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WOMEN AT THE HELM

Navigating the Digital Landscape of Agriculture

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Centre for Research on Innovation and Science Policy (CRISP) and International Rice Research Institute (IRRI)

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Women at the Helm: Navigating the Digital Landscape of Agriculture

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Editors

Foreword

Agribusiness startups are reshaping India's agricultural sector, fostering a strong entrepreneurial mindset. This growing interest, alongside advancements in digital technology, has spurred rapid expansion in the sector's technology and digital solutions ecosystem. Technologies like big data, Artificial Intelligence (AI), Internet of Things (IoT), and various digital platforms play a crucial role, aiding aspiring entrepreneurs from idea conceptualization to identifying opportunities in production, marketing, and distribution.

The proliferation of digital technologies presents unprecedented opportunities for women to engage and lead agricultural enterprises in India, overcoming longstanding barriers such as limited access to information, resources, and markets. Despite these advancements, challenges persist, and adoption of digital technologies varies widely among enterprises. In the Indian context, research on the use of digital solutions by women agripreneurs remains limited.

In 2023, the Centre for Research on Innovation and Science Policy (CRISP) and the International Rice Research Institute (IRRI) conducted a study, as part of the Evidence Module of the CGIAR GENDER Impact Platform, interviewing 16 selected women agripreneurs in India. The study aimed to understand their utilization of digital tools, exploring the types of tools used, developed digital solutions, and how these facilitate enterprise-building processes.

Each entrepreneur shared insights on their use of digital tools, highlighting benefits in networking, self-learning, upskilling, education, e-commerce, sales, and enterprise management. While digital technologies have opened avenues for career advancement, women agripreneurs acknowledge gaps in fully harnessing these potentials.

The study identified two types of enterprises led by women in the digital ecosystem: digitech enterprises, often founded by women with a background in technology, and digitally enabled enterprises, leveraging various digital technologies to promote their businesses. The majority of women entrepreneurs operate digitally enabled enterprises, reflecting the tech-driven nature of modern agribusiness.

This compilation of interviews illustrates how digital innovations support women agripreneurs in India, showcasing their entrepreneurial journeys, aspirations, challenges, and strategies to overcome these challenges through digital interventions and other forms of support. It is intended to benefit those supporting women agripreneurs, particularly within India's agribusiness incubation centres, offering valuable insights and lessons for leveraging digital innovations to enhance enterprise performance. We sincerely believe that each of these life stories will also inspire several budding women agripreneurs and help them assess their digital capacity gaps and take steps to address these.

Editors

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Digittech Enterprises



01

From Scholar to Innovator: Revolutionizing Agriculture through Technology

"If there is a large, immovable rock-like challenge in my path, I would choose to behave like water and navigate my way around it to my destination. As entrepreneurs, women need to know where they have to stand like a rock and where they have to be flexible like water."

Rajul Patkar
Co-founder
Proximal SoilSens
www.soilsens.com

Ditty Maria Dominic and Bhuvana N recently conversed with Rajul Patkar, one of the co-founders of Proximal SoilSens. Their conversation delved into Rajul's entrepreneurial journey that was driven by a mission to make a meaningful impact in the agricultural sector through technology. Here are some highlights from the interview.

SoilSens® empowers farmers by providing them with an integrated platform solution to understand their soil better and apply water, fertilizer, and pesticides precisely to optimize input costs and crop productivity. Technologies innovation started at IIT Bombay and continued at Proximal SoilSens. Soilsens's vision is to make technology accessible to every farmer regardless of their farm size. They have built indigenous technologies focusing on 'Made in India, Made for World'. In its multiple deployments, SoilSens has proven that its technologies are robust, affordable, accurate, and beneficial for farmers to improve yield and overall income and save the environment. Currently, the world's smallest soil testing device, Nutrisens, is making waves and has reached the global market quickly.

Can you provide a brief overview of your personal and professional background?

I come from a conservative community where women's education was not actively encouraged, especially in technical fields. Although I was born in Indore I was raised in Andhra Pradesh due to my father's job. Fortunately, my parents held progressive views and wholeheartedly supported my pursuit of higher education. Growing up in the southern region of India allowed me to nurture my academic ambitions instead of conforming to the prevalent trend of early marriages among girls in my community.



In contrast to most girls who opted for arts or commerce, I had a clear vision – I wanted to pursue a technical education and contribute meaningfully to society. My unconventional nature was evident from an early age, and my dream was to become an engineer. I pursued my BTech degree from Andhra University. Upon graduating, I aspired to move to a city where I could find more opportunities. Although my family was initially skeptical

and unsupportive of this decision, I was determined to construct my own path and explore uncharted territory. So, I convinced my family and relocated to Mumbai, where my aunt lived. While in Mumbai, I succeeded in the GATE exam and gained admission to an MTech program at one of India's prestigious institutions, the Indian Institute of Technology Bombay (IIT-Bombay).



Mr. Joe Biden, President of the USA (then Vice President) looking at one of the devices fabricated by Dr. Rajul as part of her PhD on his visit to IIT Bombay, 2013

My journey at IIT was marked by substantial growth. I engaged in a project supported by the Ministry of Human Resource Development (MHRD), now known as the Ministry of Electronics and Information Technology (MeitY). In this project, I designed an affordable hardware solution – a Field Programmable Gate Arrays (FPGAs) Evaluation Board – to assist engineering college instructors. My motivation for this project stemmed from the realization that many educational institutions lacked access to such expensive equipment. Subsequently,

I successfully transferred this technology to a computer manufacturer, providing these boards to various engineering institutions.

This period of innovation and impact solidified my entrepreneurial inclination and unwavering desire to contribute positively to society. In 1996, I completed my master's degree and embarked on a professional career, gaining varied experience across various organizations. However, my passion for entrepreneurship and my commitment to giving back to society never wavered. Driven by this vision, I took



a significant step in 2011, enrolling in a PhD program at IIT-Bombay after a 16-year academic gap. This decision marked a pivotal moment in my personal and professional growth, reinforcing my dedication to create lasting societal impact.

Could you share the story of your transition from academia to entrepreneurship?

My journey from academia to entrepreneurship began with a clear and unwavering commitment: I refused to let my

PhD thesis gather dust on the IIT-Bombay library shelves. Instead, I was resolute in my desire to make a real impact with my research. Early on, it became evident to me that the domains of health and agriculture held immense promise for driving meaningful change. What spurred me further was the stark realization that within my academic cohort, there were few, if any, venturing into the realm of sensors for agriculture. This, coupled with the distressing news reports highlighting the plight of farmers, I found my calling in the agricultural sector.



The SoilSens team cultivating ideas in their office at Pune

Although I lacked a formal background in agriculture, I was undeterred. To bridge this knowledge gap, I embarked on a journey of exploration and education. I traversed the length and breadth of India, visiting prestigious institutions such as the Indian Agricultural Research Institute (IARI), the International Rice Research Institute (IRRI), and the Professor Jayashankar Telangana State Agricultural University (PJTSAU).

These visits allowed me to forge connections with seasoned experts in the field, immersing myself in the intricacies and challenges of agriculture. The pivotal moment arrived when we secured funding from the Department of Science and Technology (DST) and MeitY. These projects were dedicated to developing

cutting-edge moisture and nutrient sensors explicitly tailored to the agriculture sector. It was then that my academic pursuits seamlessly melded with entrepreneurship.

In retrospect, my journey underscores the profound impact of determination, networking, and an solid desire to create positive change. It serves as a testament to the notion that one's background should never limit the pursuit of transformative innovations.

As I continue on this path, my commitment remains unwavering – to leverage technology to improve agriculture, ensuring our efforts leave an enduring and impactful mark on the world.



How did you manage the dual responsibilities of pursuing a PhD while simultaneously building your enterprise?

I had a clear vision that the outcome of my doctoral research should yield a practical product benefiting farmers. In academia, there's often a strong emphasis on publishing research papers, a demanding task that consumes a substantial amount of time. To navigate this challenge, I pursued two distinct endeavors: one focused on my PhD and the other dedicated to my entrepreneurial venture.

In my academic pursuit, I published research papers and secured a patent for a product I developed as a part of my research work. However, it became evident that this product would require additional time to fully mature before being introduced into the market. This realization prompted me to embark on a parallel journey to create a product for my entrepreneurial venture. This product would

be cost-effective and user-friendly, catering specifically to the needs of our farming community.

Have you participated in any incubation programs?

Our journey into incubation wasn't immediate. In the early stages of building my company, I didn't recognize the need for incubation. While I was well-versed in technology, I lacked crucial insights into entrepreneurship. As a result, I made numerous mistakes and soon realized the value of being part of the right incubator.

Affiliated with IIT-Bombay, I was aware of their incubator, the Society for Innovation and Entrepreneurship (SINE). Since SINE primarily focused on technology rather than agriculture, I didn't formally incubate there. However, I did seek their guidance whenever I encountered challenges. We also had the privilege of winning a 3-lakh rupee prize in an innovation competition organized by SINE.



Meeting with Gururaj Deshpande, renowned venture capitalist and Professor Kusre, IIT Bombay

In my experience, I've come to appreciate that startups often need accelerators more than traditional incubators. The real key is finding incubators that can offer practical, experience-based advice tailored to the unique needs of each incubatee. Some incubators provide theoretical guidance readily available in books,

but entrepreneurs like me require real-world insights from individuals with hands-on experience in entrepreneurship and related fields. The knowledge gained in a typical six-month program can be condensed into just one day when such mentorship is available.



Participating in an incubation program goes beyond education – it's about building a network and becoming part of a larger ecosystem. Every WhatsApp group within an incubator network has played a role in our journey, offering valuable support and guidance. I've had the privilege of being incubated under DST NIDHI's Promoting and Accelerating Young and Aspiring Technology Entrepreneurs (PRAYAS) program and at Venture Centre, Pune. Although I couldn't complete the PJTSAU AgHub incubation due to the challenges posed by COVID-19, Dr Kalpana Sastry, the Managing Director of AgHub, has been a steadfast mentor. Additionally, I've attended programs in various institutions, including the Research and Innovation Circle of Hyderabad (RICH), Indigram Labs, and Millenium Alliance, all of which have contributed significantly to our growth and success.

Please describe the range of products your company offers.

Our journey began with developing a moisture sensor, a technology that would go on to lay the foundation for our commitment to revolutionizing agriculture. The moisture sensor was the first step in our mission to empower farmers with innovative tools for more efficient farming. Our second product – an IoT system for irrigation management – harnessed various sensor measures, including soil moisture, temperature, and humidity. This system operates on solar power and can be used in open fields, greenhouses, and polyhouses. While our IoT system was significantly more affordable than imported alternatives, real-world field testing revealed a challenge, small farmers found it difficult to bear the cost.



Diverse SoilSens solutions

In our pursuit to create meaningful impact, we embarked on a journey to design something portable and cost-effective, accessible to all. The result was a smaller, more affordable version of our IoT system, about the size

of a dongle (4-5 cm), which could be easily shared among farmers. When a group of 10-15 farmers pooled resources to purchase this product, they gained the ability to map moisture levels in their fields, facilitating better



irrigation planning. This initiative caught the attention of the United Nations Development Programme (UNDP), which recognized our product as 'farmer-friendly'. We're committed to making technology accessible to all, ensuring that even small farmers can benefit from the digital agricultural revolution. At Proximal SoilSens, our innovations are driven by our dedication to empowering farmers and driving positive change in the farming community.

Then, we developed a soil-testing device called NutriSens, a groundbreaking device that is now the star product in our portfolio. NutriSens represents a leap forward in the world of soil testing technology, offering innovative solutions to address the challenges current soil testing methods face. What sets NutriSens apart is its remarkable design – it's one of the world's smallest soil testing devices. Gone are the days of bulky, infrastructure-dependent equipment. NutriSens is incredibly portable and remarkably easy to use, revolutionizing the way soil testing is done.

One of the most significant advantages of our NutriSens soil testing device is the dramatically reduced testing time. Traditionally, farmers would send soil samples to a lab and wait for results, which could take up to 15 days. With NutriSens, that wait time is slashed to just 10 minutes, providing farmers with immediate insights into their soil's health. Our device measures six critical soil parameters, and we're continually expanding its capabilities by adding more parameters.

We firmly believe that NutriSens will revolutionize soil management, much like how the glucometer transformed diabetes management. In addition to NutriSens, we're proud to offer the SoilSens Weather Station, which captures real-time weather data so as to empower farmers further with essential information for their agricultural decisions.

How does the soil testing device, NutriSens, work?

We've integrated our soil testing device, NutriSens, with our mobile applications to provide farmers with a powerful on-field solution. When farmers are out in the fields, they can easily create a soil solution and apply it to the paper-based sensor strip within the device. The magic happens as the device runs the test in real-time, generating results for six essential soil parameters. But we don't stop there. The actual value comes when we present these results as a 'health card' in PDF format. This digital report includes the measured parameters, actionable insights, and best agricultural practices tailored to the specific soil condition and crop grown. Being mindful of sustainability we provide only soft copies of these health cards. We've also designed our sensors to be paper-based (if required), ensuring eco-friendliness at every step. Sharing these health cards is a breeze. Farmers can easily send them via WhatsApp or any other application, or even take printouts if needed.



Nutrisens-Worlds lightest and smallest soil testing device



Behind the scenes, we collaborate with private agricultural consultants who curate a vast database of advisories. This is where the magic of local expertise comes into play. When our technology is taken to a new location, we work closely with local experts. They input advisories for various crop and soil types, which then automatically get generated based on the specific soil test results.

Currently, we're making waves in Uttar Pradesh, Jharkhand, and Odisha, thanks to partnerships with esteemed clients – TATA Trust and Collectives for Integrated Livelihood Initiatives (CINI). Together, we're bringing the power of technology to agriculture, making farming more efficient, informed, and sustainable.

Working of Nutrisens©

How do you view the transformative potential of digital technologies in the agriculture sector?

At Proximal SoilSens, we believe in the tremendous potential of digital technologies to transform the agricultural sector. Beyond our sensor-based products, we've harnessed the power of digital innovation to offer a comprehensive suite of solutions. Our portfolio includes two mobile applications: the FARMER© App for farmers, and PROFIT© (Professional Resource for Optimizing Farming, Innovation, and Technology) for agriculture experts, along with the web-based CropWise application. Our web-based app bridges the gap between our valued client, and their network of 1000 farmers.

Soilsens FARMER App - Your Ultimate Agriculture Companion!
One Application for Sustainable Agriculture

- Geotagging of Fields**
Easily locate and mark your fields on a digital map. Efficiently manage and monitor your land.
- 7 Days Weather Forecast**
Stay prepared with accurate weather predictions. Plan your farming activities ahead.
- Soil Moisture Data & Irrigation Advisory**
Instant access to real-time soil moisture information. Get precise irrigation recommendations.
- Record Water Quality Data**
Maintain detailed records of water quality. Make informed decisions for irrigation and crop health.
- Connects to Nutrisens**
Seamlessly integrates with the Nutrisens device. Receive a comprehensive soil health card with fertilizer advice.
- Record Keeping of Farmer Activities**
Keep track of all your field-related tasks. Streamline your farming operations. Take and upload photos directly from your fields. Seek expert advice with visual context.

Embrace the FARMER app and revolutionize agriculture practices. Farm smarter, not harder!
 8668725877/8459991072

Soilsens FARMER© App



With our CropWise© app, one can remotely monitor all the farms, access sensor data, and gain real-time insights into on-field activities, no matter where you're located. The digital advantage empowers you to make informed decisions and optimize farming operations. With regard to farmers, our geotagging feature allows them to track and manage their farms effortlessly. They can log daily activities, which then helps them to create a valuable record of their work. This data not only aids farmers in maintaining better records but also allows customers to track their activities closely, thereby facilitating more informed actions in the future.

We understand that not all farmers may be tech savvy, so we've adopted a phase-wise approach to app deployment. At present we're in the first phase, focusing on raising awareness among farmers and ensuring they

feel confident with using the app. We're more than just a hardware company; we're dedicated to providing a complete, integrated solution that combines the power of both hardware and software. At Proximal SoilSens, we're committed to driving positive change in agriculture through the digital revolution.

Did you avail of any financial support or grants?

Securing funding is our overriding challenge, especially because we are a deep tech company, and cannot be compared to the more traditional agribusiness enterprises. It entails substantial financial investments, from developing groundbreaking products to validating them, conducting pilot programs, and marketing our innovations. It is an intricate process where every step requires a significant allocation of resources.



Meeting with BIRAC-DBT team

As a domain primarily driven by government initiatives, soil testing presents unique challenges. Given the intricacies of this landscape, even larger corporations find it challenging to engage effectively with small-scale farmers. Despite rigorously testing and validating our products against industry standards, farmers and academic institutions

often request formal certifications to endorse the technology. Achieving validations at a larger scale is a resource-intensive endeavor.

One of the most pronounced hurdles is the bureaucratic paperwork called for to access financial support. This cumbersome process not only prolongs the acquisition of funds



but can also hinder our ability to meet critical project milestones. Additionally, when dealing with government funds, there is a notable limitation in the allocation of resources. While the funds may be granted, a substantial portion is often earmarked for specific purposes, leaving limited flexibility, particularly when hiring essential human resources.

In essence, the financial landscape poses multiple challenges for us. It underscores the necessity to secure funding and allocate it efficiently to develop world-class products, including the critical investment in human resources. To ensure a steady cash flow, I adopted a few strategies. First, I maintained a lean business model, hiring only passionate and dedicated individuals. Second, I took on a second formal job, working around 16 to 17 hours a day, combining my startup efforts with a reliable and steady source of income. This approach reduced my dependence on the startup for personal finances.

Furthermore, I diversified my product focus, not relying solely on one offering. While I had confidence in the soil testing device, I concurrently developed moisture sensors and small IoT-based systems, mitigating the risk of a single product failure. Funding from BIRAC, Atal Innovation Mission, Millenium Alliance, and DST Nidhi Prayas supported the various technological developments and enhancements. With all our products patented, revenue from the alternative products sustained us until the soil testing device was fully developed.

What is your marketing strategy, and could you tell us about your customer base?

Our journey to successful marketing has been truly exceptional. We've achieved remarkable results with a minimal marketing budget, and a commitment to efficient customer acquisition. The secret to our success has been one-on-one networking, forming personal connections that have brought in the majority of our valued customers.



Women SHG members at Solapur, Pune getting acquainted with Soilsens solutions



We're proud to have over 20 B2B clients, including industry giants such as ITC, TATA Trust, and Mahindra. Our strong partnerships with these prominent companies are poised to yield even more impressive results in the coming months. But we're not limiting our horizons to just one region. Our reach extends globally, and our dedicated team actively engages with potential clients in Indonesia, Mozambique, Tanzania, and Guatemala. We're on a mission to share our innovative solutions and expertise with farming communities worldwide.

In recent months, we've also expanded our horizons by collaborating with NGOs and Farmer Producer Organizations (FPOs). We've recognized the need to strengthen our presence in this sector, so we've welcomed a new marketing professional onto our team. This expert is actively in the field, building

connections and forging partnerships with NGOs and FPOs. Together, we're working towards making a substantial impact and transforming the future of agriculture – one partnership at a time.

We are also trying out a new marketing strategy involving school students in rural areas. Convincing farmers is tough because they are always apprehensive about adopting new technology. Therefore, we are introducing our technology to school children so they can discuss our device with their parents and persuade them. This approach is feasible, primarily because our device is exceptionally user-friendly, even for schoolchildren. Additionally, it serves a second purpose, of familiarizing school children – the future generation of farmers – with technology, making them less hesitant to embrace it.



Students from Deep Griha Academy, Pune testing soil using Soilsens technology

What is the rationale behind your collaboration with FPOs and NGOs?

We are the winners of Social Alpha Krishi Mangal's 2.0 Cohort, and with that fund we

are trying to collaborate with NGOs and FPOs. We are aiming for two things: One, to build a network of agripreneurs who are FPO members; and two, to provide services in rural



areas. These agripreneurs can provide soil testing as a service by using NutriSens and earn additional income. So, we are exploring them as potential soil testing partners. We have collaborated with a few NGOs and FPOs in Maharashtra and Gujarat. Individual farmers are not our main customers, as it will not be

feasible for individual farmers to invest in a device that will be used only once or twice in a cropping season. Hence, we are trying to market our products to FPOs, NGOs, or agripreneurs. We are also exploring FPOs and NGOs as our implementation partners.



A woman agripreneur demonstrating Soilsens technology to women farmers from Gujarat

Have you established any collaborations with public-sector agriculture departments or institutions?

We have pitched our product to the UP government and the deal is yet to be finalised. We also demonstrated the soil testing device

at the central government level, and as directed by them, we are validating the soil testing device. We have also spoken to a few ICAR and international institutes, like IRRI, for collaborations. Many of these partnerships with the public sector are in the pipeline.



Meeting with officials from the Ministry of Electronics and Information Technology



What are the future initiatives or goals that SoilSens has in mind?

We have many products in the pipeline for launch, such as Portable Chlorophyll meter, Portable pH meter, Portable NPK meter, Portable TDR Soil Moisture Meter, etc. On the technology side, we plan to launch these products and add more features to our already established products. Collaboration with both the public and private sectors is something we look forward to.

Are there any policy-level changes you would like to see implemented?

I believe that our policies are well-formulated, but the primary issue often lies in their implementation. However, I think there is room for some policy-level adjustments. For instance, many funding schemes and grants have age restrictions. This can pose challenges for female entrepreneurs like me, who started their ventures later in life. Unlike men, many women face a heavier burden of family responsibilities and professional workloads in their younger years. Therefore, it would be beneficial to either remove or raise the age limits for women in these funding

support schemes. The aim should be to ensure that financial support is accessible to all entrepreneurs, regardless of age.

Another aspect that greatly concerns me is the potential for policy support to be misused when it appears that a business is owned by women, when in reality, it is being operated by men. There should be some mechanism to understand and verify the contribution of women in an enterprise before providing them with the support earmarked for women entrepreneurs. If a woman entrepreneur is leading that organization and is holding 60 to 70 percent of the business, then she should be given priority.

Furthermore, as to funding, it is imperative to augment the budget allocated for human resources. Establishing a mechanism connecting entrepreneurs with local public organizations or institutions is crucial to ensure they receive essential support for their endeavors, including research and marketing. The presence of a robust policy in this regard will foster collaboration between entrepreneurs and public sector entities.



Receiving Millenium Alliance award in 2022



What would be your message or advice to fellow women entrepreneurs?

In the world of entrepreneurship, two invaluable principles have been my guiding stars: building robust networks and embracing the power deriving from seeking help. These behaviors have proven to be more than just strategies; they are essential virtues every entrepreneur should nurture. Connect with people, forge strong networks, and don't hesitate to reach out when you need assistance. This approach has been a game-changer, opening doors and opportunities I could never have achieved on my own.

In the early phases of your entrepreneurial journey, having a reliable source of income outside your venture is crucial. I firmly believe that entrepreneurs, even with boundless passion, should not hastily abandon alternate means of financial stability.

Something should keep trickling in, ensuring your survival. After all, your survival is the foundation of your startup's success.

Be ready for disappointments and setbacks along the way, they are the footnotes in the story of success. Stay resolute in your vision, don't be deterred by objections or naysayers. If your purpose is clear and your intentions are noble, forge ahead with unwavering determination. Remember that our efforts hold immense value even if we impact just one percent of the nation's farmers through our enterprise.

Lastly, never chase money as an end in itself. Focus on doing exceptional work that creates a positive social impact. When you genuinely make a difference, rest assured that money will naturally follow in the wake of your meaningful endeavors.





02

Digital Innovations Beneath the Waves: Rise of an Aquapreneur

"One defining aspect of entrepreneurship is the presence of risks at every turn. It is crucial to embrace these challenges without fear or hesitation, and instead, be prepared to venture into uncharted territories, learn from experiences, and adapt to navigate the highly competitive world we live in."

Snehal Verma

Co-Founder and Director
NatureDots
www.naturedots.com

The CRISP team comprised of Bhuvana N, Sejal Agarwal, and Ditty Maria Dominic conducted an interview with a promising young aquapreneur with the aim of gaining insights into her groundbreaking startup, and to explore how digital technology is driving transformative changes in the freshwater and marine ecosystem while assisting nature and fish farmers. Let's take a closer look at their insightful conversation.

NatureDots combines nature-based science with DeepTech tools for a climate-resilient, nature-positive economy. Their AquaNurch® System, an intelligent think machine, unravels the interconnections of complex ecosystems using technology and science. Beyond conventional approaches, NatureDots transforms aquaculture, promotes healthy fisheries, and restores ecosystem health through innovative solutions.

Can you tell us about your background and career journey, from being a computer science engineer to your current role in water and coastal resource management?

I was born in Mumbai and fell in love with the amazing marine life of our coasts, I spent a lot of my time observing the tidal pools. But as my parents moved around different parts of India due to their jobs, I found myself always spending most of my time around waterbodies, observing the human-nature-water interactions. In hindsight I believe these early experiences shaped my interest and future trajectory.

As for my background, I am trained as a computer science engineer with a Master of Business Administration (MBA) and now a Master of Environmental Management (MEM) in Water and Coastal Resource Management from



Duke University, North Carolina. My work experience has been in the renewable energy sector, non-profit management, and multilateral agencies; and I have delivered global projects in three countries. As an engineer-turned-forest manager-turned water innovator, the best way I can describe myself is that I have specialised in being a generalist. As I dabbled in multiple roles, I can now see a common theme running through it all, namely 'impact-focussed work'.

Please share with us the concept behind AquaNurch and how it relates to your experiences and observations.

AquaNurch – as an idea and a concept – began with my journey as a student

entrepreneur and innovator at the Indian Institute of Forest Management (IIFM). I chose to be with IIFM after leaving Xavier School of Management (XLRI), Jamshedpur, and Indian Institute of Management (IIM), Indore, because of the uniqueness of the Institute and the fact that it was surrounded by water on three sides. This made me choose it. I often spent much of my free time birding or watching the gharials and soft-shell turtles on the lake banks, from the safety of campus boundary walls. In 2018, for one of the class projects I chose to work on freshwater fish farmers' issues/distress points in the Bhopal Upper and Lower Lake systems. What started as a class assignment turned into a two-year long deep-dive into understanding the complexity around our freshwater resources.



With commercial fisheries producers in Chhattisgarh

As my engagement continued with more frequent visits with my advisor (who is now an official advisor to NatureDots) I was able to develop a trust-based bond with the local fishing community members. I still remember...

it was 2018 December when I received a distress call from one of the fish farmer's sons early in the morning requesting me to immediately visit the lake areas where they had stocked their fish. As I reached the location,



I sensed the scale of destruction that had taken place the night before, the entire three tons of fish were dead and floating on the surface. At this point their entire stock of Indian major carp was ready for harvest; it must be remembered that farmers usually take loans to raise them. All of us were clueless as to what had gone wrong and why this destruction had happened. When we tried to find out what had happened overnight, they said that there were rains the previous night that resulted in water in the pond getting polluted with water from surrounding areas resulting in change of water chemistry in the pond. This was based on the farmer's inputs. As a techie myself, my problem-solving mind immediately sprang into action and I got my friend, Ashish Kumar, (who is now the AI-Data Head at a multi-national company in Silicon Valley) involved in helping me design a simple system to capture the changes in water quality. That's how we build the first minimum viable product (MVP) of AquaNurch.

On further engagement what we discovered was that many people who are engaged in fishing have usually migrated from different parts of India with a community knowledge of fishing, and they are largely landless labourers. Fishing is an additional source of income for their own sustenance. This event became a sort of starting point that led me to think seriously about AquaNurch. In other words, the idea of AquaNurch came from this problem that fish farmers face and the biodiversity in our freshwater bodies.

How did the journey start once you had your idea about AquaNurch?

As a student at IIFM, in one of the class projects I decided to work on the water ecosystem with special reference to pollution, and also with a passion to do something for society and particularly help fish farmers achieve a good source of livelihood. During the project period at IIFM, I met and discussed many things with Mohammad Aatish Khan,

the cofounder of AquaNurch, who also had similar interests like mine on working with water resources. Being a computer science engineer by education, I viewed technology as a complement for creating a systemic solution for solving some of these water-related problems, which we were witnessing. The engineering and practical experiences together with the network from IIT and IIFM on water resource resulted in the founding of NatureDots gradually.

After studies at IIFM, to understand the water sector more, I joined World Wildlife Fund Inc. (WWF), where I worked on wetlands conservation, the new Ramsar's notification and the Gangetic dolphin programme. In October 2019, I decided to quit the job at WWF, and take the project full-on to turn it into a start-up. Initially we were growing fishes in our own backyard and trying to test the water and fish life interaction. Once the codes worked and started to show significant results, I wanted to test it before taking it to fish farmers. Before COVID hit, we were in the field from October to December 2019 where we had 5-6 fish farmers with us who were ready to test our device. That's how it sort of organically grew up.



Nature Dot team at field work

How did you identify and work with fish farmers?

Somewhere along the way we adopted and followed the innovation theory curve for identifying the farmers. Initially, one-on-one interaction with fish farmers helped us understand them and their culture and



enabled us to lay the foundation for creating a strong bond of mutual trust. They were our first investors by providing their support by hosting us on fields, giving us their time and efforts on ground. We worked very closely with them and created our own 'innovative fish farmers' network which also included participation from women fish farmers.

What is NatureDots all about?

NatureDots got registered in August 2019 as a private limited company with two co-founders – Ms. Snehal Verma and Mohammad Aatish Khan – and started working as a full-fledged company from December 2019. It is a Nature-Tech + hard-tech start up dealing with water resource management, water pollution, etc., with the help of technology and focusses on how currently these resources are being

managed to create better robust systems. NatureDots' product, AquaNurch® System (<https://naturedots.com/product>) is an intelligent systemic-based think machine which is unwrapping the interconnection of complex ecosystems by using the power of technology and science (to simplify and not to complicate). Given the complexities of the aquatic ecosystem, NatureDots' team goes beyond the conventional approach of data analytics, water parameters monitoring using Internet of Things (IoT) and geo spatial analysis. With this system and solutions, we are transforming aquaculture-based food systems, ensuring healthy fisheries (food-security and protein security) and re-installing ecosystem health by assisting in restoration, conservation and protection.



Field work with individual commercial fisheries producer

Can you elaborate on your prime product – AquaNurch System?

As said earlier, the AquaNurch Systems (<https://naturedots.com/product>) is a first of its kind deep-tech tool developed to provide solutions to the natural resource problems associated with water. The AquaNurch units acts as a Neural Node, capturing the pulse

of water ecosystems from both the depth and the surface of water, combining it with the geospatial planetary spatial temporal data, and processes it using proprietary AI models. The system acts as a Biophysical Chemical Ecological Big Data Factory on the natural system where it is deployed providing localised, accurate, timely and simplified resource intelligence. Its data Application



Programming Interface (APIs) are capable of providing primary onsite real-time data from 5-seconds to any defined interval. The team then leverages massive data and other information on ecosystem health to navigate and generate customised usable, beneficial insights for different customers and use-cases, providing a roster of services. Focussing on the freshwater aquaculture in India, we are delivering solutions in the form of alerts, advisories, and insights in 13 languages; globally in English via mobile and web dashboard.

Is the data available on web dashboard as an open source?

Yes, that is the idea, to make it accessible to everyone in open source. AquaNurch's data for different water assets is made available on request. As we are in the early stages of our enterprise, navigating complex AI and data compliance while being resource efficient always necessitates constant effort to maintain the right equilibrium. We charge nominal fees for our data assets which are essential to maintain the robust quality and security of our pipelines.

So, who are your primary clients?

Currently, we are working with fish farmers, water asset managers, restoration managers, etc., where products are customised according to their needs on a payment basis. We have an internal process and templates for customer identification and engagement. The product price depends on the kind of stakeholder (B2B, B2G) we are dealing with – government and commercial aqua-culturalists. We customise the product price depending upon their needs as well as duration of the engagement. Smallholder farmers are engaged indirectly through government or a business partner. Under National Rural Livelihood Mission (NRLM), we have partnered with Chhattisgarh State Rural Livelihood Mission (Bihan) as one of our government partners.

Though the company is based on digital innovation, what other digital innovations do you use?

We use a 'Software as a Service' (SaaS) platform and a mobile application that provides information to our clients as and when needed. We are also using internally developed AquaNurch as an AI-IoT device to derive data and use on our web-based platform, and mobile application to communicate the relevant advisory to our customer. Since these services are customized as per need, its cost is also derived accordingly.

How did the idea of providing advisory services work?

The biggest challenge we found was that fisheries have high mortality rates. The risk behavior and the risk appetite of fish farmer is very different as compared to crop farmers or such. When they are doing fishery, as a thumb rule, they assume having a certain percentage of loss arising from mortality rates. If they put 100 fish, they know and are prepared to get only 70 fishes out of 100. But we know that these losses can be avoided through better management and availability of best sectoral practices and information.

Instead of bombarding the farmers with an overload of information, we worked very diligently in creating these advisories and insights that are specific to each species of fish in different states. We advise them on: what is the stocking cycle they should follow? How many fish should they stock? What kind of fertilization method to use? How much feed has to be added? etc. These advisories are provided mainly to minimize wastage to maintain the water quality. Our solution monitors the end-to-end fisheries cycle and is capable of forecasting five days in advance of any impending changes in water chemistry.





AquaNurch Mobile application for fish farmers

For fisheries it is a matter of two to three hours where an entire stock can be wiped out! Thus, effective monitoring is super-critical. Currently we engage with 1152 fish farmers and out of that 117 are women fish farmers. The technology enables them, especially women fish farmers, in optimising their operations and assist in managing their workload. With the use of our system, they can conveniently access the best industry and pond-operation insights and are not in a blind spot in case of any changing event, which may have a negative consequence on their productivity.



AquaNurch Fisheries Farms in Chhattisgarh

How comfortable are farmers in using digital tools?

They all have mobile phones and I think they are quite comfortable. The advent of Digital India and boom in Agtech has also had a trickle-down effect in other streams of rural economy. Almost every rural shopkeeper has a Paytm app and availability of cheaper and more resilient mobile phones have made things happen. Most of the fish farmers we met possessed a smart phone and it was not that difficult for them to adopt and use our app. For us, the ground became more fertile during COVID because everything was getting done online. Even if they didn't like using cell phones, they had no other option and they had to rely on digital tools. The farmers who use digital tools are impressively vocal about its quality and convenience of use. It is evident that if it is not functioning well, they will not install or use it.



In what formats are these advisories generated?

It is in message form; alerts are notified by displaying in the AquaNurch app. We give a mix of mobile -notifications and customer calling to help them navigate and address any challenges.

Can you give me an idea of the reach of NatureDots?

Yes, we have around 3800 ha of natural water bodies under active management. 1500+ large farmers are under active engagement across Chhattisgarh, Maharashtra, Haryana and Andhra. In USA, we have 2000 ha under management.

What strategies did you employ to ensure a cautious and measured approach to scale up AquaNurch?

A strong customer connect and ensuring speedy, effective and high-quality solution delivery to our customers irrespective of their stage of fishery development and knowledge, ensured that we can create strong user sentiment for adopting our AquaNurch solution. We focus more on scaling up with quality, taking baby steps so that we can

eventually deliver big. This has been largely possible as we haven't taken any investment loan so far and are fully bootstrapped, having raised only non-dilutive funds.

Are you collaborating with other stakeholders in the fisheries sector and if so, how?

In India the ponds are state controlled, put on tender by the government. By default, government becomes our partner, and we have to have clearances from them if you need to work on that particular water body. Private ponds, on the other hand, are obviously privately held – people dig their own ponds and it calls for a different approach to reach out to them. While assessing water bodies, stakeholder analysis and insights are super critical. So, we must triangulate and bring in all those stakeholders' perspectives before taking the solution on ground.

We collaborate and partner with different agencies working in the fisheries field because the opportunities are many but scale of the problem is huge as well, and no one organization or solution can singly resolve these challenges.



AquaNurch system Installation in the fields of USA



How are you enhancing your capacities as an entrepreneur?

I haven't done any courses specially related to entrepreneurship. I have been talking to women entrepreneurs worldwide through various online platforms and received in-person guidance and mentoring from both women and men. Also, my Master's in water and coastal resource management from Duke University gave me an added advantage. While I was there, I had a chance to work with the Environmental Defense Fund (EDF) on coastal resilience, covering issues such as sea level rise, sea water intrusion and coastal resilience, and fisheries policies. I also worked on a couple of projects dealing with restoration. In addition to learning these technical topics, I also interacted with several women entrepreneurs, especially those who have established businesses during the early 1980s and 90s when times were much harder for women. Interacting with such women leaders have helped and guided me in my entrepreneurial journey.

How many staff do you have at Naturedots?

We have eight full time staff, 8 part time ones and a huge network of voluntary super members.

What are the motivating factors that kept you driving your dream project?

My interest in biodiversity restoration, especially marine life and establishing peaceful coexistence of humans and wildlife, is the key motivating factor for me.

How unique is your product?

Our solution is a first of its kind, it's a location-indifferent plug and play product specially developed from an emerging and under-developed economy requirement and stakeholder perspective, which makes it super-scalable. We created the first AI for Water in India. We are rethinking about how resources

are currently being managed. We need to rethink on the way forward as we make greater use of water resources or natural resources since everything is interconnected. And how actually tools such as DeepTech and AI could help us visualize everything together instead of using a siloed approach. The team's special expertise is positioning us ahead. Technology helps in managing things more effectively, but only if it is complemented with community knowledge and understanding can these things work out. So, empowering community with digital tools and innovations is the biggest need of the hour.

What do you have to say about data policies in the country as data is the key input for your company?

India has started thinking along those lines, especially having the data server within our country. Complexity comes when startups like us who work across borders have to deal with something like General Data Protection Regulation (GDPR) compliances of Europe or US with their own policies. I personally feel that monopolizing data is not good because if you don't share the data, you don't help the ecosystem grow. For AI you need data. We spent a considerable amount of time as an AI company to have all our AI systems in place. We take a lot of pride in terms of data security and privacy. That is where I feel whether it is a small-scale fish farmer, or a commercial or government entity, everybody needs the same privacy and security for their data.

I love the fact that the Telangana government has an open data policy for health care sector (health data). You need that. When you don't have access to data, how can you make products or do some things. We have seen a couple of policies in place in the AI space in states such as Kerala and Telangana. But on the national scale still there are lots of grey areas – regionally or globally – which is too complicated at present. As a startup we need to think through all these angles.



Do you think that the evolving digital system can replace the traditional markets in fisheries?

It is not that easy. Actually, it is a huge network of fish farmers who work in different layers. For example, a cohort of fish farmers will be working under another big fish farmer who had taken a tender to do fishing in a particular place. Similarly, the big fish farmer will have some other network where he sells the fish. It is not that straightforward. I feel whatever happens in digital space you cannot replace traditional actors or traditional supply chain systems that are in place. I find it sophisticated enough without a technology where they are able to run a business. Of course, we could sort of enhance it, complement it and make it more robust, if there are any leakages, we can seal that but we cannot replace them.

What is your biggest success so far in your entrepreneurial journey?

Working for the past two years with almost nil team attrition rate and increased customer engagement can be considered as one of my biggest successes. The farmers and the government are finding value in the products of NatureDots which is allowing it to progress steadily.

Any setbacks?

One of our clients in Washington State, USA, had his pond near a forested area. Unfortunately, our device was destroyed by a bear just after two months from installation. The team didn't understand what had happened but with the help of the State Parks Department we came to know about the bear attack. So, I feel that one needs to have the capacity and capability to deal with such unexpected situations. Also, since it is an Indian start up, we must comply with a lot of formalities in other countries and can only export a limited number of devices. So, we need to be extra careful of terrains in foreign countries.

What are your future plans?

Our plan is to drill down under beach head and have more areas of water monitoring and expand the geography of our AquaNurch installations. Our big dream is to get almost 15 million inland fish farmers on board and have 2.5 million hectares of water bodies under active monitoring.



Field work with fisheries producers

What awards or recognitions have come your way?

We are the World's First 'Whale' Start Up for achieving a 'Hockey-stick' acceleration for solving hard-problems, fusing profits and impact in tandem with creating a better world; and we were awarded the Green Growth Startup UNEP Asia-Pacific Award. We were also recognized at IIGP 2.0, 3M Young Innovators and many of these accomplishments can be found on our website (<https://naturedots.com/>). NatureDots is a World Economic Forum's and HCL Tech's Global Top Innovator. We have been spearheading water causes on a global scale representing the concerns of water and fish farmers at the UN water conference, WEF-Davos, World Food Programme and FAO, Rome. As a torchbearer for water security and food-system resilience our efforts have been recognized and resonated across the globe.

As an entrepreneur what are your important learnings?

Firstly, it is important to not get too



emotionally attached with the idea, and being open to share, listen and accept other people's opinions for making your own idea stronger. Secondly, one should have the ability to take risks, but it should be a calculated risk. Thirdly, one should do a thorough assessment of

user's willingness to pay for services. Finally, one should not be afraid of sharing ideas with others thinking that it could be stolen. Sharing may help one to learn new ideas or form a team if someone has the same idea. It is a very big ecosystem where many such ideas are



NatureDots at Summer Davos, WEF, in Tianjin 2023

needed.

How gender responsive is NatureDots?

We have company policies of ensuring equal opportunity and gender sensitivity with a robust culture of cross-cultural exchange and sharing. You can find more from the job-posting section on our website dealing with

our team hiring and culture policies.

Any specific challenges you faced as a women entrepreneur?

It was challenging initially for me as a woman to get into a male dominated field. But, once the farmers see that you know what you are talking about, they automatically respected



me. Later, we progressed with testing our ideas/tools in the field, identified our farmers and engaged in actual business.

Safety and security are also another challenge during field visits by women colleagues or me. Finding a safe place to stay, mode of travel, etc., are important when planning our visits. These would differ from location to location.

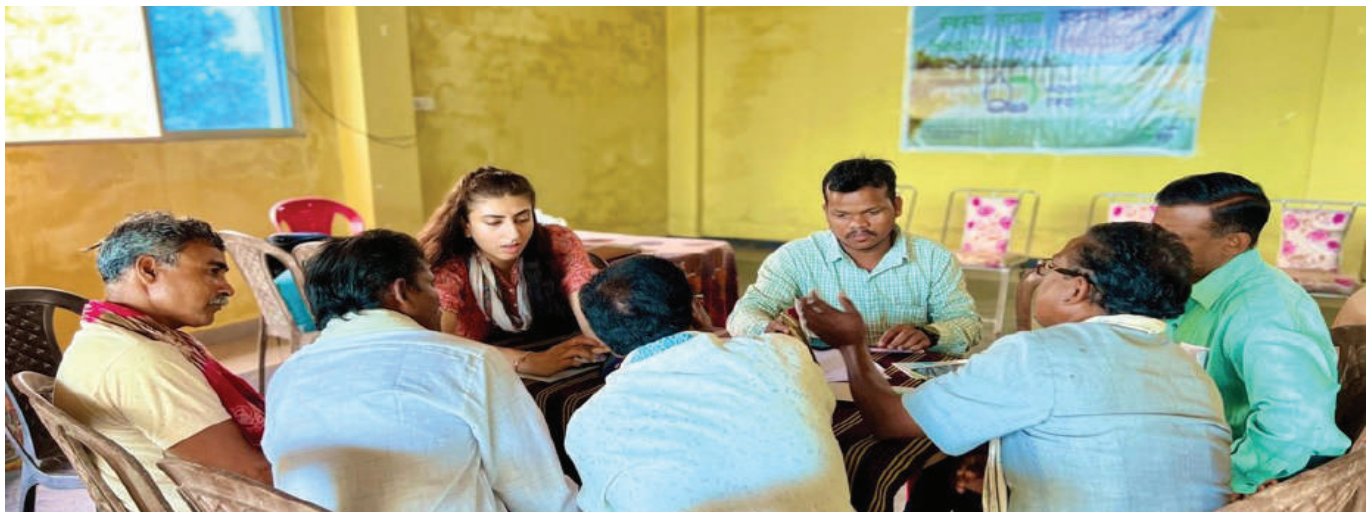
During one of my fund-raising rounds, I faced some biased questions such as what is my age? am I married? when am I planning to get married? etc., which were not generally asked to my male co-founder. All those questions made me realise the hardships faced by a women entrepreneur, especially while raising funds.

Any specific learning as a 'woman' entrepreneur?

Yes, as a woman, one should not let any

gendered or biased comments or actions affect you. As a first-generation woman entrepreneur, I can share that best learnings come from speaking and interacting with other women entrepreneurs so as to keep yourself abreast of how things should be handled, and to learn the tactics. Having a good cohort of people around who are supportive is important as an entrepreneur, and as a woman it becomes a game-changer. Such advisers and mentors help to boost one's growth.

There is no age limit for any woman to start her own business. It should be her choice when she wants to get married, have children and so on. Soft skills are very essential for women entrepreneurs. It is important to have a network of women entrepreneurs within which they can discuss their problems related to their journey, biases, etc., and get solutions to their problems.



With commercial fisheries producers

Any suggestions for policy actors?

Fisheries should be considered as a separate domain under policy and within that there should be distinction between different types – freshwater fishery, farm-based fishery, marine fishery, etc. There should be more centralised data available for fisheries sector to progress.

Any specific advice for upcoming women entrepreneurs?

Don't be afraid of trying something new. One defining feature is that there is risk in

everything. It is always good to try things out. Definitely, age should not be a bar. Being a woman entrepreneur is not easy. One needs to learn to handle difficult situations. To start with, it can be a lonely journey. Use any kind of network to get out and never get afraid to randomly try out solutions for your problems. Upskilling is super important, and it should never stop.





03

Solar Dreams and Agriculture Revival: the RenKube way!

"Dream big, fly high and soar like an eagle far above all challenges. The Indian startup ecosystem is primed to nurture women entrepreneurs, and the opportunities are unlimited. Hence, dream big and kickstart your journey".

Lakshmi Santhanam

Co-Founder, COO

RenKube

www.renkube.com

How did RenKube pioneer a transformative synergy between solar technology and farming, reshaping India's landscape for a greener tomorrow? Dr. Lakshmi Santhanam takes us through the inspiring journey of RenKube in a recent interview with Bhuvana, N and Ditty Maria Dominic.

RenKube (<https://www.renkube.com/>) is a renewable energy-focused company that is a pioneer in Motion Free Optical Tracking (MFOT) of solar panels. It has a research and development site in Bangalore, India. Set up in 2017, the company is led by a group of passionate individuals committed to contributing to a sustainable future by producing cutting edge products in the area of renewable energy. Today, their focus is on developing and commercializing MFOT-based solar technology.

Dr. Lakshmi, could you please brief us on your background and what inspired you to start the company?

RenKube is the brainchild of a group of software engineers with more than a decade of experience in software development and expertise in diverse areas such as network security, algorithms and protocols, etc. I am the Chief Operating Officer and co-founder. I have a PhD in network security and have worked on innovative business initiatives like wireless streaming technology from my stint at Intel and new security features for routers while at Cisco. I lead the design of our patent-pending product, various aspects of the business, including manufacturing, legal matters, and fundraising. Balaji Lakshmikanth Bangolae, is the CEO and also founder who leads RenKube's product design, innovations and business strategy. He brings more than 20 years of experience, and was among the first 10 employees at Cisco India. He holds 13 U.S. patents

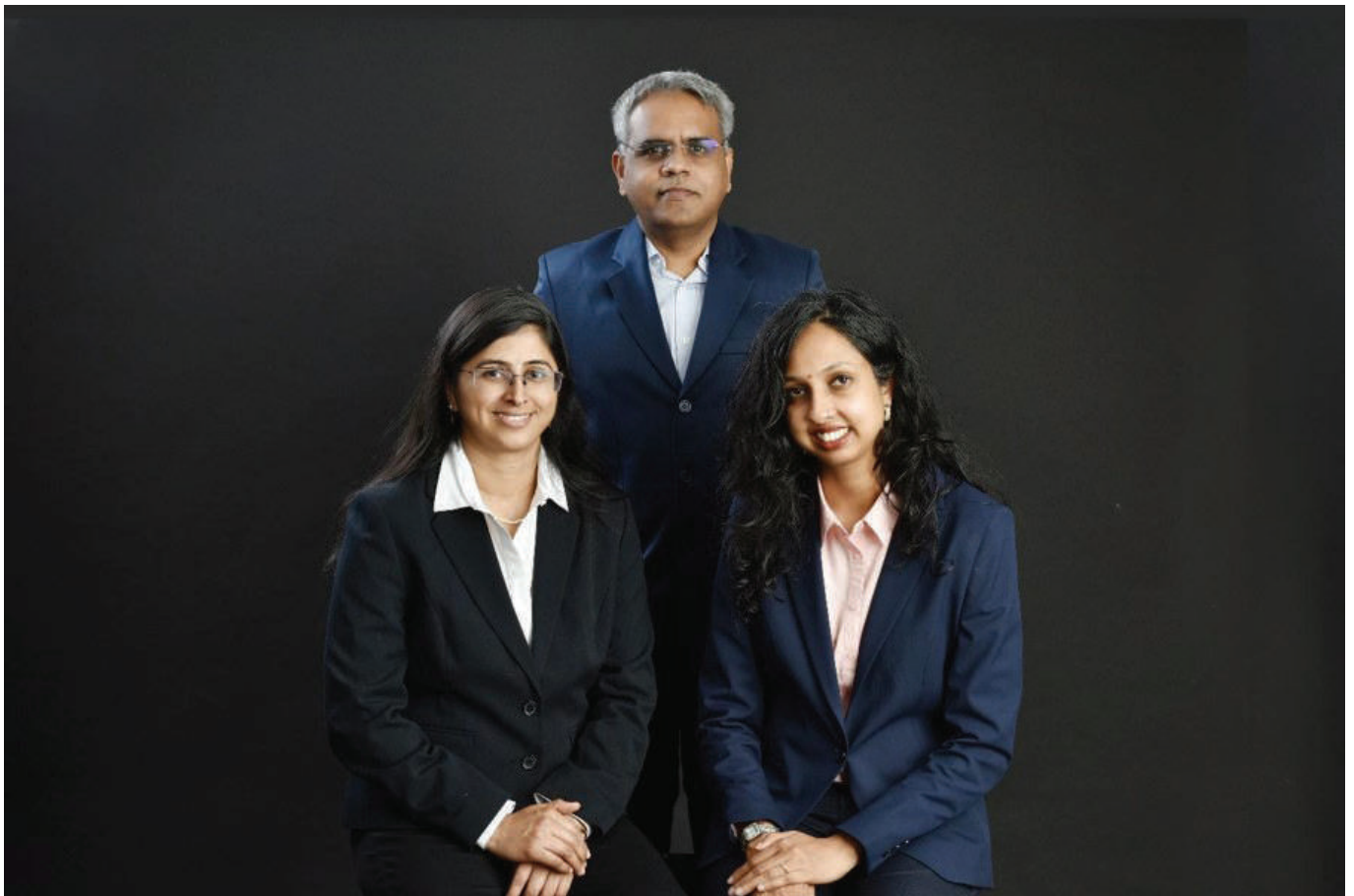


and was the recipient of three Pioneer Awards at Cisco. Another co-founder, Deepika Gopal, who was working with us at Cisco for six years, has a Master's degree at University of California, San Diego.

Our journey began during our time at Cisco, where we successfully collaborated on various projects, forming a strong bond and deep understanding of each other's capabilities. This synergy, combined with our technical expertise, has been pivotal to RenKube's journey since 2017. Our main mission at RenKube is to implement innovative renewable energy solutions by converting any surface exposed to the sun into an energy generating unit. This includes a wide range of products related to solar energy, such as in-building

integrated photovoltaics (solar panels incorporated into the structure of buildings like roof or wall), solar balcony (like solar panels integrated into glass facades in the balcony), and rooftop solar. Our vision is to change the way people use solar energy in their daily lives, making it a ubiquitous choice in all walks of life.

We leveraged our strength in software and algorithms to develop a proprietary AI solution that can come up with the best glass design for photovoltaic panels to capture more sunlight, thereby increasing the energy generation in the panels. Our foray into Agri Photovoltaics or AgriPV is an extension of our vision to enable the dual use of land for solar and agriculture.



RenKube's Founding Team

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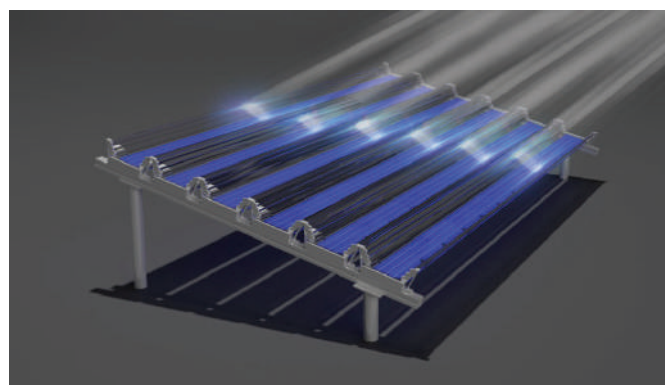
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Can you take us through the process of the ideation and product finalization at RenKube?

We picked up the idea of renewable energy back in 2017 when it was still not so popular but looked promising. India is a sunshine-rich country; yet we have an immense power outage which can be bridged by adopting solar. Hence, we focused on the problem of making solar energy generation more efficient. At first, we focused on solar thermal technology, but lacked the mechanical expertise to make a product that would have attractive unit economics.

We overcame this failure by focusing on our strengths and took a cross-disciplinary approach by applying software to solve the problem of energy efficiency in solar panels. We focused our innovation not on solar cells but on a layer above it, i.e., on the solar glass to make a perfect glass design using software to capture more sunlight. We applied our expertise in algorithms and AI to build a proprietary software that can carve perfect glass geometry (which we call as light redirecting prisms) to capture sunlight and redirect it to the solar cells. This was not easy.

The angle of the sunlight falling on the panel changes continuously during the day and throughout the year, making it hard to capture sunlight efficiently. Our AI-based software helped us handle the complexity of catering to the varied angles of incident sunlight and capturing it with a minimal amount of glass without overshooting the peak rating of the panel. The smart glass design once manufactured and assembled on the solar panel remains completely stationary and doesn't require any seasonal tilt/adjustment. Hence the name 'Motion Free Optical Tracking (MFOT)'. Its advantage is that it doesn't need any mechanical parts like motors or gears. The only maintenance needed is the cleaning of the light redirecting prism and the solar panel.



RenKube solar panel redirection

In early 2020, we realized that the unique nature of our panels (with an interleaved arrangement of solar cells and reflectors) would provide better lighting under the panels as well, rendering it suitable for agriculture, unlike traditional solar panels that throw a solid block of shadow that makes growth of vegetation impossible. AgriPV enables a symbiotic relationship between solar panels and crops. The transpiration from plants keeps the panels cool and improves energy generation by 5% and the canopy of the solar panels on the crops reduces irrigation needs, especially in a tropical climate like India. The concept of AgriPV was taking shape around the globe, in different arrangements like leaving gaps between every adjacent solar panel or raising the solar structure or growing



crops in the inter-row gaps between solar panels, all of which limit the agriculture yield to 50% of the total area.

With RenKube's technology, we can make 100% of the land usable for both agriculture and solar energy generation. This can completely transform the life of a farmer who can make solar their 3rd crop by leasing the land to solar developers that can bring in a fixed guaranteed income of 30,000/acre/ annum, all the while continuing with their regular agricultural activities. We are actively working on this mission to bring in change in the lives of small and marginal Indian farmers.

Currently, our focus is on two product lines – the Agri PV panel “Krishi” that is designed for dual use in the same land and the second product is the energy efficient PV panel “Adi” that focuses on improving the energy yield in solar panels by up to 40% by capturing more sunlight with our patent-pending light redirecting prisms. Both the products align with our vision of driving the clean energy transition in India and making efficient use of available resources, whether for agricultural productivity or enhanced solar energy generation.



RenKube solar panels in the field

Can you share the key challenges your team faced during the transition from a software background to the world of deep tech and cleantech?

Indeed, the transition brought with it a steep learning curve, and adapting to a completely different field, with manifold challenges. In deep tech, especially clean tech, the gestation period for product development is considerably longer than in software. Our proprietary software gave us the prototype design as a CAD sketch, but to translate it to a physical glass piece was tough as it involved interacting with unskilled laborers

at Firozabad, which is India's glass hub. Sometimes, the software sketch was not amenable to manufacturing due to problems in making the mould or would result in too much material wastage and consequently increased the unit cost price. In a hardware product which has dependency on moulds this can easily take a few months. This is in sharp contrast to a software patch that can easily fix a bug and can be released within 3-4 weeks. Post prototype development comes the validation of our minimum viable product (MVP). To drive a transition of a clean tech idea from technology readiness level 4 to 6, it



is quite capital intensive. But luckily for us the multiple government funds aided us in the early stages. Even after MVP, to commercialize the technology involves multiple stages of validation like product certification and field validation as the idea is proven from kilowatts (KW) scale to megawatt (MW) scale. It is also important for us to validate the working of our light redirecting prism in different latitudes, geographical conditions and land terrains. In the case of AgriPV, micro-climatic conditions of crops indigenous to the region are different; hence it's important to validate the suitability of our panels for different crop types with extensive data collection.

Can you provide an overview of your funding status and sources?

The founders bootstrapped the company with their own funds for initial product development. We built three iterations of our physical prototypes in glass and established a small glass melting facility as an inhouse experiment center during Covid times. Currently, we have raised approximately ₹ 5 crores in investment, as a mix of equity and grants. We received grants from government sources such as Nidhi Prayas; Micro, Small & Medium Enterprises (MSME) grant from Indian Institute of Sciences (IISc); Biotechnology Industry Research Assistance Council (BIRAC) from IKP Knowledge Park, Hyderabad; TIDE 2.0 from SINE IIT Bombay; and a substantial grant from the US-India Endowment Fund for an innovative roofing product that aims to enhance energy generation from building-integrated PV.

What has been your experience with incubation centres?

As we progressed and developed our product, we realized the importance of understanding the business landscape, identifying the customer segment for our product, market research and fine tuning the story of our customer value proposition as we started interacting with different stakeholders. We

participated in several incubation programs, such as Startup Nexus with the US embassy and collaborated with institutions like IISc and IIT Mumbai, which played a crucial role in our growth and catapulted us from researchers to technopreneurs.

What is the role incubation centres play in a startup?

Incubation centres provide startups with access to resources and equipment that they may not be able to afford individually, and often have specialized laboratories and equipment tailored to different industries, allowing startups to use them for experimentation and research.

Typically, government grants and funding are channelled through these centres, making it easier for startups to access these opportunities. They provide the last-mile connectivity between innovators and government funding sources. They also help startups navigate the complexities of grant applications and milestone-driven funding processes. After the grant is obtained, they provide guidance with monthly reviews, weekly seminars, access to industrial workshops and conferences, showcase opportunities to potential investors and also offer essential support, mentorship on both business and technical fronts.

In my journey, every incubation centre enabled me to build a strong network of entrepreneurs. I've been part of five different incubators over the last three years, and now I'm in turn serving as a mentor at these centres. Remember, this strong entrepreneur network is not just about exchange of information on funding opportunities; we also discuss nuances like handling grant money, GST compliance, TDS, and the intricacies of negotiating term sheets during fundraising. Having the support of experienced fellow entrepreneurs is invaluable.



Did these incubation centres have a structured curriculum, and what specific areas did they focus on in addition to technology?

Yes, the incubation centres provided a standard set of principles for running a business, covering topics like market discovery, understanding customers, fundraising, pitching, IP, legal issues, important clauses to check in a term sheet, manufacturing agreement, and mutual non-disclosure agreement (NDAs). However, some institutions offer more specialized knowledge. For example, we participated in programs like Climate Launchpad with Knowledge and Innovation Community (KIC), which focused on calculating the climate impact of our technology and also connected us with global cleantech entrepreneurs and forums. Another important value addition is networking. For instance, IKP knowledge park conducts an annual International Knowledge Millennium Conference (IKMC) which brings together innovators, investors and government bodies from all over India to brainstorm. Being a part of this event, I learnt immensely from others and gained valuable insights from their workshop.

For our AgriPV product, we took the help of PJTSAU's AgHub Agri innovation pilot (AIP) program that helped us validate our value proposition for farmers with a systematic scientific study on the crop under the RenKube panels. They helped us bring together the right

set of domain experts to plan and conduct the study and showcase our product in different agriculture-specific events and actively helped us in gaining traction. These incubation centres helped us gain a well-rounded education beyond just technology.

What did your collaboration with AgHub entail and how has it contributed to the success of your Agri PV project?

Our collaboration with AgHub has been instrumental in connecting us with the scientific community and experts in agricultural innovation. It all started when I met Dr. Kalpana Sastry, Managing Director, AgHub, in an online event for BIRAC grant writing. Then we connected and expressed our interest in the area of AgriPV and in collaborating with their renowned agriculture institute for our research. Dr. Praveen Rao, who was then the Vice Chancellor at Professor Jayashankar Telangana State Agriculture University (PJTSAU), was very keen on setting up an AgriPV pilot and a state-of-the-art pilot that would allow mechanized farm machinery to be used. Later, AgHub helped us identify the right scientific team to conduct crop studies and we designed the optimal structure that minimizes land loss and allows tractors to maneuver underneath. Our Agri PV structure was designed with a focus to incorporate best scientific practices in drip irrigation, farm machinery and our solar structures were fabricated in a way that they can be easily replicated across different farm locations.



Pilot inauguration of Agri PV system at PJTSAU

Can you share more details about the timeline of your pilot projects, particularly the one in PJTSAU and your collaborative efforts in validating the technology?

Our Agri PV pilot project began in PJTSAU in June 2022, and we commissioned the project in November 2022. During the COVID-19 pandemic, we worked on prototypes, particularly for our light redirection prisms. While measuring the flux underneath our panels, we realized it could be conducive for crop growth underneath. We then approached

PJTSAU through AgHub for a pilot study to validate this and were eventually supported by a BIRAC grant from the government. We recognized the importance of building a replicable agricultural technology that could work across different regions and microclimatic conditions for commercialization. Though we initially considered focusing on specific crops like maize or groundnut, Dr. Parveen Rao advised us to diversify the crop variety for every season for simultaneous validation; so we included vegetables, groundnut and grams.



Crops under AgriPV Pilot

We implemented rigorous scientific practices throughout the project with the support of AgHub and PJTSAU. We used varied set of scientific instruments to measure various parameters, including photosynthetically active radiation (PAR), oxygen levels and every aspect of the photosynthesis process. We closely monitored the microclimatic conditions, humidity and soil moisture. To ensure accurate data collection, a research assistant from the University recorded and analyzed the

data. Our results showed a remarkable 95% crop yield for Rabi and Summer seasons with this setup as compared to an open field cultivation for the same crop. Currently, we are continuing our research with Kharif crops. This approach is helping us fine-tune our narrative for Agri PV. But we realized during this process that adapting the technology to different geographical locations and varying land dynamics is both a challenge and an opportunity.



Customers often seek validation in multiple locations, and the questions around scalability and reliability arise. Each region has its unique conditions, and customization becomes critical to ensure the effectiveness of the technology. However, this adaptability also presents an opportunity for us to fine-tune our solutions and demonstrate their versatility in addressing different challenges, making it a valuable asset in the clean tech industry.

Can your technology potentially replace greenhouses in agriculture?

Our technology can complement greenhouse setups. Greenhouses offer controlled environments for crops that require specific conditions. However, our technology can provide energy for greenhouse operations and other agricultural post-processing needs.

Do small and marginal farmers face challenges in adopting AgriPV in their farms? If so, how can they be addressed?

The capex involved in a solar installation is typically ₹ 4 crores for a 3-acre farm, which is beyond the means of small and marginal farmers. This cost factor becomes critical when dealing with small land holdings, typically ranging from 2.5 to 5 acres, as is common among small and marginal Indian farmers.

Generally, traditional solar installations in traditional dry arid lands typically have a return on investment (ROI) in about five to eight years. However, implementing solar on agricultural land involves an additional capex of ₹ 50 lakhs/MW to raise the structure and provide necessary reinforcements, which depend on soil conditions, terrain, etc. These structural adjustments can extend the ROI period by a year. Balancing the potential benefits of our technology with the financial constraints of these farmers is crucial.

At RenKube, we are building a technology that will address these challenges and provide more energy generation to offset the

additional capex investment for Agri PV. The dual use of land guarantees 120% energy generation and 100% agricultural yield which would provide an attractive ROI.

Though our goal is to empower marginal farmers, our initial approach is to work with high-income group farmers who have larger land holdings (100+ acres) due to their financial capability to invest in AgriPV. Once we demonstrate the benefits, we plan to collaborate with the government and suggest land policy recommendations for solar on agricultural land, provide preferential feed-in-tariffs for AgriPV, and provide upfront capex subsidy for solar developers to do AgriPV. This would build an ecosystem for Agri PV to flourish, where it is a win-win situation for everyone and we can extend the technology benefits to all the small and marginal farmers who make up the majority of the farming community in India by giving a guaranteed lease income.

Have you engaged with agricultural authorities or the Department of Agriculture to conduct trials or gather inputs regarding your technology's application in farming?

Prior to our collaboration with AgHub, we had reached out to several agricultural universities involved in Agri PV projects. With our successful demonstration in PJTSAU University, we received multiple enquiries from government bodies like the Center of Excellence, Horticulture, India Agriculture Alliance from National Solar Energy Federation of India (NSEFI), Indo-German Energy Forum, and we are seeking their interest in piloting our innovative panel technology.

What are your views on the value proposition for industries considering the use of agricultural land for solar installations?

We believe industries can benefit significantly from using agricultural land for solar



installations. They can cut their monthly electricity bills by 30-40% by financing an Agri PV project. They can pay a marginal rent of ₹ 30,000/acre/annum to the farmer for using the land, which in turn can give economic relief to small and marginal farmers. However, it's important to note that this is a long-term investment. While the initial cost may be high, the ROI, especially for industries, can be quite favorable in the long run, making it a compelling proposition.

How feasible is it to install solar technologies for residential use and how much would it approximately cost?

For homeowners interested in installing solar panels for residential use, a 3-kilowatt system would cost around ₹ 2 lakhs, which can be recovered in approximately four years, considering the savings on electricity bills. Electricity tariffs are estimated to increase at a rate of 2.4%/year, totaling an 80% increase over the next 25 years, implying that solar power provides a cost-effective and sustainable solution for homeowners.

How do you see your enterprise benefiting the agricultural and renewable energy sectors in India?

Our enterprise has the potential to transform the Indian agricultural landscape. With our panels, farmers can continue their regular agricultural activities underneath the solar panels while leasing the land for solar energy generation. This provides a steady guaranteed income, helping them overcome the financial challenges posed by the vagaries of monsoon and climate change.

At the same time, solar developers now have access to land, thereby reducing pressure on them to acquire dry and arid sites. This concept can be extended to industrial districts, where MSMEs can invest in nearby farmland for solar power generation and contribute to a carbon neutral world while supporting local farmers. India's ambitious target of generating 450 GW of renewable energy by 2030 requires innovative solutions. Our approach allows us to expand solar installations without competing for valuable land resources enabling a win-win scenario for the clean energy transition. This transition not only reduces carbon emissions but also improves the livelihoods of India's farmers who are an important part of the country's economy.



RenKube solar panels in the field



How was your journey as a woman in the startup world and while collaborating with different entities?

My journey as a woman in the startup world was quite unique. Our team had a balanced gender representation, with almost 50% women, which created a comfortable and supportive environment. Additionally, our long-standing ties with each other's families provided a strong support system during tough times. The solar and manufacturing world has minimal representation by women, and I encountered some challenges in asserting myself. Convincing industry leaders required persistence and evidence-based discussions and extra effort to change the initial biases and gain trust. However, some of our strongest supporters in the supply chain have been women leaders, such as Ms Mirunalini Chellappan, director of our manufacturing partner Swelect Energy Systems. Ultimately, women supporting fellow women in their professional circles can be a catalyst for positive change.

Are there specific programs or quotas for women to access funding and secure deals?

There is growing recognition of the need to support women entrepreneurs. Some newer funds are being established with this focus. While venture capital funding specifically targeted at women-led startups is still limited, there is a positive shift happening in the ecosystem. Many incubation centres and accelerators, including those run by tech giants like Google, Amazon, and Qualcomm, have initiated programs to support women entrepreneurs that serve as a platform for women to connect, share their journey and inspire one another.

Would you say RenKube is at the forefront of remodeling renewable energy and agriculture in India? What policy challenges do you foresee and changes are you advocating for to

allow the coexistence of solar-based innovation and agriculture?

Absolutely, policy challenges are essential for our work. Currently, in India, the use of agricultural land for solar installations faces policy restrictions due to concerns related to the potential loss to farmers and the impact on the food supply chain. However, our technology mitigates this problem by benefiting both farmers and solar developers. We are actively engaged as a part of India Agriculture Alliance with the Ministry of New and Renewable Energy (MNRE) to submit a draft recommendation on land policy changes that are supportive of Agri PV (watch our video on the RenKube pilot presented as part of MNRE's India Agrivoltaic Alliance launch). Specifically, we're advocating that governments should permit installation of solar systems exceeding 2 MW on agricultural land as long as at least 85% of the agriculture yield is maintained. This policy change would drive the rapid expansion of Agri PV in India.

Besides policy amendments, how do you think the government can promote this innovative approach, especially in the context of incentivizing solar on agricultural land?

The government can incentivize the adoption of Agri PV by offering preferential feed-in tariffs for energy generated from agricultural land. This will encourage developers and industries to invest in this approach, making it more economically viable. To ensure that farmers receive regular income from solar farming, we need a clear policy mandate and the involvement of nodal agencies in the disbursement of solar income. Additionally, capacity building centres can educate farmers about the benefits and feasibility of this approach. Collaboration with organizations like AgHub is also essential in bridging the gap between research and practical implementation that can transform the lives of people.



What lies ahead for RenKube?

Our long-term vision is to convert every surface that is exposed to the sun to an energy generating unit with attractive unit economics. We want to be the drivers for the proliferation of solar in all walks of life and go towards a carbon neutral world.

How has your enterprise been recognized?

We have received multiple awards for our innovation, such as the National Startup Award from the Government of India (2022), Startuppreneur award from the Confederation of Indian Industry and British Petroleum (2021).

RenKube was also the only Asian company to be chosen to present in the prestigious National Renewable Energy Laboratory's annual Industrial Growth Forum event in the USA in 2022.

What's your advice to fellow women entrepreneurs?

Dream big, and fly high and soar like an eagle far above all challenges. The Indian startup ecosystem is at this moment primed to nurture women entrepreneurs and the opportunities available are unlimited. So, dream big and kickstart your journey.



Receiving National Startup award 2022



मा. राज्यपाल, महाराष्ट्र राज्य
यांच्या शुभ हस्ते
प्रमुख अतिथी

श्री. मंगल प्रभा

हारी, बघाव्या, कोकण, लक्ष्मणराव

स्वामी एन. भा.प्र.से.

जयपुर

५ मार्च



04

Driving Change: The Story of an IoT Agri-Industry Influencer

"Entrepreneurs should never wait for opportunities to come to them. They should start as early as possible with the available resources, plan and prepare to toil and rise in the domain of entrepreneurship."

Kalyani Shinde

Director

Godaam Innovations Pvt. Ltd.
www.godaaminnovations.com

Sejal Agarwal and Bhuvana N conversed with Ms. Kalyani Shinde on her entrepreneurial journey and how the digital tool devised by Godaam is helping onion farmers to reduce produce loss at warehouses.

Godaam Innovations Pvt. Ltd., based in Nashik, Maharashtra, revolutionizes Agri-tech, empowering farmers and enhancing crop shelf life. They bridge the gap between farmers and consumers, creating a structured, accountable value chain. Their mission is to upgrade the agricultural ecosystem through innovation and technology. For more details, visit <https://www.godaaminnovations.com>

Please tell us briefly about you and how your entrepreneurship journey began.

I was born and raised in Nashik in an agricultural family. Growing up, I gained a deep understanding of the agricultural ecosystem. In 2016-17, while pursuing my engineering degree in computer science, I witnessed a significant issue in the onion market that affected not only my own family but also countless other farmers. I overheard my family discussing the escalating costs, time, and effort involved in onion production, while the fluctuating prices made it an unreliable venture. Often, the prices would be extremely low, discouraging farmers from continuing production. Only once or twice every five years would the market offer appropriate compensation for their efforts. Motivated to find a solution, I turned to the internet for research and discovered that onion warehouse storage was a major challenge faced by farmers. I took up extensive investigation, seeking the perspectives of various stakeholders such as mandi personnel, merchants, farmers, and the government. Despite gathering all this valuable information,



I still lacked clear direction on how to address the problem. Eventually, I came across Digital Impact Square (DISQ), an open innovation centre under the Tata Consultancy Services (TCS) Foundation's CSR initiative in Nashik. Recognizing the potential it held, I applied to DISQ with the intention of finding a solution to the issue of onion pricing. In January 2018, during my final year of engineering, I was selected and began working full-time on the onion storage problem. This marked the birth of Godaam Innovations, and in 2018, Godaam Innovations was officially registered as a private limited company.

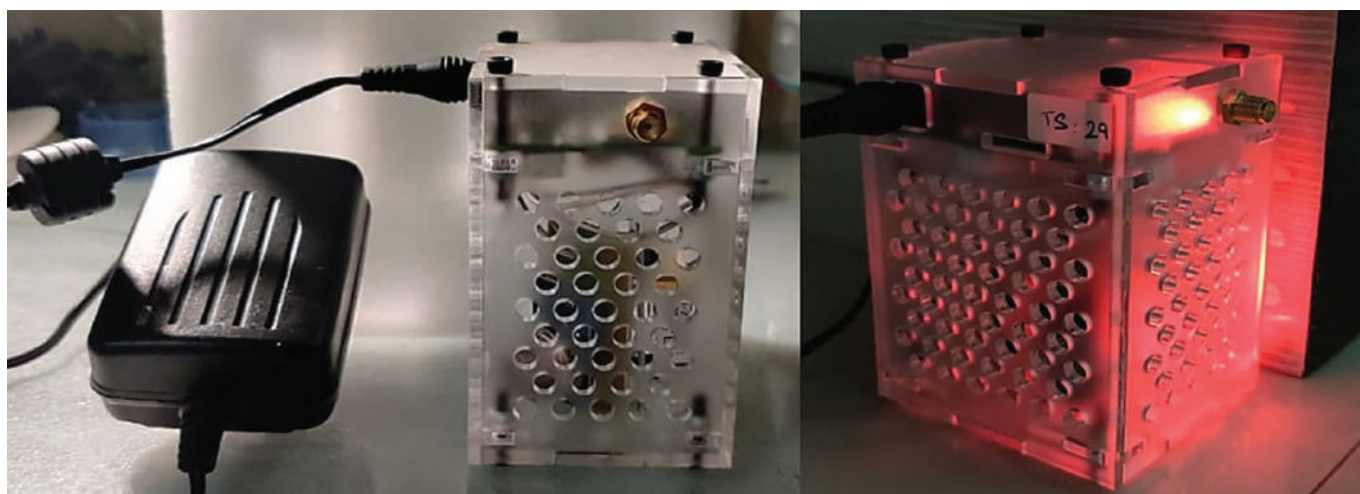
How did you begin analysing the problem?

India is the second largest producer of onion. India produces around 3.5 crore metric tons annually of which 70-80 percent is stored in warehouses. As the next harvest can be done only after 8-10 months, its storage is very critical if a continuous supply in both domestic and international markets is to be ensured. However, around 40-50 percent of wastage is reported during storage which leads to fluctuation in prices, which was my main problem statement at Digital Impact Square. I, along with my other teammates whom I met at Digital Impact, started working on this problem. For the first 3-4 months we studied the onion ecosystem, through different stakeholders and at different crop production stages. During the study, we also realised that

we need some experts who can guide farmers throughout the crop cycle. Another problem we realised was related to market linkages. Market linkage involves various stakeholders such as farmers, local merchants, and the government. To deal with these stakeholders, there is a need to form a community that can work in partnership and collaboration with all the stakeholders involved. These were the kind of explanations we identified initially based on our analysis during the DISQ incubation period.

How did you develop the digital solution?

After detailed research, we realised that engaging experts or establishing market linkages would require much effort and networking, but making changes at the warehouse storage system level alone can help in reducing the wastage of onion during storage. While interacting with farmers on the warehouse issue, we found that we are able to trace rotten onions through foul smells and height of the onion heaps. However, by the time farmers sense the smell or change in height, they have already suffered a loss of 20-25 percent. Based on these conversations, our team made an IoT- (Internet of Things) based hardware device which monitors real time micro climatic conditions in the storage and also detects the foul smell in the field and during storage.



IoT based hardware device of Godaam Innovations Pvt. Ltd.



Can you provide details about the modus operandi?

A single IoT device can provide cover for 10 metric tons in a warehouse, and the number of devices installed are based on the capacity of a warehouse. Based on detection, we alert the farmers who can then either re-grade their produce to increase its life shelf by a month, or sell it in the market immediately so as to reduce wastage. To alert farmers we send text messages to them on their mobile phones; and are planning to develop an application for this at present. We also send bi-weekly alerts for the current status of their crops.

Post-installation, we keep on monitoring the device as a part of their maintenance package. Godaam Innovations also has a dashboard wherein all the data collected through the IoT device is stored and is accessible for tracking the onion quality and quantity on a real time basis. We intend to use this platform to create an end-to-end value chain eventually to show the variety and quantity of the onions stored that can be used to link market traders. This dashboard can be used by cooperatives having warehouse storage (more than a thousand tons) or government representatives with whom they have partnered. We are also in the process of creating an application wherein farmers can get the required details.

How many clients do you have now?

Now, we are present in Madhya Pradesh, Maharashtra and Uttar Pradesh, and have sold more than 250 units of the IoT device. Soon we will be working with 30 farmers by installing our devices in the farmers' warehouse. We started with individual farmers and have now started focussing on farmer cooperatives and targeting community warehouses. This will help in creating larger impact.

How do you engage in stakeholder collaborations?

Getting into the DISQ programme has helped me and the team to get to know about other

programmes. Also, the team has developed the habit of exploring such opportunities that can help us raise funds or find mentorship/guidance support. My personal networks have also helped me to find these opportunities.

The programme mainly helped me understand how research has to be undertaken, and how to conduct interviews in specific ways so as to get the required information. DISQ also connected me with the ICAR-Directorate of Onion and Garlic Research (DOGR), Pune, for getting domain expertise. TCS has also been supportive in getting inputs and guidance as and when needed. Some experts were identified and onboarded remotely, during the journey, who helped in carrying out the technology-related operations.



Godaam Innovations IoT based hardware device at onion warehouse



As I hail from an agricultural background, we did some basic trials in my own circle of farmers. However, for large scale testing, we partnered with Tata Trust wherein the latter partly paid for the device and the remaining was paid by farmers so as to share the cost burden. We also partnered with John Deere, a manufacturing company, under the CSR initiative for setting up these IoT devices in our work locations.

We have worked, and continue to work, in collaboration with Tata Steels. We realised that generally the warehouse is a conventional structure and are mostly semi-open. The warehouse size is generally for 50 metric tons which when increased to 500 metric tons, needs to be renovated to make space for proper ventilation and create a controlled environment. Creating cold storage is also not feasible for every location. So, we collaborated with Tata Steel to renovate these warehouses, as 60-70 percent of the construction involves the use of steel. Tata Steel got three warehouses constructed – one each in Madhya Pradesh, Maharashtra and Uttar Pradesh – under the brand name Agronest, India's first smart warehouse for onion storage. These warehouses provide a controlled environment for onions in terms of temperature and humidity, along with the IoT device installed by us.

Did you get any grants for incubation from the prevailing government programmes for entrepreneurs?

Yes, currently we are a part of two grant programs – BIRAC and Pusa Krishi – and have received a total grant of around INR 75 Lakhs, along with mentorship and guidance from these centres. We also had a partnership with Tata Center at IIT-Bombay wherein the professors mentored us on data collection and analysis. We were also a part of another incubation programme of 'UnLtd India' at Mumbai where we received Rs. 2 lakh as part of the cohort. I have also been a part of Nidhi

Fellowship and Pune International Centre which helped me get the required mentorship for my journey. In 2018, we received Rs. 3 lakhs as funding from DOGR, Pune, for starting our pilot.

How big is your team at Godaam Innovations?

In 2018, DISQ formed a team of four members from multiple disciplines sharing similar interests. For the initial six months, the team conducted a study around the topic and prepared a plan. After six months, the plan and prototype were validated by a jury and industry partners. After that validation, the team registered the entity as a private entity. Then there were four members in the team which has now increased to seven, including me. There has been shuffling in the team since 2018, except for the core team of four. Majority of the team members have an engineering background. There is a customer relationship manager with an agriculture background who communicates with customers, potential farmers, and organisations for the product. He is also responsible for collecting feedback from the existing farmers using the device.

Did you face any specific challenges being a woman entrepreneur?

As a woman entrepreneur, I must confess that I did not face any particular challenge owing to my gender. Instead, I think that sometimes people are more open and patient with women, which has benefitted us. There have been occasions when I had to go alone to represent Godaam Innovations in public meetings/forums. However, as I am comfortable and confident in my networking skills, this didn't affect me in leading things singlehandedly when required.

In team management, we focus on hiring individuals who are aligned with the company's vision so that they are not affected by stereotypical norms. I believe that 'if we



keep the team together in our journey, they don't mind taking orders even if it's coming from a female leader' (myself).

What are the challenges farmers experienced while using the digital innovations, especially the digital tool of Godaam?

I have come to understand that farmers will not hesitate to use digital innovations if they find value in it. However, the major challenge

is the mindset of farmers. Farmers believe that since onion is a perishable item there definitely will be losses in its storage. So, my team and me have to convince farmers on how this IoT device can help them detect foul smell for identifying the rotten stage of onions and reduce their losses. The team makes all-out efforts to help farmers realise that 40-50 percent of their losses can be reduced to 5-10 percent with this technology.



Discussion with rural onion producers

What is your take on the funding status for entrepreneurs?

I think it is a myth to think that one needs to have funds before starting any enterprise. The basic things necessary are: having a detailed research, good team members in place, and some little funding to test the prototype product/services, and the capital to initiate the work. The programme we have joined, that is Digital Impact Square, provides a monthly stipend for 12-18 months depending upon the idea, for covering personal expenses and creating a company corpus. As of now, we have raised around INR 1 crore through grants and fellowships apart from the revenue created through our IoT device. This has helped us to sustain ourselves in the market. At present, we have not taken any loan.

How do you identify your stakeholders?

There are different kinds of farmers in different regions. We figured out that it is easy to approach and convince progressive farmers who are willing to make the required expenditure for the storage. We didn't put much effort in convincing each farmer that we came across but pitched our product in front of those who were willing to purchase it. Word of mouth and known farmers also played a role in increasing our reach.

We partnered with like-minded organisations, such as Sahyadri Farms, that helped us get connected to various farmer cooperatives. These cooperatives then paved the way for getting us linked to individual farmers.



In addition to this, we also gave various interviews and wrote articles which helped us to create awareness about our services. This helped us to reach out to more organisations and individuals.

How are your financials?

Depending on factors such as capacity of storage, the startup's services are packaged into three categories of high, medium, and low. The hardware installations for each are priced between Rs 1 lakh to 1.2 lakh, Rs 70,000 to Rs 90,000, and Rs 30,000 to Rs 40,000, with a monthly charge of Rs 5,000 to Rs 10,000. The device we market is priced at Rs 11000 and comes with a three-year guarantee. Farmers are required to pay 30 percent annual fee from second year onwards to cover data monitoring, alerts and maintenance of device. This will be approximately Rs. 5000 to Rs. 10000 per month. We get around 30 percent margin on our product cost. We calculated Return on Investment (RoI) for the device and it was found that a farmer is able to cover the cost within one year along with a profit of 10-15 percent on average/year.



Interaction with farmers

For hardware installation, we mainly have categories based on the storage capacity. For high storage capacity, the installation charges will be around Rs. 1 lakh, for medium storage capacity around Rs. 80,000, and for low storage capacity around Rs.35,000.

For the initial 2-3 years, our expenditure was focused on identifying customers, product development, creating team and market

linkage. Post-COVID, from 2021, we started focussing on revenue and have generated around Rs 26 lakh in 2021-22.

Currently, digitalisation is the key to scaling an enterprise. I try to keep the enterprise operations digital to the maximum extent possible apart from the field component that requires device installation and maintenance work.

What are the key motivating factors for you to continue as an entrepreneur?

Firstly, I must mention the trust in our products and services by different people who have been a part of the journey, including partners, farmers, mentors, organisations, etc. Secondly, we are encouraged by seeing the impact our product is creating in the lives of farmers and other stakeholders.

What is your experience with investors?

From my experience I can only say that an investor looks into different factors such as team structure, vision of the team, product viability and scalability, etc., while investing. There are different kinds of investors with different motives – profit motive, creating impact, and others. So, our enterprise should fall into those categories that interests and impresses investors.

What are your major learnings from your journey as an entrepreneur?

On an entrepreneurial level, we initially started with individual farmers but realised that the business-to-consumer (B2C) model would be a difficult thing to crack during the initial stage due to trust issues and lack of fund for farmers. So, we decided to approach a community of farmers and warehouse for the same which can then help us connect with individual farmers who are willing and (more importantly) can afford the services. We also learnt that focussing just on impact will limit our scale. So, in order to scale, we have to focus on creating business as well.





**Honouring Ms.Kalyani's startup innovation on world women's day
by the Hon'ble Governor of Maharashtra**

At a personal level, I realised the importance of learning new things (but at the same time, unlearning too) and also the value of collaboration and networking that determine success of an enterprise. Being an emerging young entrepreneur, I feel that it is a good time now to start as there is a lot of energy, enthusiasm and fewer responsibilities on the personal front as compared to starting an enterprise later in life.

What are your future plans?

In the next 2-3 years, we have plans to scale our products and services to earn a revenue of INR 15-20 crore annually from our work with onion farmers. We also have plans to focus on including other crops that have a longer shelf life, such as potatoes.

I am also a committee member of the National Horticulture Mission for onion value chain, subsidy and warehousing. We are discussing about getting subsidy for our IoT device for farmers, and also pushing our devices into the government warehouses.

What words of wisdom would you like to share with budding entrepreneurs?

From my experience, I can say that budding entrepreneurs should have clarity in their mind regarding the business proposition. For instance, does the problem you are trying to solve actually exist, and who is your target audience, as well as financiers and mentors who can support you. Starting at an early age really helps. But they should have clear ideas on the finances needed and mentors who can actually provide support.





05

Besties and Business: The 'FROOTS' Approach to Food Safety

"Welcome every aspect of entrepreneurship, no matter how small, as each task plays a vital role in constructing a strong and resilient company. Think big but do not hesitate to start small, modest beginnings form the bedrock of enduring triumph".

Shefali and Shefalika

Co-founders
Froots Technologies Private
Limited, Mumbai

Bhuvana N and Ditty Maria Dominic interview best friends-turned-cofounders of FROOTS Technologies Private Limited, an emerging agri-tech startup in the domain of quality and food safety. Excerpts from their insightful conversation follow.

FROOTS – Food with Good Roots is driven by a passion to tackle global food safety and quality concerns. We strongly believe that "Eating Right" is only possible by "Selling Right" and "Growing Right". Our constant endeavour is to incentivize the farmer to "Grow Right". Quality backed price discovery is a fair way to incentivize the grower. Our goal is to digitize quality management practices across the value chain, harnessing digital advancements to ensure top quality, safe, and traceable products. FROOTS envisions a world where everyone enjoys access to high-quality safe food. Froots with good roots can be accessed at <http://agriq.ai> ; Facebook; LinkedIn; Instagram.

Could you tell us about yourself?

Shefalika: Shefali and I have been close friends for 25 years. We were batchmates at G. B. Pant University of Agriculture and Technology (GBPUAT) studying B.Sc. in Agriculture during 1997-2001. Our shared passion for agriculture drove us to explore different paths after graduation. After completing this degree, I pursued PGDM at Symbiosis Institute of Management Studies, Pune. I then gained experience in start-ups, business strategy, corporate finance, valuation, modeling, and strategic planning, working across diverse industries like agriculture, fintech, insurance and commercial finance. I worked with multiple hustler start-ups as well as established organizations like GE Capital, Bharti AXA Life Insurance, and ICRISAT, to name a few. My love for agriculture got me back to starting Froots with Shefali.





UNLEASH THE GOLD !

Shefali: I graduated with a B.Sc. in Agriculture from GBPUAT. I then pursued a Master's in Horticulture at Punjab Agriculture University, Ludhiana, and then completed an MBA in Agri Extension Management at MANAGE, Hyderabad. Following my education, I embarked on a career in the banking industry, starting with ICICI Bank. In the rural agri-business sector, I worked on programs involving farmer financing, food processors, fisheries, poultry, and oil millers, addressing their working capital and trade requirements. During this time, we focused on simplifying working capital finance processes. My journey at ICICI Bank included roles in the International Banking Group, where I dealt with lending to Special Economic Zones (SEZ) and corporates. Later, I transitioned to the Corporate Banking Group, specializing in corporate finance. It was after this experience that Shefalika and I joined forces to launch our venture, FROOTS – Food with Good Roots.

What inspired you to start FROOTS and how did it begin?

Food safety and poor food quality are a growing concern worldwide. Being agriculture graduates, we were always concerned about the safety of food. Quality has mostly been

assessed based on physical parameters like size, shape, color, feel, touch, and smell. Internal quality parameters are often ignored. As parents, we were concerned about what we were offering our family to eat! Being close friends, we would share our thoughts on the kind of toxic chemicals and additives ingested with the food we consumed. Many of these chemicals are carcinogenic and have a slow poisonous effect on our bodies. At the same time, being agriculture graduates, we understood the challenges faced at the ground level in ensuring safe food for consumers. Growers and small-scale processors face economic crises and adopt poor practices to maximize their yields and income. They have little incentive to practice responsible farming practices. This led us to the idea of working together on a solution that would address food quality issues and at the same time incentivize responsible farming and processing. And that's how FROOTS was born.

**Grow Right
Sell Right
Eat Right**

Creating a digital integrated food quality platform across the value chain

Vision and Mission of 'FROOTS'

FROOTS – food with good roots was born out of a passion for solving quality problems in agriculture and the food industry. Our Vision is of a world where every individual has access to the best quality of safe food. We are on a mission to create a digital food quality management platform for various food business partners to ensure that they have the right supplier, the right product, and uncompromising quality at the best price possible. We wish to create a world where food safety meets innovation by digitalizing the processes to produce high standard quality products. This will lead to cost optimization, better price realization, maximize production area, and access to premium market. The buyer in turn gains access to safe and traceable good food with maximum transparency.

What is the key product of FROOTS for the groundnut quality management solution?

Currently, we are developing a computer vision-based, AI-powered Quality Management

Solution for the groundnut value chain. We firmly believe that eating right is only possible when food is grown right. So, it's important to sell right and grow right. Incentivizing growers and building scalable, adoptable technology solutions are crucial steps in aligning all parameters to ensure consumers have access to safe and nutritious food. Recognizing the importance of promoting food safety, we emphasize protecting the interests of both farmers and supply chain stakeholders. This has been a central topic in our discussions.

Within the groundnut value chain, we focus not only on the physical quality of food but also on internal quality parameters. While many associate qualities with the appearance of food, we understand that food safety goes beyond looks, especially given the growing interest in healthy eating. FROOTS was established to address these issues and create a more secure and healthy food supply chain.



'EyePhy' Device/'EyePhy' Mobile Application



Currently, we are working on a quality management solution for groundnut targeting farmers, processors, importers, exporters, and bulk domestic buyers. The solution, cloud-enabled and based on computer vision and spectroscopy, conducts physical and intrinsic quality testing of groundnut. This ensures a consistent supply of groundnut based on their specifications from a network of verified farms and primary processors, through digital tracking, monitoring, with faster onsite validation and testing of quality at source. It will result in lower rejections and higher price realization for sellers, while reducing the burden of operationally intense and cumbersome quality control and inspection, to ensure optimal quality. The solution can be aligned with regulatory standards for food safety and quality, enabling it to set base prices of agri-produce (linked to quality) for better price discovery, preventing price exploitation of farmers.

What challenges have you encountered in the value chain of agriculture that you wish to address?

The key challenge in the agriculture value chain revolves around the quality assessment of produce at each stage. At every step, the quality of produce is tested by the buyer, and based on that grading and sorting is done to arrive at a specification to determine the price. Traditionally, the physical quality of agricultural produce is estimated manually through sampling process which has limitations quality assessment. Manual quality assessment is time-consuming and susceptible to errors due to human dependency. Given the substantial volume of agricultural produce received at various points in the value chain, including in mandis, and at the buyer and exporter end, conducting manual quality tests becomes practically difficult to ensure the quality of the entire batch. Additionally, stakeholders rely on laboratory testing for internal quality parameters, but this process is time consuming. The delay in obtaining results

becomes problematic, especially considering the high price volatility in the agricultural market, as prices may have changed by the time the results are available. The absence of real-time, on-site quality assessment poses challenges for sellers (farmers/processors) as they lose bargaining power when unable to judge the produce's quality firsthand. Trust and transparency in the value chain are further compromised due to these issues. Therefore, addressing the limitations in quality assessment methods and implementing more efficient, timely, and transparent processes is crucial for organizations operating within the agriculture value chain, which we are trying to do.

Why was your focus on groundnut and aflatoxin?

To give you a timeline, we initiated our project in 2019. Initially, we had a broad concept focusing on internal quality management in salads, smoothies, exotic fruits and vegetables, nuts, and honey. However, as we delved deeper into the project, we realized the need to tackle quality issues in one crop at a time owing to the diverse nature of crops and their critical quality parameters. Consequently, we decided to narrow down our scope to a specific crop to begin with. Shefali and I decided to focus on groundnut after conducting thorough research, meeting with potential buyers, and networking extensively.

Groundnut is one of the fastest moving commodities with huge potential gap, both in the export and domestic markets. We engaged with various buyers within the value chain, which revealed common problems. One prevalent issue was inconsistent supply and lower fill rates at the buyer's end. Buyers expressed frustration, stating that they received a wide range of quality, of which around 80% to 85%, did not meet their specifications, leading to rejections. Another challenge identified was the importance of adhering to critical quality parameters. Buyers



found it necessary to invest in quality control, inspection, and assurance to ensure they purchase and sell the right products. As we gradually delved into our work, we initially focused on groundnut due to extensive interactions with groundnut buyers. However, a growing concern arose regarding aflatoxin contamination.

Aflatoxin, a fungal-born mycotoxin, posed a significant issue for exporters. Many countries enforced strict food safety mandates, rejecting materials if aflatoxin exceeded permissible limits. The rejected material often found its way into the Indian market, including high-end processors and even animal feed. Aflatoxin has been categorized as a Group 'A' carcinogen by the World Health Organization and poses severe health risks, including a high risk of liver

cancer (accounting for one in four liver cancer cases). This contamination wasn't limited to groundnuts; it extended to maize, red chillies, spices, various tree nuts, milk, poultry, and dairy products, directly and indirectly impacting hundreds of value chains. To deeply understand this issue, we approached organizations like the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and Food Safety and Standards Authority of India (FSSAI), focusing on food safety regulations to protect India. While global food safety is important, we believed that addressing it at home should be the starting point. Studies revealing that Indians consumed aflatoxin levels 40 times higher than permissible limits[1] further underscored the need for action and deepened our concern.



Visit to ICRISAT, Hyderabad



Our conversations with buyers, exporters, and high-end processors only reinforced the urgency of containing aflatoxin, as rejected consignments proved costly. Discussing export statistics, out of groundnut's \$1.8 billion export potential, we could only export \$0.6 billion due to quality-related challenges, highlighting the compelling case for controlling and preventing aflatoxin across all value chains. Our focus began with groundnut. To tackle this issue comprehensively, we identified four key aspects within the value chain: testing,

monitoring, prevention, and control. Our goal is to prove aflatoxin presence through testing, track its occurrence across the value chain through monitoring, implement preventive measures, and control its spread. At FROOTS, we initially prioritized testing and agricultural intervention, recognizing that aflatoxin can contaminate crops both pre-harvest and post-harvest. Our objective is to prevent and control aflatoxin contamination across the entire value chain. That's how FROOTS – Food with Good Roots in its current avatar was born.



Quality check

What is the range of products offered by FROOTS?

FROOTS is working on an integrated quality management solution including on site testing tools, machine learning (ML) and cloud-based software applications which give actionable alerts and insights supported by a comprehensive decision support platform. We operate in two modes – Quality Assaying and Total Quality Assurance.

For Quality Assaying, our imaging-based app "EyePhy" helps in rapid, automated and more frequent onsite quality evaluation. By capturing images of groundnut samples and processing them instantly, the solution empowers stakeholders to make rapid purchase and control decisions. The results can be viewed on a mobile and web platform. We are in pilot testing mode for this product and expecting its commercial release in the next quarter.



'EyePhy' device

For Total Quality Assurance, we have an integrated platform "AgriQ". We take the buyer's specifications back to the clusters on the ground. www.AgriQ.ai is a platform for registered buyers and sellers with the ultimate aim of demand-driven production. We work with a cluster of verified farmer groups and processors to ensure that we produce right, as per the buyer's required parameters. We have defined and outlined various on-farm,



at-processing, and in-storage processes which are rigorously followed and executed on the ground to get the right quality of groundnuts. We focus on critical internal quality parameters like Aflatoxin and moisture apart from grading as per physical quality parameters.

We have started working with three clusters on the ground and will soon go live with our digital tracking and monitoring of these operations. Online tools on the platform support easier quality control and inspection.



'EyePhy' mobile application

How do these products address clients' needs?

Our innovative solutions empower both bulk buyers and sellers in the agricultural sector by providing tools and platforms that streamline processes, enhance quality assurance, and foster a more transparent and demand-responsive supply chain.

The "EyePhy" app enables buyers to make rapid and informed decisions through automated onsite quality evaluation. The quick processing of groundnut samples and instant results empower buyers to act promptly in the purchasing process. The integrated platform "AgriQ" provides buyers with enhanced control over the quality of the agricultural products



they are sourcing. The ability to communicate specifications directly to clusters on the ground ensures that products meet required parameters.

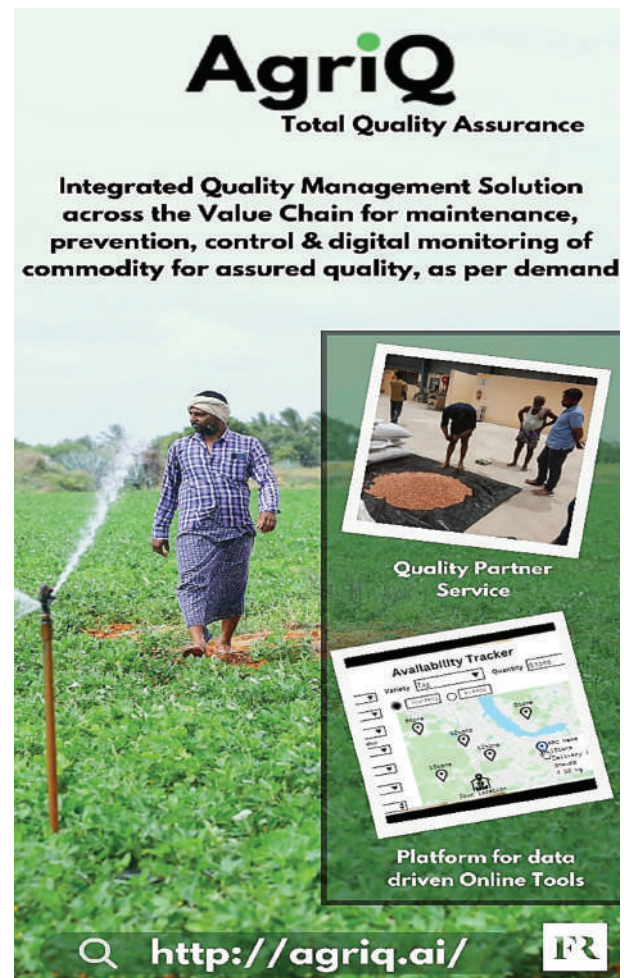
The “AgriQ” platform aligns the production process with the specific needs and specifications of buyers, for more efficient and targeted production practices. The forthcoming digital tracking and monitoring capabilities promise transparency and accountability in the supply chain. Buyers can track the entire process from on-farm activities to processing and storage, ensuring adherence to quality standards.

On the other hand, sellers registered on the “AgriQ” platform gain access to a wider market through its network of verified credible and fair buyers. The integrated approach enhances the credibility of sellers as they adhere to defined quality parameters. For sellers, the processes in “AgriQ” facilitate efficient on-farm, at-processing, and in-storage operations. This efficiency ensures that the right quality of groundnuts is produced, meeting both internal and buyer-specific quality parameters. The comprehensive decision support platform, supported by machine learning and actionable alerts, aids sellers in mitigating risks related to quality assurance. Early identification of potential issues allows for timely corrective actions. The digital tracking and monitoring system brings transparency to on the ground operations, allowing sellers to showcase their commitment to quality. This transparency can enhance trust and strengthen relationships with buyers.

What kind of prevention and control measures did FROOTS provide to groundnut farm and processing centers?

Rooted deep in our philosophy is our commitment to accessibility, whether its good food or innovative technology. While global solutions come with hefty price tags ranging from Rs 3-9 lakhs, we are focused on spatial and spectral imaging, making solutions

not only cutting-edge but also much more affordable. The solution combines cutting-edge technologies such as computer vision, ML, Near-Infrared Spectroscopy (NIRS), and cloud computing. Unlike traditional testing methods that often require destructive sampling, the proposed solution enables non-destructive testing.

The banner features the AgriQ logo at the top, followed by the tagline 'Total Quality Assurance'. Below this, a bold statement reads: 'Integrated Quality Management Solution across the Value Chain for maintenance, prevention, control & digital monitoring of commodity for assured quality, as per demand'. The central image shows a farmer in a blue checkered shirt and a white headscarf walking through a green field with a drip irrigation system. To the right, there are two inset images: one showing people in a processing facility and another showing a smartphone screen with the 'Availability Tracker' app. The app interface includes a map, a list of locations, and a table with columns for 'Variety', 'Quantity', and 'Status'. At the bottom of the banner, the website 'http://agriq.ai/' is displayed next to a QR code and the FROOTS logo.

AgriQ.ai platform

Cloud-based analysis provides a scalable and efficient platform for processing large volumes of data. It is not just about technological innovation but also about the impact. The solution reduces rejections, optimized resource use, and aligned with circular economy principles. It is not just another tech solution, it is a catalyst for informed decision-making and on the ground prevention of critical quality parameters like Aflatoxin, touching the lives of farmers, buyers, and everyone in the global agricultural ecosystem.

By combining visual information from computer vision with spectral data from

NIRS, there is a more comprehensive, robust, accurate assessment of groundnut quality. The development of a user-friendly app interface allows buyers to access quality information remotely, enabling faster purchase decisions. The solution can be aligned with regulatory standards for food safety and quality and be utilized to set base prices of agri-produce (linked to quality) for better price discovery, to prevent price exploitation of farmers. Research suggests that more than 90% of contamination can be prevented and controlled at the farm level (pre-harvest). Hence, we are working across value chains with a focus on prevention and control along with testing and monitoring, preventing huge health and economic hazards. The solution aligns with circular economy principles by reducing rejections, optimizing resource use, and enhancing the value chain of groundnut through informed decision making and Aflatoxin prevention and control throughout value chain by rigorous tracking and risk based actionable alerts.

Did you encounter challenges/risks during operationalization? If so, how did you mitigate them?

Yes, we did have challenges. Data variability is a big challenge owing to factors like location, climate, storage conditions, and agricultural practices, making it important to consider diverse datasets to build and train accurate machine learning models. Rigorous calibration procedures with a wide range of samples from different geographies and continuous validation and reinforcement are critical.

Another significant challenge has been convincing stakeholders to understand the importance of closing the loop across the value chain. We must check every link in this chain to ensure quality control, especially when dealing with issues like Aflatoxin prevention. This comprehensive approach is crucial. Convincing stakeholders, including farmers and processing centers to embrace behavior change within the agricultural sector has been critical and is often underestimated.



Field work at primary processing units

Additionally, addressing the issue of rejected produce is vital. The agriculture sector rejects a significant portion of its produce, and there's a need for alternative plans and support from the government to address this problem. Proper incentives and support for farmers and processors can encourage better practices and motivate them to "Grow Right".

Tell us about your engagement with farmers. We are very selective about our collaborations

and partnerships. Since we can't do everything from technology development to agriculture, business, and fieldwork ourselves, we identified key agricultural clusters and assessed how to gain entry and resources for their enablement. We build connections with on the ground executing agencies, as they need market linkages, financing options, and business guidance to work towards quality produce.





Farmer's meet at Prakasam district of Andhra Pradesh and Junagadh district of Gujarat

We've realized the importance of local contacts, as language and trust are critical. We try to learn a few local words, but it's our local connections, NGOs, influencers, and our execution partners like Synergy Technofin and Rythu Sadhikara Samstha (RySS) who help us on the ground. Through incubators like AgHub

and FASAL we gained access to support from agriculture universities like Dr. Panjabrao Deshmukh Krishi Vidyapeeth (PDKV), Akola and Professor Jayashankar Telangana State Agricultural University (PJTSAU), Hyderabad. Without local collaboration, nothing can be achieved in agriculture at the field level.



Engagement with farmers at field works

How did individuals, particularly men, respond when you as women sought collaborations and engaged in fieldwork?

Well, it wasn't always smooth sailing. During a market visit, a trader seemed surprised that only two women had come without male counterparts. However, as we engaged with them and proved ourselves by supplying

groundnuts, they gradually became more accepting and open to discussing quality standards. We even heard comments like, "Aren't there any men in your company?" The agribusiness sector can be quite male-dominated, but we're seeing changes. People are acknowledging our capabilities as we take on responsibilities and deliver results.



While gender bias and resistance to female leadership still exist, our assertiveness and competence are helping break down these barriers.

Women are highly empathetic and amazing multi-taskers. Both are very critical qualities to

pin point the exact problem of stakeholders and then working in a focused manner on solving the issue. Especially in our field where technology adoption needs behavior change at the farm level, women can be great change leaders!



Our Women farmers

How do digital innovations, including your technologies, benefit women in agriculture?

Being a passionate agriculture graduates, we have been trying to solve consistent quality supply issues in agriculture value chains by developing scalable and adoptable testing and monitoring technologies at farms

and processing centres. It's been a double challenge, one being a woman in agriculture, and two talking in the language of technology to solve business issues.

In Indian farming, women have been doing most of the labor on farms and yet have little say in business matters (financial transactions involving produce buying and selling).



Women at farm activities



We have developed a computer vision-based, cloud-enabled solution for quality testing and linked it to the base price which can be demanded for that produce. This will help our fellow ladies in the farm command incentives for growing right!

Well, when it comes to digital innovations in general, we believe they should be kept simple and not be too technical for easy adoption on the ground. Making them too technical can hinder their acceptance. We're working on a solution that's as straightforward as taking a photo and getting results. Users can cross-verify it at random intervals through labs or other means. Simplifying digital innovations is essential from a user perspective. Lately, women have been adapting quite well to digital technology. We once met a young and enthusiastic lady overseeing five villages where

groundnut is grown. She used a smartphone with an app to capture information about crop production stages and various climatic factors like rainfall and humidity. Women like her, who serve as community guides, are quite proficient with digital tools. At the farm level in Prakasam, we're working with women's Self-Help Groups (SHGs) involved in natural farming. They have trainers who help them adopt natural farming practices. Women play a crucial role in daily farm operations, even though they may not always make the final decisions. It's great to see women taking the lead in farming operations. For example, in Ananthapur, many women who are into the roles of agriculture leads Self Help Groups (SHGs). They are open to adopting new technologies because they understand the importance of saving time and effort.



Sorting and Grading

Having learned about your agri-tech journey, we are curious to understand how 'you' developed expertise in creating a technology-based groundnut quality testing solution?

When we look back to our journey, it involved several skills sets and technical proficiency. We've harnessed these skills through a combination of education, professional experience, and mentorship. I (Shefalika) have a strong background in finance and strategy. Additionally, my involvement with startups allowed me to understand the intricacies of the startup ecosystem and its financial aspects. On

the other hand, Shefali's background is deeply rooted in agriculture and she has significant exposure to agribusiness management which was honed through evaluating small and medium enterprises for lending purposes. This background is instrumental in understanding the agricultural aspect of our venture.

Regarding the technology aspect, we leaned on mentors and advisors who had expertise in areas like imaging, AI, ML, and computer vision. For instance, we work closely with an advisor with 30+ years of experience in imaging, which aligns with our computer



vision-based solution. Their guidance helped us understand and implement these crucial technological components and navigate the technical challenges. In our core solution, computer vision is the key enabler. We comprehend the scientific intricacies of what we aim to detect, such as aflatoxin, and understand the pathology aspects and responses of pathogens. This scientific grounding is vital for developing our solution effectively. To say, our skill set development has been a combination of formal education, corporate experience, and the invaluable guidance of mentors and advisors who have helped us navigate the intricacies of both the business and technology aspects of our venture.

Given your experiences in the groundnut value chain both in the field and lab, tell us about your team and the specific roles each member plays.

Sure, we are a small team of passionate hustlers. Shefali and I have distinct but complementary roles. Shefali handles sales, operations and agribusiness aspects, while I oversee strategy, finance, tech and products. Shefali is known for her consistency and discipline, driving us forward, while I tend to be more of a motivator. So, not only do our skills complement each other, but our behavioral dynamics work well too.

We have a sales and marketing office in Mumbai led by a very experienced professional. In Mumbai, we promote value-added products from our clusters, through stalls in banks, showcasing their uniqueness and fostering direct connections between Farmer Producer Organizations (FPOs) and consumers.

We're operating in clusters in Andhra Pradesh, Maharashtra and Gujarat with our strong on the ground partners. Our technology team in Pune is skilled in AI and ML, imaging and DevOps. We are actively considering expanding opportunities in the future.

Could you elaborate on how you identified mentors and the role of incubation centers in your journey?

Incubators and accelerators have played a pivotal role in shaping our journey. Our incubation journey began in 2019 at the Atal Incubation Centre – Rambhau Mhalgi Prabodhini, Mumbai, when we were working on salads and veggies. They facilitated our participation in the Stanford Seed Program which helped us sharpen our business model and build focus.

More recently, we initiated a collaboration with the AgHub Incubation Center in Hyderabad, which has proven to be an indispensable support system in our journey. It is here that our product was fine-tuned, with AgHub offering not just guidance and mentorship but also access to a unique one-to-one mentorship program. Working closely with AgHub's experts, particularly Dr. Kalpana Sastry, Managing Director and Mr. Vijay Nadiminti, CEO, AgHub & Director, who bring extensive experience and industry connections in agriculture, has been invaluable. Their mentorship has provided us with profound insights into the intricacies of agriculture and the integration of technology.



'FROOTS' with incubator team of NaaVic-Agri-business Incubation Centre (R-ABI) at ICAR-NIVEDI



ICAR-National Institute of Veterinary Epidemiology and Disease Informatics' NaaViC, Agri-Business Incubation Centre (NaaViC), Bangalore helped us secure funding under Rashtriya Krishi Vikas Yojana (RKVY-RAFTAAR). This grant has helped us build our prototype and be ready for pilot testing with prospective buyers.

We have been a part of FASAL, a Centre of Entrepreneurship (CoE) for IoT in Agriculture established by STPI (under the Ministry of Electronics and Information Technology, Govt.

of India) at Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. Their unwavering guidance and mentorship received from Software Technology Parks of India (STPI) and the CoE FASAL team's support has not only streamlined our approach but also fueled our confidence in bringing our innovative solution to the market. FASAL's support extended beyond advice, they've facilitated our access to specialized lab instruments and equipment apart from funding, crucial for the development and testing of our solution.



Selection for ESC-STPI Start-Up initiative 2022

ICAR-Indian Agricultural Research Institute (IARI), Pusa Krishi has been helping us extend our solution to include the detection and quantification of internal quality parameters. Dr. Akriti Sharma, CEO of Pusa Krishi and a Senior Scientist in Agribusiness Management at IARI has been very supportive in helping us establish ground truth through data validation, before we build and train our models. She is helping us gain access to spectral labs, greatly enhancing our capabilities in detection. Support from IARI grants us access to cutting-edge research and innovation in agriculture, broadening our perspective and connecting us to a network of scientists, technical and imaging experts.

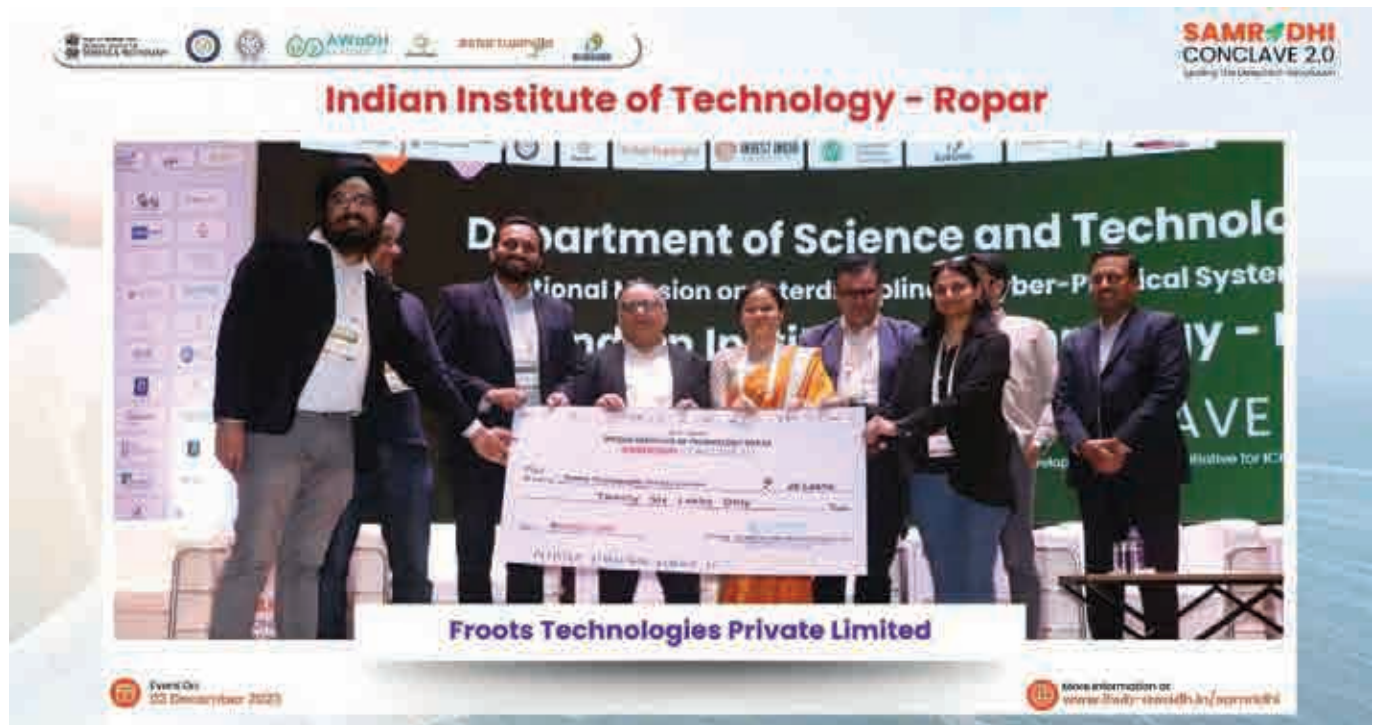
We are thrilled to announce our recent selection to join the cohort under Samridhi 2.0. This accelerator program is an investment-driven initiative by iHub – AWaDH, a Technology Innovation Hub established by the Department of Science & Technology (DST), Government of India, located at the Indian Institute of Technology, Ropar. This milestone marks a significant step in our journey and we are eagerly anticipating the acceleration of our progress as we gear up for the commercial scaling of our product.

Our collaboration with mentors and advisors from diverse backgrounds has been enriching. Our imaging specialist advisor has offered



crucial insights into feature extraction, annotations, and the deployment of cloud-based technology, aligning seamlessly with our computer vision-based solution. Simultaneously, mentors specializing in front-end development and user interface design have played a vital role in crafting a

user-friendly presentation of our solution, a pivotal factor in its adoption by end-users. This support and guidance have helped us seamlessly enable the agri value chain with simple, adoptable technology solutions on the ground.



Selection at DST-NM-ICPS Samridhi Conclave 2.0 at IIT Ropar

What are your future plans?

As Patrick Collison says, "Most tech companies are building cars. Stripe is building roads". Similarly, we at Fruits are building an Agritech Quality Management Solution that aims to provide all APIs relevant for quality assaying, control, and inspection. These can integrate with various platforms providing Quality Assurance to all buyers and sellers. As discussed earlier, since April 2023 we have been focusing on a cloud-enabled, ML-powered, rapid, non-destructive solution for onsite physical and internal quality testing in groundnut. These are being pilot tested with a few bulk buyers and processors, enabling larger data collection to improve model accuracy. Based on this, we need to work on model reinforcement training.

We are in talks with mandis and regulatory bodies to align the solution with regulatory standards for food safety and quality and

utilize it to set base prices of agri-produce (linked to quality) to prevent price exploitation of farmers.

The quality testing mechanism/kit can also be easily adapted to other produce beyond groundnuts such as maize, red chillies, tree nuts and spices, which are impacted by aflatoxin. We plan to extend the same imaging technology with diffraction grating, wavelength identification, and associated responses to other contaminants like pesticides, adulterants, and other toxins.

While we have a larger funding round in mind, we understand the importance of demonstrating the product's viability first. Therefore, our immediate focus is on securing minimal funds to sustain operations until we can showcase the product's effectiveness and generate revenue through pilots. Our goal is to gradually to expand our reach and impact.



What opportunities do agricultural graduates have in the present job market?

Agricultural graduates today have a range of opportunities, particularly in agribusiness startups and companies. Many of these companies are actively hiring graduates from agricultural universities and MBA programs. They offer roles beyond traditional research and development, expanding into areas related to agribusiness management and innovation.

Furthermore, there's a trend of agricultural universities (such as PJTSAU, Hyderabad) collaborating with tech incubators to provide internship and project opportunities to students, which gives them practical experience while also exposing them to corporate work environments and innovative projects. The idea is to encourage universities to adopt models similar to IITs, where students actively engage in projects and entrepreneurship, fostering an entrepreneurial mindset among agricultural graduates. Lastly, there's a misconception that agricultural professionals cannot work in agritech and develop technology. Technology is a tool, and individuals can acquire tech skills and knowledge to develop agriculture. In fact,

those with agricultural backgrounds often have a better understanding of the practical implications of technology in the field.



Interns of B.Sc. (Agriculture) from Best University

What advice do you have for aspiring women entrepreneurs?

Shefali: I would like to emphasize that no work is small when you're starting your own business. Be prepared to take on any task, whether it's accounting, soil testing, or hands-on work like setting up hydroponic farms. Every experience counts and contributes to building a strong company in the long run.

Shefalika: It's crucial to start without thinking that your initial steps are too small. Small beginnings are where every successful venture starts and growth comes with time. Avoid procrastination and start with whatever resources are available, continually evolving and building upon your foundation as you progress.



Digitally Enabled Enterprises



06

Journey Of An Agripreneur: In Conversation With Nalini Murthy

"Women in business must be competent and smart in this time-constrained world which is full of opportunities. Aiding them are a plethora of digital tools to establish and sustain businesses. Starting an enterprise broadened my vision and knowledge and gave me greater confidence to face the world"

Nalini Murthy

Director,
FarmFreshBangalore
www.farmfreshbangalore.com

Bhuvana N, speaks to emerging woman entrepreneur Nalini Murthy from Bangalore to understand her journey as an entrepreneur and how digital innovations help her sustain her business. Excerpts from the interview follow.

FarmFreshBangalore.com is a Customer-Supported Agricultural (CSA) social enterprise connecting farmers and consumers to provide nutrition-rich, natural farm produce to consumers and ensure sustainable and fair income to small and marginal farmers. The company has more than 2000 active customers, over 350 farmers, 12,000 subscribers, and an annual turnover of ₹ 1.2 crores.

What inspired you to become an agripreneur? Can you tell me about your background?

Agripreneurship was not my cup of tea until I met Mrs. Radha Desikan Eswar, founder of Fractal Entrepreneurship (<https://fractalentrepreneurship.org>) in 2012. I had never given it a thought or imagined I would set up FarmFreshBangalore.Com one day. The motivation from her and incubation at Fractal Foundation resulted in what I am today!

Having been born into a farmer's family, I was very interested in agriculture and farmers since childhood. As a natural corollary, I decided to pursue a career in agriculture following a Bachelor's degree in Agriculture (2001) and a Master's degree in Agricultural Extension from Tamil Nadu Agricultural University (TNAU), Coimbatore (2004). Though the education equipped me with scientific knowledge and information on agriculture practices, my desire to learn more about agriculture development and reach farmers with a reliable solution to their problems was unmet. I was always exploring opportunities to serve the farming community.



The year 2004 proved to be a turning point. That year, the coastal agricultural lands of Tamil Nadu were badly affected by a Tsunami. Sea water had entered and stagnated in agricultural land for more than seven days. The salinity of the land increased, rendering it unsuitable for cultivation. This allowed me to work as a volunteer in one of the rehabilitation projects on the 100-acre Kuzhunji farm developed by Dr. Nammazhvar, a pioneer of the organic movement in Tamil Nadu. The land was developed into a green healthy forest without using chemical fertilizers or pesticides. It was very surprising for me at that time. While my college education had taught me the use of chemical fertilizers, here was an instance where a crop could be grown without any chemicals. I began to visualize a very different and safe world.

After that, I worked at several non-government organizations such as PREPARE (an NGO working on Tsunami Rehabilitation); ADRA – International (rehabilitation); AME Foundation, Bangalore; and ARTYPlantz, Bangalore, which works in the areas of natural farming, organic agriculture, sustainable agriculture, and biodynamics. I worked as a columnist on urban farming for The New Indian Express for two years. The experience I gained in Organic Terrace Gardening (OTG) under Dr. Viswanath Kadur also spurred my interest in chemical-free, poison-free food production and the possibilities through organic practices.

How did you come across Fractal Entrepreneurship Foundation and how was your journey?

In 2012, I was a new mother looking for a job. Mrs. Eswar of Fractal Entrepreneurship came across my profile on a jobhunting site and offered me a job where I could take my child to work. This new opportunity made me realize how the world had progressed. I soon joined Fractal Entrepreneurship Foundation and worked with her on several pilot projects. I had a passion but not a business idea. At work, her

constant mentoring turned my passion into a sustainable business idea. The Foundation incubates individuals like me who dream of making a difference in society through sustainable practices that are not detrimental to nature. They impart incubates with business, technical, communication, and social skills and enable innovation and strategic thinking. These skills vastly boosted my entrepreneurial spirit.

During the process of incubation, the idea of FarmFreshBangalore.Com emerged, and it was incubated at Fractal Entrepreneurship Foundation based in Bangalore. In 2018, it started working as a separate entity. Other similar startups like Urban Mali Network (urban gardens without chemicals), Sampoorana Ahara (healthy food incubator), and Horticultural Therapy (palliative care to patients) emerged under the same mentorship and are connected. Mrs. Eswar imbibed in us the values of social enterprise and work towards developing equal opportunities for all and promoting horizontal growth rather than vertical growth. We meet every first Saturday of the month to exchange new ideas, views, strategies, and resources to develop startups. For instance, FarmFreshBangalore.Com and Sampoorana Ahara share business premises and also a customer base.

How did you come up with the idea for your business, and what issues does it address?

My experience working with development organizations and conducting farmer training programs made me realize the two sides of the divide that need to come together. While farmers know what they are doing and have to do and have enough knowledge about cultivation practices, on the other side are consumers who need good and safe food and are ready to pay for it, irrespective of the price of the produce. But this gap is not being narrowed. There are several hurdles in the way farmer's produce reaches the consumer's



basket. This made us realize that farmers are really in need of market support for their produce. Farmers face two crucial challenges – marketing and getting the right price for their produce. This was the idea behind setting up FarmFreshBangalore.com.

Walk us through the process of launching your business and the biggest challenges you faced.

The journey of FarmFreshBangalore.Com is not as simple as it looks. My first challenge as an aspiring entrepreneur was how to transform my idea into a form. While we may have a dream, how to turn it into reality often befuddles us. Incubation centres and mentors like Mrs. Eswar provide support in turning ideas into an enterprise.

The second challenge is identifying the source of investment. There are innumerable financial opportunities for startups today. But, getting an initial investment is highly challenging. So, initially, I invested my own money, through

my savings, and pledged jewellery and some assets. We slowly began earning money which was enough to meet our expenses. When there was a sustained cash flow, we obtained a ₹ 10 lakh MUDRA cash credit loan from a bank in December 2021. But all has not been smooth sailing. There have been critical financial situations when our customers helped us out by obtaining annual subscriptions and connecting their friends to subscribe. In that sense, it would be right to call ours a customer-supported enterprise.

How did you go about expanding the business?

It all started with being a one-woman show—identifying customers and organic farmers, deciding on the price for the produce both on the supply and demand sides, budgeting, procuring the produce, cleaning, grading, packing, and delivery. Though it was quite stressful, I planned every activity and mapped ways to identify both producers and consumers.



Meeting with farmer groups

I adopted a participatory approach in villages to identify farmers, interacting with individuals and groups of farmers and explaining to them the initiative, its benefits, and steps to join the enterprise. It was quite a challenge

identifying farmers who are purely into organic farming with certification to produce crops; that's where my extension lessons, skills, support from the Department of Horticulture and Indian Institute of Horticulture Research



came in handy. Once the farmers were convinced and a certain amount of trust was established towards FarmFreshBangalore. Com on the assured market price (10-15% more than the conventional market price), the business started to take shape. While we used local transport to procure the produce from farmers, public transportation proved to be commercially viable and cheap for growing startups like us.

Until the enterprise made some profits it was highly challenging. Being a woman there were also challenges from the family, having to prove myself and the worth of the enterprise and its future. As the business became sustainable, I gained support from everybody.

How did you identify your potential customers?

Following the confirmation from producers to supply produce, the consumers are identified using social media sites such as

Facebook (farmfreshbangalore)
Instagram (farmfreshbangalore)

YouTube (farmfreshbangalore2520)

LinkedIn (nalinimurthy)

WhatsApp groups; through acquaintances and word of mouth.

Every internet source meant for communication was explored for advertising and popularizing the enterprise with a variety of offers and freebies. This helped us increase our clients. Word of mouth and feedback from customers on social media sites brought FarmFreshBangalore.Com recognition and widened our customer network.

As we deal with perishables, it is highly important to procure, sort, and supply the produce on the same day to customers. We don't have a cold storage facility. It is more like farm to fork but we facilitate and add value by procuring the produce from farmers, cleaning, sorting, grading it, making customized nutrition balanced baskets based on dietary recommendations, and delivering the same at the consumer's doorstep in an easily storable way.



Farmers supplying to farmfreshbangalore.com

Where does your farm produce come from?

About 80% of the vegetables are procured from Bangalore and its vicinity (within a 40 km radius). The fruits and other specific products are procured from other states, for instance, avocado from Kodaikanal, spices from Kerala, apples from Shimla, and grapes from Nashik.

Farmers in these states are identified through

the organic farmers' forum web page or from the website of the Horticulture Department. The list of farmers certified as organic producers within and outside the state is available on the website. For instance, from the 1000 farmers registered under the organic farmers' forum, we contacted at least 300 active farmers and tried to get the produce



with an assured income to producers and at the same time pricing the produce affordably for consumers. We are expanding our network and reaching consumers through research, word of mouth, acquaintances, networking on various platforms, conclaves, seminars, workshops, conferences, buyer-seller meets, etc.

What are the main consumer challenges FarmFreshBangalore.Com is addressing?

FarmFreshBangalore.Com mainly addresses three challenges – the low availability of nutritious food for consumers, the lack of marketing support to farmers, and the limited business or employment opportunities for agriculture graduates and diploma holders.

We observed that in general there is no practice of consuming recommended quantities of fruits, vegetables, and greens even though people are aware of how their inadequate consumption can lead to poor health and lifestyle diseases.

To address this first challenge, we designed economic nutrition packages. Our target customers are urban dwellers in cities like Bangalore. We sensitize them on eating healthy and poison-free food by providing whole food plant-based nutrition packages, recommended by doctors. For this, we teamed up with Dr. Achyutyan Eswar, founder of Sampoorana Ahara, Bangalore. Under his guidance, we researched the nutritional requirements for an individual/family (all age groups) and what could be supplied through plant-based nutrition packages. Based on this, we customized the nutrition basket with the right quantity of fruits, vegetables, and greens that meets their nutritional requirements. For instance, an adult has to consume 400 gms of fruits, 150 gms of vegetables, and 120 gms of greens per day to meet daily nutritional needs. We use our e-commerce platform to market these packages.



Organising farmers' produce for delivery to consumers

The second challenge of ensuring a sustainable income for farmers is mainly addressed by empowering them to produce what consumers need. This is where our tailor-made subscription model plays a role. For instance, if I have 1000 subscribers, we communicate this demand in advance to farmers for them to produce the required quantity. Hence, farmers provide us with the required quantity of produce, supporting us in minimal customization (organic and diversified crop production) of produce. This reduces the farmer's stress of having to take produce to a market; so, they can concentrate on the production.

We believe that adopting good farming practices to produce premium quality produce will get a premium price for the produce. We pay a fixed price to farmers and make sure that a minimum of 50-60% of what the customer pays goes to them. Money is needed to maintain the enterprise and pay for staff salaries. The subscription model aids farmers in need-based production which encourages sustainable income and reduces market stress. This is a major issue to be addressed in agriculture.



To address the third challenge, we created fractals, which are like franchises. They work in the same subscription model at different locations in the city. Each fractal can be created and run by agriculture graduates, thereby generating business and employment opportunities.

How are the prices for the produce fixed?

The market price, especially for perishables, is not stable. At times it becomes highly challenging to convince farmers of the price. So, we analyzed 15 years' data from IIHR, Bengaluru, HOPCOMS, Karnataka (daily price updates), and Mandis (weekly price updates). Based on the trend, we fixed a price for each produce at 15-20% more than the conventional market price. We observed that the price of a few perishables reaches the maximum or drops to the minimum at least once each year. Instead of expecting only a high price once a year, we advised farmers to have a sustainable income throughout the year. But again, we don't compel them to sell the produce at the price fixed by us. They can sell their produce at the pre-decided FarmFreshBangalore.Com price and sell the surplus in the market or to other organizations like ours. FarmFreshBangalore.Com also facilitates farmers' sale of produce in the market for a better price.

What are the mechanisms in place to ensure transparency between customers and producers?

To assure customers that they are getting farmer produce that is genuinely organic and grown without any chemicals or fertilizers, their organic certification certificate is uploaded on our website. If a farmer does not have such a certification but is growing crops without applying any chemicals, the farmer has to give us a self-declaration form stating that the crop is produced organically without chemicals/fertilizers/pesticides before,

during, and after crop production. Similarly, farmers can also get the margin we make in the business by tracing the prices quoted for the produce through the website. In short, we make sure that all three — producers, consumers, and FarmFreshBangalore.Com — are in a win-win situation.

What is the frequency of the procurement and delivery of produce?

Procurement and delivery are everyday processes; 365 days a year. Farmers clean, sort, and grade the produce at the farm gate. But, after procurement we repeat the process. Four staff are engaged in produce procurement, cleaning, grading, packing, and delivery.



Preparing Nutritional Baskets

The recommended nutritional baskets are prepared following Dr. Gregor's daily dozen optimal nutrition recommendation for individuals (adult/child/women)/families. We rely on Artificial Intelligence (AI) to generate customized data based on Dr. Gregor's prescription. The nutrition basket is prepared for 52 weeks considering our subscriber's profile. Weekly baskets vary as per the recommendation. Our vegetables are classified into gourds, cruciferous, roots, and pods which are all included in the nutrition baskets, with vegetables under each category varying



each week. So, by the end of the month, our customers would have consumed almost all kinds of vegetables in recommended doses. Some customers ask for the replacement of vegetables.

What is the scale of the enterprise?

My business of one expanded with my husband assisting me. Later we hired two full-time employees for packaging and deliver produce. Now, in addition, we have an accountant, a customer relations manager, and four staff for logistics management.

On the demand side, from a meager 30 subscribers in 2018, we have grown to more than 2,000 active subscribers. At the supply end, initially we procured produce from only three farmers. Later on, we shifted to farmer groups (30-40 farmers) and are now working with farmer producer organizations to meet the increasing demand. Now around 350 farmers are linked with us to market their produce.

Our financial turnover too has grown, from our initial investment of ₹ 10 lakhs and an income of ₹ 14 lakh. Every year at least ₹ 10-15 lakh investment is being added, while the gross income has also doubled. In this financial year, we invested ₹ 50 lakh and earned a gross income of ₹ 96 lakh. Annually, our profits are going up by 10-12%.

What is the unique selling proposition that distinguishes you from your competitors in the industry?

Our unique innovations benefit both consumers and producers in a sustainable way. This differentiates us from other competitors in the business. Our customers benefit via a cost-effective holistic nutrition package, fixed cost irrespective of market fluctuations, and the adoption of digital tools in the business (<https://farmfreshbangalore.com/>), and door delivery of chemical-free fresh fruits and vegetables, saving on time and energy.



Door delivery of Nutrition Basket



What has your biggest success been so far, and how did you achieve it?

For an entrepreneur like me, every passing day, every new subscription, and every new farmer network is a success. In our five-year journey of success, we are now a family of 3,000 active customers, 350 active producer networks, and 6 staff.

To mention a specific case of success, during the COVID-19 period our enterprise tried

hard to meet the demands of urbanites with fresh plant-based nutrition packets though we could not meet the demand. It is also worth mentioning that Farm Fresh has subscribers globally who want us to lend our services to their families in Bangalore. This exposure has allowed me to be a guest speaker at institutions such as MANAGE, Hyderabad, University of Agricultural Sciences- Dharwad to motivate other aspiring entrepreneurs.



From her participation in the All India Agri Startup Convention 2022 held at the University of Horticultural Sciences, Bagalkot where she presented about Farm to Plate model of farmfreshbangalore.com

Together, factors such as our active involvement in social media platforms, mutual networking ability, diligence, quality products and services to producers and customers, trust among the FarmFreshBangalore.Com family (staff/producers/customers), and continuous efforts towards growing have been key to our success.

Can you talk about a failure or setback you've experienced in the business and what you learned from it?

In the first year of the business, the procurement of produce posed a challenge as the company worked with individual farmers spread across a 100 km radius. Transportation and logistics expenses amounted to 25% of

the investment. However, we were able to identify cost-effective public transportation wherever possible. We then adopted a cluster-based model covering 5-20 farmers in each cluster that helped reduce costs. During the summer, procuring greens was difficult due to irrigation problems, but the cluster-based model and cooperation of farmers led to solutions. Staff coordination was another challenge as there were ego issues and a lack of coordination, which we tackled with a humane attitude, clear communication, and a flexible work system to improve coordination. Proper planning and backup funds for emergencies were lacking, resulting in setbacks. The company developed a savings plan and reserved funds for emergencies.

How are digital innovations supporting your business?

Digital innovation has a key role in agri startups or any business for that matter. In our case, our website provides all the information about us, the supply of and demand for organic produce, and our contact details.

Secondly, our social media sites give us much publicity and connect us with more customers within and outside the city.

Thirdly, about 98% of our financial transactions with producers and consumers are through digital payment gateways, online wallets, UPIs, and net banking. We collect cash only when senior citizens fail to use digital tools. We have tied up with Razorpay gateway for secure payment processes.

Fourthly, we have a WhatsApp group of producers, consumers, and incubates of agri startups. These are great platforms to share our product offerings, exchange ideas, views, put forth a new proposal, seek mutual help, etc.

Women find these digital tools safer, with no face-to-face interactions and dealings.

How effective is it to rely on digital tools for a sustainable business?

Our enterprise began without a website. All the information was in spread sheets, and information sharing was through WhatsApp messages. This made tracing and tracking this information is cumbersome. Through Zoho, we chose a website that cost us hardly ₹ 1000- 1500/ month and set about designing it. Such platforms are good as initial options. My husband who is a graphic designer helped out and now takes care of all social media marketing and promotions. Once the enterprise became sustainable, we shifted the website platform to Shopify and hired professionals to fine-tune the website with additional plugins. Having a website (<https://farmfreshbangalore.com/>) during the time of COVID-19 doubled our customer base and business. Such digital tools have sustained several startups like ours. Our subscription base increased. It saved both customers' and producers' time and allowed for timely online payments. In a place like Bangalore with working families/individuals, it becomes more convenient, saves their time, and reduces stress while at the same time, they no longer have to worry about missing their nutritional intake as we supply well-researched nutritious baskets. Moreover, once people subscribe to our service, there is no change in cost for three months despite variations in the price of fruits/vegetables/greens. Another advantage is the door delivery of our products.

Our website contains blogs that have good visibility and response from our customers. These digital tools help us monetize every opportunity and widen our reach. For instance, a mother with a gluten-allergic son recently sent us very positive feedback on how a blog on our website on gluten-free bajra as an alternative had helped her. This personal touch is important. She is regularly in contact with me and is one of our prime customers now. In addition, digital tools like Grammarly, Chat GPT, etc, are aiding the writing and publishing of blogs.



Presently, we are relying on digital marketing. We have found ways to get leads through Google ads and Facebook ads which don't call for huge investments. This is one of the most convenient ways to promote the business.

Through the fractal incubation centre, we are working on creating a virtual PaaS platform for business operations for Fractal Entrepreneurs and an AI-aided incubation platform for new aspirants of Fractal Entrepreneurship. Digital innovations are key to the survival of any business and for ease of doing business. I am keen on applying digital innovations related to traceability of produce, a tool to check whether the produce is organic/inorganic and where everybody can also check the authenticity of the produce.

How do you stay motivated and focused on your goals?

My passion and progressive attitude in addition to the work experience with stalwarts like Mr. G. Nammalvar, Dr. B.N. Vishwanath, Mrs. Eswar, and my fractal friends keep me motivated and focused.

What kind of challenges did you face being a woman entrepreneur, and how did you overcome them?

The challenge started from home, with my family's discomfort with my business plan. I'm certainly not an exception in this country where married women are stereotyped only as caregivers of kids and family. My family would have been more comfortable with a 9-5 job that gave me ample time with the family.

I cannot but help recall the words of my mentor Mrs. Eswar, who believed that there is always a way out without compromising either business or family interests. It is just a matter of strategizing and learning to delegate work (which comes easily to men). I learned this over a period of time. The business needs to be viewed as a child that needs care and attention to grow well. Women being experts

at multi-tasking, running both a business and home should not be difficult once skills have been mastered, strategies around problems have been figured out and delegation of work happens.

For a woman, finance is also another challenge. Getting a loan sanctioned needs the husband's signature. In my case, I was always clear and honest about the purpose of the business, investment needed, my financial status, how I would make money out of the investment, the present status of the enterprise, my cash flow status, etc.

That's how I got my loans sanctioned. Responsibly repaying loans is also important. Success does not happen at the push of a button...it is the fruit of being responsible and focused.

How do you see your business evolving in the next few years?

We have plans to establish four more centres/ fractals in Bangalore City with a target of delivering chemical-free food to 12,000 subscribers by 2025. We will also expand our direct/indirect support to at least 1,000 small and marginal farmers who are doing natural/ organic farming.

Our vision is to support farmers who are keen to transition from chemical farming to organic farming through the formation of a Farmer Fractal Foundation. We have to create a farmer fractal to bring about a shift in cultivation practices from chemical to organic. While farmers are aware of the consequences of chemical farming, many continue it due to societal pressure.

So, it is important for extension personnel to educate and influence them to shift to organic farming. In certain cases, social recognition can reduce societal pressure to bring about a big change in the village.



What are the biggest lessons you learned as an entrepreneur?

Every day is a new lesson for me. My world expanded exponentially once I started my incubation journey and the enterprise. My vision and my thoughts broadened. I told myself that what I eat must also be consumed by my customers. If I was facing an issue, so were my customers. This broad understanding reduced my fears and gave me the strength to face new challenges.

Remember that you are your support system and need to be mentally strong. Tomorrow, I should be able to show my kids the right way of living, doing things, and leading a better life. When it comes to businesses, maintaining transparency in operations and remaining loyal

to customers are important. Establishing trust between producers and consumers sustains the business in the long run. This was one of the greatest lessons I learned.

What's your advice to entrepreneurship aspirants?

If you have an idea, get it incubated through a well-established incubation centre that helps you explore opportunities and gives wings to your ideas. There is a vast market opportunity for agricultural graduates or anyone else. Just to give you an example, consider Bangalore city with its population of around 1.2 crores. At present, we are targeting only 12,000 families, barely 0.001 % of the population! That is the extent of opportunities that await you!



Some
More

HIGHLIGHTS

100%
Natural Ingredients

Functional &
Nutritive Ingredients

Minimally
Processed



Some More

A Spoon Full of Good Health



07

Journey from Motherhood to Entrepreneurship

"Entrepreneurs should prioritise investing on learning and upgrading knowledge in their domain to innovate and keep ahead of competition that would enable them to scale up their enterprise."

Deepa Muthukumarasamy
CEO

Some More Foods
www.somemorefoods.com

Ditty Maria Dominic and Bhuvana N interacted with Deepa Muthukumarasamy from Tirupur, Tamil Nadu to understand her journey as an entrepreneur, and how digital innovations help her sustain her business. Excerpts from the interview are given below.

Some More Foods is a health food brand started in 2013. It aims to reinstate traditional food ingredients backed by scientific principles of nutrition and bring them back to the present food culture and thus promote wholesome nutrition. The brand has a strong presence in Tamil Nadu currently, and they are expanding swiftly in other states as well as exporting to a few countries like Qatar, Dubai, Bahrain, US.

Can you please brief us about your background?

I was born and brought up in Tirupur district of Tamil Nadu. I did my graduation in Nutrition Food Service Management and Dietetics from PSG College. Then post-graduation in Food and Nutrition from Women's Christian College, Chennai, and MPhil from PSG College, Coimbatore. I come from a conservative family where women are not encouraged to start a business on their own. But doing something of my own and being financially independent was always on my mind.

How did you get the idea to start this enterprise?

Motherhood put a start to my entrepreneurial journey. As any other mother, I was keen on providing the healthiest meals to my baby. I was willing to pay any price for the baby foods in the market, but I couldn't trust its quality completely. Baby foods in the market were loaded with sugar and preservatives. So, I started making baby food at my home itself to feed my baby. After a few months my relatives



and neighbours got to know about my baby food preparation, and they placed orders for giving it to their kids as well. I received orders initially from around 10 people from within my close circle. My customers liked the quality of my product and gradually through word of mouth I started getting more orders. The trust and confidence my customers had in my product kept my business going, though it was on a small scale. Having a Master's in Food and Nutrition helped me to formulate the products in the most nutritious way and this gave me the confidence that I can excel in the food processing industry. As my business idea arose from seeing people asking for some more of the baby food I had prepared for my own kid, I started branding and marketing my baby food products under the brand name 'Some More' in 2013. Slowly, over the years I started manufacturing nutritious millet-based food products for adults as well, under the same brand 'Some More'. As the market for baby foods and millet products were entirely different, in 2014, I started 'First Spoon' as a separate brand exclusively for baby foods. I have a 10-member team to help me with managing the enterprise.



Diverse food products of Some More Foods

How do you source the raw materials and process it?

Getting good quality raw material is a key factor that is vital for quality assurance. So initially I focussed on connecting with farmers who can provide me with assured quantity and quality. For this, I learned from other agripreneurs how they source their raw materials, I travelled to farmers' fields, attended meetings, expos and kisan melas. Slowly I built good rapport with farmers. Now I am associated with around 40-50 farmers

who are members of various farmer producer organizations (FPOs). The procurement of raw materials is on a 'cash and carry' basis, and it is purely dependent on the demand or the orders we receive in a particular month. At present, I procure around 2 tonnes of millets/ month. In addition to millets, we source lentils and hand-pounded rice, cardamoms and other spices for flavouring. We have seven product categories (noodles, pasta, vermicelli, extruded RTE products) with 52 Stock Keeping Units (SKUs) under 'Some More' and 4 products with four variants under 'First Spoon'.

How did you find the market for your products?

Though I was getting orders from my close circle initially, it was not consistent, and to scale my enterprise I had to find alternate markets. I validated baby food products by meeting with paediatricians and after ensuring the quality of my products they recommended those to the mothers. Later as my products started gaining greater demand it was sold through hospitals as well. Also, I was distributing millet products to 100 stores in and around Tirupur through a single distributor. We export millet noodles to UAE and USA. We are in hypermarket chains like D Mart, Spar, Lulu and other organic stores. Participating in both domestic and international expos has increased our brand's visibility which has enabled us to generate more collaborations.

What are all the financial and technical support you have availed of?

Though I had started my enterprise in 2013, up to 2017 I did not go through any incubation phase nor did I receive any financial assistance. My enterprise 'Some More Foods' was completely bootstrapped and it was a part-time activity. I was not aware of any incubation at that time as incubation centres were not that prevalent. Later in 2017 I got incubated through The Indus Entrepreneurs (TiE) for 6 months under the program called All India Road Show for Women's Economic





Product promotion at Fast Food and Café Convention 2023

Empowerment through Entrepreneurship (AIRSWEE). After the incubation I took up my enterprise as a full-time activity.

The incubation helped me to scale up my business as up to then I didn't know anything about digital marketing, team building, innovating, branding, etc., which are the key pillars for the success of any enterprise. Deep learning was gained from that incubation period that opened my eyes and motivated me to focus on 'Some More Foods' which was very stagnant at that time. After the incubation I kept actively learning and enhancing my skills by attending many online and offline programs. Last year I completed the Goldman Sachs Program and Consumer Brand Accelerator Program from IIM Bengaluru. I was also a part of the IIMK LIVE Fellowship program. I had participated in the two-week training for millet entrepreneurs at IIMR. The training had lectures by resource persons, plant visits, and hands-on training which imparted technical knowledge on setting up

of a manufacturing unit, and other aspects such as packaging, marketing and R&D. It was a great opportunity for peer learning from fellow agripreneurs as well. There we had peer learning as well as formal learning sessions given by the institute's resource persons.

Are you using digital tools to promote your enterprise?

I am avidly using digital tools for managing my enterprise. I have websites for both brands: somorefoods.com ; firstspoon.in we are active on social media, like Instagram ([somorefoods_](https://www.instagram.com/somorefoods_/)); Facebook ([SomeMoreFoodProducts](https://www.facebook.com/SomeMoreFoodProducts/)); LinkedIn ([Some More Foods](https://www.linkedin.com/company/Some-More-Foods/)) and Whtasapp. We have a tech team for help with digital marketing.

How are digital tools helping your enterprise?

Digital tools help immensely to increase the visibility of our products and branding. This is a major advantage from earlier times



when digital tools were not accessible to this extent. In 2013 when I myself had developed the website, I did not put much focus on it. After attending the TiE AIRSWEEE in 2017, I realised the importance of digital marketing and converted it into an e-commerce website. It is a one-stop shop giving more information about us and our products. Our sales has improved a lot through the website now. We receive orders also through WhatsApp, Instagram, FB. WhatsApp is significantly helping us to connect with our customers, especially with feedback. This creates a trust in customers as we are in touch with them whenever they need us. All financial transactions in sales are done digitally as it gives a record of the transactions and makes it easy to trace back in case of any problems. Also, I network with fellow entrepreneurs and learn from them how they use social media platforms in scaling their enterprises.

Do you think digital tools are crucial for promoting enterprises? Is there anything that you achieved which would not have been possible without digital tools?

From my experience I would say digital tools are very important to scale up enterprises. People are more into online shopping after COVID, and convenience is something customers look for nowadays apart from quality. A strong digital footprint is the only way to win a good customer base. We need to remind people about our brand every now and then. For this, digital marketing is very important. Digital tools have not only helped in expanding the market for my product, but also, in smoother management of my enterprise.

During COVID when many businesses were shutting down, we started exporting. The demand for healthy products increased and we impacted 100+ Resellers. Resellers are micro entrepreneurs who want to start business with minimal investment. We handhold them in creating sustainable businesses by sharing the

knowledge and experiences I had gathered in the industry during the last few years. We aim to create 500 micro entrepreneurs in a period of ten years.

What are the challenges that you faced in your entrepreneurial journey?

I would say, initially everything was a challenge. From sourcing the inputs to marketing I did not know anything, and nobody was there to support me. Being a first-generation woman entrepreneur from a conservative family, there were lots of challenges that I faced. I raised working capital for starting my business by taking home tuitions, selling clothes, doing decoration work, and making baby foods. I was earning around 30,000 to 40,000 rupees per month from these jobs, and I was saving it up for investing in Some More Foods. After being in the sector successfully for 10 years, now my family is ready to invest in my businesses and they are very supportive as well.

Cash flow was a great challenge I faced earlier, and through the re-seller and export market that we managed by 'cash and carry' we were able to scale our enterprise. I am grateful that although many businesses were badly affected due to COVID, I could sustain my enterprise through timely and innovative strategies.

What is the turnover of your enterprise?

We have scaled by 2X year on year since the company's incorporation. We are aiming to attain a goal of 10 Cr revenue by 2026.

More than financial gains, I value the impact I have made in the lives of people. I support many women entrepreneurs with the experience I gained in the FMCG sector. My efforts were recognized by Coimbatore Management Association in 2020 and I received the Best Woman Entrepreneur Award. Also, we bagged first runner-up position in "Aglive 2023: The Millet Challenge".





Do you think the Government is offering women entrepreneurs adequate support?

I feel that government schemes to promote women entrepreneurs are very few, and awareness about these schemes is very poor. Entrepreneurs like me get updated about these schemes through online platforms. But women who don't have access to digital tools or who are not active in online platforms are completely unaware of such schemes that they can avail of for setting up their enterprises. Government should conduct awareness programs to reach women in tier 2 and 3 cities who are not active in online platforms and who do not have access to digital tools. The government can come up with more schemes that can help entrepreneurs, especially at the scaling up stage.

What are your future plans?

We are planning to launch millet-based RTE products and expand via chain stores in domestic markets, and also start exporting to around 10+ countries by 2026.

What was the strategy that helped you initially to scale your business?

Direct communication with the customers was something I religiously did right from the start. We always made it a point to be connected to our customers and collected feedback on our products.

This made the customer relationship strong, which was 60 per cent. For any enterprise customers are the backbone of success, hence serving them with best quality products should be a priority.

What is your message to aspiring entrepreneurs?

Giving excuses and blaming one's own situation should never be an excuse for not achieving big things in life. Most of the successful people are successful because they overcame the hurdles in their way. Only if we have determination to go on and the mindset to learn from challenges can we succeed. Whatever challenges you face is going to shape you as a better person. Not all the days are going to be the same, if you have the necessary determination your day will come. Now I am a role model to many women who want to be entrepreneurs. That is one of the achievements I cherish.

Identify your strength and work on that. We women are amazing multi-taskers which is a much-needed quality for any entrepreneur. But entrepreneurs need not do everything by themselves, rather they should have the knowledge to handle everything and then delegate the work.

This is important as it gives more mind space to plan for bigger things, namely the scaling up of your enterprise. Understanding that it is teamwork and delegating tasks to the right people is the key to success. Collaboration is the way forward and one must avoid struggling to do things all alone.

Funding is a critical factor for any enterprise. Identify investors who align with the enterprise's goal and are ready to grow with the enterprise.

I have seen many women entrepreneurs, when they fail in the beginning they will discontinue. But I would say learn from your failures and you will be able to recover the losses. Focus on your strengths. Believe in yourself. There is scope to learn a lot of things. Invest in improving your skills and try to be ahead of the competition. Perseverance, persistence and hard work are very important. Never give up!





08

Fostering Traceability and Trust in the Organic Produce Value Chain

"The Earth can shake us off whenever it feels like and continue to exist, but it is we, as humans, who bear the responsibility of safeguarding our existence and nurturing our cohabitation with this planet. So, the messaging in climate change awareness campaigns should be 'save the human race from extinction' rather than 'save mother Earth'. Maybe then people will realize the urgency."

Gitanjali Rajamani
Co-founder and COO
Farmizen
www.farmizen.com

Sejal Agarwal and Bhuvana N recently interacted with Gitanjali Rajamani to know how Farmizen is promoting organic farming by providing a transparent marketplace for farmers and providing access to quality chemical-free organic produce to consumers. Follow their conversation to know about Farmizen and Gitanjali's journey as an entrepreneur.

Farmizen, a startup company based in Bengaluru, has set out to build a food ecosystem that's better for consumers, farmers and the planet. Its theme, "Your plants, your food, Our Future" is fulfilled by the values of trust, collaboration, empowerment, and sustainability engrained in its operations. It delivers organic produce grown by local farmers via Farmizen e-shop and also via its Farmizen app.

How did Farmizen start?

It all started in 2017 when three close friends, Mr. Shameek Chakravarty, Mr. Sudaakeran Balasubramanian and I came together to create something truly special. Inspired by the popular online game Farmville, we embarked on a mission to provide organic and traceable food to consumers. We came across videos exposing the use of harmful chemicals in food crops, which raised concerns about the impact on our well-being. Despite the presence of regulatory bodies, we recognized the gaps in implementing relevant policies and checks. Driven by a sense of responsibility to address the issue and ensure that people can access safe and chemical-free food, we developed a mechanism whereby consumers know whose produce they are buying, its origin, what cultivation practices the farmers are practicing, if the produce is purely organic, etc. Not every consumer can afford to get their produce tested for chemicals or check the quality or authenticity of the food they consume.





Farmizen model inspired from Farmville game

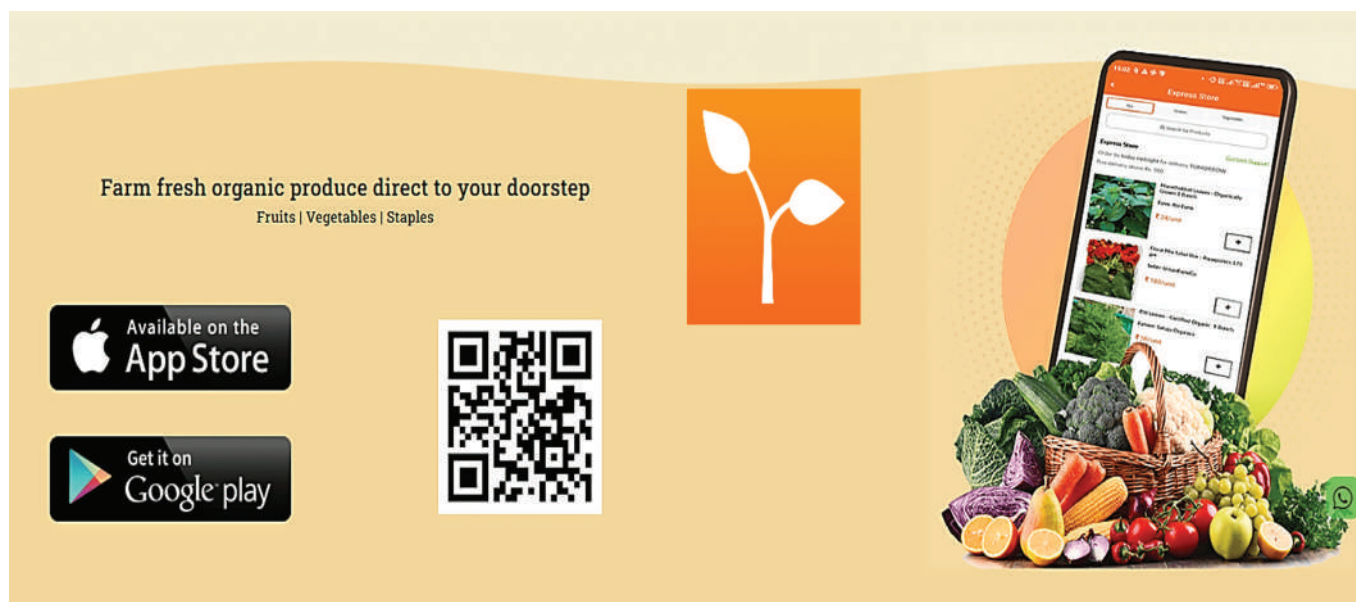
Can you elaborate on your business model?

We established Farmizen as a private limited company based at Bengaluru in 2017. Our initial model involved the renting out of patch of farmland by city dwellers who would decide what they want to produce. We identified

a few farmers who would grow it for them, harvest it, and get it delivered to their homes. Farmizen ran this model successfully for two years with more than 30 farms in Bengaluru, Hyderabad, Pune, and a few in Surat. However, we realized that it is a very niche model that would be difficult to scale up.



Founders of Farmizen with their first model



In 2019, Farmizen underwent a significant transformation by establishing itself as a marketplace for organic produce. This shift was driven by the realization that a vast majority of smallholder farmers in India faced challenges in reaching consumers directly. Often, they had to rely on intermediaries, which resulted in unfavorable pricing for their produce. Moreover, consumers purchasing from middlemen had limited knowledge about the farmers and the inputs used in the production process. Recognizing these issues, Farmizen set out to address them through its marketplace platform. By connecting farmers directly with consumers, we aimed to enable traceability to the food supply chain. This meant that consumers could learn about the farmers behind the produce they purchased, understand the farming practices they employ, and have confidence in the organic nature of the produce. Simultaneously, by eliminating intermediaries, Farmizen sought to ensure that farmers receive fair prices for their hard work and dedication.

In essence, the marketplace model developed by Farmizen had a dual purpose: to empower both farmers and consumers while establishing a transparent and sustainable ecosystem. By facilitating traceability, Farmizen aimed to foster trust and provide a fair market for smallholder farmers, ensuring they receive a good price for their produce, and creating

opportunities for improved livelihoods. In addition to the marketplace, Farmizen took another significant step by launching the Facebook group 'Organic Farming India,' with a membership of over 2.3 lakhs. This group serves as an invaluable online platform, connecting organic farmers with customers across the entire country. It functions as a vibrant community, facilitating interactions, knowledge sharing, and enabling organic farmers to directly engage with potential customers. Through this platform, we also try to strengthen the organic farming approach and promote sustainable practices in India.

How has technology transformed your operations at Farmizen?

Professionally we are techies. So, definitely technology has played a pivotal role in enabling Farmizen to function effectively. To mention a few instances:

- Traceability:** With the aid of technology, both consumers and farmers can easily trace the details of the produce. Through the Farmizen app, customers can place orders, access information about the farm's location, and gain insights into the cultivation process. This seamless integration of technology has successfully established a strong connection between farmers and customers.



- **Logistics management:** Farmizen allocates approximately 15% of its costs to logistics management. Leveraging technology, we have streamlined our delivery mechanism, optimized routes, and ensured efficient transportation. By incorporating features like route planning for pick-ups and delivery, we have been able to effectively monitor and control our costs.
- **Demand and supply forecasting:** Digital innovations have empowered Farmizen to accurately predict demand and supply dynamics. By leveraging data collected over time, we can now anticipate customer preferences based on choices, seasonal variations, and festivals. We are now able to project the required quantity of specific crops and approach farmers accordingly. This data-driven approach minimizes wastage and reduces food losses. At Farmizen, our wastage rate is less than 5%, significantly lower than other enterprises.

In addition to our App, we are also active on social media platforms like Facebook (farmizen); Instagram (farmizenofficial); twitter (farmizen); YouTube (farmizen) and also WhatsApp. Through these technological advancements, we have revolutionized our operations, fostering transparency, optimizing logistics, and ensuring efficient demand and supply management. Such innovations have propelled us closer to our goal of providing organic and traceable food while minimizing waste and enhancing the livelihoods of farmers.

What is Farmizen's scale of operations?

We are mainly present in Bengaluru and have a small presence in Hyderabad now. We currently have more than 35,000 customers and are connected with more than 8,000 farmers pan India.

How does Farmizen work?

We mainly handle the initial phase of the supply chain, which involves collecting

produce from our farmer partners, even in small quantities, and listing it on our app. Occasionally, farmers themselves transport their produce to Farmizen. Once the produce is received, our team does the sorting, grading, and packaging based on the customers' orders. Subsequently, we deliver the packaged produce to the customers. While we get produce from farmers across India, the vegetables and greens we offer originate from farms located nearby. Vegetable farms are situated within a radius of 40-60 km, while greens are sourced from farms within a radius of 20-25 km. In our procurement process, we take various factors into consideration, such as the season and occasion. For instance, during the mango season, mangoes contribute significantly to our revenue, accounting for almost half of our total earnings in that season.

How do you identify farmers for the supply of produce?

We employ various strategies to identify farmers and establish partnerships. Most of our farmers have gotten to know about Farmizen through their networks and have reached out to us. For others, we utilize online resources, such as internet searches for organic farmers in Karnataka whom we approach to become Farmizen partners. We attended a few workshops on natural and organic farming, and these often open up opportunities to connect with farmers. We also reach out to relevant institutions like government organic farming departments, etc., to gather information or establish connections with potential partners. Our Facebook group mainly serves as a platform for engaging with more farmers.

In addition, word of mouth and references play a crucial role in farmer identification. Farmers already associated with Farmizen can recommend us to other farmers practicing organic farming. Additionally, the dissemination of Farmizen-related videos and articles on the internet helps raise awareness



about our objective of bringing organic farmers together. The organization receives enquiries from farmers across India. There is a form on our website that farmers can fill in with their requests, following which we contact them.

How easy/difficult is it to retain farmers in the long run?

For every farmer, there is an initial trust building period where we have shorter credit periods or instant payment cycles of 2-3 days. However, the credit period extends to 15-20 days as trust builds between us and our client farmers. While most farmers are selected through references and word of mouth, for completely new farmers, we arrange for an agronomist to check some of their produce. If the farm is located near Bengaluru, an agronomist is sent to inspect the farm. We encourage farmers to practice crop diversification by growing multiple crops. This win-win approach benefits soil health and also allows us to procure different varieties of produce from a single farmer. Although we engage with farmers, they are free to sell their produce to others. We communicate our requirements in advance, and any remaining produce can be sold in the open market. However, the price offered in the open market is generally lower than the price paid by Farmizen; So farmers prefer us for selling their produce.

How unique is Farmizen compared to your competitors?

Farmizen distinguishes itself through its unique selling proposition (USP), which is the provision of detailed information about the farm and farmer for each agricultural product it offers. This approach gives farmers the recognition they deserve for producing quality produce. We believe that by establishing a direct connection between farmers and consumers, it fosters trust and accountability. When farmers know their consumers, they are less likely to compromise the quality and

safety of the food they grow. Similarly, when consumers have knowledge about the farmers behind the produce, they are less inclined to haggle over prices. This strategy has successfully cultivated a sense of community and rapport between the two parties, leading to instances of consumers specifically requesting for crops from specific farmers. This appreciation boosts farmers' morale and encourages them to dedicate more efforts in organic farming.

In contrast to food delivery platforms that prioritize quick delivery, we have opted for a different approach. We have deliberately chosen not to keep excess stock, as it would result in wastage. Recognizing that food wastage contributes significantly to climate change (accounting for approximately 30% of it, according to studies), we aim to minimize repercussions on the environment. Rapid delivery would require more resources for transportation, escalating costs, and negatively affect the business. By prioritizing sustainability and minimizing wastage, we set ourselves apart from competitors in the market.

Despite being a growing company, we actively engage with small-scale farmers across India. Our goal is to source diverse and rare varieties of produce, including wild leafy vegetables, drumstick flowers, balloon vine, and more. With a streamlined delivery process, we can efficiently transport perishable items such as jamun within 24 hours, something larger aggregators struggle with due to storage losses. Our ability to provide such unique produce expands our market reach and satisfies customers' demand for unconventional produce.

How does Farmizen reach customers?

We offer a range of options to supply our produce:

Subscription-based model: Customers can opt for a monthly subscription that has a fee



ranging from ₹ 1000 to ₹ 4000. They receive a selection of fruits, vegetables, salad boxes, etc., delivered at regular intervals, typically on a weekly basis. We also provide a mini subscription box designed for individuals or couples, weighing around 4-5 kg per box. The vegetable subscription boxes contain a variety of vegetables, including staples, leafy greens, and exotic produce based on the customer's preference. For larger households of 3-4 members, we offer a regular vegetable box weighing approximately 8-10 kg, priced at around ₹ 2500 per month, delivered weekly. In an effort to minimize wastage, any surplus crop is included as a bonus to subscription customers. This not only reduces waste but also generates excitement among customers, leading to positive word-of-mouth referrals.

Pre-orders: We inform customers about the produce available and the respective farmers associated with it. Customers can place pre-orders based on their preferences. We purchase the requested items from farmers, maintaining a buffer of around 5% to account for potential wastage. The ordered produce is then delivered to customers the following day. This approach enables us to closely monitor and manage wastage.

Daily orders: Customers have the flexibility to place orders on a daily basis, without any minimum quantity or amount specification. The majority of our customers fall in this category, allowing us to cater to diverse preferences and varying needs. Our package of options mainly focusses on convenience and customization, allowing customers to choose the most suitable way to receive fresh and sustainable produce.

How do you deliver the orders?

Upon receiving the harvested produce, we ensure delivery on the following day. To facilitate this, we ask customers to place their orders by 8 PM the day before. Subsequently,

deliveries are scheduled between 6 AM and 10 AM the next day. In order to meet these delivery deadlines, our team works diligently during the night to pack the orders.

We use cold storage specifically for select produce such as fruits, which have a longer shelf life. However, the majority of our food items, particularly vegetables, are promptly delivered to customers the next day to preserve their nutrient levels. Understanding the requirements of working professionals, especially women, we plan to introduce an evening delivery service to accommodate their needs and provide greater convenience in receiving their orders.

What is the staffing pattern at Farmizen?

We currently have a team of 40 individuals. This includes staff responsible for various warehouse operations such as managing incoming supplies, packing, grading, and quality checking. The core team consists of 10 individuals who handle specific areas of operations, including technical operations, marketing, customer support, procurement, logistics, and the 3 founders.

To enhance our logistics capabilities and accommodate increased seasonal demands, we have partnered with external vendors such as Telyport, Blowhorn, and Porter. This strategic decision serves as an alternative if our primary delivery partners are unavailable, ensuring smooth operations and customer satisfaction.

Could you elaborate on your professional background?

All the founding members of Farmizen come from backgrounds in IT and consulting.

I belong to an agriculture family and understand the ups and downs that farmers face in agriculture. I believe that our IT background has been instrumental in enabling





Fruit harvest bundles for delivery

us to explore the potential of technology and data analysis in our enterprise. This perspective might not have been as pronounced if we had solely come from an agricultural background. While most team members have an IT background, we also have a few individuals with agricultural expertise.

What's the profile of your clients/customers?

A majority of our consumers are in the age group of 30-45 years and many of them are new parents. It also includes those who are at ease with using mobile applications. Many home chefs also order from Farmizen. A small percentage of our customers are patients, like those suffering from cancer or who have been medically advised to eat organic produce.

However, we have fewer bachelor customers because they generally buy in very small quantities depending upon their need or their cook buys it for them.

How do you generate the revenue to sustain your business model?

Our revenue comes from three different modes. Rates for fruits and vegetables fluctuate based on a mutual agreement between our farmers and our team. This

monthly rate is determined by considering prevailing market prices and ensuring fair benefits to both parties. We then add a mark-up on the agreed price before selling the produce to customers. The application displays these rates transparently, allowing farmers to monitor the selling prices set by us.

The mark-up percentage varies with the product. For instance, staples like rice typically have a mark-up of around 15% while the margin is relatively higher on perishable items to account for wastage and transpiration in fruits and vegetables. In terms of financial performance, our sales amounted to approximately ₹ 16 crores in 2021-22. We incur monthly expenses ranging from ₹ 15-25 lakhs and currently are operationally profitable. We have raised one round of funding in our rented farm model i.e., of US\$ 300,000 and have no loan liabilities.

What learning support did you obtain in your entrepreneurial journey?

Through my co-founder Shameek, I came to know about Goldman Sachs' 10000 Women Program[1]. I joined it in 2016 and have also been part of their Ambassador Program. These programs helped me hone my entrepreneurial skills and be a part of a women entrepreneur



network that has inspired me. Since the program was in collaboration with Indian School of Business (ISB), Hyderabad, it also widened my network, connecting me to different people and mentors. I went with my first start up to the program and also presented the idea of providing traceable organic food to consumers. The appreciation this garnered from my batchmates and mentors motivated me to pursue the idea.

Goldman Sachs started this program in 2008 to provide women in underserved communities around the world with a business and management education. This initiative was started based on a survey which showed that:

- Women are more responsible in paying off their loans
- Women tend to engage more women in their enterprise
- Women need a push in learning the traits of business, especially finance
- Women find it difficult to obtain funding compared to male entrepreneurs.

The course was truly transformative. I had the opportunity to meet and be mentored by esteemed professors. Another important aspect is that the program created an ecosystem that connected me to many women entrepreneurs who have always been very encouraging and supportive in each other's journey.

What kind of challenges have you experienced in your journey as an entrepreneur?

We faced several challenges, and one of the most important one is the lack of awareness about organic farming among consumers. I believe there is a vicious cycle wherein farmers are forced to poison their land using chemicals due to consumer preference for 'perfectly shaped and good-looking' produce. Customers have often come back with questions: is the produce that looks good actually organic? Then we have to explain

to them how the produce is grown and why organic produce can look attractive too.

The second important challenge has been in identifying farmers who actually practice organic farming. Though organic farming is actively encouraged, finding farmers who practice it is difficult. There is a need to motivate more farmers to make the transition to organic farming. Farmers face challenges in making a shift from conventional chemical-based farming to natural/organic farming. This indicates the lack of sufficient resources for them to learn from. They also struggle to find these resources online. To tackle this gap in information, we connect them with experienced organic farmers in our region in order to mentor such transitioning farmers.

Thirdly, we took time in understanding our customers, their needs, and demands based on season, occasions, etc. For example, it was a learning experience when we procured the usual quantity of eggs but then sales went down; later, we realized that it was due to Navratri. So, it is important for us to account for these factors while estimating demand and procuring these items.

Apart from these, we faced challenges which most entrepreneurs in all sectors generally face in India, such as poor logistics, including inefficiencies in production and supply systems, tedious company registration process, and getting the right candidates, especially agriculture graduates who are knowledgeable about organic farming to support our operations.

During the days of COVID-19, sales were very high because no one was stepping out for purchases. However, at present, the loss of jobs has meant the lack of disposable income, impacting their purchase preferences like exotic fruits and vegetables. This change impacts our business as our fixed costs are the same. So, keeping a reserve is necessary. We



added staff during the pandemic to cater to the increasing demand with a belief that online commerce would prevail. But as the situation changed, we have had to reduce our team size as well.

As a women entrepreneur, have you faced any specific challenges, and if so, how did you tackle them?

Though a lot of work in the field is done by female farmers, land ownership is skewed in favor of men. When I started engaging with male farmers, I experienced some barriers in the free flow of communication owing to the urban-rural divide, my non-farming background, and gender. To tackle this, I had to initially build trust by letting them know of my farming skills and knowledge, telling them about my company, and the benefits they can derive by being a part of it. Many times, being a woman has been an advantage, as in general people are more open with women and trust them more readily.

Mansplaining (explain something to a woman in a condescending way that assumes she has no knowledge about the topic) is a common problem many women entrepreneurs face initially. I too experienced such situations. I adopted a strategy of listening to what was being said but also putting forth my point of view in a non-confrontational manner, thus helping me get work done amicably.

As a women entrepreneur, it is important to navigate through the comments and tantrums people might throw and keep one's focus on the goal.

What are your key learnings from being an entrepreneur?

One of our learnings is about supporting farmers in their transition to organic farming. Farmers believe other farmers who are practicing organic farming. So, connecting them with each other builds trust and motivates them to make a switch to organic

farming. Farmers also need continuous support in training, logistics, and marketing to make a successful transition. For the first three years, when a farmer starts growing organic produce, s/he is not given a certificate. Additionally, the cost of production is a little high as the quantity of produce declines initially when transitioning to organic farming. So, for those three years also, we took their produce and sold it on our platform with a statement saying 'farm is not using chemicals but is not certified organic'. This shifts the onus of buying the produce on the customer. We shared the cost burden of these farmers and kept them motivated in this journey of transition. We also conduct online meetings with farmers, scientists, and doctors to address their doubts regarding organic farming.

The second aspect is convincing customers and sustaining their loyalty. We periodically organize farmers markets where customers can interact with farmers and see the produce themselves. The team at Farmizen sends articles and newsletters to its customers and posts updates on social media platforms to spread awareness about organic produce. Our team works in shifts 24×7 to fulfill orders and deliver them on time.

Thirdly, to maintain business operations smoothly, all members of the core team should have a basic understanding of all the operations so that the exit of any one doesn't affect business operations. Having three co-founders helps in managing things better; we are able to share roles and responsibilities in a balanced way. In our team, I feel that women are better at grading and sorting compared to men, which even they admit. However, due to night operations, we are not able to hire many women owing to safety and security concerns.

Any special advantage of being a women entrepreneur?

Quite often, people are appreciative that a woman is doing all these activities. So, they are





open to conversations and take me seriously. Also, people trust women more readily and that helps.

What keeps you and your team motivated?

Personally, I find it very heart wrenching to see farmers committing suicide, discarding unsold tomatoes onto roads due to poor pricing, setting fields on fire, etc. These are disturbing and have motivated my team to help these farmers improve their crop quality, soil health, and their living conditions through organic farming. Similarly, people are quick to

spend hefty amounts on medical tests and on treating many new ailments without realizing their root cause – the consumption of produce with high levels of toxic chemicals. This too motivates us to spread awareness among people and make traceable organic produce available to them.

Entrepreneurs often face tough times in their professional journey and may feel demotivated to continue. However, the huge number of success stories of farmers and customers keeps us motivated to continue creating impact in this sector. It is heartening to hear



farmers describing how their income has increased and how they utilized the money to buy new vehicles, send children to school, build a new house, etc. Similarly, consumers have described the benefits of consuming fruits and vegetables bought from Farmizen and how it has helped in reducing mineral and vitamin deficiencies. Some customers also described how Farmizen produce reminded their grandparents of the taste of vegetables they used to consume in earlier times. Such testimonials always keep me motivated and encourage my team to provide good service to both consumers and producers.

What are your future plans?

We are keen to expand into more cities to help increase the demand for organic produce, thus creating new supply chains for farmers practicing organic farming. We are eager to create a learning program on organic farming for farmers and consumers. This will help farmers learn how to opt for organic farming, the modern machines and equipment available for purchase/rent, establish market connections, good quality input supply, etc.

What's your advice to emerging entrepreneurs, especially women?

It is important to have a very clear and elaborate three-year plan detailing the problem statement and a business plan to address these, including finances, target audiences, and stakeholders. Perseverance is another quality required to keep the idea going for at least 1-2 years. During the first three years, based on a reflection of past performance, you should have the courage to change course and take corrective action. The ability to evaluate the business model adopted based on emerging contexts is also important. So, be passionate about your idea but also be realistic. In the often-demanding realm of entrepreneurship, women face the added challenge of balancing their professional pursuits with responsibilities at home. Navigating this maze, the unwavering support from and encouragement of families can be a strong pillar to lay a solid foundation to success for women entrepreneurs.



Farmizen-Organic farmers Nest organic market





09

The Mushroom Maverick: A Conversation With Ladakh's Inspiring Young Woman Entrepreneur

"Inspiring youth to take up agriculture is my dream, and I am trying to be the change I want to see, through my enterprise."

Sonam Angmo

Founder

Ladakh Mushrooms

[www.instagram.com/](https://www.instagram.com/ladakhmushrooms/)

ladakhmushrooms/

Ditty Maria Dominic and Bhuvana N interacted with Sonam Angmo from Leh, Ladakh to understand her journey as an entrepreneur, and how digital innovations help her sustain her business. Excerpts from the interview are given below.

Ladakh Agritech is an enterprise established in 2021, having its registered office located at Likir, Leh, Ladakh. It is engaged in the production and marketing of fresh mushrooms grown in the pristine environment of Ladakh under the brand name of Ladakh Mushrooms.

Can you tell us about your cultural and educational background?

I belong to an agrarian family in a small village called Likir in Ladakh. We have a family farm and though my parents are holding government jobs, farming is something they engage in unfailingly. As a child I was very fond of helping in my family farm. After my schooling in Ladakh, I went to Jammu for pursuing BSc (Agriculture) from Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST). Further on I got my Master's in Agriculture Biotechnology from UAS-Dharwad. After completing my Master's I came back to Ladakh in 2018. That year I took a break to discover myself and learn things at my own pace as I was not sure of pursuing higher studies. I knew I had to do something on my own, but being just out from college I lacked clarity. As part of my learning journey, I joined an NGO called 'Ladakh Ecological Development Group' and worked in a European Union project on decentralised sanitation, in collaboration with a renowned NGO called 'Bremen Overseas Research & Development Association' (BORDA). My short work tenure at the NGO gave me an overview of the problems in my society and the changing scenario in Ladakh.



What inspired you to be an entrepreneur?

Being a student of agriculture, I was able to notice the drastic shift of Ladakh from an agrarian community to a tourism-based community. Migration of youth to cities and the predominance of tourism as a livelihood strategy has left Ladakh with barren lands which were once lush green with nutrient-rich crops, such as buckwheat, barley and other fruit crops. I was moved by these abandoned agricultural fields and startled by the ongoing cultural shift. Youth were either finding jobs in other cities or waiting for government jobs. I knew that although I may not be able to make that big a change to this situation, I can be the change and inspire others. Yet I continued clueless about what I should do. During that time, one random day, my brother and I were having our favourite mushroom dish in a downtown restaurant. He started talking about how people in Ladakh had a huge appetite for mushrooms as most of them are vegetarian. And then he asked me, "Can we grow mushrooms in Ladakh as the demand is huge and it is met by supplies from cities outside Ladakh?" As I was an agri-graduate, he used to test my knowledge by asking random questions on agriculture. This made me realise that I did have basic knowledge about mushroom cultivation, so, considering the huge demand-supply gap, there was indeed scope for mushroom cultivation.

After conceiving the idea how did you kick-start your enterprise?

I realised that the climatic conditions of Ladakh were not conducive for mushroom cultivation throughout the year. The initial days were challenging. Though I had the basics in mushroom cultivation gained from my studies, I understood that undertaking it as a business called for further learning and guidance. Hence during the initial days, my focus was on learning, and that led me to do a SWOT

analysis. The first formal training I had was from the KVK Leh's Dr Vikas Gupta who was experimenting with the cultivation of oyster mushrooms in Ladakh.



Dried mushrooms

After the KVK training, my intention was to set up a cultivation unit at Leh town since it would be easier to supply to the nearby cafes. But later I realised that my real intention was to inspire youth to take up agriculture, of course the monetary benefits I would gain were also important. Hence, I dropped the Leh idea and decided to start the cultivation at my family farm in the village. In October 2018, I started cultivating around 10-15 bags of mushrooms in a small makeshift room – measuring 4-5 feet – in my village. Sadly, the first set of bags got fully contaminated, and seeing my distress my parents realised that mushroom cultivation was not just my hobby, but a serious venture. Though it was a difficult time I learned about potential causes of contamination and prepared well for the next set. The second time it was a success and I cultivated around 30 bags of mushrooms.



What are the many things you tried after the successful cultivation of your first batch of mushrooms?

In 2019, I carried out a trial on button mushroom cultivation as there was good demand for them and the supply was coming

from Srinagar and Punjab. It was bit difficult as button mushrooms need compost as growing medium, but given Leh's extreme weather conditions composting takes around 6-7 months. So, I continued with the cultivation of oyster mushroom.



Delivering hands-on training on mushroom cultivation to farm women of Tarchit, Khatpu and Hemaya villages in Ronga valley of Ladakh

Another trial I did was in 2020, during the COVID-19 days, to replace plastic bags with reusable plastic bottles. Being an environmentalist the extensive use of plastic bags bothered me very much. While looking for alternatives, I came across an article that discussed the scope of reusing plastic bottles for growing mushrooms. So, now I collect empty plastic bottles and even buckets and upcycle them for mushroom cultivation. In 2020, I got a chance to collaborate with an NGO called 'Local Futures' for conducting a hands-on training workshop on mushroom cultivation for the youth of Ladakh. This introduced me to an area that I had not yet explored. I found it very satisfying to train and impart knowledge to people, so that they can take up mushroom cultivation and find a source of income. Currently, I have trained around 600 farmers by collaborating with various organizations such as State Bank of

India-Rural Self Employment Training Institutes (SBI-RSETI), ICICI Foundation, The United Nations Development Programme (UNDP), GB Pant Institute-Leh, and other NGOs.



Workshop on mushroom cultivation at Stok for youths

In 2021, while conducting one such training on oyster mushroom cultivation, I realised that a lot of farmers are interested in growing oyster mushrooms but availability of quality spawn was the major problem they faced.



This led me to start spawn production. In July 2022, the spawn production unit became functional, and currently I am supplying spawn to farmers as well as to KVKs. Last year I also enlarged my production unit for both spawn and mushroom cultivation. Currently, the production unit has a capacity of 400 kg, but due to financial constraints I am able to produce only 100 kg, with one casual labourer to assist me. This year I am planning to produce 200 kg.

Where and how do you market your mushrooms?

I have registered my enterprise as 'Ladakh Agritech' and 'Ladakh Mushrooms' is the brand name of my mushrooms. In the initial two years when cultivation was on a small scale, I was just distributing the mushrooms to my family, relatives, friends and villagers. This was to introduce them to the taste and nutritional

benefits of oyster mushrooms. This helped me to get feedback about my produce as well, and since it was mostly positive feedback I had people asking for more of my mushrooms. As mentioned earlier, before starting the enterprise my proposed market was the cafes in Leh town. The demand is very high there and I thought I would be able to supply to a few cafes. There are 2-3 restaurants to whom I supply regularly. Other than these regular customers, I have a list of customers who purchase occasionally, so if the harvest is more, I will call them and supply. Most of the produce goes within a 10-15 kms radius.

Other than that, I keep my products for sale in the stalls at the District Industries Corporation (DIC) Leh, where they sell the products of many entrepreneurs like me under the brand 'Ladakh'. I also sell buckwheat, rajma, barley and vegetables which I cultivate in my farm.



Promotion and marketing of products at Ladakh Agritech Mela in August 2022

Furthermore, I participate in exhibitions that help immensely to enhance the visibility of my products. I have not gone for any exhibitions or fairs other than in Leh town, but the UT administration takes the products of entrepreneurs from Ladakh to Delhi and other cities for exhibiting and selling at different fairs and exhibitions. They have taken my products to expos conducted by the Confederation of Indian Industry (CII) in Chandigarh and Delhi.

Are you also making value-added mushroom products?

I have been selling dried mushrooms in Leh market on a trial basis on a very small scale. I've been seriously thinking of starting value-addition activities as it can increase the shelf life of mushrooms and also provide higher returns. But, as I said earlier, currently my scale of production is very low and I am not even able to meet the existing demand. So, value



addition can be taken up only if I produce more, and that is constrained by financial and infrastructural limitations at present. Expanding my scale of production requires more investment in infrastructure and labour, which at the moment I am trying to find. If I get financial assistance, I will certainly get going on the value addition unit.



Online marketing of mushrooms through Instagram

What are the digital tools you use and how can these tools help in promoting your enterprise?

I am active on social media platforms such as Facebook, WhatsApp and Instagram. I gave several interviews on mushroom cultivation through All India Radio and Doordarshan Kendra-Leh. Once I went to train women of Tarchit-Khatpo villages on mushroom

cultivation as part of a UNDP initiative. They did not recognize me initially and before I was introduced to them, they started telling the co-ordinator from UNDP that they want to learn about mushroom cultivation from Sonam Angmo, to whom they listen regularly on radio. I was surprised to know that I have many regular listeners, that too mostly women! I would say, digital tools are excellent for increasing the visibility of enterprises, learning from peers and finding markets. Coming to the use of digital tools to promote my enterprise, I have an Instagram page called 'Ladakh Mushrooms' through which I share the activities of my mushroom unit. After seeing my Instagram posts, many youths are reaching out to me for advice on starting their own mushroom enterprises. Also, students from the Himalayan Institute of Alternative Learning (HIAL) visited me twice to learn about mushroom cultivation. So, I would say digital tools are helping me to achieve my dream of inspiring youth to take up agriculture.

On WhatsApp I am part of many farmer groups. Through WhatsApp I get orders as I put availability of mushrooms on harvest days on my Status. When my first spawn lot was ready, I had put it on Status and within 2-3 days I could sell all of it. So, in a place like Ladakh where villages are scattered, social media platforms enable excellent connectivity. Today I have customers from the remotest of villages in Leh and I am able to reach fellow farmers – this is possible only because of these digital tools. I have not yet tried digital marketing and e-commerce website marketing, considering the small scale of my business. But in the near future I plan to increase production and will explore digital marketing. Other than social media tools, I use Canva software to design posters and Instagram posts. In future I am planning to start a YouTube channel too, as I think it will help me reach out to more people.



Did you get any support through schemes or grants?

In 2018, I applied for a loan for setting up my unit through Jammu and Kashmir Entrepreneurship Development Institute, and I did a one-month training programme under that institute as well. I was very hopeful about getting financial assistance through that scheme, but due to bifurcation of J&K and

Ladakh all the funds got cancelled. Then in 2021, I took support of 15 lakhs with 31% subsidy for the spawn production unit from District Industries Centre (DIC) Leh, but I did not get any financial support for mushroom cultivation. The room for the mushroom cultivation and spawn unit was constructed with financial help from my family.



Harvesting of oyster mushrooms

What challenges do you face as a mushroom entrepreneur, and particularly, as a woman entrepreneur?

I admit that being a young woman entrepreneur is not easy, but I have always made it a point to strive forward whatever challenges come up in my way. As an unmarried educated woman, people seem to be very bothered about my marriage. I know they are my well-wishers, but rather than acknowledging my hard work, when they bring everything down to marriage, I feel very insulted. I strongly believe a man of my age would not be bothered with such concerns, rather his achievements would have been hailed. Coming from a family where I am a first generation entrepreneur and both the parents are government employees, the default expectation from me is to get a government job. Advice like "Government jobs

are the safest jobs for women as ultimately raising children is a woman's lifegoal" is always there. So at these times, my motto is, 'Hear everybody's opinion but do only what I want'.

The other major challenge I faced is financial. The climatic conditions are conducive for mushroom cultivation only from April/May to October, as after October it will be extremely cold (below zero). So, making year-round income from mushroom cultivation is hard in Ladakh, and usually I engage in activities at my family farm or volunteer with NGOs during winter.

During last winter I experimented with a new mushroom growing room for checking if it is possible to cultivate mushrooms in winter or not. Fortunately, I see a good opportunity to grow even in winter months.



Your future plans?

I usually don't make long-term plans. But I certainly have plans to scale up my enterprise. I hope to increase my production at least to the full capacity of my unit. For this I will need to employ more people and I am planning to give employment to women. Also, training more women in mushroom cultivation and mobilising them into an FPO is something that I want to do. I feel women will get more support and guidance if they form an FPO.

Learning about digital marketing and increasing the digital footprint of my enterprise is another major item on my agenda. This can be done only after I increase the scale of production. But I believe digital marketing can scale up my enterprise and it is a pressing need.

Being a nature enthusiast, I also have plans to promote cultivation of the heirloom crops of Ladakh – buckwheat, local white rajma, local pea and barley – as I feel these crops are commonly neglected by farmers even though they are highly nutritious. So, I would like to expand my enterprise into the production and marketing of these crops as well. Opening a farm school that children, youth, farmers and aspiring farmers can visit, volunteer, and learn about farming is also something I hope to do in the future.

What is the turnover from your enterprise?

As I am unable to produce mushrooms year-round my turnover is less than one lakh per month. Last season, I had a net profit of

around 70 percent. In the coming year I am expecting a threefold increase in the business.

What awards and recognitions have come your way?

In 2021- I received 'ICAR-Krishak' award under the Farm Entrepreneurship category. During the 2020 Kisan Mela organised by the Defence Research Institute they presented me with a Certificate in recognition of my work. During Kisan Samman Diwas 2021 organised by the Directorate of Extension, SKUAST-Kashmir, I got Champion Farmer Award. I was also awarded LSF Entrepreneurship Award by the Ladakh Science Foundation in 2021.

What is your message for aspiring entrepreneurs?

I believe in the Gandhian quote 'Be the change you want to see'. When we are trying to do something different, many will come with problems and advice. At those times focusing on your own goals and vision is what matters most for success. Entrepreneurs have to be problem solvers, which is what they should be focussing on rather than on finding problems.

As far as Ladakh is concerned, youth should recognise the rich culture of Ladakh and take up farming as an enterprise. Unlimited scope exists for agricultural enterprises in Ladakh, be it mushroom cultivation or any other enterprise. Rather than abandoning Ladakh's agriculture and leaving it to older generations, youth should build their own enterprises in Ladakh for its betterment and a brighter future.





10

The Tenacious Woman Entrepreneur of Bastar

“Overcoming limitations is as important as getting out of our comfort zone. Victimizing ourselves and hanging on to excuses are never an option if success is the goal”.

Shaikh Raziya

Founder

Bastar Food Firm & Consultancy Services (BFFCS)

www.bastarfoods.com

Ditty Maria Dominic and Bhuvana N interacted with Shaikh Raziya, to understand how Bastar Food Firm and Consultancy Services is impacting lives by working closely with local communities, artisans, and small-scale producers to source, process and market the highest quality forest minor produces that showcase the authentic essence of Bastar.

Bastar Food Firm & Consultancy Services (BFFCS) is a start-up venture started in Bastar district of Chhattisgarh state, India, in 2017. It is a private venture started by Shaikh Raziya to bring food technologies through Research & Development to the tribal belt of Bastar and surrounding areas in Chhattisgarh (<https://bastarfoods.com/>)

Can you give us a brief background about yourself and how you decided on your enterprise?

I was born and brought up in Bastar, Chattisgarh. Following my graduation and post-graduation in microbiology, I taught for a while. As my family was keen on my becoming a civil servant, I went to Hyderabad to prepare for the UPSC examination. But I soon realized it was not my calling and returned to my village. When I couldn't find a job in Bastar, I knew I had to start my own enterprise but could not decide on what to do. I was offering food consultancy services for a few food processing firms of my friends and my client base was growing. This made me realize the potential of starting a consultancy.

This was the time that Sarada Ram Krishna Sevashram in Bastar was doing a project under the Safe Motherhood Initiative. The director of Sarda Ram Krishna Sevashram, Mr Amit Sen Gupta, is a mentor who asked me to work on the project. My work there provided



a clear view of the lives of Adivasi women in Bastar. Women and youth in these tribal areas face huge unemployment. I was hit by the harsh reality when a young boy told me that the easiest option for them to gain employment was to join naxalite groups, where they get a monthly salary of INR 20,000. The youth there are clueless on how to get a job and have nobody to guide them. This dismal situation led me to ruminate on how I could provide employment to these underprivileged people. I started learning about various government schemes pertaining to entrepreneurship, tribal development, rights and culture of tribal communities and other aspects. I found that a food-based enterprise would have great scope in Bastar, as it can derive value from locally available forest minor produce. But I did not want to confine my

business to food processing alone. So, given my experience in consultancy and the scope of food processing, I founded Bastar Food Firm and Consultancy Services (BFFCS) in 2017.

Take us through your journey from conception to setting up of BFFCS.

The major objective of setting up BFFCS was to create livelihood opportunities for tribal people and youth from insurgency-prone areas and unprivileged backgrounds. It was thus designed as a platform where youth/women can showcase their ideas/skills so that we can support them. My intention was creating jobs in the jungle by making use of forest minor produce so that people don't have to migrate to other cities or join naxalite groups for jobs.



Cleaning of mahua flowers

But the initial days were challenging. I was looking for loans and grants to set up my office-cum-food processing unit, but could not find any. So, I was engaged in providing consultancy services to food processing firms and skill training for rural women and youth. I was saving up from these activities to

invest in a food processing unit. By the end of 2020, I established a manufacturing unit. I was researching and formulating recipes for products that can be made using forest minor produce, which would be something new as well as healthy for customers in cities. Bastar is famous for mahua flowers; they are a "Dawa



to Daaru" and way of life for tribals in Bastar. Considering its inimitable health benefits and its abundance in forests, I started formulating recipes using mahua. Our first branded product was Mahua laddoo which was a roaring success in the market. Currently, we have 20

value-added products of mahua as well as other forest minor products. We designed products for every segment of customers, from babies to the geriatric, like mahua cookies, daliya, mahua tea, wild honey, rasam powder, energy bars, dheki rice, tamarind sauce, etc.



Different products of Bastar Foods

What is the process you follow from procuring raw material to processing and packaging?

Our main raw material is mahua, which we procure from around 300 tribal women in 10 districts of Chattisgarh and Madhya Pradesh. We are connecting to tribal people with the support of the Department of Forests. We share short videos on Standard Operating Procedures (SOPs) for collecting and handling raw material with the tribal community through officials of the Department of Forests, so that the quality of the raw material is maintained while it is collected or cultivated. Other than mahua, we also procure dheki rice,

tamarind, millets, turmeric, and chillies. These raw materials are processed in our processing unit which has eight women employees. We make sure there is no compromise on the quality of the raw materials as well as finished products. Our lab for testing the quality of our products is managed by a food technologist; we also link up with other labs for quality testing.

How are the products marketed? Do you use digital technologies to reach potential customers?

In the international market, there is a huge demand for tribal foods sourced from



indigenous communities, mainly after the COVID-19 pandemic, as people are more health conscious. So, the export market is our main target currently. Last year we exported 12 tons of mahua and this year we are exporting

around 70 tons to London and 15 tons are for the domestic market. Domestic marketing is done mainly through digital marketing platforms as our target customers are the urban population.



Promotion and marketing of products

Our website (<https://bastarfoods.com/>) is where customers can find details about the products to order through Whatsapp. Our products can also be found on e-commerce platforms like Amazon, Tribesindia, Lokabazar, Amazon, Flipkart and Meesho. We also get orders through Instagram and Facebook. A person recruited to manage our social media platforms and digital marketing submits weekly reports on the digital marketing strategies implemented, customer response, product reach, etc. We also supply our products to Tribal Cooperative Marketing Development Federation (TRIFED) stores, Central Reserve Police Force (CRPF) canteens, police canteens, National Mineral Development Corporation (NMDC) Co-operative societies and Forest department general stores.

Other than food processing, what other activities does BFFCS undertake?

In addition to our product offerings, Bastar Foods also provides customized consultancy services. Our team with extensive knowledge of the Bastar region and its culinary traditions, provides guidance and support to individuals

or businesses in product development, market research, and in business strategy development. We offer comprehensive business training programs designed to equip aspiring entrepreneurs with the knowledge and skills needed to succeed in the food industry. We provide practical insights on various aspects of business management, including marketing strategies, supply chain management, financial planning, and more. We work closely with local entrepreneurs, fostering fair trade practices and providing a platform for their exceptional products to reach a wider audience.

Can you tell us more on the trainings given to tribal women?

Tribal women may not be educated but they have native knowledge about forest minor produce and traditional recipes. Our aim is to integrate their knowledge with technology. So we train these women in hygienic food processing practices, food loss and other food handling aspects. We teach them the recipes of our products also. Along with raw materials collected or cultivated by them, like mahua, tamarind and wild honey, we also



procure finished products if they meet our quality standards. To date we have trained around 3000 women from various districts in Chattisgarh. Around 300 women have taken up value addition activities after receiving

our training. These women can either market their products to us or sell them through the Madhuvania brand of Chattisgarh government which promotes the sale of products from forest minor producers.



Training on food processing given to tribal women

In what activities is BFFCS collaborating with the Government?

BFFCS has collaborated with Government departments (Forest Department, TRIFED, etc) to establish eight food processing units in Chattisgarh under various livelihood promotion schemes.

The government invests money and BFFCS takes care of setting up the processing unit, training, licensing, raw material sourcing, processing, packaging, and marketing. Once the unit is well established and sustainable, we handover the operations back to the government departments. These units are mainly for people from tribal communities, so that they can bring their produce, process it at a nominal fee and make a livelihood out of selling them. This is how the government is promoting micro-enterprises in tribal areas.

How do you keep yourself updated?

Attending trainings, conferences and exhibitions are part of my routine to keep

myself updated. I have attended three training in the past three years conducted by the National Agriculture and Food Analysis Research Institute (NAFARI), Pune. The training sessions were on food adulteration, mechanization, Hazard Analysis Critical Control Point (HACCP), and other general aspects of food technology. Most of my learning occurs while attending exhibitions and conferences where I meet other entrepreneurs, learn what they are doing differently, and clarify my queries. I always take my team with me for these events so that they can also learn, explore and come up with new ideas.

What challenges did you face in your entrepreneurial journey?

My major challenge was the lack of financial support. Initially I didn't get a loan. My enterprise was completely bootstrapped and I invested Rs 10 lakhs from my savings to begin with. Recently I got Rs 15 lakhs as loan with a 35% subsidy under a scheme of the Ministry of Food Processing Industries. Team



management is the second major challenge. Aligning the objectives of the team members with those of the organization is difficult at

times. Every entrepreneur should be skilled enough to convince the team to work based on plans.



Winnowing of Dheki rice at the processing unit established in collaboration with the government

Working with the government sector is another challenge. I think it is hard to convince it of a woman's idea than a man's idea. Convincing bank and forest department officials was tough initially. Travelling is costly as well as risky in forest areas like Bastar and is another challenge. I am constantly on travel to procure raw materials and give trainings to tribal women. Obtaining adequate quantity of quality raw material is another challenge we face. This year our target was to procure 300 tons of raw material but we could procure only 80 tons, as we could not get quality produce due to erratic rains. Penalty from e-commerce websites like Amazon is also a major issue. Bastar being a remote village, delivery personnel find it difficult to pick up products from us on time; this delays product delivery to customers. But ultimately, we have to pay the penalty even though it is not our fault. COVID-19 also created several challenges, as we were not able to export or market our products domestically. Yet we didn't shut

down our unit completely. As a service, we started distributing mahua-based products free of cost to COVID-19 patients, for which we got very positive feedback from them. During the pandemic we also conducted online trainings and consultancy services. All these challenges have served as learning experiences for me.

Any significant personal achievements which you would like to share with us?

I participated in the TiE conference in San Francisco as a Motwani Jadeja Foundation 2019 fellow, where I could present my work before academicians from top universities and other successful entrepreneurs from around the world. I was also selected by NITI Aayog in 2019 as one of the 30 women transforming India.

What is the turnover of your enterprise?

I started my enterprise with Rs 200 and currently the total turnover is Rs 25 lakh.





In conversation with tribal women about hygienic handling of raw materials

What is your message to aspiring women entrepreneurs?

I have messages for both aspiring women entrepreneurs and policy makers. To women entrepreneurs I would say that taking up entrepreneurship in itself is a difficult task and being a woman adds to the challenge. But, with focus and determination it is very doable. Convincing others to believe in your ideas may be difficult initially. Believe in yourself and show them what you are capable of. Make sure you are impacting lives through your

enterprise, and that should be your measure of success.

I would like policy makers to craft effective strategies that support women entrepreneurs in taking up digital tools. Scaling up can be done only if enterprises have a strong digital footprint. However, many micro-entrepreneurs lack the knowledge, capacity and resources to use digital tools. So, even small steps like conducting digital marketing courses in the local language would be a great support to entrepreneurs.





11

Learning, Leading and Empowering: A Biotechnologist's Path to Entrepreneurship for Socio-Economic Change

"Learn to say 'No' when needed, never hesitate to 'Ask' for help or resources, and always be ready to 'Talk' about your ideas and challenges."

Sowmini Sunkara

CEO

AGRIGHAR

www.agrighar.com

Bhuvana N, Ditty Maria Dominic and Sejal Agarwal recently had a dialogue with Dr Sowmini Sunkara, a passionate and accomplished entrepreneur who has harnessed her technical knowledge and entrepreneurial spirit to create meaningful impact in the field of rural development and agriculture. Excerpts from their interview are presented here.

Agrighar Services Pvt. Ltd, established in 2019, is a social enterprise dedicated to promoting entrepreneurship and employment in agriculture and allied sectors, with particular emphasis on engaging youth, women, farmers, and Farmer Producer Organizations (FPOs). Their overarching mission is to minimize rural-to-urban migration by tapping into untapped rural potential. Agrighar serves as a one-stop platform, offering skill training, consulting, warehousing, job works, food processing, FPO/ farm management services, and entrepreneurship development programs to bolster India's rural economy.

Can you tell us about your journey from being a biotechnology expert to a social entrepreneur?

My journey has been truly fascinating. From a young age, I harboured a profound passion for learning and a relentless curiosity to apply my knowledge in practical ways. My academic background lies in agricultural biotechnology and I hold a PhD. I can talk proudly of over 12+ years of research experience, particularly in genetic engineering, molecular biology, plant tissue culture, and transformation. While my expertise was largely rooted in laboratory work, I began to feel a strong calling towards social entrepreneurship, in an effort to bridge the gap between science and business. This compelling need led me to immerse myself in the realm of social impact, where I could



leverage my technical knowledge to create meaningful change.

From 2015 to 2016, I had a remarkable opportunity to involve myself in the Telangana Rural Inclusive Growth Project (TRIGP), working closely with the farming community at Society for the Elimination of Rural Poverty (SERP),

Telangana. This experience brought me into direct contact with rural women and farmer groups and marked a pivotal turning point in my career. It deepened my commitment to explore the intricacies of rural and community development.



Involvement in Telangana Rural Inclusive Growth Project- TRIGP

In essence, my academic expertise and the invaluable network I've cultivated through my experiences have empowered me to become an entrepreneur dedicated to serving the farming community by using my services through agri-enterprises.

You've been involved in various organizations, including Agrighar Services Pvt. Ltd, Womenery Association of Incubators in Manufacturing (WEAIM), and Agri Business Yuva Farmers of India (ABY farmers), and others. Can you elaborate on the roles and contributions you've made towards fostering entrepreneurship and innovation in the agricultural sector through these organizations?

My journey has been a continuous exploration of that which lies at the intersection between

my academic background and my passion for rural development and agriculture. In 2005, I embarked on my research career as a scholar at ICRISAT in Hyderabad, specializing in Genetic Transformation. This path eventually led to the pursuit of a PhD at the same laboratory, deepening my expertise in genetic engineering, molecular biology, plant tissue culture, and transformation.

Fast forward to 2015-2016, a pivotal year when I transitioned into a new role as a consultant in sustainable agri-livelihoods for the Telangana Rural Inclusive Growth Project (TRIGP), supported by the World Bank and executed by the Society for the Elimination of Rural Poverty (SERP) in Telangana. It was during this engagement that I immersed myself in understanding the intricacies of vegetable



value chains, gaining insights into the genuine needs of farmers in agriculture. Under this project, I played a crucial role in developing modules aimed at promoting agricultural livelihoods through value chains and Farmer Producer Organizations (FPOs). Moreover, I had the privilege of managing numerous Self-Help Group (SHG) members across all districts of Telangana, delivering various training programmes through SERP. This experience underscored the significance of food processing, value addition in the agricultural value chain, and the pivotal role of women in shaping these value chains. My aspiration and enthusiasm to become an entrepreneur took root here.

Subsequently, in 2016, I volunteered with Grama Bharathi, an NGO, allowing me to re-connect with farmers and FPOs engaged in natural and pesticide-free/organic farming. Here, I contributed by facilitating FPOs in marketing, certification processes, and gaining further insights into value chain activities through Grama Bharathi and FPC.



Anantapur FPOs Marketing training

2017 marked a significant milestone in my journey as I became a seed investor for ABY Farmers' ((7) ABY Farmers LLP: Overview | LinkedIn) and took on the role of a designated partner. ABY Farmers is a social enterprise with a primary focus on agri-processing and marketing, directly sourcing commodities from farmers at market prices and sharing 50% of the organization's profits with the farmers and Farmer-Owned and Managed Organizations (FMOs). Concurrently, I assumed the position of National Project Coordinator for Indo-German Cooperation

on seed sector development and worked as a National Resource Person/Consultant in agri-value chains at the National Institute of Rural Development and Panchayat Raj (NIRDPA). Here I gained invaluable experience that gave me a profound understanding of ground-level issues faced by farmers and the actions required to address at least 1% of these challenges. This eventually bloomed into a proprietary firm M/S Agri Ghar Services in 2018.



NRLM-National Resource Person

In 2019, an opportunity came up to join the group of pioneering first-generation women entrepreneurs i.e., 'WEAIM'. This is India's first 'women incubator aggregator association', dedicated to nurturing women in the manufacturing sector, with a strong focus on the MSME sector and this inspired me to work in depth on addressing the real problems faced by women entrepreneurs.

Meanwhile, in November 2019, I founded my brainchild, Agrighar Services Pvt. Ltd., with a vision to promote rural livelihoods through entrepreneurship and skill development programs and services, particularly in the fields of agriculture and allied sectors.

By 2022, I co-founded 'WEMART Global,' an exclusive e-commerce platform designed to showcase and connect women entrepreneurs' products with global markets. In the same year I was honoured to be nominated as a 'non-official member on the Executive Committee at the National Institute for Micro, Small, and Medium Enterprises (ni-msme), Hyderabad', representing women's associations. Today, my full focus is on expanding the reach and impact of Agrighar Services Pvt.



Ltd, reflecting my unwavering commitment to fostering entrepreneurship and innovation in the agricultural sector. These various leadership roles and the dedication with which I worked within these organizations are a testament to my commitment to drive positive change in rural development and agriculture.

How is the Agrighar initiative supporting farmers and women in agriculture and entrepreneurship?

Agrighar is a multi-faceted initiative aimed at supporting farmers, women, youth in agriculture and entrepreneurship. It provides a platform for various stakeholders in the agriculture sector, including entrepreneurs. We offer training and practical exposure in areas such as food processing, manufacturing, value addition, packaging and marketing. Our goal is mainly to bridge the gap between theoretical knowledge and practical implementation. Agrighar serves as a hub for learning, networking, and collaboration, empowering women to enter and excel in the agricultural sector.

What kind of services does Agrighar provide?

As mentioned earlier, we focus on skill training, agri-value chains, entrepreneurship development programmes, and FPO/Farm management.

We mainly impart skill-based practical training to the rural and urban youth in agriculture and allied sectors at the Agrighar's integrated skill training centres. We organise exposure visits to the agri-entrepreneurs/progressive farmers, SHG women, and FPO representatives upon registration to visit our integrated skill training centre and multi-food processing manufacturing unit.

The second important service we provide is by connecting stakeholders in the agri-value chains. This is a one-stop networking platform for all agri-enterprises/service providers in the

value chains through our end-to-end services, such as consultancy, skill development training, mentoring, warehouse and processing facilities. The FPO/farm management aspect is focused where the FPOs are provided services through unique business/profit sharing or consultancy modes. Frequent mentoring, consultancy and training programmes are given on entrepreneurship development programmes (EDP) to develop entrepreneurial abilities and skills required to run a business. Both offline and online entrepreneurship development programmes are conducted along with consultancy services.



Aleru Farmers' Meet in Telangana state

What are the capacity development programmes organised under Agrighar?

Agrighar mainly focuses on four kinds of capacity development programmes for farmers, FPOs, youth and any aspiring agripreneurs. The programmes include:

Exposure Visits: Agrighar organizes exposure visits for aspiring agri-entrepreneurs, progressive farmers, SHG women, and FPO representatives to visit our Integrated Skill Training Centre and Multi-Food Processing/Manufacturing unit on second Saturday of every month. This exposure visits are mainly to motivate aspiring entrepreneurs with different choices of agri-enterprises from farm to fork. Each visit costs Rs. 499 + GST/person.

AWAKE (Awareness Workshop on Agri-Knowledge for Rural Entrepreneurship/ Employment): AWAKE is much more detailed mentoring sessions on Agripreneurship programmes, where the feasibility of the entrepreneur is valued. These sessions are



conducted both offline and online so that we can reach to PAN India aspirants. Each session has a fee of Rs. 2,500 + GST.

Incubation Programme: Incubation programmes – primarily for aspiring entrepreneurs – focus on solar dehydration, millet enterprises, mini dal processing units, mini rice processing units, cold storage solutions, and cold-pressed oils. The programme offers support on various aspects, including documentation (such as Detailed Project Report [DPR]) preparation, project feasibility studies, government schemes/grants, facilitation of bank/loan linkages, and legal compliance. It also provides mentoring support, infrastructure facilitation, assistance with backward and forward linkages, networking opportunities with peers/business partners, institutional collaboration, marketing support, and post-business support to scale up businesses. This programme is conducted

in Telugu, Hindi and English languages. It is promoted through social media channels and through Agrighar network connections. Each programme requires a registration and a participation fee of Rs. 20,000 + GST.

FPO Consultancy (AFC): Agrighar provides comprehensive support to Farmer Producer Organizations (FPOs), assisting them from inception to becoming well-formed, market-oriented groups. The services include baseline surveys, farmer mobilization, value chain development, capacity-building/training for directors, promoters, shareholders and staff, development and implementation of business plans, establishment of backward and forward linkages, infrastructure/machinery set up, value addition, food processing, marketing strategies for local, inter-state, and international markets, network partnerships with other FPOs, and assistance with accessing government schemes and loans.



Exposure visits of FPO representatives & aspiring agripreneurs to Agrighar

What is NEᱤSHA by Agrighar all about?

NEᱤSHA is the brand name for the culinary delights recently developed by Agrighar Services Pvt. Ltd. At present we are engaged in preparation of a range of mango rolls, dried veggies, instant millet breakfast & meal

options (ready to cook), millet snacks (ready to eat), dry fruits and nuts, spice mixes. These are available on e-commerce platforms such as WEMART Global (www.wemartglobal.in) & Agrighar's NEᱤSHA mini store on Swiggy (<https://agrighar.mini.store>). Delivery is available across India and the products are





Brand Launch

purely marketed online.

You've also emphasized the importance of digital tools in your initiatives. How have you integrated digital innovations into your work, and what benefits have you observed?

Digital innovations have played a crucial role in expanding our reach and impact. We've incorporated digital tools for various purposes, including online training, supply chain management, HR, and marketing. These tools have enabled us to connect with a wider audience, offer online courses, and promote our initiatives effectively. Digital marketing, social media, and e-commerce platforms have also helped us reach potential customers and collaborators. Most of our capacity development programmes reaching the concerned audience are through digital technologies, especially via social media. Starting with WhatsApp, we are highly active on Facebook, LinkedIn, Twitter, Instagram and YouTube.

I have empowered my team to be proactive in social media and also to use basic digital applications such as CANVA that helps us in

designing posters. The team is also taught to acquire the minimum skills that enable them to mark likes, sharing, commenting, and posting on social media sites so as to reach our work to a wider audience. Most of our training programmes are conducted online via Zoom and awareness about our programmes are created through online platforms. 95%+ of our payments are online following digital India policy and recently our Agrighar-developed culinary products under the name NESSHA has gained visibility and popularity in online markets through publicity via digital applications. Overall, digital innovations have streamlined our operations and enhanced our visibility.



Team Agrighar





WEAIM – Period Donation Drive

You've highlighted the need for awareness campaigns and training programmes. What steps do you believe are essential to raise awareness and promote entrepreneurship, especially among women?

Raising awareness and promoting entrepreneurship, especially among women, requires a multi-pronged approach. Firstly, there should be targeted awareness campaigns through webinars, workshops, and social media to educate women about available opportunities and resources. Secondly, public-private partnerships can facilitate the funding of training programmes and initiatives. Thirdly, creating a supportive ecosystem where women are encouraged to ask questions, seek help, and learn from one another is crucial. Lastly, improving access to information, such as subsidies and funding options, is vital to ensure that aspiring entrepreneurs are well informed.

Your journey has much influence on empowering women in agripreneurship. What inspired you to empower women and what are your goals in this regard?

My decision to empower rural women entrepreneurs stemmed from my experiences working in rural areas. Witnessing these women create livelihoods and businesses inspired me to do the same. I realized that if they could do it, so could I. This realization led me to move away from my research-oriented job and start my own enterprise. My primary goal is to empower rural women through various means, including training, skill development, and livelihood generation. I've now structured this vision into a business format, where we focus on scaling and enterprise development. Now I am empowering women not only on the financial aspects but also on the emotional aspects. We have a women association (WEAIM) where there is 30+ women entrepreneurs having varied business profiles. It is really tough to talk about branding or promotional activities, unless they understand the business. There is no dearth of knowledge; what's required is the intention on what to do and how to do it. Knowledge is available. So, I mainly empower women now on how to overcome the emotional baggage while you are aspiring to empower socially and economically.



How do you see financial empowerment contributing to gender equality and women's decision-making abilities?

Financial independence is the cornerstone of gender equality. When women have control over their finances, they gain a stronger voice in decision making, both within their families and in communities. It empowers them to make choices that align with their aspirations and needs. Financially empowered women can invest in education, healthcare, and personal development, breaking the cycle of dependency. This, in turn, leads to more inclusive and equitable societies. But, to become financially independent, she should be first independent in her own mind.

How many farmers/FPOs/women have you empowered in your journey and what are your plans for the future?

During both pre-and post-COVID periods I travelled a lot into interior areas for motivating thousands of farmers to organize into self centered, structured organisations – for example, farmer enterprises such as FPOs – which help them in gaining bargaining power, cultivation skills, and technology interventions. At Agrighar, we are now offering exposure visits to motivate these rural aspiring entrepreneurs, youth, SHG women and 80+ FPOs representatives (Each FPO represents 500-1000 farmers each) every alternate week to gain confidence to enter into food processing activities.

What is the kind of challenges women experience in their entrepreneurial journeys?

For an entrepreneur, challenge doesn't differ by gender. But, for a woman challenges definitely prevail. Despite my qualifications and experience, I encountered challenges purely because of my gender. For instance, when I applied for a substantial loan of 2 crores, I was sanctioned 1.95 crores but was asked to have my husband sign as well. I firmly declined because I believe that women should

be treated as individuals, not dependent on someone else's endorsement. This experience made me question the prevailing gender biases in the business world and motivated me to advocate for change.

Have you undergone any training in incubation centres? If so, how effective are they?



Yes, I was an incubatee at the National Centre for Management of Agricultural Extension (MANAGE) – Centre for Innovation and Agripreneurship (CIA) Cohort 3 under RKVY- RAFTAAR Scheme, GoI. In addition, I have successfully Completed Goldman Sachs 10,000 WSP 3.0 MOOC by IIM Bangalore & NSRCEL and also Women Entrepreneurship Development Programme (WEDP) from the National Institute of Food Technology Entrepreneurship and Management (NIFTEM). Incubation centres play a role in making one understand the process of entrepreneurship and to develop one's own network with



other entrepreneurs who are evolving new innovative ideas. These centres also provide you with an outline on what an enterprise should be, the requirements as mandated by law, and the general structure necessary to start an enterprise, together with orientation on the kind of support provided by the government.

It must be kept in mind that incubation centres are not the end of learning for entrepreneurs. They only provide supporting sources for aspiring entrepreneurs. We must develop our own networks and learn all the necessary upgraded digital skills and we should know how to sell our enterprise to survive in the world of startups/enterprises. I have attended several online courses during the COVID-19 period so as to empower myself before I start something to empower farmers/women/youth. For example, even though I had experience of working with FPOs, I attended various online classes to know in depth about the FPOs and its management. Similarly, business

development, food processing technologies, how one can motivate women in the rural areas and many other such courses I learned online. Furthermore, as needed, I also attended offline courses to enhance my skills. As I have mentioned earlier, there is no shortage of things to learn. I learn when I realise that there is a need to know more.

What are the major recognitions you have received in your entrepreneurial journey?

I was felicitated by MANAGE for being selected as a Finalist for the National Entrepreneurs Award (NEA), from Ministry of Skill Development and Entrepreneurship (MSDE). I was a panellist on the Global Forum for Food and Agriculture (GFFA) – 2021. I am invited as a resource person by many organisations to empower youth, women and students. Special thanks also go to print, digital & broadcast media for covering our story under various categories.



Recognition from Telangana State Government for Indo–German Project and Women’s Leadership Award 2023 from HYBIZ TV

Based on your journey so far, what advice would you like to give to aspiring women entrepreneurs?

To all aspiring women entrepreneurs out there, I say: “Learn to say ‘No’ when needed, never hesitate to ‘Ask’ for help or resources, and

always be ready to ‘Talk’ about your ideas and challenges.” But you also need to prepare for ‘No’ because obstacles will certainly come your way, but your determination and resilience will lead you to success.





12

Himalayan Mushroom Queen: Empowering Women in Medicinal Mushrooms Cultivation across India

‘Entrepreneurs are like birds. They believe in themselves, are innovative, risk taking, determined, and must be open to change. Believe in yourself. Start and see things with a positive mindset. Nothing is impossible for a willing heart’.

Hiresha Verma

Founder and chairperson
Han Agrocare
www.hanagrocare.com

Bhuvana N and Ditty Maria Dominic recently interviewed Dr. Hiresha, to explore her journey as an agripreneur from an IT professional since a decade. Excerpts from this interview.

Han Agrocare is a social-business enterprise, a blend of social good, innovative technology, hard work, women power and love, which results in healthy mushrooms round the year. Their mission is to cultivate and promote chemical free, hygienic, organic, exotic and medicinal mushrooms while conserving the environment and providing employment to women, landless farmers and tribals so as to meet the United Nation’s sustainability goals of gender equality, poverty alleviation, and health and wellbeing.

Tell us briefly about yourself, including your academic background and areas of expertise.

As my father was a Commandant in the Border Security Force (BSF), my upbringing and living has been throughout India. Currently, I am settled in Dehradun, Uttarakhand. I have a Bachelor of Science from Bhonsala Military College, Nashik, and a Master’s in Human Resource from National University of HR, Chennai, followed by an MBA in International Business (in distance mode) from the Institute of Chartered Financial Analysts of India (ICFAI). I worked with TATA Telecom as a P&A executive for almost two years. Later, I started my own company ‘Hanzen technologies Pvt Ltd’, with focus on Business Process Outsourcing (BPO) & Knowledge Process Outsourcing (KPO) software development. I was a hardcore IT person back then. In 2010, I also started ‘Hanzen Consultants’, that focused on supporting firms with their business planning and strategies. Later, in the year 2012-2013, I closed my IT company and founded another company called ‘Hanzen International’, with specific focus on mushroom production and marketing in Dehradun.



How did you come to a decision on transitioning from an IT career to agriculture, despite lacking expertise in the agricultural field?

In 2013, I had an opportunity to assist flood-affected villages in Uttarakhand hills through an NGO. We provided essential supplies, such as food, clothing, and other necessities to the people in need. During my time there, I noticed a recurring theme in many villages: only women and children remain in these villages as the men had migrated in search of employment and never returned thereafter. Witnessing the struggles faced by these women and children deeply impacted me, especially since I am a single mother and understand the challenges of raising children alone while ensuring a good standard of living. I couldn't shake off the images of their plight from my mind after returning from the hills. These women had limited education, no job opportunities, and their livelihoods depended on gathering firewood from the jungle. I often wondered how they managed to survive and support their children, considering the scarcity of resources in the hills. Introducing

information technology (IT) to these remote areas seemed impossible given their educational backgrounds. For several months, I pondered over this predicament, trying to find a solution.

Eventually, I stumbled upon information about mushroom cultivation in the hills through an acquaintance. This idea ignited a spark within me, and I delved deep into researching and understanding the intricacies of mushroom cultivation. Although I was new to this sector, I wholeheartedly committed myself to learn from scratch and transform this information into a viable opportunity. This experience turned my life around completely. Today, I proudly stand as a mushroom entrepreneur founding 'Han Agrocare', empowering approximately 5000 women in Uttarakhand, Himachal Pradesh, Madhya Pradesh, Jammu & Kashmir and Maharashtra. Through mushroom cultivation, we have provided these women with a sustainable source of income and a pathway to self-reliance. It has been a very transformative journey, for myself as well as for the women back in the hills, who are with me today.



Women mushroom producers of Han Agrocare



As a newbie in the mushroom production business, how did you empower yourself before empowering others?

It was very challenging to start everything from scratch in a completely new domain. But, the thirst to help the women and children and my prior experience of being an entrepreneur where I would get an idea about starting and running a business profitably and get it done, kept me motivated. But again, this particular enterprise was nowhere related to any of my prior experiences. It demanded a unique skillset and knowledge that one had to acquire first-hand. Initially I did much research and reading to understand the agriculture sector and on the importance of mushrooms in India and overseas. With the basic knowledge and understanding gained from my research, I tried to experiment by myself in my small servant quarter at Dehradun where I invested INR 2000 in production of oyster mushrooms. The production was good and I also learnt it practically. This attempt gave me the assurance of 'Yes, this enterprise is doable and also viable'. But many things had to be refined to make it professional and quality oriented for the market.

So, I went to ICAR-Directorate of Mushroom Research (DMR) centre, Solan. I took training from there to make my mushroom cultivation more scientific. In addition, I also enrolled in several other training programmes related

to mushroom production practices to make my skills perfect. Once I gained the skills and got confidence, I started approaching and convincing women in the hills to take up mushroom production.

Later, when we had a plan to install an AC plant, we needed professional training. In addition to DMR support from Solan, I also went to the International Society for Mushroom Science (ISMS), Beijing, China, to get professional training in mushroom cultivation. That made quite a difference in making the whole organizational setup and production activities professional and quality oriented.

How did you mobilize women into mushroom production?

I had some basic ideas about the villages where more women were left behind in the hills, so I started travelling to different villages and identified the women. Initially, I faced the challenge of acceptability and trust among them. They were not ready to listen or accept me. So, I adopted the following strategies:

- I started sharing my expertise on mushroom production and enlightened them on this practice and that it could be a source of good earnings for them;
- I supplied them with compost, spawn and all other inputs free of cost and asked them to grow and sell on their own;



Mushroom production at Han Agrocare



- We needed a place to keep our mushroom bags. I identified the rooms/schools/ cow sheds/ houses which were vacant in the villages. I arranged for a temporary infrastructure by utilizing all these vacant places and asked the women to start their productions in these places;
- I started a training programme for the interested – free of cost – where I gave them compost, spawn, and other necessary supplies.

At first only five women turned up whom

I trained on skills related to mushroom production. The training had both theory and practical sessions. It used to take me about 3-7 days to set up some skill sets in them on mushroom production as I had to start from scratch. I did this mainly to make them realise the benefits of mushroom production. They used to get good income and were happy also, which gave me immense satisfaction. So, initially it started with five women, later it grew to 10, 60, 100, and today more than 5000 women are involved in mushroom production activity with me.



Microentrepreneurs of Han Agrocare

To mention a case, in the tiny hamlets of Chamoli, Tehri, Haldwani and Gopeshwar more than 1200 women are into mushroom production activities. Now we are present in Himachal, Uttarakhand, Jammu & Kashmir through our trainings. Currently we have plans to start training and promoting women micro entrepreneurs in mushroom production in Chinchuwada (Madhya Pradesh), Jaipur (Rajasthan) Hyderabad (Telangana), and Vishakhapatnam (Andhra Pradesh). It was mainly word of mouth and one woman's success that led other women in the village to get inspired and come forward to take up these production activities.

We are starting our second mushroom production unit at Telangana and Andhra Pradesh where we have entered into an MOU

with Malla Reddy University, Hyderabad and Bharatiya Engineering Science and Technology Innovation University (BESTIU), Vishakapatnam. Probably, I can start my second branch in Telangana so that we can provide our service in the South and empower more women mushroom microentrepreneurs as there is much demand for mushrooms in southern states.

How did your enterprise perform during the difficult COVID-19 period?

Yeah, that was a very challenging and difficult period. In our enterprise until the pandemic, we were relying on the compost supplied by the state government of Uttarakhand. But, during the COVID-19 lockdown period we realised the worth of producing compost in



our own farm unit as the compost supplied from government was irregular. This resulted in a big problem for mushroom production. My women farmers to whom I supplied compost started mentioning: "Why can't you start a production unit of compost, so that we can purchase it from you and we can be assured of the quality as well?" So, this is how my idea of putting up an AC plant came. So, I started with one very small compost unit in two rooms, and today I have ten rooms with complete compost unit and a spawn unit.

Another challenge experienced was that there was no market for mushrooms. Women couldn't sell their mushrooms, it was thrown out, and much wastage was experienced. So, when I realised the situation, I asked all women mushroom producers to bring all their mushrooms to my plant. When all the mushroom were collected, the idea of value addition from mushroom was born. We started preparing mushroom pickles, mushroom papad, mushroom cookies, and many more value-added products. This is how our value addition activity started. I told them that you can grow and bring it here so at one place, we can make products and sell it.

So, during COVID days, amidst problems we innovated products and did not let even a single mushroom go to waste, and our second segment of value-addition activities started.

How did you end up producing medicinal mushrooms?

Simultaneously with our value-addition activities during COVID in 2019, I was considering medicinal mushroom production and marketing also because our country is importing medicinal mushrooms from China and Indonesia. So, I thought, why can't we cultivate it in our own country? That is how our pilot batch of medicinal mushrooms such as Shiitake, Ganoderma, Lion's mane, and Turkey tail, started in 2019. I did not start everything at one go. First, I started cultivating Shiitake, once it was possible to cultivate it then I went on to Ganoderma, followed by Lion's mane and Turkey tail. This is how I eventually started and finalised the formulations. Since this is giving five times more price, I started making substrate of these mushrooms at our production unit and supplying to the women. I give training for women in the hills on how to produce these, the key aspects to be taken care of, etc.



Value added products and nutraceuticals of Han Agrocure



Accordingly, they started growing these mushrooms and I started buying back the produce from them so that they don't have to travel anywhere to market these. We have found buyers for it across India and internationally also. So, I buyback all the produce. Today, I have more than 2000 women with me who are producing medicinal mushrooms and earning Rs. 10,000 to Rs. 15,000 per month.

We make value-added products and extracts from these mushrooms. From these extracts we make nutraceuticals. For example: Ganoderma is very good at addressing the issues related to sleeplessness, anxiety, depression. Lion's mane is a very good brain tonic for attaining focus and reducing the chances of getting Alzheimer's and Parkinson's disease. Turkey tail is very good for those with diabetics; Shiitake is very good for enhancing immunity. All these have anti-cancer, anti-viral, anti-inflammatory and antioxidant properties. These are rich sources of Vitamin D2. We have

a good team of specialists who extract these bio-compounds. Now, we have started making powder, capsules and tincture from these.

How did the women respond to your proposal for producing medicinal mushroom?

Initially it was a challenge convincing them and many were resistant to change from button mushroom production to medicinal mushroom production, due to the convenience of marketing and comfort of production. Once, they realised the higher margins and assured market from us, now most of them are into medicinal mushroom production. For button mushroom, they were getting Rs.100/kg, for medicinal mushrooms they are getting Rs.500 to Rs. 600/kg. This margin made them change from button to medicinal mushroom production. The women were trained on medicinal mushroom production and now they grow these medicinal mushrooms on their own.



Medicinal Mushrooms

How do you provide support to your farmers?

I have a good professionally trained team both at the back end and front end of my enterprise. We have 22 staff now and 90% of them are women. They are in production, marketing, procurement, accounts and administration. Our team trains women, landless farmers, tribals who take substrate for mushroom production from us. We also handhold them during the production process, provide needed

technical support and buy back their products. With regard to infrastructure, we have our own mushroom and compost production plant; spawn production, substrate production unit; food processing unit; extraction unit; and packaging unit. It took me eight to nine months to have all the infrastructure in place and functioning properly. We also have a marketing team to market our medicinal mushrooms.



How did you maintain year-round production before the infrastructure was in place?

Before we installed our production infrastructure, we managed our production basically in huts. Our production was continuous. We planned it very intelligently. We used to take up alternate tunnel production. First only one tunnel production in two rooms (where one tunnel has capacity of 20 tons of mushroom production), followed by second batch of production. By the time we had the second batch of produce, the first one had already met the market needs. So, this alternate batches system helped us to meet the demand in the market throughout the year. The products were sold under the brand name 'Hiresha's World of Mushrooms'.

What is the secret behind the many recognitions you have gained and the title 'Mushroom Lady of India'?

I am very keen to learn and improve myself with respect to the knowledge and skills related to mushroom production, and also make my company attain the greatest heights professionally. This can happen only when my company and product is unique. But only uniqueness doesn't fetch the result. It must be made known to the world. So, I actively take part in several entrepreneurial programmes, and started participating in competitions. The idea was not to get any awards or recognition. The idea was to learn and spread the word

on our medicinal mushrooms all over. More and more people should know about it. In India, we are not generally aware of medicinal mushrooms and it is not in our staple diet; moreover, several myths revolve around it. But it has several health benefits. In China, there are several traditional medicines from these mushrooms which Indians have not realised.

So, just to spread this knowledge around, I started participating in all the government entrepreneurial programmes conducted by the Ministry of Micro, Small & Medium Enterprises (MSME), Department of Biotechnology (DBT), and Niti Aayog. In addition to spreading the importance of medicinal mushrooms, this also brought me much recognition and awards for the uniqueness of both the product and the enterprise.

What kind of collaborations do you have at Han Agrocare?

I enter into MoUs with universities for product development and evaluation. We utilize their research labs and expertise for a variety of product development and testing. The strategy I use here is, I enter into an MoU with one university for only one product; for example, if I collaborate with one university to do research on a beverage, then I collaborate with another one to do research on bakery products, and so on. Likewise, until now we have collaborated with six universities for six products' development and evaluation.



Dr. Hiresha as Chief guest at Uttaranchal University



For marketing, we have collaborated with few people who does influential marketing for us. But not much as we have our own people to do marketing on online (e-commerce website) and offline platforms.

Please tell us about your incubation journey. I joined many accelerators and incubators. I acquired my incubation knowledge from various sources: Nexus US Embassy, Atal Incubation Centre (AIC ISB), Indian School of Business (ISB), and ICAR-Pusa Krishi. I also completed my ambassador programme from Goldman Sachs. Even today I am doing 'Shitij' incubation programme from ICAR-PUSA Krishi. These incubation and accelerator programmes continue to enhance my knowledge and skills on a regular basis as this is not my forte and was never my field. I read and study a lot. I keep on updating myself and these keep me moving along with the best.

Are your products available in the hypermarkets?

We are soon launching our products in the hypermarket chains. This has not been done until now because they take most of the margin and we needed funds. As we are now quite established, very soon we will be launching our products on online marketplaces, such as Flipkart, Amazon, Snapdeal, and some other export portals. Presently, we are selling through our e-commerce platforms and also offline where we keep our products in others' outlets, like supermarkets. If we are to open our own outlet it will call for more funds and at present much of my fund flow is into R&D and helping women.

What digital tools do you use to develop and promote your enterprise?

As I have knowledge of running an IT firm most of my earlier team members were from that field, this and my own personal IT skills are helping me in this company as well. Most of the BPOs and lead generation teams are

involved in getting market deals by telephone calls, online searches for market leads and regular follow-up. KPOs help in research and development. Now, digitalization of the company is underway where we are adopting artificial intelligence (AI) techniques for market analysis. My digital background actually helped me much in promoting my products on standardized e-commerce platforms, and to publicize in social media and analyse the trend of sales and demand and follow-up. I have focused on making my enterprise smart where the staff monitoring, evaluation, and activities moderation are all done online using AI techniques. To be specific, every employee has to go through Key Performance Indicators (KPI), Key Result Areas (KRA) online. The whole organizational system has been made very systematic where they get general orientation, company orientation, and they have to undergo their personal KPI, KRA. To make the organization smart, these smart skills and techniques are adopted. Even to analyse the market situation, my analytical skills gained from my IT experience has helped me to progress at a faster pace. Or else, it would have been very difficult to manage all alone.

How are you managing finances for your enterprise?

Actually, the company started formally from 2015. From 2013 to 2019 it was more of a trial and error situation. It was a proprietorship company at that time with just me investing without any returns. In 2019, I registered it as a legal entity and so one can say it started from zero and today our turnover is more like 3 crores.

Any capacity building activities for women from Han Agrocare?

As mentioned above we provide training on mushroom production for women. In addition, recently we started training university students also when the university requests it. Depending on the kind of batch the training period varies from three days to one week. We



have PowerPoint presentations where we make our participants get the necessary knowledge visually through photos, movies and our

work stories. Most of our training is visual and practical oriented. No classroom kind of teaching, and it is completely skill based.



Training on mushroom production to rural Women

Can you tell us some of your personal challenges and how you overcame those during the initial days of Han Agrocare?

When I decided to shift from IT to agriculture, no one including my family members or friends supported me. Instead, everyone made fun of me. Only my children supported me in those days. Even before I started, everybody declared me a failure. You need to have a strong mind to overcome such emotionally draining situations. I was determined to make it happen and show everyone that I can do it.

I started from a farm at Dehradun where I prepared compost for mushroom production. I had failed eight times continuously in making the perfect compost. My money drained away like crazy in the process. Everybody around me were like shut it off, it is not your cup of tea. But I did not leave my trial and continued with my effort to make it. Today, you won't believe that we are so proficient in making compost for mushrooms that we are sending our compost to all of Uttarakhand, Uttar Pradesh, Himachal and other places. So, continuous persistent practice made things happen right in my case.

Another most important challenge was getting finances as the banks were not willing to provide loan for the enterprise. Initially

the bankers did not trust the product as it is perishable in nature. After several visits to the bank for seven to eight months, INR 60 lakhs was sanctioned for infrastructure and working capital. In three years, I repaid this, but this whole process was really tiring. Nobody (family/friends) supported me financially in those days. But now everybody is standing in line to support me. Perceptions have changed about me and my company today but not before Han Agrocare.

Later, availability of quality spawn for mushroom production was also an important challenge where I invested in our own spawn production unit to meet the demand.

Lastly, I can say marketing. The vendors want to purchase our products at a very low price. Even with the best quality, they used to pay Rs. 20 less to us when compared to the payment they make for the suppliers who are men. I used to fight for it and take a firm stand. Then, I started selling these mushrooms by myself in small 50-100 gm pouches. I used to go early morning around 4 AM and sit near parks and places where people come for morning walks and sell to them. Like this we got our product recognized and also got more margin by selling in this manner.



What kind of strategies have you adopted to make things work with women at Han Agrocare?

I always prepared myself well (learn everything and learn in depth) before stepping out to teach and train women. There are cases where women don't come forward and have the notion that 'things don't work for them'. Initially they were not ready to learn new things. Right at the start, they say 'it is not possible'. So, under such circumstances, it is important for me to learn and demonstrate everything myself first and then show them how things work. Then they will start to accept and learn. In training my staff and women who produce mushrooms for us, I learnt and acted first and they followed me later. This is how I tried to motivate them – by example.

Secondly, the women in the hills had no clue about digital applications. Slowly and gradually, I had to teach them what the apps are all about and how it can be used to network, communicate and learn. The digital literacy trainings were also imparted non-formally. For instance, we have an employee who is just 10th class passed and had no clue about using computers or anything, so over

a period, I taught her how to turn on the computer, turn it off, use MS office, manage documents, etc. Now, she does everything by herself. All these things did not happen in a day or a fixed period. As the company started evolving, these skills were also introduced among our women network and staff by me. In today's world, digital literacy is very important. Realising that, I started to act on it quite early and my Han Agrocare family are in the process of learning and updating themselves. Also, mobile phones play a key role in making the learning process faster.

How many Awards and recognitions are in your basket now?

As mentioned earlier, nothing was expected. It all came my way during the process of Han Agrocare's evolution. Much of the credit goes to the women who have been with me in making things happen correctly. I have around 50-51 awards till date, but there's still a long way to go. Latest one is from Niti Aayog where they have recognised us as one of the 75 innovative companies in India (<https://www.niti.gov.in/sites/default/files/2023-02/Compendium-of-75-agri-entrepreneur.pdf>).



Empowering Women Entrepreneur of the Year 2021 on behalf of the Ministry of Micro, Small and Medium Enterprises, Government of India / Mushcon International Mushroom Festival- 19-20 October 2021

I am also awardee with 'Accelerator in AWE' Award from Banasthali & US Embassy in 2022; 'Enterprising Women Entrepreneur' Award from MSME and ICAR in 2022; International Recognition Award as the 'Mushroom Lady of Uttarakhand' 2021 from Government of India; 'Best Progressive Farmer' Award

from ICAR in 2021; 'Enterprising Women Entrepreneur' Award from MSME 2021; 'BEST Social Enterprise Award' from Action for India in 2019, and many more. But, there's still a long way to go and much more to do in mushrooms and women empowerment.





Other awards and recognitions for Dr. Hiresha

I am also awardee with 'Accelerator in AWE' Award from Banasthali & US Embassy in 2022; 'Enterprising Women Entrepreneur' Award from MSME and ICAR in 2022; International Recognition Award as the 'Mushroom Lady of Uttarakhand' 2021 from Government of India; 'Best Progressive Farmer' Award from ICAR in 2021; 'Enterprising Women Entrepreneur' Award from MSME 2021; 'BEST Social Enterprise Award' from Action for India in 2019, and many more. But, there's still a long way to go and much more to do in mushrooms and women empowerment.

Where are you exporting your products currently?

We are currently exporting our products to Dubai-UAE, Qatar and Nepal. Very soon we are starting our exports to Canada, Indonesia and Europe. To enter into export markets, quality of the products is very important. To mention an incident, when we were pitching for Dubai market, all my competitors were from China and I was the only company from India. I just gave my samples and asked them to try it out. They were reluctant initially but, you won't believe it when I say that our product was in the top list, higher than China which is one of the leading countries in mushroom production.

Now, there is great demand for our product in Dubai. Initially the demands were like 400-500 kgs. But now it goes by containers. So, we must work more to meet the demand without compromising on our quality. So, now I need more and more women in production activities to meet the huge demand.

What suggestions would you like to provide to policy makers to strengthen entrepreneurship in agriculture?

I observed that there is not much emphasis on medicinal mushrooms in agriculture-related policies. This needs to be addressed and there should be a provision to grant Ayush certificates for medicinal mushrooms. I feel that policies need to be regularly updated bearing in mind emerging areas such as medicinal mushrooms, hydroponics, vertical farming, etc., to promote new enterprises in these sectors.

What advice do you want to give to aspiring women entrepreneurs?

Nothing is impossible for a willing heart. If you think, you can do it, you will do it. When an IT background person like me can jump into the agriculture sector and make it happen, anything can be made possible.





13

Coconut Magic: From Homemaker to Entrepreneur

"There is a butterfly inside everybody which is waiting to spread its wings and fly. We just need to come out of the cocoon of self-doubt and insecurities, seize the opportunities and fly high."

Sumila Jayaraj

Founder

Greenaura International

www.greennutinternational.com

Ditty Maria Dominic and Bhuvana N recently interacted with Sumila Jayaraj, to understand how she grew her coconut-based enterprise from a small home-based unit to a well-established firm. In this interview, she narrates her inspiring entrepreneurial journey.

Greenaura International is an integrated coconut processing unit in Thrissur, Kerala, founded by Sumila Jayaraj in 2012. The mission of the enterprise is to develop and produce value-added products from coconut, support local coconut farmers, and make the goodness of coconut available to the whole world.

Can you walk us through your life before you became an entrepreneur?

I am from a small town called Chavakkad in Thrissur district of Kerala. After my post-graduation in literature, I got married and moved to Mumbai as my husband was working there. Soon I became the mother of twins and got very busy as a full-time homemaker. After six years I shifted back to Kerala as my husband had to move abroad for a job. I had enough time on my hands as my kids were going to school and my husband could visit Kerala only once a year. So, to keep myself engaged I joined as an Assistant Manager in a newly-started virgin coconut oil manufacturing company near my home, which was affiliated to the Coconut Development Board. I worked there for three years and when I look back, I see that it is this job experience that laid the foundation of my later entrepreneurial journey.

Please tell us briefly about your journey from Assistant Manager to entrepreneur.

During my job as Assistant Manager, the company got a lot of enquiries about virgin coconut oil and I used to be the





one to attend calls from customers around the world, as I was proficient in both English and Hindi. This is when I realised the qualities of virgin coconut oil and I started learning about this product and got passionate about the project. One day we got a call from London and I could crack an export order with that client. This really motivated me as it was the company's first export order and despite it being my first job I could crack it.

After a while we got our next export order from the USA and the customer was a Keralite. While explaining to him about our product I was going by the usual line of 'how good a moisturiser virgin coconut oil is' and its benefits. Then he told me if you want to get more customers you have to do a documentary with genuine testimonials from customers. He made me understand that the product will then speak for itself rather than me pontificating about the product. So, in search of a testimonial I found a doctor – an oncologist – who purchased virgin coconut oil regularly from us and I asked him how he used the oil and requested for a testimonial from him. In his testimonial he said that he was doing research at the Regional Cancer Centre, Thiruvananthapuram, on 72 children

who were cancer patients. After chemotherapy these children would get painful ulcers in their mouth, but there was one exception, one kid who didn't have any ulcers. On enquiring with the child's mother, he came to know that she was applying virgin coconut oil inside the child's mouth which was preventing the ulcers. So, as an experiment, the doctor started applying our virgin coconut oil to 10 more children, and as testified by him all the kids who got the virgin coconut oil treatment did not get mouth ulcers.

This testimonial really surprised me and ignited a passion inside me. Later I got many testimonials which really motivated me. I was really enjoying my work then but later I decided to leave the company and start my own unit. Initially I started a proprietorship in the name of Greennut International; later in 2022, Greennut International was reconstituted as Greenaura International with Greennut as its brand name.

How were the initial days of starting your own enterprise?

In 2012, I started my own manufacturing unit right in my home premises. It was a small unit with two women helping me and a driver



who took care of distribution. It was a tough time back then and many a time I had to drive myself for distribution, when the driver was not available. In 2013, the Assistant Manager of a well-trusted co-operative company of Kerala visited our unit and impressed by the quality of our products, gave a huge order to resell it under their brand name. This motivated me and from then on, slowly we started getting orders. Later I shifted to a leased-in unit and

started manufacturing desiccated coconut powder also, along with virgin coconut oil. In 2021 I bought land and started my own unit. Now we have eight coconut-based products viz., coconut milk, cold pressed extra virgin oil, desiccated coconut powder, coconut chutney, coconut water vinegar, hair cream, low fat desiccated coconut, coconut pickle; and three products are in the pipeline as we have to get license for those.



Product portfolio of Greenaura International

How did you gain the technical know-how and financial capacity for establishing your manufacturing unit?

The basic technical knowledge came from my own experience and trainings I received during my first job in the virgin oil manufacturing company. Thereafter I got training from CSIR-Central Food Technology Research Institute (CFTRI), Mysuru, on processing of virgin coconut oil and they transferred the technology. I have undergone training from the Coconut Development Board on manufacturing of coconut water vinegar as well.

My enterprise is a 1.8 crore project. Initially, for setting up the unit at my home premises I had got a 30 percent subsidy on the overall establishment cost from the District Industries Centre (DIC). I got 70 lakhs term loan and 20 lakhs working capital from SBI under the Stand Up India Scheme for purchasing the machines. I also got financial support from Agriculture Infrastructure Fund Scheme. Currently I have 13 permanent staff working with me, of which eight are women. We have a quality control lab in our unit, where we check the quality parameters of our products regularly. We got food safety certificate and ISO HACCP certificate as well.



Certificates received by Greenaura International



How do you source the raw materials?

Coconuts from the coastal belts of Kerala are world renowned for its quality. The coconuts in my locality are known for the high oil content, and its dense and tasty flesh. So, I procure coconuts for my unit locally from around 25 farmers for a price higher than the market price by 1-2 rupees. Ten thousand nuts per day is our capacity, but currently we are using only 60 percent of the capacity. Chavakkad being a coastal district, coconut is a major agricultural produce of the region, and we have a surplus supply of good quality coconuts.

How do you market the products? Are you doing digital marketing?

Initially I only focused on the domestic market. I used to distribute my products to retail shops, supermarket chains, etc. But in India,

especially in Kerala, it is very difficult to market my products as the people are not aware of the goodness of virgin coconut oil and allied products. But in other countries there is greater awareness and hence our products have more demand in the export market. In 2016 we started exporting our products and till now we have exported to UK, New Zealand, Malaysia, Singapore, etc. Currently we are exporting only to the US. Around 50 percent of our products is exported and the main products that we export are coconut milk, extra virgin coconut oil, coconut water vinegar, and desiccated coconut. We have Kosher Passover certification for exporting. Other than this, we put up stalls at exhibitions and trade fairs which help us to grow our customer base and gain more popularity.



Exposure visit organized by ATMA to the Processing Unit of Greenaura International

Yes, we are doing digital marketing as well. I got my first export order from IndiaMART in 2016. I can say that digital marketing offers greater opportunity to reach out to many more customers, especially in far off places, and it has enhanced the visibility of our products. Many queries come from customers pan India and abroad on how they can purchase my products. Hence, I decided to get into digital marketing. Currently we are marketing through e-commerce websites like IndiaMART and Amazon. We also get orders through WhatsApp.

Do you think digital platforms are helping your enterprise?

Yes, certainly. In my view any enterprise can succeed in today's competitive world only if they showcase their products and their work in the digital world. Digital platforms open great opportunities but it also pose several challenges. While these platforms help us to scale up and expand our enterprise, it also exposes our lack of capacity to cater to big orders. However, even if an enterprise is having high quality products, if they are not able to take up on their digital foot print it is impossible to expand their customer base and scale up; so digital marketing is absolutely necessary.

I was in a way lucky to be well-acquainted with website management through my first job, before even starting my own enterprise. So, I had developed website for my company in

2013 itself. In 2022 a few YouTube channels had interviewed me and documented my work, and it was only then that I really became aware of the power of digital tools. A few of the videos got lakhs of views and I got calls from people around the world who had watched them. It astonished me when my products – from this small town in Kerala – got the attention of people from countries like Ghana. So currently I am focussing on being more active on social media platforms like Instagram, Facebook, etc., which I believe can get us more customers.

What challenges did you face as a woman entrepreneur?

I will not say being a woman in particular posed any challenge, rather, I faced challenges that most entrepreneurs, man or woman, would face. The initial challenge I faced was in getting a loan from banks. I had to wait for almost one year to get my loan sanctioned. Other than that, I would say low awareness among people about the quality and importance of virgin coconut oil and other products was a major challenge that makes domestic marketing difficult. Also, there is generally an erroneous belief in society that small enterprises like mine are making huge profits and we are corporates. To an extent this creates some political challenges. As for any other entrepreneur, COVID pandemic time was challenging for me too. At that time, I had to shut down the leased manufacturing unit. But I was not disheartened; instead, I planned on



Workers engaged in processing and packaging



establishing my own unit once the pandemic was over and in 2021, I successfully started my own unit.

What are your specific achievements?

I consider impacting farmer's lives and supporting around 50 families who are indirectly involved with the activities of the unit my greatest achievements. Other than that, I have got several awards for my work.

Recently I was awarded 'The Best Entrepreneur Award' by the Kerala Gazetted Officers Association and 'The Best Enterprise in Food Processing Award' by Hues of Life magazine. In 2022, I received METRO MSME 'Best Enterprise in Manufacturing Award' from Kerala State Industrial Development Corporation (KSIDC). In March 2022, I got 'Best Woman Managed Enterprise Award' from the Thrissur Management Association (TMA).



Recognition of Greenaura International's efforts by the Kerala Agricultural University and Thrissur Management Association

My work was recognised by the Kerala Agricultural University on Women's Day 2018, and recently by DIC. I have been invited as a resource person for various webinars and trainings on entrepreneurship development as well as coconut processing. I have been featured in popular magazines and journals such as Karshakasree, Indian Coconut Journal and Sambadhyam. In a nutshell, I scaled up my enterprise from a small shed at my home to a one crore turnover enterprise through my hard work and persistence.

What are your future plans?

More than a business, this enterprise is my passion. I believe in the quality of the products and that keeps me motivated to scale. Hence my plan is to fully explore the value addition aspects of coconut and develop around 100 products from it. I am planning to establish an R&D lab for developing diverse coconut products which are ready to cook and ready to eat.

What is your advice to aspiring entrepreneurs?

Hard work is the crucial factor behind the success of any enterprise, without hard work nothing can be built. Aspiring entrepreneurs should always remember that 'slow and steady wins the race'. Any enterprise will take time to flourish, and entrepreneurs must hold on to patience and persistence always.

I have a few words for those entrepreneurs who are aspiring to take up coconut processing enterprises. There is high potential for coconut-based enterprises, but we should think beyond the usual product chain of coconut, copra, oil and coconut oilcake.

There is scope for more value addition and people should come up with more innovation in this sector. Entrepreneurship in the coconut sector is not only a revenue making opportunity but also a viable option to support coconut farmers in the country.



I also have a small message to customers. The only two things that get easily digested by infants are breast milk and virgin coconut oil. Breast milk is rich in mono-lauric acid and there is 47-50 percent of this lauric acid in our virgin coconut oil as well. So, it is one of the safest and most nutritious products. Also, coconut-based products in general, and virgin

coconut oil in particular, are treasure troves of vitamins, healthy fats and antioxidants. Simple steps like using virgin coconut oil as moisturiser rather than chemicals can yield better results. It is high time that we embrace our roots and adopt the use of coconut-based products over chemicals.



Interacting with participants of Agripreneurship Orientation Programme conducted by RKVY-RAFTAAR Agri Business Incubator, Kerala Agricultural University





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14

Newlook Herbs: Crafting Herbal Success from Home

"Life was unfair to me and living as a victim was an option, but I chose to turn my pain to purpose, and success was the result."

Jeevitha Kandasamy

Founder

Newlook Herbs

Salem, Tamil Nadu

www.newlookherbs.in

Ditty Maria Dominic, Bhuvana N and Alagu Niranjan D recently interviewed Jeevitha Kandasamy from Salem, Tamil Nadu, to understand how she established a thriving venture by making herbal products from a small home-based unit.

Newlook Herbs is an authentic traditional skin and hair care brand, deeply grounded in the ancient principles of Ayurveda, founded by Jeevitha Kandasamy in 2020 at Salem, Tamil Nadu. The brand's unwavering commitment is directed towards creating top-notch skin and hair care solutions, meticulously formulated from the finest herbal elements.

Could you provide us with a brief overview of your educational and cultural background?

At the tender age of one, my father succumbed to cancer, leaving me as my mother's only child. So, since childhood, I dreamed of becoming a doctor and helping cancer patients. However, fate took a different course, when I got into a road accident. My health condition posed challenges to my studies and I couldn't complete my schooling. Consequently, in 2010, at the age of 19, I got married. My husband lived in a rural village, approximately 25 kilometres away from Salem. Transitioning from my home in Puducherry to this new environment proved to be an arduous journey. Yet, my husband's unwavering support encouraged me to undertake a diploma course in Computer Science. At that time, he managed an institute that undertook project works and I subsequently joined the institute after completing the course. It was during this period that I dedicated myself to acquiring computer skills along with expanding my knowledge on many other topics, including medicinal properties of herbs.



Due to my father's cancer-related demise, I found myself driven to provide assistance to cancer patients in whatever capacity I could. I took it upon myself to accompany the cancer patients from my village during their visits to JIPMER Pondicherry, for consultations. The reason for this was that many villagers faced challenges in communicating with doctors, as most of the doctors were North Indians who spoke in Hindi or English. During those hospital visits I used to see a large number of cancer patients which really saddened me. I firmly believe that our lifestyle choices play a major role in the development of cancer. In today's world, it's apparent that people are exposed to many chemicals through the various products they use in their day-to-day lives, which causes cancer. So, I began thinking of what I could do to reduce chemical use, though the idea of being an entrepreneur never occurred to me at that time.

When did the realization of your entrepreneurial aspirations first dawn upon you?

The profound sorrow I experienced at that period of my life became the catalyst for my

journey into entrepreneurship. It began when I conceived in 2019 after an 8-year struggle with infertility due to gynaecological issues. The moment of conception felt surreal, especially after undergoing various treatments. During this period, I delved into educating myself about childbirth and child development. That's when I realized the importance of minimizing chemical exposure in my child's life. This led me to the idea of crafting a chemical-free soap for my unborn baby, considering that the very first act is usually bathing the baby, even before the introduction of solid foods.

Lacking prior experience in soap making, I turned to YouTube tutorials, and attempted to create soap through trial and error. Unfortunately, my initial attempts failed due to improper ingredient proportions, causing a burning sensation in my eyes. Frustrated by these setbacks, I realized that the standard proportions from YouTube weren't suitable for my needs. Consequently, I enrolled in a local soap making class and visited soap factories, which enabled me to grasp the correct ratios of ingredients.



Distributing herbal soaps to Kirumappakkam PHC

I incorporated marigold flower extract, readily available in my village that is renowned for its skin benefits, into the soap formula. Through continuous testing and refinement, I began to

perfect my soap recipe, driven by the intention of creating the best possible product for my child. However, in September 2019, tragedy struck, as I lost my child due to complications.



This devastating loss plunged me into a state of depression. Amidst this emotional turmoil, the onset of the COVID-19 pandemic compounded our challenges as my husband lost his job.

But the pandemic intensified the importance of hygiene. As messages promoting hand washing and cleanliness were gaining

prominence, I couldn't help but wonder about the chemical content in the soaps being used. This compelled me to distribute my chemical-free soap within my neighbourhood and to anyone seeking an alternative. Encouragingly, I received positive feedback, with one neighbour reporting a significant reduction in skin rashes after using my soap. These responses ignited my motivation.



Preparation of herbal shampoo, Muringai seed oil night cream and kuppaimeni (*Acalypha indica*) based herbal pet soap

Simultaneously, I was an active participant on Clubhouse, discussing my soap-making endeavours, herbal remedies, and the significance of minimizing chemical exposure. The connections I formed on Clubhouse and the genuine interest shown by thousands of listeners boosted my self-confidence. This newfound confidence inspired me to believe that if I could capture people's attention through dialogue, my chemical-free soaps would also resonate with them. So, in 2020, I made the decision to turn soap-making into a business venture. This step not only provided a means to overcome financial constraints but also offered a path toward healing and resilience.

How was the journey once you decided to start your enterprise?

I started my enterprise in my home with an investment of INR 5,000. Soon I realised that I only knew how to make soap but had no idea of diversification, packaging and marketing. At that time one of my connections from

Clubhouse was attending a conference and asked me whether I can help them in making moringa leaves (*Moringa oleifera*/ drumstick leaves) based herbal products to sell in their stall.

I had never thought of making soaps using moringa leaf extract, but as per their request I made it and went for the conference.

There were moringa farmers, retailers, exporters, researchers and other officials there but I was the only one with Moringa soap. I was astonished to see the demand for Moringa, especially in the export market. Many moringa leaf producers and dealers came to me asking if I can make soap if they provide me with the raw material.

Another event that gave me a sense of direction is the agripreneurship development session conducted by the Entrepreneurship Development Institute of India (EDII) under the Periyakulam Horti-Business Incubation Forum.





Receiving certificate from EDII Periyakulam for successfully completing the incubation

The class gave me an idea of the importance of diversifying my products and developing unique products. Now I am a member of the forum. So, in essence the journey has been good so far and my brand is getting recognized by more and more people as each day passes. In August 2022, I got 'Sakthi Masala Homepreneur Award' in the beauty and wellness category.



**Shaki masala homepreneur Award 2022
(Beauty & Wellness Category)**

Currently what are all the products you have, and how do you procure the raw materials for it?

I have around 13 products which include eight types of herbal soaps, one herbal shampoo, two creams and two types of oils. Each of my products has a story behind its crafting. The soaps we make are cold pressed and the base is made of oils. This is different from the soaps we generally get in markets as those are 'melt and pour' soaps that uses petroleum products as base. Compared to 'melt and pour' soaps, our cold pressed ones take more time to make. It takes around 45 days to make a batch of soap. Another peculiarity of our soap is that we use six oils viz., coconut oil, rice bran oil, castor oil, food grade palm oil, illupai and punga oil in soaps, while usual soaps are made with a single oil which makes skin dry. So there is a lot of research that goes into finding the right ingredients and developing new products. One of the bestsellers that I developed by researching is the night cream made by mixing moringa seed oil and turmeric essential oil. Through my research on moringa seed oil I got to know it reduces ageing by 7 times and this motivated me to make moringa soap.





The diverse range of products from Newlook Herbs

Likewise, the oil and cream made for psoriasis treatment from Veppalai (*Wrightia tinctoria*) are two other bestselling products; and formulations of these products is our trade secret. The story of how these products were developed is interesting. In my village Veppalai is found in abundance. So before even starting my business, just out of interest, I had been researching and learning about it. Veppalai is hailed for its qualities in treating dry skin. So, in the initial days of my enterprise, on a regular visit to a home for handicapped children, I got a request from the teacher of the home to make a skincare product that will help in reducing the dryness of the knee and elbow joints of these kids. Most of the kids were unable to walk on their feet and their crawling movement caused chafing of knees or elbows on the floor. This caused intense drying and itching. So, I made an oil and cream using Veppalai for them, and it was very effective. So, I started to make it for sale under my brand. Once while I had put a stall in an expo,

a girl came to me asking for any products that can cure her psoriasis. I suggested that she use my psoriasis cream made from Veppalai. Though I couldn't guarantee that it would cure her psoriasis, I hoped that it would help to some extent. But to my astonishment she called me after three months and told me that her psoriasis had been cured completely. So currently, my main products are psoriasis cream and psoriasis oil.

I don't add any chemicals in my products, though I use a minimal amount of preservatives. I have many customers in France, Germany, Malaysia and Singapore who are regular buyers of the oils and creams.

Except for veppalai oil, I procure all other raw materials from known farmers in my village. I make veppalai oil in my own unit at home, as farmers don't make it and it is not available. I have around 10 regular farmers who supply raw materials to me.





Exhibiting the products at Tamil Nadu Startups and Incubators Meet 2022

How do you market your products?

Majority of the marketing is done through digital marketing. I have a website for my enterprise through which customers can learn more about our products and there's a Whatsapp number to place orders. Also, we have an account on Instagram and we get orders through that as well. I also supply to other companies for selling through white labelling. Putting stalls in expos is another major way I market my products. Now I have started marketing my products in kits, with each kit holding different products of the customer's choice. This has helped me to sell even more.

How do you think digital platforms are helping your enterprise and what are the challenges you face in using these platforms?

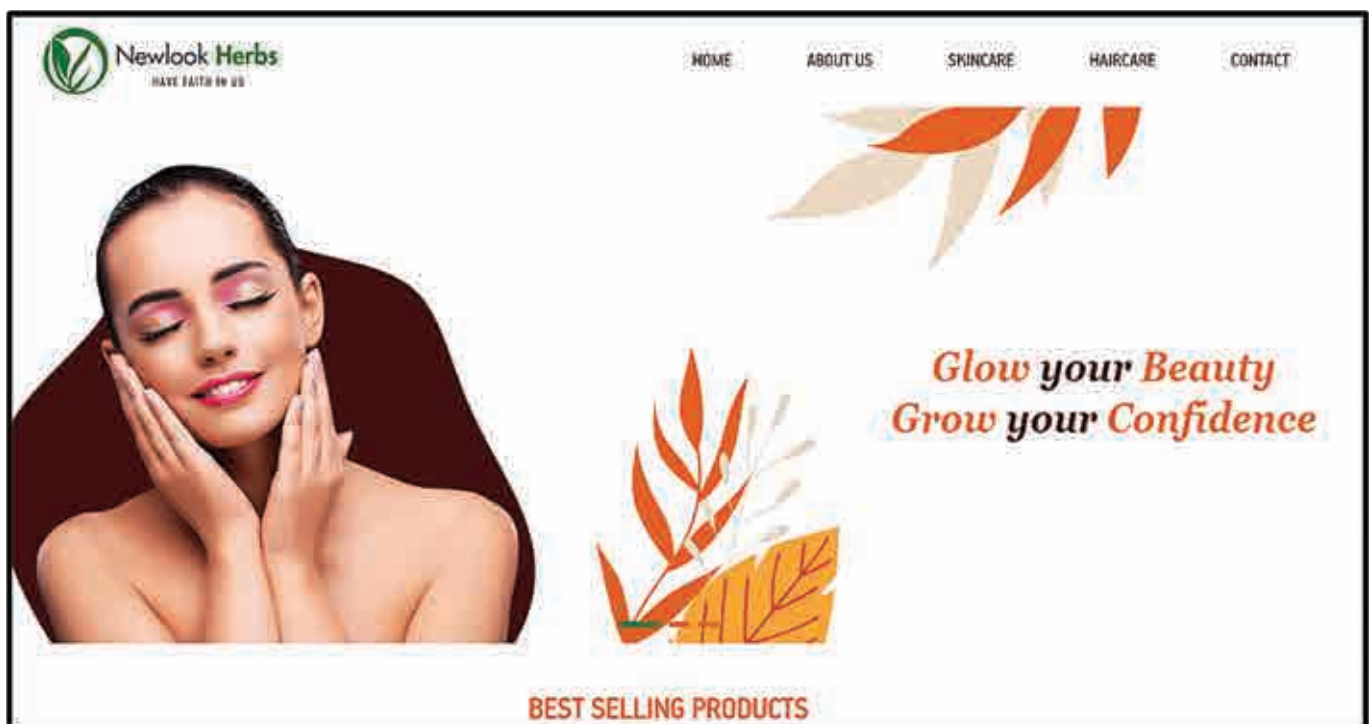
The comfort of sitting in your own space and reaching hundreds of people is the biggest advantage that digital platforms provide. I would say digital platforms, such as Clubhouse, helped me in networking and learning. When I went for the conference that I mentioned earlier, people identified me from Clubhouse. Also, marketing would have been a major hurdle without digital platforms such as Whatsapp, Instagram and Websites. If I am able to successfully market my products all over India and foreign countries, that's only because of digital platforms.

But I have faced many challenges as well in digital marketing. Even though I was posting regularly about my products on social media, my products were not getting any popularity. In the incubation that I attended this aspect was not taught. So, I had to take an online

digital marketing course. The class helped me in getting ideas on how to reach more customers through digital platforms. Paid promotions in social media are very popular but the amount of money influencers and celebrities ask for promoting products is huge, and I cannot afford that.

Also, digital platforms pose another challenge – greater competition. For instance, if we see Instagram reels, there are hundreds of brands making soaps, lip balms, etc. If they are ready to invest, they can do paid promotions with influencers who have large numbers of

followers. Whether it is a quality product or not, these influencers are trusted by many and they all will buy the products. So, if an entrepreneur is not able to promote the products and compete in digital spaces it is hard to thrive. Other challenges that I could have faced was in website development and designing of posters to put on social media. But luckily for developing the website I got help from my family members who were developers, and for designing posts, the basics I had learned during my diploma classes helped. I use Canva app for designing posters to put on social media platforms.



Newlook Herbs Website

What is your message to aspiring women entrepreneurs?

In a world where being a woman often invites scepticism and challenges to one's capabilities, it's essential not to rely on external validation or anticipate immediate trust from others, especially in a country like India where establishing credibility can be an uphill battle for women. Instead, have confidence in your own abilities and then set out to pursue

your entrepreneurial aspirations. However, it's important to be thoroughly equipped to tackle the obstacles that may arise. Luckily, in this age of digital advancement, solutions are readily accessible at our fingertips for any challenge that we may face. Ensure that you are digitally literate. Prioritize continuous skill enhancement and commit to a journey of ceaseless learning, as staying updated is the cornerstone for achieving success.





15

Enriching the Lives of Marginal Tribal Farmers of Meghalaya

"I was cruising along, and then life threw me a curveball that changed everything. It may be a drop in the ocean as far as my work is concerned, but I'm happy to contribute to providing sustainable livelihoods for marginal farmers, mainly women, who may not even know me"

Meenakshi Bharadwaj

Founder

Aranyam Natural Options

www.aranyam.co.in

Ditty Maria Dominic and Bhuvana N interacted with Meenakshi Bharadwaj, founder of Aranyam Natural Options based at New Delhi to learn how she embarked an inspiring entrepreneurial journey, lighting up the lives of smallholders in the North East of India.

Aranyam Natural Options, popularly known as Aranyam Naturals is a Delhi-based social startup founded by Meenakshi Bhardwaj. It sells diverse organic products and food blends sourced from tribal farmers in North-East India. The organization's focus is twofold: supporting tribal farmers and providing customers with a healthy, organic way of living through products sourced from farmers.

What motivated you to take the entrepreneurial leap?

The year 2015 was when I transitioned from being a freelance consultant in the education sector to begin a remarkable venture, after my work led me to the picturesque Meghalaya for a CSR conference. During my stay in Meghalaya, a chance meeting with a missionary who works with tribals in the remote villages of the North-East was the turning point. Our interaction resonated deeply, and as a parting gesture, she gave me Lakadong turmeric and forest honey – sourced directly from local farmers of her village. While I attempted to extend monetary gratitude, she instead asked me to help the very poor farmers, predominantly women, who had been cultivating this extraordinary turmeric for years using traditional farming methods.

I was initially unaware of how Lakadong turmeric was different from that available in the market, until the missionary told me about its exceptional qualities and its pre-eminent position among types of turmeric due to its remarkably high



curcumin levels compared to conventional varieties. This revelation left an indelible mark on me, and I committed myself to the cause. However, upon my return to Delhi, the complexities of life took over, relegating my promise to the periphery. Nonetheless, I maintained regular communication with the farmer and every subsequent conversation with her left me with a sense of guilt, knowing that I hadn't been able to provide her the help she needed.

However, I decided it was time to take the first step. A laboratory testing of the turmeric revealed it had an unprecedented 7-10% curcumin content compared to 2-3% found in

conventional turmeric varieties. This revelation felt like a divine sign and left me with a feeling that I held something truly exceptional in my hands. It served as a powerful impetus, driving me to support the dedicated farmers behind this remarkable produce that is cultivated naturally. This led to the creation of Aranyam Naturals in 2017.

When I look back, it is as if life decided to hit the reset button and steer me in a completely different path just when I thought I had figured it all out. Destiny, it seems, has a remarkable way of revealing itself in the most unexpected moments.



Harvesting of Lakadong Turmeric

Could you share some insights into Aranyam Naturals' inception and initial days? How did you navigate the challenges and opportunities that arose during that time?

My background added to the challenge of initiating this endeavor from the ground up. Devoid of substantial investors or elaborate funding, my resolve and determination became the guiding force in my journey. I bought 100 kilos of Lakadong turmeric from the farmers of the region as a trial. Since I had

no marketing/selling experience, the roadmap to unlocking its potential eluded me. I started by introducing the turmeric to friends, family and any receptive audience, but despite my diligence, I was left with a lot of surplus.

That's when I decided to sell it through the Amazon platform. Though this idea seemed simple, it wasn't without its complexities. Establishing a brand presence, aligning with trademark protocols, and navigating legal intricacies required meticulous attention.



Google proved useful in the learning exercise and I could sell the remaining stock of the first batch through Amazon, marking a moment of pride.

Yet, the voyage wasn't bereft of challenges, exemplified by a curious customer inquiry concerning the nature of the turmeric – raw or boiled. Lacking agricultural expertise, I sought counsel from my social collaborator in Meghalaya. She explained that the turmeric was, in fact, raw turmeric powder. Lakadong turmeric's resistance to fungal attacks unlike other varieties, eliminates the need for boiling. In retrospect, this journey has been a continuous quest for knowledge, a steep learning curve punctuated at each stage. From inception to the present, the journey has been a narrative of evolution, growth, and ongoing exploration.



Cleaning harvested turmeric

An initial affiliation with around 20 odd farmers marked the start of our venture. We slowly increased the procurement quantity as more farmers began seeking our help. During this time, I realised that solely focusing

on turmeric might hinder the business's expansion potential, considering the already saturated turmeric market. After a lot of research, consultations, reading on ayurveda, the idea of value addition came up. It spurred a fresh chapter which involved the crafting of unique turmeric health blends, enhanced by the inclusion of ingredients such as black pepper, ginger, cinnamon and cardamom. This wasn't merely about mixing ingredients; it was the harmonious fusion of spices for well-being.

Such an evolution was laden with challenges. Sourcing quality ingredients was a premier requirement. Capitalizing on our existing network, we obtained exceptional organic ginger from the North-East. Premium cinnamon with exceptional medicinal properties was sourced from Sri Lanka and cardamom was sourced from the tribal belt in Odisha, from a woman farmer whom I coincidentally connected with at the Women of India Organic Festival, 2018. It was a bond founded on mutual need, a symbiotic partnership where quality met demand.

Subsequently, the farmers from Meghalaya offered locally-made immunity-boosting gooseberry (amla) candy and sun-dried ginger salty. The ginger undergoes a process of sun-drying after being grated and combined with lemon and salt. It was important to me that I commit to procuring amla candy only if it was prepared using jaggery, as a majority of our customer base preferred to avoid white sugar. The response to both these products has been remarkable, although production quantities remain limited due to resource constraints and packaging challenges faced by the farmers. As time progressed, our product range expanded to a diverse array of 25, calling for increased raw material procurement. This meant providing support to an even greater number of farmers. I rented out a small place, employing a small team of two girls and two boys who do the sieving, peeling, grinding, making blends, packaging and labelling.



I started by procuring 100 kg of produce in the first year. Today we have crossed 1 metric tonne. In essence, our journey has been one of constant evolution, fuelled by the recognition of opportunities and the unwavering commitment to deliver exceptional quality products to our customers. My family has been my biggest support in this journey.

How do you formulate the recipes for the blends? Have you availed any technical and financial support?

I have not undergone any training or incubation till now. The blends are formulated using my own research and online research. The precise proportion of each ingredient is of paramount importance in the preparation of blends, towards which I invest lot of researching time. We're serious about quality, rigorously testing blends despite the cost.

I believe that sponsored training and incubation often lack specificity, and don't cater to the precise needs of my venture. Moreover, I find the paperwork and legal requirements associated with obtaining financial aid highly cumbersome. I am reluctant to take loans given the potential risks, particularly given my age. My path is unique – a blend of research, intuition, and reluctance to tread conventional routes.

How do you market your products? Has digital marketing helped?

Right from the outset, our market entry was marked by a strategic debut on Amazon, spearheading the launch of Lakadong turmeric and its intricate blends. Our sales avenues now witness a dynamic influx of orders through our website on Shopify, WhatsApp, and Instagram platforms. While we initially also explored collaborations with retail outlets, the inherent trade-offs in terms of margin absorption and delayed payment cycles prompted us to discontinue this route, with the exception of one organic retail outlet – Nature's Soul, which was very prompt with payments.

The weekend artisan markets in Delhi have proven transformative in our pursuit – the credit for the exceptional sales in these markets goes to my husband. Our participation in artisan market events has yielded significant dividends. Notably, our participation at the Women of India Organic Festival in 2018 and at the Global Organic Expo in 2022 and 2023 was attributed not solely to our signature turmeric offerings, but equally to our portfolio of blended products. Another milestone will be our participation as a gifting partner at the Ayuryog Expo scheduled on 21 -25 September 2023. Thus, the comprehensive marketing strategy of ours spans both the digital expanse and tangible real-world interactions.



Exhibiting diverse products from Aranyam Naturals

How has the feedback from customers been?

Feedback from our customers are blessings like no other. Contented customers validate our products. I have a distinct recollection of one such customer. A doctor from



Bengaluru reached out to us after having explored multiple turmeric brands. Our product emerged as the singular answer to his need. The satisfaction derived from such endorsements is unparalleled.

Another feedback that I received was for a novel turmeric blend for pets, melding the fibrous essence of turmeric with black pepper together with a measured infusion of coconut oil that yielded a remarkable immune-enhancing concoction for our canine companions. I found that my dog loved it and it seemed to boost his immunity. After lab testing, it found its place in our product array on the website.

Another customer sought help for his three-year-old Labrador grappling with arthritis. While we could not promise the blend would work, a sample was dispatched to him. A few weeks later, he called to inform that the dog's arthritic discomfort had abated, and he was running around like before. However, what was surprising was his creation of a viral video documenting our product's transformative impact on his pet's well-being.

How are digital tools impacting your enterprise?

Digital tools are helping immensely in my entrepreneurial journey, and have greater potential to scale my enterprise. Initially, our market foothold was mainly within e-commerce platforms such as Amazon and Shopify. I believe that digital landscapes function as a dynamic force with the power to reach a broader spectrum of consumers.

This year, a few students from a mass media institute in Delhi interned with us. Their efforts not only elevated our social media presence, particularly on Instagram, but also led to blogs about our products. Their contributions began a process of active engagement across Instagram, Facebook, and LinkedIn wherein we narrated our journey, work, products and how to order them.

The resourceful interns ignited the concept of social media campaigns. Initiating the #MyAranyamStory campaign on Instagram, we encouraged customers to share their personal experiences with us. The response was heartening. Many customers, including celebrities, shared their 'Aranyam story' on Instagram. Remarkably, this initiative was a big success and our customer base grew by 133%.



#MyAranyamStory Campaign in Instagram

However, our digital expedition did not culminate there. An influential editor from a renowned magazine, who also happens to be a loyal customer, authored a piece extolling our products. Subsequently, the impact was profound as enquiries poured in from across India. Venturing onward, our next digital frontier is YouTube, for which we are planning diverse ways to incorporate our products seamlessly into consumers' daily routines.

What major challenges did you face in your entrepreneurial activities?

Navigating the dynamics of entrepreneurship is akin to juggling and necessitates prudent



financial management. I have not sought financial assistance, and whatever money we earn is ploughed back to support more farmers. To sustainably support the farmers, procurement needs to be regular, and lack of funds is a major constraint.

The pandemic brought on several challenges. While turmeric was deemed an 'essential' commodity, we struggled to make sales. However, the commitment to our farmers remained unwavering in those difficult times even though sales were low. The transportation of turmeric and honey from Meghalaya to Delhi was another major challenge during that time.

Venturing into the sphere of government services unfurls an additional layer of complexity. Though we are duly registered as an MSME, and are often invited to participate in organic expos and events, the prohibitive cost of procuring a stall is a hurdle. The initial capital outlay constitutes a formidable obstacle. Even though there is reimbursement, we do not have the funds to invest upfront and then wait for the reimbursement. The money gets locked up and it takes anywhere between 3 months to one year to get the reimbursement, which is why in spite of being an MSME I often do not market or publicize through these expos.



A woman farmer from Meghalaya with the harvested Lakadong turmeric

Organic certification has its own challenges and is very tedious and expensive. Many opportunities have been lost due to the lack of an organic certification. The farmers too don't have the time, resources and knowledge to get produce certified.

Packaging is another major problem, especially for honey. By the time honey reaches Delhi by road from Meghalaya, sometimes a lot of it spills over. While the product cannot be packaged in plastic bottles, the handling of

glass jars is very cumbersome and expensive. The spend on packaging, coupled with logistics and accompanying losses, are all borne by the enterprise.

What would you rank as your greatest achievement as an entrepreneur?

Assisting agricultural stakeholders in creating a reliable and sustainable livelihood has been my greatest achievement. We are dedicated to honouring commitments and uplifting farmers, particularly the exceptional women who have nurtured the land across generations.



Aranyam Naturals serves as a conduit between farmers and consumers, grounded in unwavering integrity, and is an endeavour that empowers, prioritizes quality, and uplifts. It is truly fulfilling to be able to uplift marginalized farmers, particularly women, and simultaneously offer high-quality products to customers while maintaining ethical standards.

Your awards & recognition

Aranyam Naturals was recognized for transforming lives through agribusiness at the Agripreneur India Meet in 2019. We were also invited by the government to participate in the World Food India Expo, 2017, a global food processing industries event.



Aranyam Naturals being recognized at Agripreneur India Meet 2019

What are your future plans?

Entering the export market is a major goal. I am currently engaged in the documentation and legal protocols required to spread our products globally. Supporting a greater number of farmers is another goal.

Increasing our presence across social media platforms gives wings to our narrative, enabling us to reach an even broader audience, spreading our story of excellence and support to more households and hearts.

Our journey is interwoven with passion, meticulous care, and aspirations.

What is your message to aspiring entrepreneurs?

Success requires patience, dedication, discipline, and an iron will to never give up. There is no right definition of a successful business. Focus on providing benefits and being fair to all stakeholders involved – from suppliers to customers – and you will always find your business to be in demand.





StartupTN

PRESENTS

தமிழ்நாடு

Startup திருவிழா



16

Aruvi Eco: Inspired by a Father's Farming Legacy

"Stop running the rat race, focus on what you have and build the better future that you are aspiring for."

Kalaiselvi

Founder

Aruvi Eco

www.aruviorganics.com

Alagu Niranjan, Bhuvana N and Ditty Maria Dominic recently explored the journey of Kalaiselvi, Founder, Aruvi Eco, to understand her inspiring journey as an agripreneur. Excerpts from this interview.

Aruvi Eco brings you organically grown produce sourced from local farmers committed to sustainability. They believe in the power of nature to nourish our bodies and promote wellness. They have a diverse range of products under various categories, such as amla delights, dip tea sensations, mango marvels, and tropical temptations.

Please tell us about yourself and your background.

I was born and brought up in Tirupur. Since my school days, I used to spend my vacation at my aunt's home in the village. Maybe because of that, I developed an interest in plants, trees and nature from a very young age. After summer vacation, when I returned home, even if I found a small bit of land, I would sow some seeds, plant some saplings, and water them every day after coming back from school. I got much happiness seeing them growing and bearing flowers and fruits. So, that was the way I grew up.

For higher education, I did BE in Computer Science, like others in my age group during the 2000s. After graduation, I started working, then I got married; later, I completed my MBA also. Life went on. For 10 years, I lived in the USA along with my husband and kids. Due to personal reasons, we decided to come back to India. In the meantime, my parents had moved to our village permanently.

Whenever we got holidays, my family and I used to come back to our village. Here, I must tell you about my father, a man very passionate about farming.



I often think that I love agriculture very much maybe because of him. He worked very hard and converted our ancestral land which was coarse and barren into a green garden. He intelligently managed our farm by installing cameras and guiding laborers remotely, even while we were staying in the town far away from our village. From 1999 onwards he hasn't even used one gram of chemical pesticides on our farm. Now our 10 acres of land holds 600-700 trees of different kinds – fruits such as mangos, sapota, guava, amla, etc.

Whenever I went home during holidays I worked right beside my parents in the farm. My father insisted that we (my sister and I) plant saplings, as he believed that we had green fingers and were lucky.

How did your family's return to India lead to the discovery of your farm's untapped potential?

Initially, we were in Chennai for a while after our return from the USA. During COVID-19, our whole family had to go live on our farm in the village. That was the turning point, where I got some insights about the potential of our farm's productivity.

When I saw our farm's fruits, which are completely free from any sort of chemicals, lying rotting on the field, I recollected the

time where I myself was buying organic food items at high prices. For example, amla (Indian gooseberry), which is valued as a super-food worldwide, lay all over the ground going to waste. This was the condition even after asking our customers to take amla for free.

So, initially, I tried to utilize the unused amla by myself. I searched on Google and tried to make some hair oil for home use; that gave me some satisfaction. But 20-30 kgs of fruit going waste was distressing. That's when my father gave me this idea of value addition.

We started thinking about it, as we had more time during COVID. But, getting proper training from good places was a big challenge at that time. So, Google became my primary source of information about value addition. I tried things through trial-and-error method. Little by little I made progress.

During September 2022, I formally registered our company, also involving our children as part of the firm. Subsequently, the company logo and labels were sorted out, then the products were laboratory tested.

What are your main products?

As I was already experimenting with amla, I decided to start with the same fruit. I learnt that around 25 products can be made from amla and I shortlisted six products. The technical support for product development was initially provided by a food scientist at the Krishi Vigyan Kendra (KVK) in Pongalur. Other than amla, I began developing other products such as Guava leaf-based tea, Amla Moringa soup mix, Jamun seed powder, Raw Mango Powder, Moringa Powder, Dip Teas/ Soups and dried Sapota (chiku). I made use of all possible trees and plants and got good products out of it.



Drying the amla at the farm





Different products from Aruvi Eco

What role did trainings play in strengthening your enterprise?

Once the pandemic settled, I started connecting with various institutions – Tamil Nadu Agricultural University (TNAU), Coimbatore; National Institute of Food Technology Entrepreneurship and Management (NIFTEM), Thanjavur; and NGOs run by retired professors of TNAU. For the next two years, I invested all my time in training. I am a member of a few incubation forums, through which I get course and events related information. I also got business information through a program called PSG-Science & Technology Entrepreneurial Park (PSG Step). They help entrepreneurs to groom themselves. After investing time in training, I personally decided not to use white sugar in my products, and used jaggery instead. Another decision which I made was not to add any kind of additives or preservatives to my products and hence the shelf-life of my products is relatively less, that is four months.

What is your view on business incubation?

Incubation centers are a great place to start for any aspiring entrepreneur. They provide all kinds of support to budding entrepreneurs. Most of the incubation centers have a standard set of training materials and/or training routine. But, for people like me, who want to do things a little differently, they don't have customised information. They always promote standard solutions, but entrepreneurship is all about risk taking, isn't it?

I can share one such experience. I needed the recipe for making amla candy with jaggery but in almost all trainings that I attended, they were giving the recipe that uses sugar as the ingredient. So, I met the trainer personally to know the details about proportion of jaggery to be added for preparing the candy. But they had no answer; maybe because they are not aware of it or they don't want people to take risks. I am not sure, but I didn't get any help in that regard. This increases my trial time as I am still learning about this area of product development.





Unveiling Amla products at StartupTN

How did your digital marketing journey evolve, and what strategies proved successful?

For marketing, I started with a WhatsApp Status group, as I had a handful of people who had already tried my products. So, the products were officially launched on WhatsApp. For two months, the product was only marketed through WhatsApp. Then, we decided to expand our digital presence in Facebook and Instagram also. Thus far we personally maintain these pages.

Once I understood that my knowledge of digital marketing was limited, I started attending a lot of workshops related to digital marketing. As I am part of many groups, such as Startup India, I get these event alerts.

The major constraint I faced in digital marketing of my product was lack of time. I had to spend my entire time in developing and manufacturing products and thus could not spare any time for digital marketing initially. Therefore, I decided to partner with a company to market and promote our products

on various platforms such as WhatsApp, Facebook Instagram, YouTube and LinkedIn. For B2B deals, I expanded my presence on LinkedIn. And in addition to these, we (my children and I) created a website and included a blog feature on our website. The idea of including Blogs on the website came through my learning from digital marketing courses. I learnt that people generally tend to use Google to ask any question that comes to their minds. So, we have started writing blogs on most frequently asked questions around our products and their ingredients. This way I am expecting to attract organic traffic to our website. Other than promotional activities, I actively seek feedback from our customers, especially the negative ones and suggestions for improving our products. And I use such feedback to improve our products.

Do you have a presence on e-commerce sites? Was it challenging to set up your store on these e-commerce sites?

Since January 2023, we have registered and listed our brand on Amazon (<https://rb.gy/m53ec>), Meesho, myStore, ONDC and Swiggy





Exhibiting the products at an expo

Mini. All our products are now available on our website (www.aruviorganics.com) as well.

From my understanding, anybody can set up a store on commerce sites. Their customer support will help anyone to set up and bring up their products there.

From what I have observed, a mere listing of products on e-commerce sites will not fetch new orders. We need to invest our time and money to promote our product catalog to attract new buyers. Product photography was another area that we never concentrated on before. With proper product images, description and listing, it is better to invest in paid promotions, which will build the initial customer base for our brand.

What other means did you use to promote your products?

Stalls in exhibitions played a big role in linking our products with various people. Once I met a person at an exhibition, he found my work interesting and requested to shoot our work as a video for posting in his YouTube Channel (Uzhavan Magan). He visited our farm and shot the video; when the video was out, it was a big leap for me (<http://y2u.be/bScs-ZvW3VQ>). I got lots of hits. That's when I realized my target audiences are more on YouTube and Facebook, not on Instagram. I am also in Clubhouse, and I regularly listen to a program called Business over Breakfast (BOB).

Are you getting support from any government schemes?

I have registered under Pradhan Mantri

Formalisation of Micro food processing Enterprises (PMFME) scheme, through which I am planning to automate my production process. I came to know about this scheme from news articles and advertisements in the newspaper.

What are your future plans?

Next, I want to export all our products, but only after meeting all local demands. Soon, I would like to automate most of the work with our Amla-based products, as the products are already standardized. Meanwhile, I will be spending a considerable amount of time developing other innovative products. I wish to convert my whole manufacturing area into an industry-like environment where machines run throughout the day with one product or the other in the making. It should be a 24/7 working company. Employing more women and differently abled people is also in the pipeline.

What were the challenges you faced while establishing this business?

My entire family has been supporting me in this process, especially my father, without whom I would not have reached this far. Naturally, some of my acquaintances criticized me for choosing a farm-based business over a salaried job where I can sit in an AC room and earn. Such criticisms were disturbing, but I overcame it once recognition came in with the success of my venture.

What is your advice to fellow women entrepreneurs?

Having chemical-free and sugar-free products in hand, I am very hopeful about growing in the business. I know it is a really big challenge to handle everything at once with family, business, and all other things; but when it comes to prioritizing your vision one just must take strong decisions. Do not wait for the right time and do not consult too many people for advice because that is how you will get confused. Just follow your dream. You'll definitely get there one day.



Final Remarks:

Supporting Women Agripreneurs to Deploy Digital Tools

These interviews highlight that digital technologies have created opportunities for women agripreneurs to advance their enterprises. However, they also reveal a lack of capacity to fully realize their potential in this area. More detailed discussions on these aspects are provided in the Working Paper, (<https://rb.gy/9aam46>) which is based on the study that included these interviews.

We believe there are three ways to support women agripreneurs in this regard.

First, incubators and accelerators promoting women agripreneurship should focus on providing digital skill training. Many women entrepreneurs lack the necessary skills to use digital applications beyond social media.

Second, public-sector agricultural institutes should enhance their contribution to supporting digital tech agripreneurs. These entrepreneurs require agricultural expertise to refine their digital innovations. Public sector agricultural research institutions should be mandated to provide technical and infrastructural support from solution development to final validation.

Finally, specific funding support is needed for women agripreneurs to establish and enhance the digital presence of their enterprises. Creating a digital footprint requires both technical expertise and financial support. Women, especially those without a technology background, often rely on third-party services for website development, digital marketing, and social media management. Financial support is crucial to cover these costs.



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