with at least a 55 percent grade point average and ICAR/UGC recognized graduates in Environmental Science, Botany, Zoology, and Chemistry are eligible to be trained under this scheme.

Training and Benefits

Candidates between the ages of 18 and 60 who meet the qualification criteria are eligible. The selected candidates receive 45 days of free residential training at one of the 121 Nodal Training Institutes (NTIs) in their respective states. Following training, successful candidates can set up either individual or group projects, with individual projects being funded up to Rs 20 lakh and group projects being funded up to Rs 100 lakh. Other advantages include no margin money up to 5 lakh, or 10-15 percent or as determined by the banks for amounts greater than Rs 5 lakh. The Nationalized/RRB/Cooperative Bank will determine the interest rate for the loans. The MUDRA scheme waives collateral security up to a loan amount of Rs 10 lakh, with repayment period of five to ten years depending on the project. NTI also provides support to candidates for up to one year after the training is completed.

Project Cost and Subsidy

Subsidies are available for projects costing up to Rs 20 lakh (individually) and Rs 100 lakh (for a group of five). For extremely successful ventures, an additional limit of Rs 5 lakh is set aside for subsidy. NABARD offers credit-linked, composite and back-ended subsidy with three-year lock-in period. The subsidy percentage provided under the scheme is 36% for general category and 44% for women, SC/ST, North Eastern, and hill states.

Role of Nodal Training Institutes

(NTIs)

MANAGE employs a workforce of 127 Nodal Training Institutes (NTIs) spread across the country to implement the scheme and train and establish candidates as agripreneurs. Every year, the NTIs are scrutinised to determine whether they should remain in the scheme or be delisted based on their performance. In addition, new NTIs are inducted into the scheme each year, making it better equipped to handle and improve the scheme. These NTIs include agricultural universities, private organisations, non-governmental organisations (NGOs), Krishi Vigyan Kendras, SAMETIs, and so on. The NTIs are solely responsible for the candidates' training and establishment, and they also provide candidates with a year of handholding support after the training is completed. The other responsibilities of NTIs are as follows:

- Organize training and handholding activities under the Agri-Clinics and Agri-Business Centres Scheme as per the AC&ABC guidelines.
- The NTI is responsible for the proper selection of candidates through screening and giving them a year-round support through handholding them after the completion of the training programme.
- Maintain proper records of documents of candidates trained batch-wise along with all supporting documents.
- NTIs need to maintain proper records of DPRs of candidates, DPR submission to Bank details, etc.

Guidelines For Awarding Best Agripreneurs

- Entries will be invited through the MANAGE website. The application should consist of proof for outstanding achievements of the agripreneur
- Each NTI may nominate the five best agripreneurs trained from their institutes in the format provided for the purpose in the MANAGE website.
- MANAGE will short-list five best agripreneurs from each state (from

among those States having at least 100 established ventures).

- No. of awards
 - One award/State - States having < 100 agri-ventures
 - Two awards/State - States having 100 to 500 agri-ventures
 - Three awards/State - States having > 500 agri-ventures

Impact Created By AC&ABC Scheme

A third-party evaluation was conducted to study the impact of the scheme it has created on the agripreneurial ecosystem of the country. The following findings came out of the study:

- Service area – 30 Villages per Agripreneur
- Coverage – 570 Farmers per Agripreneur
- Total number of farmers covered - 1.8 Crores
- 72 percent of the farmers indicated increase in productivity
 - Impact on yield – 17.4 percent
 - Impact on income – 28.8 percent
- Employment created – 1.9 Lakh @ 6 per Agripreneur
- Approximate Private investment in Agriculture – Rs.1.30 lakh Crores @ Rs.4 lakhs per Agripreneur.

Challenges and Way Forward

According to various studies and evaluations, the major problems in establishing agri-venture were lack of own money to start business, lack of proper support from NTIs, lack of family support, lack of business and field experience, high rate of interest on loan and lots of formalities in getting bank loans. Heavy competition from existing market players, marketing and infrastructural problems, perishability and seasonability of products, fluctuation in demand and prices of products, illiteracy and lack of knowledge of the farmers and insufficient cash in hand to run the business were the major problems faced by agripreneurs in operating agri-ventures.

WE PROVIDE FARMERS WITH LATEST AGRICULTURAL EQUIPMENTS, HYBRID SEEDS, ORGANIC FERTILIZERS AND MORE



NAME OF THE SHOP

Big Farmers, Jahangir Chowk, Srinagar

NAME OF THE AGRIPRENEUR

Mr Mir Gowhar Bashir

STATE/ REGION

Jammu and Kashmir

NO. OF FARMERS BENEFITTED

3000 plus

NO. OF EMPLOYEES

6

HIGHEST TURNOVER

Rs 4 crore

IMPACT

We deal in agricultural equipments, pesticides, organic fertilizers and seeds. Our motive is to provide farmers with the latest agricultural equipments so that they can maximize agriculture yield and maintain a rapid growth in their income. We deal in hybrid seeds and organic fertilizers so that the farmers can make most of the fertile land.

We have helped young educated science students to establish their shops at far flung areas so they can generate income and provide better technology to farmers simultaneously.

The main fruit production in the valley is Apple. We provide the right information to the farmers about the spray usage, right dosage for various diseases and other treatments for controlling it.



BRIDGING THE GAP BETWEEN FARMERS AND ADVANCED SCIENTIFIC KNOWLEDGE OF COMMERCIAL LIVESTOCK FARMING



NAME OF THE ORGANISATION

Indira Livelihood Development Center

(Awardee of First National Agripreneurs Convention MANAGE, 2017)

PROJECT AREA

Kesopur village, Hilsa, Nalanda

NAME OF THE AGRIPRENEUR

Dr Chandrakant Kumar Nirala

YEAR OF ESTABLISHMENT

2016

STATES OF OPERATIONS

Bihar, Jharkhand, UP

SERVICE PROVIDED TO FARMERS

Consultancy, Training and Marketing Services provided to livestock farmers, fishery farmers and new agri entrepreneurs to set up new ventures in successful model.

NUMBER OF FARMERS BENEFACTORS

500 approx

NO. OF EMPLOYEES

Full time 6, part time 8

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 26 lakh

IMPACT CREATED:

ILDC is an ACABC centre under a flagship ACABC scheme and chairmanship of Dr Chandrakant Kumar Nirala, a veterinarian (ex-employee of NABCONS/BAIF/KOSI CADA/IFFCO). The centre was formed with the vision to bridge the gap between farmers and advanced scientific knowledge of commercial livestock farming. The aim of ILDC is not profit creation but to create and increase income of farmers, and enhance the quality of their life through scientific knowledge and commercial production. In the initial stages of development, the impact was created by replication of the farm model among farmers. Approximately 35 trained farmers have established their ventures with fishery, goatery, dairy, and other agriculture allied fields with a successful model.

ILDC also provided the farmers with a standard market to sell their products with a real price market. More than 100 farmers are directly linked with telemedicine treatment facilities with the centre and benefit from the low-cost ethno-veterinary treatment. On the demand of the farmers, the ILDC team also provides an on-field training program with a practical model.



WE PROMOTE INTEGRATED FARMING SYSTEMS AND MORE, INCREASE FARMER PROSPERITY



NAME OF THE SHOP

M/s. Veeranjaneeya Agencies

NAME OF THE AGRIPRENEUR

Mr M Naga Raju

YEAR OF ESTABLISHMENT

2003

REGION OF OPERATION

Telangana, Andhra Pradesh, Karnataka & Maharashtra

SERVICES TO FARMERS

Field Visits, Plant Diagnosis Services, Farm Designing, Plantation Work, Drip Installation, Farm Pond Work, Farmer's Trainings, Market Linkages, Publication of Latest Information, Kisan Melas, Exposure Visits and Quality Inputs Supply

NUMBER OF FARMERS BENEFACTORS

Above 1 Lakh Farmers

NO. OF EMPLOYEES

6

HIGHEST ANNUAL TURNOVER

Rs 5 Crore

Activities

Promoted Integrated farming System. This enabled many farmers to enjoy an assured daily income. Shifted farmers from conventional/ chemical to organic farming. Supported and guided many farmers to start their own enterprises, helped in registrations.

Promoted E-Marketing by guiding farmers in value addition of fruits, cereals, pulses and millets.

Conducted Inter State exposure visits to Farmers to Jodhpur in Rajasthan and Nasik in Maharashtra

Published market information of agriculture produce and distributed free to farmers.

Providing Trainings on Natural/Spiritual/Organic/ Vedic Farming methods to farmers and agriculture officers





Providing Trainings to Extension Officers and Farmers about Supply Chain Management, Cold Storages, Value Addition, Role of FPOs, Exports of Horticulture Produce, Micro Irrigation, Ultra High Density of Plantation, INM & IPM, Agri Tourism, Urban Farming (Terrace, Backyard & Front yard Gardening), Water Soluble Fertilizers, Raised Bed Farming Techniques, Guest Faculty to SAMETI, HTI, EEI and MANAGE.

Supporting Farmers by supplying the quality Seeds of Taiwanese Company's Papaya, Ice Box Watermelon, Musk Melon and Exotic Vegetable Seeds, Mulching Sheets, Protrays, Cocopeat, Perlite, Vermiculite, Implements, UV Shade nets, Grow Bags, Crop Cover, Yellow & Blue Sticky Pads, Fruit fly Traps, Solar Light Traps, Drip Material, Farm pond Silpalin Sheet, , Quality Fruit Plants, Avenue Plants, Medicinal, Aromatic, Spices, Coconut Plants and Flower Plants. Erecting of Shade net Houses, All types of Bio Control Agents, Fencing Material (Chain Link Mesh, RBT Wire, GI Angle Rods).

IMPACT CREATED

Many of my associated farmers enjoy maximum selling price by supplying farm produce direct to consumers. Many of my farmers are enjoying daily income by selling organic leafy vegetables for country poultry birds and eggs. My farmers are also enjoying weekly income by selling sheep and goat meat.



My farmers are enjoying farm income fortnightly by selling Sweet Corn, Baby Corn, Papaya and Drumsticks produce to food processing industries and as well as markets. Many of my farmers are supplying Ice Box Watermelon & Musk Melon fruits to Azadpur Mandi of New Delhi. They are earning a handsome profit on quarterly basis. We have successfully established the linkage between farmers and market buyers across the nation.

My farmers are confident enough to produce pesticide-free fruits, vegetables, rice, pulses and millets. More than 200 farmers are registered with TSOCA as Organic Farmers. Many of my farmers are selling their farm produce on their own brand and enjoying the double income. I strongly believe in 3D Extension Demonstration, Documentation and Dissemination of the innovative Agriculture technology.

Thousands of my urban farmers are following my lectures delivered at Horticulture Training Institute Hyderabad on YouTube, producing and consuming their own pesticide free fruits and vegetables from terraces. It gives great satisfaction when they share the feedback and experience. Thousands of Urban farmers got trained by me in Hyderabad.

In my farm development projects, lakhs of plants have been planted in farmer's fields. Now many farmers are paying my consultation fees without any agitation. Many thanks to MANAGE for awarding me for my services rendered to farmers as Best Agripreneur Award for the year 2017. I also received an award from PJTSAU. I feel very happy when my farmers felicitate me, immediate after the training classes in different districts.

WOMAN POWER: SUCCESS THROUGH WIDE NETWORK OF SERVICES



NAME OF THE SHOP

VKS AGRI CLINIC CUM
MINI STL

NAME OF THE AGRIPRENEUR

S Sellapponnu, B.sc Agri
and MBA

ESTABLISHED IN THE YEAR

March 2009

REGION OF OPERATIONS

Tamil Nadu, South
District Siyaganga,
Madurai, Virudhunagar

SERVICE PROVIDED TO FARMERS

Agri Consultant, Retail Agri
Inputs, Agro Commodities
Marketing Linkage

NO. OF FARMERS BENEFITTED

20000-22,000 Farmers

NO. OF EMPLOYEES

14

HIGHEST TURNOVER

Rs 5.3 crore

IMPACT

- * Effective land utilization
- * Eco-friendly management of soil and water
- * Soil and water test analysis
- * Nutrition management of crops and retail agri inputs link with FPO
- * Contract farming like Chillies, Cotton, Paddy
- * Effective marketing – Premium price of produce
- * Post Harvest Management - warehousing, Collateral Manager, To increase the sale – cost of produce at needy time to farmers
- * Solar water pump installation and service
- * Taking contract of follow land for minimum period of five years and handing over the land to customer at productive stage
- * Employment opportunity for villagers
- * Maximizing the yield even with limited input



How do we feed a growing world population?



☐ Farm new land

☒ Get more from existing farmland

syngenta[®]

The world needs more food. By 2050, there will be another 2 billion people on our planet. How do we provide enough high-quality food and preserve our environment? At Syngenta, we believe the answer lies in the boundless potential of plants. We develop new, higher yielding seeds and better ways to protect crops from insects, weeds and disease. So farmers can get more from existing farmland and take less new land into cultivation. It's just one way in which we're helping growers around the world to meet the challenge of the future: to grow more from less. To find out more, please visit us at www.growmorefromless.com

WOMAN POWER: WORKING IN MANIPUR FOR HEALTHY PLANET, HIGHER FARMER INCOME


NAME OF THE ORGANIZATION

Green Biotech Pvt. Ltd.
Company

NAME OF THE AGRIPRENEUR

Geetashori Yumnum (MSc Forestry from
Kumaun University, 2007, University topper)

ESTABLISHED IN THE YEAR

2014

STATE OF OPERATION

Manipur

SERVICE PROVIDED TO FARMERS

To counsel and sell bio-agents to farmers to promote organic farming in the region, boost the flavours in indigenous food. Our Main objective is to provide innovative solutions to improve farm output through high quality agriculture, aquaculture and animal husbandry inputs.

NO. OF FARMERS BENEFITTED

3000 Farmers

NO. OF EMPLOYEES

12

HIGHEST TURNOVER

Rs 45 lakh

IMPACT

Green Biotech provides innovative solutions to improve farm output through high quality agriculture, aquaculture and animal husbandry inputs. To promote organic farming in the region and to bring out the flavours of indigenous food, I have organized training programs for farm women and farmers. More than 2,500 farm women and farmers have been trained and involved in organic farming.

Green Biotech organises awareness programs and trainings for farm women for preparation of domestically-made compost. We also organize various awareness programs and trainings for preparation of domestic bio pest control by using waste materials. For example, preparation of bio pest control using ginger and garlic extract, bio pest control using cow urine and cow dung etc.

I was invited to participate at the five-days training program on "Empowerment for Women Leaders in India" organized by Confederation of Indian Industry (CII) in collaboration with HIDA (The Overseas Human Resources Development Association) in November 2014 at Tokyo Kenshu Center, Japan.

I won the Best State Women Agripreneur award at the First National Agripreneurs' Convention, Agri-Startups Exhibition and Award Ceremony in March 2017.



WOMEN POWER: HEALTHY, SUSTAINABLE FOOD INNOVATIONS



NAME OF THE ORGANISATION

Bazic (Bewust Foods Pvt Ltd)

NAME OF THE AGRIPRENEUR

Ms Tanu Shree Singh, Ms Sonia Grover, Ms Reema Rathore

YEAR OF ESTABLISHMENT

2019

REGION OF OPERATIONS

Manufacturing in Jaipur, Rajasthan; Delivering all across India

SERVICE PROVIDED TO FARMERS

We provide free premium quality seeds, make direct payments, provide agri advice and weather updates, organize regular farm visits to solve their problems, and connect them to local authorities for government schemes, programs, etc.

NUMBER OF FARMERS BENEFACTORS

30

NO. OF EMPLOYEES

12

IMPACT

The market for ready-to-eat packaged food is growing daily. The need of the day is healthier, sustainable food innovations. Bazic is one such innovation.

We are building India's first crop to cookie model integrating marginal farmers with agri-scientists, food scientists and foodies. We consistently work at developing the best possible concord of health and deliciousness.

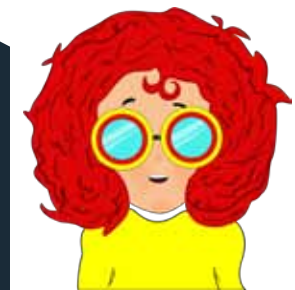
Currently, we are working with 30 farmers who learn the best agri practices, receive weather updates and all the help they need from our team of experts. We have made people eat thousands of kgs of millets instead of maida, which saved 7,500,000 liters of water for Mother Nature and also benefited their health.

Our farmers grow pre-tested and standardized seeds of millets. Once the millets are harvested, they reach our manufacturing unit in Jaipur, Rajasthan. We develop some incredible, never heard of dishes like Bajra Cheese Cupcake, Jowar Nankhatai, Bajra Walnut Brownie, Bajra Choco-chip, Bajra Coconut Cookies etc.

We deliver to 17000+ pin codes in India via Amazon, Flipkart, wellversed and our website. For the hyper-local market in Jaipur, we run our cloud bakery through Zomato and Swiggy. We will be soon available in the UAE and Qatar.

All our products are made in 100% freshly milled millet flour. We are a zero-maida/zero wheat company and have certified gluten-free products.

Another amazingly unique feature of Bazic is that it is 100% founded and owned by women. With Bazic, we intend to produce food that is helpful for the people, for the planet, and for the farmers.



WASTE INTO WEALTH: USING FALLEN ARECA LEAVES TO MAKE VEGAN LEATHER



NAME OF THE ORGANIZATION

Bhoomi Agri Ventures

NAME OF THE AGRIPRENEUR

Suresh S R and
Mythili Suresh

YEAR OF ESTABLISHMENT

2020

STATE OF OPERATIONS

Shivamogga district,
Karnataka

SERVICE PROVIDED TO FARMERS

Conversion of Areca leaf into
Palm Leather

NUMBER OF FARMER BENEFACTORS

As of now 25+

NUMBER OF EMPLOYEES

6

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 540,000 in
FY 2020-21

IMPACT

INTRODUCTION

The is a start-up business, providing clients with 100% natural, vegan, bio-degradable, eco friendly products. We also help local farmers to build a secondary income.

Areca catechu is a major commercial crop in Malnad region of Karnataka. As per government records, there are 27000 hectares of land is under areca crop cultivation. In each hectare, there are around 2000 to 2500 trees.

The Areca Palm has giant leaves. Every year, a tree sheds five to six leaves. These leaves take about 100 to 120 days to decompose. The fallen leaves cause problems for farmers during cultivation. They also become a breeding place for mosquitoes.

Huge labour is required to dispose of these leaves. A European customer to whom we were supplying the areca leaf plates asked whether the leaves can be turned into vegan leather.

Following this, we at Bhoomi Agri Ventures decided to convert this waste into wealth. We started collecting fallen



areca leaves from small and marginal farmers through rural women and youths. In this way, we started the business of converting Areca leaf into Areca Palm Leather, which is 100 % vegan leather. We also manufacture Areca Leaf tableware and cutlery using these leaves.

Currently there are many areca leaf plate manufacturing units in south India. Most of them do not maintain hygiene during the process. As a result, they are not able to maintain quality and lose revenue, since they do not get a good price for their products. We implement all precautionary steps during manufacturing to ensure that we get a hygienic and quality output.

PROCESS

Areca leaves are brittle. Using a biological solution, we convert them into areca palm leather. This is our own innovation and a patent for the same is under process.

This palm leather is a very good alternative for animal leather. Since more and more people are now moving towards veganism, we see a huge market for our products.

The global demand for vegan leather has seen a paradigm shift owing to rising applications across furnishing, automotive, clothing, bags and other industries. As per a global survey, the global vegan leather industry will be worth 89.6 billion dollars by the year 2025, with CAGR of 49.9%.

TEAM

I am Suresh SR. I have done BSc and MBA. I have 15 years of work experience. My wife Mythili Suresh has done BA. We both hail from farmer families. We know the problems caused to farmers by Areca leaves. In order to address their challenges, we started Bhoomi Agri Ventures.

Our Mentors

Dr Shashidhar KC, Director of Extension, UAHS, Shivamogga, Karnataka.

Mr Tjeerd Veenhoven from

Netherlands. He is an international designer with more than 20 years of industrial experience. He is our mentor, guide and designer. Ms Surbhi Singhal from New Delhi is our designer consultant.

Our Vision

Better rural management for sustainability. Creating employment. Additional revenue for the rural eco system.

Yearly one billion animals are slaughtered and abused for their skin. The conversion of animal skin into leather harms the environment. It pollutes the water and air in nearby areas.

As explained above, our business adds immense value to the rural eco system. We provide employment to youth and women. We provide additional income to farmers. We teach gainful craft to all our workers. We reduce the slaughtering of animals for their skin. We save the environment. We want to eliminate the usage of plastic plates.

Strengths

- * Abundant of Raw material availability locally.
- * Biodegradable, 100% natural, vegan, eco friendly products
- * Vegan products are three times cheaper than 100% leather products
- * Adding new dimensions to unused agricultural by-product

Weaknesses

- * Lack of research in improving product range
- * Lack of awareness among people about the product
- * Seasonal availability of raw material
- * Requires high temperature and low humidity to store raw material during rainy season

Opportunities

- * No need to cut or peel any part of the tree for obtaining raw material
- * Increasing demand for vegan products worldwide
- * More and more social media groups



emerging to promote the marketing of vegan products

- * Government support to reduce the usage of plastic products

Threats

- * Competition from big business lobbies in the market
- * Competition from low cost, non-biodegradable products manufacturers
- * Requires huge space to store raw materials, since availability is seasonal
- * Inconsistency in raw material is a big threat during final production

HUGE MARKET

In the western world, more and more people are switching to vegan leather after awareness regarding the damage caused during the manufacturing of animal leather. Hence there is a huge market for our products.

Any natural colour can be given to areca leaf leather, but its natural woody texture is most attractive.

MOBILE AGRICULTURAL SCHOOL & SERVICES

GRASSROOTS CHANGE BY REACHING THE GRASSROOTS



NAME OF THE ORGANIZATION

Mobile Agricultural School & Services

NAME OF THE AGRIPRENEUR

Vijay Bharat

ESTABLISHED IN THE YEAR

2005

STATE OF OPERATIONS

Jharkhand

SERVICE PROVIDED TO FARMERS

Skill Enhancement of farmers by reaching their doorstep

NUMBER OF FARMER BENEFACTORS

More than 2,75,000

NUMBER OF EMPLOYEES

21

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 2.05 crore

IMPACT

Reaching the doorstep was quite challenging. We took the initiative to reach out to the farmers' doorstep to ensure participation level up to 100 percent. We registered huge success.

This massive doorstep training with our incessant efforts changed the mindset of farmers. Many of them now readily agreed to adopt non-traditional crops as suggested by our team of experts. Due to our intervention and transfer of technology, farmers chose dragon fruit, zucchini, broccoli, pointed gourd, watermelon and the like.





Impact

Reaching the doorstep was quite challenging. We took the initiative to reach out to the farmers' doorstep to ensure participation level up to 100 percent. We registered huge success.

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In the initial phase of our training, we made the farmers aware about the system of rice intensification and Integrated Pest Management. Now, the farmers are very keenly using pest control methods through IPM.

Our patience was tested while convincing the farmers to grow vegetables with hybrid variety. Our patience and perseverance won. Farmers have immensely benefited from this changeover.

We worked with the "Organic Farming Authority of Jharkhand" and enhanced the skills of more than 600 farmers. These farmers now use technology to produce organic fertilizers and pesticides to apply in their fields as well.

In collaboration with JOHAR, a wing of "Jharkhand State Livelihood Promotion society," we imparted training on the concept of FPO. As a result, 6 FPOs have been made.

- Now, farmers are receiving handsome and reasonable prices owing to good quality and better understanding about the produce
- Net annual income of farmers has increased
- More than 30 percent of farmers have adopted plastic mulching with drip irrigation systems
- Social status of the majority of farmers has enhanced
- Linkages and bridging with different institutes have been initiated by us
- Many farmers adopted an Integrated farming system with two or more agri-enterprises



I HAVE PROMOTED THE USE OF COW DUNG AND COW URINE FOR PRODUCING ORGANIC MANURE AND BIO PESTICIDES

NAME OF THE ORGANIZATION

Om Sai Agrilclinic And
Agri Business Centre

NAME OF THE AGRIPRENEUR

Dilip Kumar Bisen
(MSc. Ag Entomology)

YEAR OF ESTABLISHMENT

2012- 2013

STATE OF OPERATIONS

Chhattisgarh

SERVICE PROVIDED TO AGRICULTURE

Blending social cause with
pro-nature agripreneurship

NUMBER OF FARMER BENEFACTORS

5000

NUMBER OF EMPLOYEES

25

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 2 crore

IMPACT

I have helped in preventing cattle slaughter by promoting utilization of cow urine and dung for producing organic manure and bio pesticides. I thought that if cattle owners are made aware of the natural medicinal properties of cattle bio waste (urine and dung), they would not send aged cows and other cattle to slaughter houses.

I realised the harmful effect of indiscriminate use of fertilizers and pesticides. They unnecessarily increase the cost of cultivation also also erode soil fertility. Through various campaigns and gram sabhas in about 40 villages spread over five districts in Chhattisgarh, I created awareness among the farmers regarding non-chemical techniques of plant protection, and organic methods of fertilizing the soil. The result is that now, Chhattisgarh government purchases cow dung from farmers at the rate of Rs 2 per kg.



WE PROVIDE LIFE-SAVING GEAR FOR JASMINE FARMERS



NAME OF THE ORGANISATION

Shri KS Lakshmi Agri Clinic & Agri Extension Centre

NAME OF THE AGRIPRENEUR

K Suresh Kumar, BSc (Agri)

YEAR OF ESTABLISHMENT

2008

STATES OF OPERATIONS

Tamil Nadu

SERVICE PROVIDED TO FARMERS

Life Saving Light For Jasmine Growers

NUMBER OF FARMERS BENEFACTORS

5000 Farmers in three districts

NO. OF EMPLOYEES

8

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 25 lakh

IMPACT

We provide head gears for Jasmine farmers. While Jasmine is a favourite flower, many people in cities are not aware that it has to be harvested at night or early morning, before 4 am. But Jasmine fields are infested with poisonous snakes. The farmers usually get bitten, and at times the snakebite is fatal.

We developed head gears for Jasmine farmers with bright, rechargeable lights. The initiative was appreciated by the state government and is now used by Jasmine farmers. Our future plans are to extensively develop solar lights. We demonstrated some of these in a recent exhibition, with the objective to further ease the problems faced by Jasmine growers and harvesters.

MITHRAA MILLETS

We purchase the millets from small and marginal farmers and self help groups. The employees at Mithraa Millets do the processing, sorting, grading, packaging and marketing. Thus we provide an additional source of revenue to farmers. At a social level, we create health awareness about diabetes and its effect on the body.

WASTE INTO WEALTH: USING FALLEN ARECA LEAVES TO MAKE VEGAN LEATHER



NAME OF THE ORGANIZATION

Jai Bharat Nursery

NAME OF THE AGRIPRENEUR

Sri Bansh Gopal Singh

ESTABLISHED IN THE YEAR

1994

STATE OF OPERATIONS

Uttar Pradesh, Bihar, Madhya Pradesh, Uttarakhand, Himanchal Pradesh & Delhi

NUMBER OF FARMER BENEFACTORS

20,000 farmers approximately

NUMBER OF EMPLOYEES

36 Male & 32 Female Labourers

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs One crore Twelve Lakhs approximately in 2020-21 (during pandemic)

Service Provided to Farmers

I. New package of practices/management strategies

- Developed package & practices of soil less nursery & vegetable coco pit based seedlings.

II. Adopted technologies

- Polyhouse size 600 sq. feet for production of off season high quality vegetable seedlings and made available to the farmers.
- Two green shade net size (1500 sq feet & 600 sq feet) for hardening of vegetable in longer time and also for sale purpose after shifting from polyhouse.
- Prepared vermi compost and microbial compost for use and sale of quality organic compost.
- Adopted Integrated Farming System with major emphasis on vegetable nursery production, landscaping, lawn management and ornamental flowers production and sale.



III. Any Other

□ Promoted pollination in cross pollinated crops through adoption of beekeeping.

□ Dairy – Cow Breed Shahiwal

□ Fisheries – P o n d having major Indian carps in 0.25 ha. area

□ Apiary – 20 Boxes of Italian/European Bee (*Apis mellifera*)

□ Post Harvest Technology – Grading & Value addition of aonla, mango, bael seasonal vegetables, packaging of seedlings, flowers & fruits etc .

□ Mushroom – Established commercial unit of oyster mushroom (*Plurotus* sp.)

□ Any Other – Made availability of garden & small gender friendly tools

□ Adopted eco-friendly approaches of crop raising for safer environment to the society.

Adoption of IFS module decreases subsequent production cost of other enterprises.

Impact

• After obtaining degree of B.Sc. (Ag.) & M.Sc.(Ag.) from Udai Pratap College & Banaras Hindu University, Varanasi, the training under Agri-Clinic & Agri Buisness Center (AC&ABC) scheme purpose of self-employment. Started the work of nursery raising of fruits and vegetables on 2.85 acres (5.0 Bigha) land on lease. I observed poor availability of quality seeds and planting materials of fruits & vegetables in rural areas. In 2007, got loan of Rs 7 lakh from bank and started the supply of quality planting materials to many farmers of Azamgarh district & another districts in close guidance of scientists of Krishi Vigyan Kendra, Kotwa, Azamgarh. After three years, my annual turnover increased from Rs 16 lakh to Rs 50 lakh. Many dignitaries such as district magistrate, chief development officer and many other officers, scientists, public representatives & many farmers visited my nursery. I organised many



trainings for entrepreneurship, and engaged thousands of unemployed youths for entrepreneurial development. I participated & delivered lectures regularly as master trainer on nursery management, land scaping, topiary & lawn management etc, organized by diverse organizations. Made a significant impact on livelihood of people and efforts to enhance farmers' income in eastern UP by spread in acreage of vegetable & fruits.



WE HAVE INCREASED FARMERS' YIELD BY PROVIDING QUALITY SEEDLING & SELECTED HYBRIDS



NAME OF THE ORGANIZATION

Penurkar Plant
Technology

NAME OF THE AGRIPRENEUR

Suresh Bhimashankar
Penurkar

ESTABLISHED IN THE YEAR

2006

STATE OF OPERATION

Maharashtra, Karnataka, Madhya
Pradesh, Telangana, Gujarat,
Bihar

SERVICE PROVIDED TO FARMERS

20,000+ Farmers

NO. OF FARMERS BENEFITTED

1000+ / Per Year

NO. OF EMPLOYEES

50+

HIGHEST TURNOVER

Rs 5.12 crore

IMPACT

* Increase in farmers' yield by 50% to 60% because of quality seedling & selected hybrids

* Intercropping of papaya+ginger & watermelon+chilli doubled the income of farmers

* We saved 20-30 days for farmers and also their efforts by providing readymade seedlings

* Free advisory increased minimum 20% yield of farmers & decreased losses to less than 1%

* Created employment for more than 50 people



FARMERS SHOULD ADOPT DAIRY FARMING TO ATTAIN HIGHER PROSPERITY



NAME OF THE ORGANISATION

7 Hightech Group

NAME OF THE AGRIPRENEUR

Bhupendra Patidar

YEAR OF ESTABLISHMENT

2016

STATES OF OPERATIONS

Madhya Pradesh

SERVICE PROVIDED TO FARMERS

Dairy farming Related All services

NUMBER OF FARMERS BENEFACTORS

5000

NO. OF EMPLOYEES

12

HIGHEST ANNUAL TURNOVER SINCE INCEPTION

Rs 40000000

IMPACT

We have a high-tech team. Our sole objective is that the income of farmers should not be from land alone. They should also be able to earn from dairy, so that they move towards integrated development.

Our team provides support services for sale and purchase of milk, animal feed, loan to buy animals, equipment used at dairy farms like rubber mats, animal milking machine, equipment used at farms like land plough, harvesting etc. We encouraged youth to take up dairy farming as a means of livelihood.





IAMKHADI

Gives Global Reach To Indian Handlooms, Handicrafts

IAMKHAADII FOUNDATION, referred to in short as IAMKHADI, is a trusted Not-for-Profit social enterprise and export start-up. IAMKHADI was incubated at Indian Institute of Foreign Trade, and is working towards the marketing and promotion of handlooms and handicrafts products (disorganized sector) for uplifting the living standards of the rural artisans and women of Non Farmer Producer Organizations (NFPO)/SHGs/NGOs by providing Market Access, Networking and Incubation Support.

IAMKHADI aims to connect grass-root producers and digitally savvy with global conscious consumers by creating export worthy micro-enterprises.

One of the landmark achievements of IAMKHADI was that it has brought all the stakeholders from Farm to Foreign together on one platform towards achieving the objective of taking Khadi from Local to Global by advocating the need of HSN Code for KHADI.

During the pandemic, IAMKHADI organized the virtual HANDLOOM FESTIVAL AND HANDICRAFT FESTIVAL in association with World

Trade Center, Mumbai. NFPOs of various states participated in the event and got enhanced online presence with high reach and engagement with the targeted visitors and buyers from 330 World Trade Centres based in 90 countries.

IAMKHADI also organized one month FASHION TECH HACKATHON and BOOTCAMP with NFPOs/ SHGs/ NGOs to ensure they learn from the most sustainable brands and retailers, trailblazers and unicorns, disruptors, progressive thinkers and pioneers through a series of workshops, sessions, demonstrations, webinars, hacks, etc. The objective was to find some sustainable & technology solutions and make NFPOs aware about those latest changes, innovations and developments.

Post Covid, IAMKHADI organized another initiative with NIFT Foundation for Design and Innovation (NFDI), #UNLOCKHANDLOOM which aimed towards mobilizing existing NFPOs/ SHGs/ NGOs for incubation program of NFDI to help in defining the early product or customer archetype to develop a MVP followed by Market Feasibility and Validation through some market traction.

IAMKHADI recently launched GLOBALSPIN TRADE CONCLAVE initiative in association with the Ministry of MSME and Ministry of Textiles. It was held in textile hubs of India like Bengaluru, Mumbai and Delhi, with the core objective to create an enabling environment for enhancing skill development for the flow of trade, commerce, and technology and promote NFPOs/ SHGs/ NGOs to engage, enable and empower to gain a better understanding of the challenges to global trade and export competitiveness. The initiative successfully concluded on March 30, 2022.

Through these GlobalSpin Trade events, IAMKHADI shall aggregate multiple stakeholders of eco-handlooms, eco-textiles and the apparels industry under the one roof. We shall work towards globalization of the textile industry by analyzing the best practices, new production techniques, innovative procedures, and product qualities to satisfy international eco-standards, considering sustainability and recyclability as a key-value differentiator amongst the international buyers.



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