



VETIVER ARTICLES

Featured in Conversations Today

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1. Dreams from Deep Roots

Mr. Kamalanathan

December 2024



Entrepreneurship offers the freedom to create, innovate and directly witness the impact of one's efforts, which fosters a stronger emotional and intellectual engagement. The challenges and rewards of building something from the scratch cultivate a sense of ownership and fulfilment, giving entrepreneurs a purpose driven path that resonates deeply with their sense of identity and contribution to the world.

Kamalanathan, a native of Pondicherry, has carved his unique path from engineering to entrepreneurship, driven by the desire to find meaning in his work. His father was a teacher and ensured that his son grew to be a natural learner. "One must learn enough to identify an opportunity when it comes. But one must unlearn and learn even more to be able to create opportunities for self and others. He always said this and I realised its deep meaning in my entrepreneurial journey," he reminisces.

After graduating in engineering and serving as an area manager for a corporate company in Chennai, Kamalanathan felt disconnected from his role. This inner discontent led him to pursue entrepreneurship, leading to his enrolment in the Entrepreneurship Development Program offered by the Department of Micro, Small and Medium Enterprises, Government of Tamil Nadu, in Guindy, Chennai. This experience exposed him to the vast opportunities in agriculture, especially in cultivating high-value crops like aromatic plants. He then underwent a training in Lucknow on the cultivation of aromatic plants.

He identified agriculture as his calling and started his journey cautiously, recognizing the potential in farming aromatic plants. He began with Moringa plantations and experienced success with the sale of moringa powder. Encouraged by this attempt, he diversified into indigo and palmgroves, with a focus on crop diversity, soil rejuvenation and market demands.

His most notable venture has been the large-scale cultivation of Vetiver, a crop with miracle like applications in bioengineering. Vetiver, with its deep roots and diverse applications, intrigued him. The plant was not only known for its soilconserving properties but also for the essential oil extracted from its roots—a key ingredient in perfumes, cosmetics and traditional medicines. “Vetiver is the only native plant that is known across the world with its Tamil name. The demand for Vetiver oil in both domestic and international markets was promising. I saw an opportunity to create something impactful,” he explains.

While Vetiver farming is gaining attention for its economic and environmental benefits, many aspiring entrepreneurs and farmers abandon their ventures due to the significant challenges involved in processing the crop. The laborintensive nature of harvesting Vetiver roots, the lengthy distillation process for extracting essential oil, and the high initial investment in specialized equipment are formidable barriers. Additionally, the need for consistent quality and adherence to market standards adds to the complexity. Recognizing these challenges in cultivating and processing Vetiver, Kamalanathan invested in extensive research for over two years. He analysed various Vetiver varieties, their oil yields and market demand, ultimately making a strategic decision to manage the entire production chain from his fields. “Vetiver’s strength lies in its resilience and consistent demand,” he explains. Despite the hurdles—such as the 48-hours harvesting process and 60 hours-long distillation, he views these as opportunities due to the reduced competition in the market. “It was important to get it right from the start. I wanted to create a model that not only generated profits but also empowered people,” he says. His endeavour to develop good quality Vetiver seeds was also supported and rewarded by the National Medicinal Plants Board, Ministry of Ayush.

Kamalathan designed his own Vetiver distillation unit. The engineer turned entrepreneur believes that a self-made unit can be tailored to specific production needs, allowing experimentation with different Vetiver varieties and processing methods to optimize yield and quality. “To stand out in the market, my product has to meet different standards. Self-processing allows for precise monitoring of the distillation process, ensuring high-quality Vetiver oil. This consistency can enhance the product’s reputation and marketability,” he adds.

Recognizing Vetiver’s role in preventing soil erosion, he distributes free saplings to areas prone to landslides. “This plant is a gift to the planet. It stabilizes soil and cleans water. I wanted more people to see its value. It has a potential role to play in combatting global warming. Our ancestors

preserved immense knowledge about native plants. It's our duty to conserve and spread it," he says passionately. During the COVID-19 pandemic, Kamalathan's efforts took on a new dimension. He supplied Vetiver roots to the Tamil Nadu government for producing Kabasura Kudineer, a traditional herbal drink widely used to boost immunity.

Agriculture graduates from Tamil Nadu and Pondicherry visit his farm and factory every year to learn all processes involved in cultivation, harvesting and processing of Vetiver. With his domestic operations thriving and a reputation for producing premium-quality Vetiver oil, Kamalanathan is now setting his sights on the international market. He envisions opening an office in Europe to directly manage sales and build a robust network with global clients. According to him, this move is not just about business growth but about showcasing the potential of Indian agriculture and traditional knowledge on a global stage. "I believe Vetiver can be a bridge connecting our heritage with the world. I'm ready to take this leap," he promises.

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Shanmuga Priya.T

2. Eco-Friendly Innovations with Jute Geotextiles

Dr Pradip Choudhury

March 2025



Fifty years ago, the educational landscape in India was not as diverse as it is today. There were fewer professional courses, and most students pursued general degrees, especially in the sciences, which were considered a foundation for various career paths. Graduating in science was often seen as a step towards becoming a teacher, researcher, or entering government services, which were highly respected and offered job security.

“I thought so too, when I graduated in Science in 1971. But then, the nascent industrial growth demanded scientific and technical expertise to help develop infrastructure, defence, agriculture and industry. I chose to explore the potential of natural materials, so completed my post-graduation in Jute Technology from the University of Calcutta in 1974,” shares Dr Pradip Choudhury, retired Scientist of Indian Jute Industries Research Association and retired Technical Advisor, National Jute Board under the Ministry of Textiles, Government of India. He is a Fellow of the Institution of Engineers and member of many professional bodies like, BIS, IRC etc.

In a career spanning almost five decades, Pradip has dedicated all his efforts, in all capacities, to prove the potential of jute as an incredible natural fiber. “Jute is a highly flexible and useful natural fiber that has many different uses. Known as the ‘golden fiber’, it is strong, durable and environmentally friendly. Jute is commonly found in products like bags, sacks and even carpets

or furniture covers. It is also used in construction for making eco-friendly materials and in farming to help control soil erosion. Jute is an excellent alternative to plastic and other synthetic materials in various civil engineering applications, as it can be woven into site-specific fabric and naturally decomposes. With more focus on protecting the environment, jute is becoming even more popular as a sustainable material that can be used in a wide variety of ways,” he explains.

Having obtained training from institutions in USA & Germany, Pradip wanted to study Jute’s versatility and develop products for different pressing needs. One such critical application in the road construction sector was explored during his reign as the Principal Scientist at the Jute Research Institute in Calcutta. If load bearing capacity of soil in the locations chosen to build roads happens to be weak, the soil is strengthened by using jute fabric that he designed and developed. This makes the roads long lasting as jute enables quicker soil consolidation. His visit to Netherlands in 1976 got him to explore jute’s capacity in protecting river bank erosion and slope stabilisation.

“When jute mats or geotextiles are placed on the surface of a slope, they create a protective layer that prevents the topsoil from being washed away by rain or wind due to run-off. Over time, the jute material biodegrades, but prior to its decomposition process, it helps the vegetation to grow, whose roots further stabilize the slope through bioengineering technique. As the jute slowly decomposes, it adds organic matter to the soil, enhancing soil fertility and providing a better environment for vegetation,” elaborates Pradip. His leadership led to successful field applications, drawing the government’s attention to promote this material nationally and globally.

In their innovative approach to slope stabilization, Pradip and team combined the natural benefits of jute geotextiles (JGT) with the powerful soil-holding properties of Vetiver grass. This bioengineering method was tested at the NTPC (National Thermal Power Corporation) dump yard in Uttar Pradesh and many other places. The team constructed a protective barrier wall around the perimeter of the dump yard using jute fabric, a biodegradable material known for its hygroscopic (moistureabsorbing) and hydrophilic (waterattracting) properties. These characteristics helped create a favourable environment for plant growth. Once the jute fabric was in place, Vetiver grass, known for its dense, fibrous roots that can grow up to 3 meters deep, was planted in the gaps within the fabric. Vetiver’s deep and strong root system makes it highly effective in stabilizing soil, especially on slopes, by anchoring the soil and preventing erosion. The combination of jute’s moisture retention and Vetiver’s robust root system provided a highly effective and sustainable solution for soil stabilization. This approach not only enhanced the stability of the dump yard but also offered an eco-friendly and natural method of reinforcing the soil.

“Jute also helps in mitigating climate change. A jute plantation on one hectare of land can absorb up to 15 metric tons of carbon dioxide and release 12 metric tons of oxygen into the air,” he informs.

Pradip’s contributions were acknowledged by various institutions, and the Border Roads Organisation (BRO) invited him to Leh and Ladakh to assess and benefit from the potential of jute geotextiles in stabilizing extreme temperatures and fostering vegetation in these challenging conditions. “Jute helps stabilize soil by insulating against harsh temperature fluctuations. The moisture-retaining properties of jute support plant growth, promoting vegetation in otherwise arid conditions. Jute also prevents soil erosion on steep slopes, enhancing soil stability. As an ecofriendly material, jute geotextiles provide sustainable solutions for this fragile, high-altitude region,” he adds.

Pradip also developed detailed guidelines for the use of geotextiles in all the applications discussed above. His standard guidelines were recognized and officially published by the Bureau of Indian Standards. Additionally, he also created the IRC Code for road construction and also RD&SO guidelines for Indian Railways and comprehensive guidelines for the use of geotextiles in all the 17 divisions of Indian Railways – all of which were accepted and published. Over 1,000 field applications were carried out under his direct technical guidance. Indian Journal of Soil Conservation awarded him the Best Research Paper on Jute Geotextiles in 2021. He was also awarded the Best Paper Presentation at international conferences in Japan (2007) and IIT Hyderabad (2024).

Over 300 roads across India have been constructed using jute geotextiles, and more than 500 slope protection projects have been successfully completed. JGT has also been used successfully in river bank erosion control, rain water harvesting tanks, agro-mulching, jute sleeves for growth of saplings etc. “Despite all the research and extensive field applications, jute holds only a 2% share of the market, while synthetic geotextiles continue to dominate. There is a need for more aggressive marketing to promote jute,” he emphasises. After his retirement in 2022, Pradip is a visiting faculty in many Engineering Colleges to educate the budding civil engineers about the potency of natural JGT. Even today he extends technical support and guidance to the manufacturers and end users of JGT energetically. “It is now for them to exploit the applications built so far using the most cost-effective natural fiber,” he smiles.

- **Shanmuga Priya.T**

3. Embracing A Culture of Scientific Inquiry and Responsibility Is Essential for Enhancing Disaster Resilience

Prof. Chandan Ghosh

April 2024



Prof. Chandan Ghosh shares with Marie Banu the significance of using Vetiver grass in disaster management

Prof. Chandan Ghosh is a seasoned professional with a diverse background spanning academia, research, and practical experience in civil engineering and disaster management.

With his Civil and Infrastructure Engineering background and having more than 20 yrs of professional services, teaching, research and various decision-making issues, Dr Ghosh joined NIDM as full professor in July 2006. He has been looking after various training, research, documentation and Disaster Management policy advocacy of India.

As professor & Head, Prof. Ghosh has made important contributions in strengthening training curriculum with field exposure and professional credence in the disaster database/documentation in the institute. He has been serving as expert member in various committees formed by DDA, MCD, NDMA, UPSC, DST, MoUD, MoES, to name a few.

Currently, Chandan holds the prestigious position of Director of Research & Innovation and CEO of Nishkam Technologies, a startup based in IIT Kanpur.

In an exclusive interview, Prof. Chandan Ghosh shares with Marie Banu the significance using Vetiver grass, in disaster management.

Your background in disaster management and how you apply that expertise in your current role at NIDM?

My background in Civil Engineering and expertise in disaster management have been invaluable while serving NIDM for about 17.5 years till December 2023, where I continue to leverage mathematical models, simulation tools, and interdisciplinary approaches to develop effective mitigation strategies for a wide range of natural and man-made disasters.

My experience in disaster management took a more hands-on approach when I joined Earthquake Risk Evaluation Center (EREC) as an advisor in 2005, a role that allowed me to apply my expertise in mitigating seismic risks. Eventually, I transitioned to the National Institute of Disaster Management (NIDM) in 2006, where I served as a professor and later as the head until December 2023.

In my tenure at NIDM, my focus has been on mitigation strategies. While traditional disaster management involves responding to crises and aiding in rescue operations, my team and I are more inclined towards identifying the root causes of disasters and implementing measures to prevent or minimise their impact in the future. This involves a combination of research, innovation, and simulation techniques to understand and quantify various risk factors, from urban heat islands to air pollution levels, infrastructure auditing, post disaster site visits and documentation and their health implications, etc.

Can you discuss the challenges and how you promoted disaster-resilient constructions in India?

Certainly. One of the primary challenges I encounter is the mindset of people. Despite having comprehensive Indian standard codes developed by the Bureau of Indian Standards, implementing disaster-resilient infrastructure, particularly in earthquake-prone areas, remains a challenge. Approximately 60% of India's landmass is vulnerable to earthquakes, including regions like the Himalayas, Gujarat's Kachchh area, the Andaman and Nicobar Islands, and the entire northeastern region.

While we have evolved our codes and practices over the years, incorporating advancements in materials and technology, the challenge lies in fostering a culture of adherence to these standards. With the increasing complexity and height of buildings, there's a constant need for innovation in structural engineering to ensure resilience. While we give usually more attentions to overground structure design & construction, the ignorance of the ground behaviours magnifies the vulnerability.

At NIDM, I focused extensively on training engineers, architects, and town planners, emphasising the importance of upgrading construction practices and learning from global examples, notably Japan. Japan's systematic approach to upgrading engineering practices and infrastructure over centuries serves as a benchmark for disaster resilience.

I often conducted training programs where I highlighted Japan's experiences with earthquakes, showcasing how they have continually improved their construction techniques and curriculum. By analysing historical earthquake events and their impact on structures, we devised experiments to recreate seismic forces on buildings, demonstrating the importance of adhering to codes and standards derived from such experiences.

My approach involved making technical details accessible to a broader audience, using practical tools and examples to underscore the significance of following established codes. Ultimately, the challenge lies in fostering a culture of proactive disaster resilience among all stakeholders involved in construction and urban planning.

Tells us about importance of raising awareness and demonstrating retrofitting measures for disasterresilient infrastructure, particularly focusing on earthquake preparedness.

Absolutely. Raising awareness and demonstrating retrofitting measures for disaster-resilient infrastructure are crucial aspects of disaster management, particularly in earthquake-prone regions. My role has become vital in not only educating people but also visiting sites to identify faults and neglected areas in infrastructure. Retrofitting, or upgrading existing structures to meet current safety standards, is an essential component of this effort.

During site visits, I often come across construction projects where fundamental safety measures are overlooked. Despite my passionate advocacy and extensive experience, there is still resistance to implementing necessary changes. This resistance is concerning, considering that earthquake preparedness is not solely about early warning systems. While early warnings provide crucial seconds for response, it is equally important to ensure that buildings and infrastructure can withstand seismic forces.

One of the challenges lies in conveying the importance of structural resilience to stakeholders, including contractors and architects. I frequently conduct voluntary site assessments, emphasising the need for civil engineers to be actively involved in construction projects. However, there remains a gap between established engineering principles and their application in practice. This discrepancy highlights the need for continued advocacy and education within the industry.

In addition to structural considerations, non-structural elements play a significant role in disaster resilience. Simple measures, such as securing glassware in chemistry labs or reinforcing glass windows, can mitigate secondary hazards during earthquakes. I have incorporated these non-structural mitigation strategies into school safety programs, recognising the importance of safeguarding our future generations.

While early warning systems provide valuable information, their effectiveness relies on swift and decisive action. Japan's example of rapidly detecting earthquakes and disseminating information to the public is commendable. However, in India, there is a lack of urgency and coordination in implementing similar systems. Despite advancements in technology, our ability to respond effectively to earthquakes remains limited.

What is the significance of bioengineering, particularly using Vetiver grass, in disaster management?

Bioengineering, especially leveraging Vetiver grass, presents a sustainable solution for mitigating the impact of disasters, particularly in hilly areas prone to erosion and landslides. Traditional engineering approaches, such as RCC structures and dams, have limitations, especially in environmentally sensitive regions like hilly areas. Nature-based solutions like Vetiver grass offer a more holistic and resilient approach to disaster management.

Vetiver grass has remarkable properties that enable it to withstand extreme temperatures (-15 to +55 degrees Celsius) and effectively control erosion. Its extensive root system helps stabilise slopes, preventing landslides and soil erosion even in challenging terrain. By incorporating Vetiver grass into infrastructure projects, we can minimise the environmental impact of traditional engineering methods, such as concrete or brick covers. Vetiver grass naturally protects slopes, reduces soil erosion, and helps restore ecosystems, promoting sustainable development in disaster-prone areas.

It also offers a cost-effective, sustainable, and longlasting solution compared to traditional methods. Once planted, Vetiver grass requires minimal maintenance and can endure various environmental conditions, making it a reliable choice for disaster management and environmental conservation.

- **Ms. Marie Banu**

4. Engaging Communities in Vetiver Cultivation Can Ensure Local Participation and Ownership

Mr. Shyam Goenka

July 2024



Mr. Shyam Goenka shares with Marie Banu his efforts to promote vetiver through media

Mr. Shyam Goenka is a pioneering figure in Nepal's media landscape, known for his instrumental role in establishing Kantipur and The Kathmandu Post in 1993. His vision was driven by a commitment to institutionalise democratic values and social justice following the promulgation of Nepal's 1990 Constitution. Despite widespread skepticism about the viability of a private media house, Mr. Goenka's relentless dedication and belief in the transformative power of independent media led to unprecedented success. Kantipur, particularly, achieved historical prominence, becoming a leading daily with unparalleled readership. Mr. Goenka's impact extends beyond media; his efforts have created thousands of organised sector jobs and elevated Nepal's media sector.

In an exclusive interview, Mr. Shyam Goenka shares with Marie Banu his efforts to promote vetiver through media.

What inspired you to start Kantipur and The Kathmandu Post despite the scepticism surrounding the viability of a private media house in Nepal?

The inspiration to start Kantipur and The Kathmandu Post in 1993 stemmed from Nepal's political and social transformation, marked by the 1990 Constitution which enshrined free press and freedom of expression. We, a team of 200 passionate individuals, were committed to institutionalising democracy, social justice, civil liberties, human rights, rule of law, and good governance. Despite scepticism about the viability of a private media house in Nepal, we believed that a robust, independent media was crucial for the country's democratic and social development.

Our vision extended beyond reporting news; we aimed to build a strong foundation for social infrastructure, providing quality education, healthcare, shelter, livelihoods, and fostering sustainable, inclusive development. The initial journey was challenging, with limited resources and widespread doubt about our success. However, our dedication and belief in the cause drove us forward.

Kantipur, especially its vernacular version, defied naysayers, becoming an unofficial 'Ombudsman' and achieving unparalleled success with over 50 percent of the national market share. The success of Kantipur and The Kathmandu Post highlights the power of collective effort, solidarity, and commitment. Today, many of our colleagues lead the media spectrum in Nepal, bringing pride to the nation globally.

Can you elaborate on the significance of Vetiver grass in purifying contaminated water and its broader environmental benefits?

Vetiver grass (*Chrysopogon zizanioides*) is a remarkable plant known for its extensive root system and robust growth, making it highly effective in environmental management and ecological restoration. Its significance in purifying contaminated water lies in its ability to absorb and break down pollutants, heavy metals, and toxins through its roots. This phytoremediation process helps clean water bodies and restore their ecological balance.

Vetiver grass offers broader environmental benefits beyond water purification. It plays a crucial role in soil erosion control and land stabilisation. The dense root network of Vetiver can penetrate up to three meters deep, binding the soil and preventing erosion. This makes it an ideal solution for rehabilitating degraded lands, protecting riverbanks, and stabilising slopes prone to landslides. Moreover, Vetiver grass enhances soil fertility by improving soil structure and increasing organic matter content. Its ability to thrive in harsh conditions, including drought and poor soil quality, makes it a resilient and sustainable option for land reclamation and agricultural productivity.

By promoting biodiversity and providing habitat for various organisms, Vetiver contributes to ecological balance and resilience. The broader environmental benefits of Vetiver grass underscore its potential as a natural solution for addressing some of the most pressing environmental challenges. Its ability to purify water, control soil erosion, and restore degraded ecosystems makes it a valuable asset in sustainable development and environmental conservation efforts.

How can the economic benefits of Vetiver in agriculture and disaster management be effectively communicated to farmers and local communities?

Effectively communicating the economic benefits of Vetiver to farmers and local communities requires a multi-faceted approach that includes practical demonstrations, education, and collaboration. Conducting on-ground demonstrations and training programs is essential to showcase the practical applications of Vetiver in agriculture and disaster management. These programs can highlight the economic benefits such as increased crop yields, improved soil fertility, and reduced disaster risks.

Farmers can witness firsthand the positive impact of Vetiver on their land and livelihood. Sharing success stories and case studies through local media, community meetings, and agricultural extension services can build trust and awareness. By highlighting the experiences of fellow farmers who have benefited from using Vetiver, communities can better understand its economic advantages. Collaborating with local agricultural cooperatives and organisations can enhance outreach and support for Vetiver adoption. These cooperatives can act as intermediaries, providing information, resources, and technical assistance to farmers.

Utilising digital platforms and mobile applications can facilitate information dissemination and real-time support for farmers. These platforms can offer instructional videos, best practices, and a forum for farmers to share their experiences and seek advice. Governments and local authorities can provide incentives and policy support to encourage the adoption of Vetiver. Subsidies, grants, and technical assistance can make it more accessible and appealing to farmers.

By employing these strategies, the economic benefits of Vetiver in agriculture and disaster management can be effectively communicated, leading to broader adoption and improved livelihoods for farmers and local communities.

What role do you envision for technological advancements in enhancing the efficiency and adoption of natural solutions like Vetiver?

Technological advancements are crucial in enhancing the efficiency and adoption of natural solutions like Vetiver. Remote sensing and GIS mapping can identify suitable areas for Vetiver implementation and monitor its environmental impact, providing precise data on soil conditions, erosion patterns, and

vegetation cover for targeted interventions. Data analytics can optimise Vetiver usage by analysing environmental data and predicting outcomes, guiding decision-making and improving resource allocation. Mobile applications can facilitate knowledge sharing, training, and real-time support for farmers and communities adopting Vetiver by offering instructional videos, best practices, and platforms for experience sharing and advice.

IoT devices can monitor environmental conditions such as soil moisture, temperature, and nutrient levels, informing the management and maintenance of Vetiver plantations for optimal growth. Drones can conduct aerial surveys, plant Vetiver on difficult terrains, and monitor growth and health, saving time and labour. Online platforms and e-learning modules can provide comprehensive training and resources, including courses, webinars, and research repositories. These technological advancements enhance the efficiency and adoption of Vetiver by providing innovative tools for monitoring, managing, and optimising its use, leading to more effective and scalable environmental conservation efforts.

How do you think media can play a role in raising awareness about sustainable practices like the use of Vetiver for soil erosion and water protection?

Media has a pivotal role in raising awareness about sustainable practices like the use of Vetiver for soil erosion and water protection. Investigative journalism can uncover the environmental challenges and highlight the success stories of Vetiver implementation. In-depth reports and documentaries can provide valuable insights and raise public awareness about the benefits of Vetiver. Newspapers, magazines, and online platforms can publish feature articles and opinion pieces from experts, farmers, and environmentalists. These pieces can educate the public about Vetiver's role in soil erosion control and water protection.

Producing documentaries and short films that showcase the impact of Vetiver on communities and ecosystems can create a compelling narrative that engages viewers and motivates them to support sustainable practices.

Social media campaigns can amplify the message and reach a broader audience. Engaging visuals, stories, and interactive content can raise awareness and encourage participation in Vetiver projects.

Media can collaborate with environmental organisations to promote Vetiver and other sustainable practices. Joint campaigns, events, and educational programs can enhance outreach and impact. Including dedicated segments on sustainable practices in news programs can provide regular updates and information on Vetiver and its benefits. This can keep the public informed and engaged in environmental issues.

- Ms. Marie Banu

5. From Kodaikanal To Florida: A Farmer's Journey

Ms. Priya Varadheesh

April 2025



Good health is a basic human right, but unequal access continues to be a harsh reality. Food, too, reflects this divide—especially when it comes to organic produce. While urban, affluent communities have growing access to chemical-free, sustainably grown food, it remains largely out of reach for lower-income families and rural populations. True equity in organic food means that everyone—regardless of income, background, or geography—has the right to eat clean, nourishing and safe food.

“This inequity is systemic. We need a collective shift in mindset, and it begins with education—especially empowering the younger generation to understand food justice,” says Ms. Priya Varadheesh, a former IT professional turned regenerative farming advocate, now based in Florida.

Priya earned her degree in Computer Science Engineering in 1992 from Dindigul, Tamil Nadu, and later completed her Master's in Information Systems at Northern Illinois University. After gaining industry experience in India, she moved to Chicago in 2000, continuing her career while also building a passion for growing her own food. Her journey into sustainable agriculture began with a simple kitchen garden. She became active in community gardening, eventually leasing her own plot where she harvested vegetables successfully—even through Chicago's harsh winters, where wind-chill temperatures sometimes dipped below -60°C .

“We harvested more than we needed, so we donated the surplus to local homeless shelters and food pantries,” Priya recalls. “That experience—despite extreme weather—gave me the confidence to think bigger. I knew I wanted to grow more. That dream led me back to India in 2012, where the tropical climate was ideal. Leaving my job was a necessary step.”

Her return to India was driven by a conviction: that clean, organic food should be accessible to all. She was deeply disturbed that many families couldn’t afford it. Determined to change this, Priya found an 84-acre coffee estate in Kodaikanal and fully embraced farming. During this time, she was mentored by the legendary organic farming pioneer, Dr. Nammazhvar. “He helped align my ideas with action. He emphasized that food purity isn’t a personal battle—it’s a community right. People must be educated to demand clean food,” she says.

Priya was part of the NGO Nambikkai Vizhudugal (Roots 4 Hope) based in Chicago, a 501(c)(3) organization. She also launched the idea of the ‘family farmer’.

“Just like we have family doctors, we need family farmers—someone who brings food production closer to the household. When people understand where their food comes from, they begin to care about how it’s grown,” she says.

Beyond awareness, Priya also sought to make commercial organic farming a viable and dependable livelihood. She began exploring farm-based tourism as a way to connect people to the land and farming. Tree planting drives, water body restoration efforts, and sustainable farming workshops soon followed— supported by her networks in both Chicago and Tamil Nadu.

In 2018, she launched Plumeria Eco Trails, a farmstay in Kodaikanal that invited guests to experience biodiversity, conservation and organic farming firsthand. With cottages and tents, and activities like high and low rope courses, it became a place where people of all ages could immerse themselves in the life of a farmer. “We wanted farming to be seen as more than labor. It’s a way of life—a vital, sacred connection to the earth. When people recognize that, they start respecting and prioritizing clean food,” Priya explains.

She was deeply involved in every aspect—running the farmstay, mentoring youth, conducting workshops for farmers and advocating for food sovereignty. But the COVID-19 pandemic brought personal losses that reshaped her life’s direction. “Losing loved ones changed everything. I realized farming can be done anywhere—and I wanted to do it with my family,” she shares.

In 2021, she decided to return to the U.S. and purchased a 144-acre plot in Florida. By 2023, she had moved in with her family and began farming on the first 10 acres. Her vision now is to transform the land into a healing forest, inspired by ancient texts and traditional plant wisdom. “It’s a plant

(treasure) hunt— we’re identifying and cultivating plants one by one, nurturing them in the nursery until they’re ready for the farm,” she says.

Through each plant, every yield and especially the bumper harvests, Priya continues to affirm her belief in organic farming. “We grow for ourselves, but we also want others to realize they can grow their own food. Our treasure hunt continues, and we’re excited to bring in many more plant species in the months ahead,” she smiles.

Her story is not just about farming—it’s about transforming food into a right, reviving tradition with purpose and inspiring others to reconnect with the soil.

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Shanmuga Priya.T

6. Farming With Discipline

Mr. V. P. Sharma

October 2025



The first step at Gratitude Farms is to develop the land by restoring its natural vitality. The intersection of natural farming and social entrepreneurship is gaining prominence as it combines environmental responsibility with innovative business models. Natural farming emphasizes soil regeneration, biodiversity and chemical-free cultivation, offering sustainable solutions to climate and ecological challenges. Social enterprises in this field are responding to the growing consumer demand for clean, organic and responsibly produced food, while also promoting ethical and sustainable market practices.

According to Mr. V. P. Sharma, a pre-retired Army officer, sustainable farming systems require the same discipline and process oriented approach that the armed forces instill. He believes that qualities such as planning, consistency, teamwork and accountability— central to military training—are equally essential in farming to ensure efficiency, resilience and long-term sustainability. This structured mind set, he notes, helps transform agriculture into a systematic and goal-driven enterprise rather than a purely traditional activity.

He served in the Indian Army for 16 years, from 1985 to 2001, and pre retired as a Major. Following his military career, he worked with several multinational companies, including Nokia, gaining extensive experience in corporate operations and management. In 2017, driven by a

passion for social impact, he and a colleague ventured into social entrepreneurship, leading to the founding of Gratitude Farms in 2018. “We travelled across the country and developed deep knowledge about natural farming. We are not interested in large scale farming or certification. Organic farming has many variants and models. We were drawn to the principles of natural farming because it focused on making the soil healthier. We understood the science behind it,” reveals Mr Sharma.

Natural farming relies on locally available resources like cow dung, cow urine and plant based formulations, significantly reducing costs and dependence on the market. It emphasizes restoring soil health, biodiversity and self-sustaining ecosystems, following a minimal-intervention, nature-led philosophy. This makes natural farming both environmentally responsible and farmer friendly, appealing to those seeking simplicity and long-term sustainability.

Gratitude Farms adopts an innovative model by taking over unused or degraded farmland from private owners or institutions and transforming it into productive, profitable farmland. The organization follows a lease based, profit-sharing arrangement, ensuring mutual benefit for landowners and the enterprise. Through the use of natural and sustainable farming practices, Gratitude Farms revitalizes barren land, improves soil health and generates economic returns. In the process, it also promotes environmentally responsible agriculture.

The first step at Gratitude Farms is to develop the land by restoring its natural vitality—this involves enhancing microbial activity, preparing the topsoil, and setting up rainwater harvesting, irrigation systems and nurseries. Once the foundation is ready, the farm is carefully designed based on natural farming principles, which focus not merely on crop growth but on soil replenishment and ecosystem health. “For example, planting vetiver grass helps sustain soil moisture through its deep root system, which enhances water retention and supports microbial life. Simply planting vetiver along plot borders and between crop beds naturally enriches the soil, maintaining its structure, moisture and biological vitality—without the need for chemical inputs,” he adds, grateful to PNS Sir for introducing him to this crop. Since then, Vetiver is an integral part of Gratitude Farms’ projects and designs.

In fact, he uses Vetiver and biochar together as they both complement their roles - vetiver boosts biological activity while biochar preserves and amplifies it, resulting in richer topsoil, higher fertility, better moisture regulation and reduced nutrient loss.

Once the soil is restored, the next step is multi-cropping, where 4–5 crops are cultivated per acre, leading to about 100 trees per acre. The focus is primarily on horticultural and medicinal plants. Each acre is carefully designed and divided into multiple plots, with medicinal plants strategically

planted along plot boundaries. These design elements have been refined over multiple trials, ensuring optimal soil health, biodiversity and farm productivity. “Our expertise in farm design grew through numerous trials and experiments, but the key insight is that plant systems naturally manage pests when designed thoughtfully. Trees and crops often complement each other, creating resilient ecosystems. Observing market price asymmetries and exploitative trading practices, we chose to focus on medicinal plants, fruits and flowers. Guided by research, we selected plant and tree species that are naturally resistant to pests,” explains Mr Sharma.

Some of the trees cultivated at Gratitude Farms include moringa, a renowned herbal supplement; pirandai, known for supporting joint health; tulsi; pather chatta, traditionally used for kidney stone relief; as well as papaya, jackfruit, amla and more recently, sitaphal. Gratitude Farms now spans over 200 acres, cultivating more than 5,000 crops per acre. Each acre supports over 216 medicinal trees, complemented by 10,000+ intercropped plants, reflecting a carefully designed, highdensity and biodiverse farming system.

While discussing a mango farm previously ruined by excessive chemical use, Sharma highlights how natural farming has fully revived the land. The farm, which produced 62 tonnes in July 2025, is now projected to yield 100 tonnes in summer 2026. “Real knowledge must translate into systems and processes that can be executed effectively to achieve the desired outcomes. Earlier, farms were cared for like babies, but that emotional connection is missing today. Labourers now simply complete their work and leave—they are not truly attached to the land, and that disconnect is one of agriculture’s biggest challenges. To address this, we bring in workers who stay on the farm and begin early in the morning, which is the most productive time for agricultural work. Our standardized systems, combined with the involvement of ex-army personnel, have delivered strong results. Having ex-soldiers as supervisors has emerged as a best practice—their discipline ensures that every process is followed rigorously and without compromise,” he emphasises.

For years, agricultural textbooks have described farming as a climate-dependent and high-risk activity, but Gratitude Farms has proven that well-designed systems and processes, grounded in research and experience, can significantly reduce that risk. “We measure every activity, every plant, and every yield,” says Sharma. “We understand unit economics—the cost of transport, irrigation, labour, logistics, lab tests, and packaging for every cycle. The farm operates much like a factory, where monitoring and precision at every step are crucial. That level of care and attention is what delivers the highquality results we see today. And through it all, our core focus remains on soil and irrigation— because nature knows its job best.”

Alongside their farming activities, Sharma and his team experimented with multiple business models. Initially, selling produce through online platforms led to losses due to additional logistics costs and wastage. Learning from this, Gratitude Farms shifted focus to supplying directly to Ayurvedic and herbal companies that require high-quality, chemicalfree herbs. By eliminating intermediaries, they reduced costs and ensured better margins, helping the enterprise grow its revenue to around Rs.4 crore annually. The team has successfully developed over 50 acres in Tamil Nadu and 150 acres in Hyderabad, with projects in the pipeline for more than 1,000 acres. “We aim to reach one million acres in the next decade,” says Sharma confidently.

-Shanmuga Priya.T

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7. I Strongly Believe That Empowering Women Farmers Can Transform the Agricultural Landscape

Dr. S. Jayashree

July 2025



Dr. Jayashree shares with Marie Banu her interest in agricultural research

Dr. S. Jayashree, PhD, is an environmental microbiologist and Founder & CEO of BioVersion Agri Services, with operations in Coimbatore and Chennai. As COO of Kiana Agriculture, Netherlands, she champions sustainable soil and human health. Renowned for her pioneering research on Vetiver (*Chrysopogon zizanioides*), she has led transformative government-funded projects empowering tribal women in the Nilgiris through eco-based livelihood innovations. Her Indian patent on Vetiver's anti-venom properties was granted in 2024.

With over 35 national and international publications, her research spans phytoremediation, anti-cancer and anti-termite studies, and alternative substrates for mushroom cultivation. Dr. Jayashree has received multiple accolades, including the Outstanding Researcher Award from Nehru Group of Institutions. A former teacher turned scientist-entrepreneur, she has represented India globally in conferences across Istanbul, Shanghai, Dubai, and more. She serves on academic boards and reviews for reputed journals, continuing her mission to blend science, sustainability, and social impact.

In an exclusive interview with Marie Banu, Jayashree shares her interest in agricultural research.

What initially inspired you to work in agriculture and related research?

I have always been passionate about life sciences. My journey began as a schoolteacher at Chinmaya Vidyalaya in Coimbatore, where I taught students from LKG to Plus Two for over 13 years. While teaching gave me immense satisfaction, I felt a constant urge to explore beyond the classroom and do something that could create a real impact. The turning point came when a student's father, Professor Lakshman Paramahansa Swami, visited one of our science exhibitions. Recognising my enthusiasm for science, he encouraged me to pursue higher research, particularly a PhD.

I registered for a PhD in Environmental Science, specialising in Microbiology. During this phase, Professor Swami introduced me to the Vetiver plant, which became the focal point of my research due to its soil-restoring properties. This experience transformed me from a teacher into a researcher, giving me the confidence to innovate for agricultural development.

What led you to focus on Vetiver and its applications for farmers?

Vetiver fascinated me because of its ability to transform contaminated soil into rich, organic soil. While conducting soil analysis in the lab, I observed how the presence of Vetiver improved soil health and texture. I firmly believed that research shouldn't remain confined to the lab—it must reach the land. This belief led me to conduct workshops for farmers in 2007. At that time, digital tools like WhatsApp didn't exist, so we sent handwritten letters to invite farmers. We managed to bring together around 60 farmers, and the workshop created significant awareness. One of the participants, Mr. Pandian from Sivaganga district, embraced Vetiver cultivation and has since become a role model for other farmers. Seeing this impact convinced me that my research could make a real difference in the lives of farmers.

What inspired you to develop your eco-friendly agricultural product, the Eco-Box?

The Eco-Box idea was born unexpectedly during my collaboration with international scientists, Dr. Metin Turan from Turkey and Dr. Sanam from the Netherlands. We were conducting field trials for an organic fertilizer product in places like Gujarat and Ooty. While working with the potato farmers' association in Ooty, I noticed heaps of discarded plastic nursery trays used for cabbage saplings. When I asked what they did with this plastic waste, they said they simply buried it in the ground. This struck me as a serious environmental issue. I discussed the problem with my friend and thought—why not design nursery trays and pots made from organic fertilizer? This way, the container itself would enrich the soil as it decomposes. We began experimenting and

created small biodegradable cups using organic fertilizer and natural tree gum. The results were excellent, with the pots lasting for 60 to 90 days and supporting strong plant growth. We have filed a patent for this innovation. As the pot decomposes, it releases nutrients into the soil, enhancing plant growth and soil fertility. Farmers no longer need to worry about disposing of plastic trays, which often harm the environment. We've also developed two versions of the Eco-Box—one made with heat-press technology that lasts for up to six months, and another without heat-pressing for shorter durations.

To commercialise the product and introduce other eco-friendly innovations, I have founded Bioversion Agri-Services. I believe there is a strong potential demand once farmers realise the environmental and economic benefits of switching to biodegradable alternatives.

What challenges have you faced in your journey from research to entrepreneurship?

The biggest challenge has been bridging the gap between research and real-world application. During my PhD, we made many discoveries, but due to a lack of awareness about intellectual property, we missed patenting several innovations, such as floating technologies for water-based cultivation.

I have learned the hard way that innovation alone is not enough; it must be protected and strategically marketed to have a wider impact. Another challenge is changing the mindset of farmers who are used to quick results through chemical fertilizers. Convincing them to adopt organic practices that take time but ensure longterm benefits requires persistent effort.

How do you see the role of women in agriculture and agri-entrepreneurship?

Women have always been the backbone of agriculture, but their voices have often gone unheard. In Gujarat, I observed a refreshing change—women farmers were asking more questions and taking the lead in adopting new practices, especially organic fertilizers. They are naturally detail-oriented and more willing to experiment with sustainable techniques. I strongly believe that empowering women farmers can transform the agricultural landscape. Women entrepreneurs can introduce innovative products, create awareness, and build community-based farming networks.

How can agriculture balance profit with ecological sustainability?

The key lies in patience and understanding nature's timelines. Today, many farmers expect faster yields, which pushes them toward heavy chemical usage. This not only harms the soil but also affects long-term productivity. Profit and sustainability can coexist if farmers see themselves as entrepreneurs.

By cutting out middlemen and selling directly to consumers or niche markets, farmers can earn better margins while maintaining organic practices. Government support and collaborative research efforts are crucial to creating farmer-friendly technologies that combine profitability with ecological balance.

What role will technology play in shaping the future of agriculture?

Technology will be a game-changer. Drones, AI, and IoT devices are already transforming how farming is done, from precision spraying to monitoring soil health. At the recent Agri Intex in Coimbatore, I saw cutting-edge machines that can drastically reduce labour and increase efficiency. When computer science innovations and biotechnology come together, India can move from being a follower to a leader in global agriculture. These technologies can also attract the younger generation, who are tech-savvy but often hesitant to enter traditional farming.

What is your vision for Bioversion Agri-Services?

My vision is to build a platform that combines research-driven innovations with sustainable farming solutions. We aim to promote eco-friendly products like the Eco-Box and bring international collaborations into the Indian agricultural ecosystem. I want Bioversion to become a bridge between scientists, farmers, and entrepreneurs—helping farmers transition to organic practices while ensuring that sustainable products reach mainstream markets.

What advice would you give to students interested in agriculture and life sciences?

My advice is to choose the right mentors and institutions, and to stay patient. Agriculture is not a quick-profit field, but it is deeply rewarding and can generate wealth if approached with an entrepreneurial mindset.

The younger generation is often in a rush to earn, but agriculture requires a balance of passion, patience, and innovation. I also believe the government needs to give more recognition and structured career paths for agricultural researchers, similar to engineers and doctors.

When I travel abroad, I feel respected as a scientist, but in India, the same level of recognition is often missing. We need to change this narrative and make agriculture a career of pride and innovation.

- **Ms. Marie Banu**

8. Inspiring Stories from Local Products

Mr V C Sreeram Nath

September 2023



Inspiration has the potential to transform individuals and societies. It can spark action, creativity, and personal development, leading to positive changes in various aspects of life. “It keeps you curious and always prepared for life-long learning. I began to realise it as a valuable tool for personal and collective betterment,” admits Mr V C Sreeram Nath, Founder and Secretary of Rameswaram Vetiver and Environmental Foundation.

Hailing from a farming family in the culturally, historically significant town of Thiruvarur in Tamilnadu, Sreeram aspired to be a journalist. He was exposed to heritage thoughts since childhood and this fostered a sense of connection. He saw his responsibility in knowledge transfer and preservation of native ideas, practices. Drawing inspiration from Dr A P J Abdul Kalam and Mr Varghese Kurian, he always envisioned building a brand for a locally developed product. “The glow of goodness that Kalam sir talks about and the success of building a brand for the cooperatives from Anand village in Gujarat leave the same legacy. The clarity on greater cause, the achievement defying all odds and their perseverance are lessons for life and I chose to be led by the energy from this inspiration,” adds Sreeram.

He studied BABL in Trichy and settled in the same city running an Amul outlet for over fifteen years. He also owned a personalised gift centre and managed his father’s coffee shop, adding in his elements of interest like the cassette unit, book shelves for the customers. “Kalam sir visited our

coffee shop once and I helped with his selection of cassette. I also started a book shop in an auto to take Kalam sir's books to rural students. I tried everything to be associated with his thoughts," he exclaims. Kalam sir's death came in as a shock and Sreeram came to Rameswaram in his auto. He liked the ambience of this town and immediately decided to shift here. His first venture in Rameswaram was a coffee shop right opposite to the Kalam Memorial. It was during this time that Sreeram got to learn about the magical, versatile and perennial grass native to the region – Vetiver.

While the coffee shop had to shut down during the pandemic, Sreeram kept his learning on Vetiver alive and explored a variety of sources to learn more about this grass, its applications and uniqueness. He appreciated this as a plant gifted by nature for the society. "It can purify all five elements of nature from the Natarajar statue in the renowned Chidambaram temple. I saw its applications in soil erosion control, natural pest control, livestock forage, perfumery, medicinal uses and also the cultural uses. Have you not seen vetiver used in homams to purify the air around us?" he points out.

Drawn into the versatility of this native grass, Sreeram began to share his knowledge in all his social circles and the social media pages became very active with discussions on vetiver. Soon, a senior scientist from the Central Institute of Medicines and Aromatic Plants (CIMAP) saw his posts and invited Sreeram to their research lab. "I was surprised to see five varieties of vetiver. I learnt their variety of applications and wanted to cultivate all these varieties in Rameswaram," he recalls. Soon, he founded the brand Rameswaram Vetiver and enrolled seven farmers from the region. His team managed to bring around five acres in Palkulam village under vetiver cultivation since the inception in 2021. Now that the cultivation was successful, CIMAP offered him a distillation unit under the aroma mission to encourage value addition processes. "Right from the beginning CIMAP has been very supportive. Be it the provision of one lakh saplings or the machinery, they knew why this was important and also understood my efforts to build this as a local brand. We formed clusters and continued production," adds Sreeram.

His marketing of vetiver has been touched by various aspects and fully informed by the ecological benefits, cultural significance. "We have supplied vetiver to Adyar river in Chennai too. Water purification using vetiver is an age old practice and its deep, extensive, fibrous roots allow sediment retention, erosion control and enhances wetland ecosystems. As a low maintenance plant, it is an ecofriendly choice for sustainable landscaping," he elaborates. His latest achievement with his brand is the establishment of the stall at Mandapam railway station through the central government scheme 'one station one product'. With a minimal rent of one thousand rupees, this scheme intends to promote local products and assured the right leverage Sreeram looked forward to within the town.

The foundation has been regularly organising meetings headed by Mr. M. Muruganandam, Founder and Managing Trustee of Rameswaram Vetiver and Environmental Foundation & Chairman of Excel Group; and declamations on vetiver, its wide applications, especially in arresting soil erosion. The latest in the series was held in Dhanushkodi where farmers also convened on ways to promote vetiver cultivation.

As the base oil for perfumes and many cosmetic products, its commercial applications are also being promoted to bring more farmers into the foundation.

Sreeram envisages to develop Rameswaram Vetiver as a brand open to all and this vision has enabled the development of buy back platform without any investment in land. “My vision is guided by vetiver’s significant role in carbon sequestration and sustainable ecotourism. Working for this on Kalam sir’s land, adapting Kurien sir’s principles gives me a sense of uniting with them. The soil revolution that vetiver promises and has demonstrated over ages needs wider recognition and our foundation is determined to take this farther,” he says with conviction.

- **Shanmuga Priya.T**

9. Instincts and Ventures

Ms. S Nirmala

December 2023



Entrepreneurship is a comprehensive skill that develops with time, but for some it is their fundamental thought process. Irrespective of age, gender, education and back ground, these individuals are characterised by resilience and relentless pursuit to demonstrate that their ideas can actually work in reality. For Ms S Nirmala, member of a self-help group from Thirupuvanam, Sivagangai district, it was also the desire to be unique that geared all her efforts thus far.

Raised in a joint family by a single mother, who worked as a teacher in a mid-day meals school, Nirmala was fully aware that she will be married off soon after completing her school education. While this mentally prepared her for new responsibilities, her husband's work in a sugar factory that required shifting to new towns every three years allowed her to introspect on roles she was capable of taking up.

She was completely focussed on her family until 30 years of age. As both her children grew older and capable of managing their routine, Nirmala found a window of opportunity to engage with different groups.

She helped B Ed students with their craft projects. She also attended many vocational training programs and taught interested women in her neighbourhood. Every interaction and engagement expanded her social circle.

Seven years ago she moved to Thirupuvanam in Sivagangai district and started making fur toys at home. While she gifted most of the toys to her friends and family, she also considered the idea of putting up stalls at exhibitions and events. “I came across an advertisement of a self-help group, inviting women to learn the art of making jute bags. I was instantly drawn to it because it was something new to learn and also a widely accepted attribute of sustainable lifestyle,” says Nirmala.

Since toys were her identity so far, she went to the training venue with her toys. Surprisingly, all women liked it and came forward to buy them. “They were all samples I had taken to show that I was capable of developing a product, but those women purchased them. It felt good and rewarding,” she recalls.

Thus began her stall activity with the SHG members as they guided Nirmala to register and promote her products at various colleges and events.

A decade ago, revenue from her first stall in Thirupathur was around 750 rupees. “I knew this was not very lucrative, but I also understood that my customers were primarily students who cannot afford to buy expensive products. I therefore started making smaller toys to suit their needs,” reflects Nirmala.

With no business acumen in the family, she wasn’t as apprehensive as one would expect her to be. “It wasn’t the absence of fear really. Rather, it was an excitement to present myself as able and determined,” she adds.

With time, she became a prominent name in her circles and marketing managers from the Department of Rural Development intimated her and her SHG about stall opportunities across the state. Within three years, she was also chosen to attend the Entrepreneurship Development Program offered by the Government of Tamil Nadu.

“I started from an activity I engaged in leisure. This program taught me the value of naming a product, branding it and the marketing strategies that may suit different stake holders. I saw it all with awe but the experience from stalls helped me relate my work in the larger scheme of things. I earned 10,000 rupees per day from my stall. It gave me the confidence to avail a loan from the Department of Micro Small and Medium Enterprises. I now have six members working with me. With each day, we are evolving into more capable and stronger individuals,” contemplates Nirmala.

From toys to the 70 different products under her SHG’s (Samayapurathal Self-Help Group) banner, it was diversification of products and acquisition of new skills that widened her networks. She learnt English to communicate to foreign customers. She taught skills like chocolate making to other SHGs and college students.

“I started as a learner. With chocolate making, I didn’t even know how to manage temperatures. In the beginning, I faced loss and learnt my lesson. With growing awareness on millets, I tried making chocolates with pearl millet and it worked very well. While the result is visible, the time and effort that went into arriving at the right mix of ingredients is implicit. In all my classes, I insist that students dive into challenges and adopt means to overcome them because these are the true strength of an entrepreneur,” she recalls, as a recognised trainer with the Department of MSME.

During the pandemic, Nirmala had to try a new product and her trials with Vetiver opened new avenues. She visualised its uses beyond the conventional wisdom and made products like hand fans, tea, car hangings, door garlands, body/hair wash powders, etc. Inspired by the versatility of Vetiver, she dedicated more time in developing new products and marketing them. The biggest hit was the herbal mosquito coil which has a huge fan base in Chennai, Tamil Nadu.

A recipient of many awards including the Best Seller Award from the Department of MSME, Nirmala has come a long way to show all women that the ability to adapt, learn and persist are the fundamentals to growing as an entrepreneur. “It is the tenacious pursuit of opportunities, creativity and a willingness to take risks that defines entrepreneurial spirit in anybody,” she affirms.

- **Shanmuga Priya.T**

10. My Dream Is to Ensure Water Conservation, Promote Biodiversity and Agricultural Development in My Panchayat

Mr.G. Selvaraj

November 2024



Mr.G. Selvaraj shares with Marie Banu his initiatives as the Panchayat President aimed at uplifting and empowering his community

Mr. G. Selvaraj is the Panchayat President of Kukur, Erode District. He has launched various green initiatives and has been recognised by the State Government with several awards.

In an exclusive interview, Mr.G. Selvaraj shares with Marie Banu his initiatives as the Panchayat President of Kukur, aimed at uplifting and empowering his community.

Tell us about yourself and your family.

I live with My wife Mrs. Sathya and my children S.S.Isai Aadhini and S. Ilanvel Aadiyan in Govindan Naicken Palayam. I studied at a Primary School in Modakkurichi and the Government Higher Secondary School until my Plus 2. Later, I pursued my BA in English literature at Chikkaiah Naicker College, Erode. After completing my degree, I tried my hand at various businesses. I first looked into the hotel industry in Modakkurichi, where I stayed in a hotel for some time. I later started a cone factory business related to the spinning mills.

My niece Ms. SS Nandashri works in the rocket launch sector in Sriharikota. My younger brother, after completing his MBA, decided to take up farming and has started a paper mill. He is now fully involved in agriculture.

What motivated you to get involved in the panchayat elections?

It was a combination of my personal interests and the need to contribute to my community. My family has always been supportive of my endeavours. My father’s side was more focused on farming, but I always felt a responsibility towards the village. During an election for local leadership, my neighbours gathered and asked me to stand for the panchayat election. I hesitated at first, but I ultimately decided to contest. There were seven candidates in total, and I was fortunate enough to win the election. Once elected, my first initiative was to plant 500 trees in the village as a part of our environmental efforts.

I started my term on January 6, 2020, and the next elections are scheduled for December 2024. I was recognised by Tamil Nadu Chief Minister for Best Panchayat and received the “Green and Clean Village award”. I also received appreciation from Hon’ble Governor on 26.9.23.

We are preparing for the next round of leadership, and I hope to continue the work we’ve started.

How has your family supported your decision to enter politics and lead the panchayat?

My family had mixed feelings initially. While my father was hesitant about my decision to run for the panchayat, fearing it would disrupt our family life, my mother was very supportive. After I won the election, I made sure to show my family the positive impact of my leadership on the village. Over time, they have come to understand the significance of my role, and now they fully support my efforts.

What are some of the key initiatives you have undertaken as the Panchayat President?

One of the first things I did was to focus on environmental sustainability. I spearheaded a treeplanting campaign in the village and we have planted over 8,000 trees so far. We targeted empty spaces for planting trees, and the local people have actively participated in this effort. It has transformed the landscape of our panchayat, which is now greener and cooler. Additionally, we identified the need for water conservation and have worked to build three new ponds to store water for irrigation. The ponds also help store wastewater from the lower channel of Bhavani river, which is then used to recharge nearby open wells and borewells. We’ve also built several check dams, which have been very beneficial for irrigation.

How effective is the plastic-free initiative in your panchayat?

We have worked hard to reduce plastic usage in the village. Initially, we distributed waste segregation boxes to every household to ensure that plastic waste is properly sorted. We also launched awareness campaigns to educate people on the harmful impact of plastic, and we made sure no plastic was used in public places or thrown into water bodies. We are gradually seeing a reduction in plastic use, and the community is becoming more conscious of its environmental responsibilities.

How do you manage the waste disposal system and the control of pests in your panchayat?

Managing waste and controlling pests is an ongoing challenge, but we've made significant strides. We took action against pesticide misuse and have been actively promoting organic farming techniques. Over the past three years, our efforts have led to a reduction in the use of chemical pesticides. In fact, our village is now known for being pesticide-free. This shift has not only helped the environment but has also resulted in better agricultural yields. I believe our initiative can serve as a model for other villages.

What support do you receive from the district collector?

The district collector has been incredibly supportive of our initiatives. The previous collector, Mr. Krishnan Unni IAS and Mr. Madhusudhan IAS, was especially helpful in fostering the growth of rural areas. Thanks to the support from the district, we've been able to implement our ideas more effectively, such as creating better roads that connect villages to main roads in just a few minutes, reducing travel time significantly. Current district officials, including Mr. Rajagopal Sunkara IAS, continue to offer his support as well, which helps us push forward with our development plans.

As a panchayat leader, have you faced any challenges, particularly related to corruption or resistance?

Thankfully, I have not encountered major issues with corruption or resistance. The community and local leaders have been very supportive of my work. However, there have been some challenges in terms of support from certain sectors or individuals. For instance, there was an instance where people were dumping garbage in a vacant plot of land. We took quick action and filled the site with sand to prevent further misuse. Some of these issues, while small, do require constant vigilance.

What are the plans for your panchayat in the near future?

We have many ongoing projects. I am especially focused on environmental sustainability. We are working on expanding the tree plantation program and creating more green spaces. Additionally, we plan to improve education in the village. We are offering special courses to students and encouraging them to pursue higher education. We are also exploring the possibility of setting up a soap production business and solar power plants to provide sustainable livelihoods for the community. We want to create an environment where people don't feel the need to leave the village to earn a living.

My dream is to ensure water conservation, promote bio-diversity and agricultural development in my panchayat. We are actively looking for funds to desilt ponds and promote tourism. I also plan to continue promoting the Vetiver method, which involves sustainable farming practices without harming the environment. We are already seeing positive results, and I am hopeful that this will bring about a lasting change.

Can you elaborate on how you plan to promote vetiver farming in your panchayat?

The use of vetiver grass, is one of the key sustainable practices we are promoting in our panchayat. Vetiver grass has numerous benefits, especially for soil conservation, water retention, and erosion control. It's an indigenous plant that requires minimal water and can thrive in poor soil conditions, which makes it perfect for our region. We are focusing on educating farmers about the benefits of vetiver, especially its ability to retain moisture in the soil and improve its fertility.

We have already planted vetiver along several roadsides and on the edges of our farms, and we've started to see significant improvements in soil quality and water conservation. Our plan is to expand this initiative by offering training programs for farmers, particularly on how to harvest and use vetiver for commercial purposes, such as making aromatic products or using the grass for building materials.

Additionally, we are working with agricultural universities and NGOs to provide more technical support, as well as financial incentives, for farmers who adopt vetiver farming. Our ultimate goal is to make vetiver farming a viable and profitable option for farmers in the panchayat, creating a model for others in the district to follow. We're also hoping to integrate it into our environmental sustainability programs to address both water conservation and soil health.

11. My goal has always been to provide clean, chemical-free food for my family

Ms. Suba

June 2025



Long-term, I plan to implement indigenous seed conservation, honeybee and poultry rearing, and develop the farm into an agrotourism hub.

Suba is an engineer by education and an organic farmer by passion. With a degree in Printing Technology from the College of Engineering, Guindy (CEG), Anna University, she began her professional journey in the printing industry and later served as a lecturer in Mumbai. Her roots trace back to a farming family in Tamil Nadu, which laid the foundation for her lifelong connection with nature and sustainable living. For nearly a decade, Suba has been dedicated to organic farming at her land in Chettikulam village, Perambalur district, Tamil Nadu.

She focuses on practices such as soil fertility restoration, water conservation, and integrated farm planning. Despite residing in the Middle East since 2011, Suba has successfully managed her farm operations remotely with the support of her family. Her current focus on dryland and drought-resistant crops reflects her adaptability to climate realities. She envisions developing her farm into an eco-tourism destination centered on sustainable agriculture.

In an exclusive interview, Suba shares with Marie Banu her passion for natural farming.

Tell us about yourself and how your farming journey began.

I was born and raised in Chennai, where I completed my schooling and higher education. My family is originally from the Trichy district. After graduating, I worked in my field for a few years and then moved to Mumbai, where I worked as a lecturer. Later, we moved to Saudi Arabia due to my husband's job posting. Because of restrictions on women working there, I took a break from my professional career to take care of our young son. In 2016, we relocated to Dubai, where we currently live. I frequently travel back to India.

My passion for organic farming stems from my childhood. My parents, especially my father, were deeply rooted in farming despite his government job. His weekend trips from Chennai to our village to tend to the land left a lasting impression on me. During school holidays, I spent time on the farm, following my grandfather through fields and helping with the cattle. These experiences built a strong emotional bond with the land. Inspired by this, I decided to invest in farmland and take up organic farming from the outset. My goal has always been to provide clean, chemical-free food for my family.

How do you manage your farm while living in Dubai?

It might sound unusual, but it has been a deeply fulfilling experience. We bought our farmland almost 10 years ago, and ever since, I've been managing it—even while living abroad. I usually travel to India every three months and stay for a month or more. Meanwhile, I have appointed a full-time family to stay on the farm. They take care of daily tasks. Every morning, I speak to them to give instructions, and in the evening, they send me pictures of the completed work. I've set up a system of remote monitoring, and although it doesn't replace the efficiency of physical presence, it has been working well for us.

What inspired you to get into farming?

Farming runs in my blood. I have vivid memories of walking the fields with my grandfather and watching my father's unwavering commitment to the farm. Even my relatives—like my aunt who is a bank manager—maintain their farmlands. Seeing their dedication made me believe that farming could be managed alongside other responsibilities, even from afar.

Was the family farm always organic?

Initially, my father used chemical fertilizers and pesticides—especially during our nursery days in Chennai. I remember we would shut all the windows and doors after spraying. Over time, he became aware of the health hazards and transitioned fully to organic farming. He joined organic farming groups and influenced me deeply. So, when I started my own farm, I committed to organic practices from the beginning.

Can you describe your land and cropping system?

The farm is located in Chettikulam in Perambalur district, and spans 18 acres of dry land. I started with monocropping, growing pulses and groundnut like other local farmers, but weather unpredictability made it unprofitable. Later, I moved to mixed cropping, focusing more on soil fertility and water conservation.

What methods have you adopted for water conservation and soil health?

Water and soil conservation are top priorities. We depend on an open well and rainfall, but water levels drop significantly in summer. I received government support to build a large pond. I also experimented with vegetation-based bund stabilization. Inspired by Arugampul (Bermuda grass) paths from childhood, I later adopted vetiver grass for its deep roots and soilholding capacity. I sourced 1,000 slips from Cuddalore and planted them along bunds and water channels. This significantly reduced erosion and maintenance costs. Now I'm planting vetiver throughout the farm as it enhances moisture retention, soil structure, and microbial life.

Are you cultivating vetiver for commercial use?

No, I use vetiver solely for conservation. Though it's valuable in perfumery and water purification, our black soil isn't ideal for large-scale vetiver cultivation. Some farmers ask why I grow a non-commercial "grass," but it has helped us save on bund repairs and canal maintenance. I also use the trimmed vetiver as mulch.

What are your future plans for the farm?

My primary goal is to ensure my family has access to healthy, chemical-free food. I also want my son to understand and appreciate the value of farming. I bring him to the farm during holidays so he can participate in the activities. Long-term, I plan to implement indigenous seed conservation, honeybee and poultry rearing, and develop the farm into an agro-tourism hub. I've already fenced two fields for this purpose. I'm inspired by integrated farms like Akshayakalpa and would love to build something similar.

Are you considering seed banks or shared farming resources in your area?

Yes, I'm seriously considering starting a communitybased seed bank to help small and marginal farmers access native varieties. I'm also exploring integrated farming methods that include poultry, dairy, and beekeeping. My biggest challenge is finding trustworthy, skilled people to help manage the expansion in my absence.

Any closing thoughts?

Farming, for me, is about more than food production. It's a lifestyle and a legacy. I want my family to understand where their food comes from and to value the soil that sustains us. Organic farming is not just a method—it's a responsibility. Even with the challenges of remote management, I believe it's possible to build a resilient, sustainable farming model that serves future generations.

12. Our Culture and Future Is Agriculture. The Whole Conscious Shift Should Come from The Consumers

Dr. C.K. Ashok Kumar

March 2023



Dr. C.K. Ashok Kumar is a multifaceted personality. An innovator and founder of First World Community, an entrepreneur enablement platform.

In an exclusive interview, Dr. C.K. Ashok Kumar shares with Marie Banu his passion for natural farming.

About your tryst from corporate to agriculture sector?

I come from Cuddalore, a predominantly agricultural district, where most of the farmers are engaged in paddy and groundnut cultivation. My father is a teacher, and I grew up in a 20-acre farm with coconut groves and paddy fields. The Cuddalore belt is known for vetiver farming, and we ventured into the sachet industry where we introduced herbal products like shikakai and vetiver (*Chrysopogon zizanioides*)

We also run C.K. Engineering College in Cuddalore. Realising that many of our students were unemployed, we motivated them to engage in agriculture and initiated Vetiver centre of excellence in our College.

Around this time, I heard about the International Vetiver Conference in Da Nang in Vietnam. I was curious and attended this conference where the World Bank officials and scientists across the world – Thailand, Mexico, Middle East, China and Africa – were present. I spoke about how the impression on vetiver farming has changed over times.

After this, my interest in vetiver farming became stronger. I came back and started reading more on this and its impact on climate change. Vetiver has carbon sequestration factors and can capture more carbon than any other grass and fix it to the roots. The World Bank scientists called it as ‘wonder grass of the world’ and more than 150 countries grow vetiver today and use it for infrastructure development. This was a huge learning for me.

About the impact of Vetiver farming?

about the impact of Vetiver farming? Vetiver is the pride of Tamil and a gift to the world. The botanical name *Chrysopogon zizanioides* is derived from the Tamil word vetiver.

Vetiver acts as a natural defence to slow river flow and reduce flooding as a cost-effective means of preventing frequent breaches of river embankments, one of the biggest problems in coastal districts of the state. Its deep roots (two to four metres in depth) bind the soil and prevents erosion. Moreover, when planted in rows to form hedges, the grass slows down water flow by acting as a barrier, thus reducing the erosive power of the deluge.

I started talking about the goodness of vetiver in several forums and how it purifies the soil. We have registered at TNAU and have formed India Vetiver network.

About the farming sector in our country today?

The fact is that a farmer is the most oppressed or a victim of his/her own farming. Many farmers in Tiruvannamalai district ask why they still living in poverty and only few can succeed.

It is sad that many farmers are not able to calculate the profit they earn in farming as they are engaging in this occupation for generations and are not sure of the revenue they generate.

The natural calamities are also a challenge which small farmers face from time to time.

We see a lot of youngsters taking up vetiver farming and natural farming. Weekend farming is now becoming popular. This is in our DNA as agriculture has been our occupation since stone age. We somehow lost our connection with agriculture after the industrial and digital revolution. In fact, many of my IT friends have expressed that their passion for agriculture as they sense more satisfaction here.

As citizens, it is our first responsibility to rejuvenate our soil. The health of the people today is not as it was of our forefathers. Agriculture is taught in Colleges and schools as a separate faculty and so is health. In my view, Agro-health should be the future because everything comes from the soil. It is based on the concept “உணவே மருந்து” If we take care of the soil, our health will be improved. Each one should be able to realise this interlink so that we can work together to create a disease-free world.

About Tamil Organic Farmers association and its activities?

We are the first world community that have launched the ‘தமிழ் ஆர்கானிக் Farmers association’ (THOFA). We conduct a lot of events and awareness programmes to encourage farmers to engage in natural farming that was led by Shri Nammalvar. Our Vision is “நஞ்சில்லா உணவு செய்வோம் நோயில்லா உலகம் படைப்போம்” meaning: TOXIC free food for all; Disease free world.

Through THOFA, we guide small farmers on the government schemes available. Thondaimandalam comprises of 14 districts from Chennai to Cuddalore and Kongu mandalam is from Coimbatore to erode belt. The current mission is to capacitate farmers to support other farmers.

Sikkim is the first state in India to become fully organic as the government has banned chemical fertilisers. We must emulate the model of Sikkim to go organic in a phased manner.

Please tell us about the impact of natural farming?

It was due to famine our country started using chemical fertilisers as part of Green Revolution led by Shri. M S Swaminathan. It refers to a period when Indian Agriculture was converted into an industrial system due to the adoption of modern methods and technology such as the use of HYV seeds, tractors, irrigation facilities, pesticides and fertilizers. This has made our land infertile.

Today, people do not having the vigour and vitality as before. We see a lot of infertility clinics mushrooming in our cities as their ability to reproduce is affected due to the quality of food they consume. Fertilisers and chemicals affect the micro nutrients of the soil.

What is the way forward to ensure productivity in agriculture?

Collective farming is the way forward as it is not successful when marginal farmers engage individually. Traditional farming practices needs to be relooked and there should be marketing support and Value addition given to those who engage in collective farming.

I believe that farmers can easily earn Rs. 50,000 a month and this should suffice to maintain their family. The fact is that the middlemen who earn more than farmers and this is the reason for farmers to remain in abject poverty.

The Amul revolution model by Dr. Cherian had 30 lakh dairy farmers collectively involved. We are in touch with these farmers and through THOFA are now looking at adopting this model and providing a marketing channel for collective farming so that many thousands of farmers will be benefitted.

Israel is a small country with less water resources, but is a world leader in agriculture and uses a lot of technology in agriculture. In our country, we have many farmers who have drones and they also lease it to small farmers. IOT (Internet of Things) based agriculture is coming up and modern factory equipment with Japanese support is gaining popularity.

The future is for agriculture. The whole conscious shift should come from consumers. They should motivate their children to engage in agriculture. Capturing the trend, Gujarat was the first to launch an Organic Agricultural University (GOAU) University.

Shri. Shubash Palekar, an Indian agriculturist like Shri. Nammalvar, has practiced and wrote many books on Natural Farming and is successful in Maharashtra. He talks on natural farming or zero budget farming. We have invited him to talk to our farmers and youngsters in a workshop planned by THOFA in Chennai in April 2023.

We are working closely with Agricultural institutions, food industries and the Government to promote sustainable farming practices to help in empowering the small and marginal farmers.

The awareness and consumption of organic food has been globally increasing. India has 4.72 million hectares under organic certification. It has been estimated that the Global sales of organic food and beverages reached USD 180 billion in 2021. The main reason behind this sales is growing awareness about the health benefits of consuming organic food. This trend is likely to continue at a compound annual growth rate of 13% till 2030 and reach a level of USD 500 billion.

- **Ms. Marie Banu**

13. Recognizing Vetiver's Deep Roots in Indian Agriculture— Both Figuratively and Literally—I Saw an Opportunity to Revitalize Its Cultivation in India

Dr. Muyeed Ahmed S

August 2024



Dr. Muyeed shares with Marie Banu his interest in the fragrance and flavour sectors

Dr. Muyeed Ahmed S is the Founder of Biotherm Flavours and Fragrances LLP, Bangalore a start-up established in 2019 that specializes in R&D for fragrances and flavors. With a background in biotechnology, forestry, and project management, Muyeed has extensive experience in plant tissue culture, genetic improvement, and sandalwood cultivation. Under his leadership, the company has developed innovative low-temperature extraction technologies, filed patents, and collaborated with government bodies like DBT, BIRAC, as well as international organizations like United Nations and IFAD. Biotherm has gained recognition by winning NBEC 2022, G20 DIA Innovation program at national competitions and selected as 75 innovations by BIRAC during 75 years of Independence program held at Biotech Startup Expo 2022 and positioning itself as a rising player in the global fragrance market. Biotherm Flavours and Fragrances LLP, Bangalore has been recognized as top 10 fragrance and flavour companies of year 2023 by Industry Outlook Magazine.

In an exclusive interview, Dr. Muyeed shares with Marie Banu his interest in the fragrance and flavour sectors.

PI tell us about your interest in the fragrance sector. What was the inspiration behind it?

My journey towards the fragrance industry began during my PhD at the Institute of Wood Science and Technology (IWST), which was originally a sandalwood research center established during the Mysore Wodeyars times. I joined a sandalwood conservation project around the time when the government relaxed restrictions, allowing farmers to cultivate sandalwood on their own land. This experience with sandalwood conservation and cultivation, combined with my work promoting these activities among farmers, sparked my interest in the fragrance industry, particularly in the extraction of oils.

Since starting in 2019, what have been some significant milestones for Biotherm Flavours and Fragrances LLP?

In the fragrance industry, I quickly realized that there was a lack of advanced technology and a shortage of raw materials. Initially, it seemed like it would be easy to establish a strong presence in the industry, but I soon encountered challenges with the existing steam-based extraction technology, which often leads to the degradation of essential oils. Leveraging my biotechnology background, I developed a new protocol for low-temperature extraction, which preserves the integrity of the oils. This innovation was supported by a significant project from the Department of Biotechnology, Government of India, and also by KITS, Government of Karnataka marked a major milestone for us. Additionally, we've worked on securing a continuous supply of raw materials by collaborating directly with farmers, offering them guaranteed buyback policies, technical support, and resources like solar water pump sets.

How have collaborations with government and international organizations influenced your growth and research?

Our work on new extraction technology led to filing a patent, particularly for a method that not only enhances the extraction process but also allows us to obtain secondary products with novel applications in the fragrance and cosmetic industries. These achievements have been supported and validated by top government research institutes, adding credibility to our work. We've also received backing from international organizations, including the IFAD from United Nations through Access Development Services, Delhi to further our collaborations with farmers. These partnerships have significantly contributed to our growth and the development of innovative products.

Can you tell us about the most innovative projects you've worked on, particularly in the fragrance and flavor sectors?

One of the most ground-breaking projects I've worked on has been in the development of a lowtemperature extraction technology for essential oils, particularly in the fragrance sector. Traditional steambased extraction methods, while widely used, have significant drawbacks, especially when dealing with heat-sensitive compounds. Essential oils, known for their delicate molecular structure, often degrade under high temperatures, losing their potency and fragrance. This issue prompted me to leverage my background in biotechnology, where we frequently deal with similarly sensitive biological materials like proteins and vaccines.

I adapted biotechnological techniques, typically used for handling temperature-sensitive substances, to develop a protocol that enables the extraction of essential oils at much lower temperatures. This method preserves the oils' molecular integrity, resulting in a higher quality product with a richer, more authentic aroma profile. This innovation not only enhanced the extraction process but also opened the door to extracting secondary products that have novel applications in both the fragrance and cosmetic industries.

Another key project has been our work with Vetiver oil, a crucial base note in many high-end fragrances. Vetiver, traditionally grown in India, has seen its production shift globally, particularly to Haiti, due to various socio-political and economic factors. However, recognizing Vetiver's deep roots in Indian agriculture— both figuratively and literally—I saw an opportunity to revitalize its cultivation in India. We've worked closely with farmers, especially in regions with sandy, less fertile soils near the sea shores where Vetiver thrives, and to re-establish this crop as a major player in the global fragrance market. This not only converts the un-utilize land into use, but also provides livelihood for the marginal farmers and women folks from the fishermen community.

Through our initiatives, we've implemented a buyback policy with farmers, ensuring them a stable and sustainable income and motivating them to focus on quality cultivation. We've also helped them with replacing diesel based water pumping system with sustainable solar water pumps, to reduce their operational cost, supported them with fertilizers, and technical guidance, making the cultivation process more efficient, economical and sustainable. This not only secures a reliable supply chain for us but also empowers the farmers, creating a more resilient and integrated value chain.

In addition to these, our work has expanded into exploring the medicinal properties of essential oils, particularly Vetiver. There is growing scientific evidence that Vetiver oil can have therapeutic effects, such as reducing stress and aiding in the treatment of conditions like ADHD and epilepsy.

We are currently exploring these applications in collaboration with government institutes, with the aim of integrating these oils into broader health and wellness sectors.

How do you envision the future of the fragrance industry, and what strategies do you have in place to meet the sector's needs?

The fragrance industry, though small, is crucially supported by the agricultural sector. One major gap I've identified is the disconnection between farmers and the industry. There's a significant opportunity for entrepreneurs to bridge this gap by connecting farmers with the industry and addressing both technical and financial needs. Additionally, the medicinal and pharmaceutical applications of essential oils present a promising area for future exploration. For instance, many essential oils have shown potential as an alternative to antibiotics, which could open new avenues for research and development in the pharmaceutical sector.

How do you balance innovation and sustainability in light of global trends?

In today's rapidly changing world, embracing technology is essential for survival and success. We see advancements in the cannabis industry, where molecular-level research is leading to new formulations. Similarly, in the fragrance industry, technologies like *in silico* modeling allow us to predict and optimize molecular interactions before even beginning the physical process. This approach not only fosters innovation but also ensures sustainability. Large companies are already investing in these areas, and in the future, we can expect customized fragrances and other products tailored to individual preferences and needs.

Any final thoughts on encouraging more entrepreneurs to enter the fragrance sector?

The fragrance industry, while small, offers vast opportunities for innovation, particularly in connecting farmers with the market. Entrepreneurs can play a key role in bridging this gap, supporting both the industry and the agricultural sector. Moreover, the pharmaceutical applications of essential oils are an exciting frontier that requires further research but holds great potential. By focusing on these areas, entrepreneurs can contribute to the industry's growth while promoting sustainability and innovation.

14. Sustainability is not a destination, but a continuous journey

Mr. Jacob Jose

March 2025



Jacob Jose is a researcher, author, and business development professional dedicated to sustainable agriculture, fair trade, and community empowerment. As the Manager of Business Development at PDS Organic Spices and Coordinator of the Sahyadri Organic Small Farmers Consortium (SOSFC), he drives market development, organic certification, and capacitybuilding initiatives for smallholder farmers. Raised in a farming family in Kerala's Kottayam district, his deeprooted connection to agriculture shaped his career.

A graduate in Chemistry and a postgraduate in Business Administration, he is currently pursuing a PhD in organic product marketing. A published author and global speaker, he actively contributes to agroecology, biodiversity conservation, and organic marketing strategies. <https://www.jacobpoovatholil.online/>

In an exclusive interview Jacob Jose share with Marie Banu his experience in fairtrade and sustainable agriculture.

What motivated you to switch to the sustainable agriculture sector?

The shift from chemistry to agriculture might seem unusual at first, but the underlying connection is rooted in my upbringing. Coming from an agrarian family, I have always had a deep appreciation for agriculture and rural life. As I completed my studies in business administration and began my research

on organic product marketing, I found myself increasingly drawn to the intersection of economic development and ecological responsibility. My time with the Responsible Tourism Initiative played a pivotal role in fostering my passion for sustainable development and communitybased agriculture. It was there that I realized how much could be achieved by empowering local communities and integrating them with broader economic and environmental goals. Ultimately, the hands-on experience with Peermade Development Society, where I worked closely with farmers to promote organic farming and fair trade, solidified my interest in this field. Organic farming and ethical trade practices aligned with my personal values, and I felt compelled to pursue this path to help make a tangible impact.

Can you tell us more about Peermade Development Society and its mission?

Peermade Development Society (PDS) is a nongovernmental organization that was established in 1980 and is supported by the Catholic Diocese of the region. The organization’s primary mission is to empower small and marginal farmers, tribal communities, and women, particularly in the agrarian district of Idukki, located in the Western Ghats. We focus on promoting organic agriculture, fair trade practices, and rural entrepreneurship. PDS aims to uplift the economic status of these communities by facilitating the production of high-quality organic products like spices, coffee, and tea while ensuring that these farmers have access to fair markets and a sustainable income. Additionally, PDS works on various social development projects in collaboration with international agencies like the UN, and national and state government bodies. We prioritize environmental sustainability by focusing on eco-friendly farming practices and supporting rural entrepreneurs in establishing their own businesses.

How do you see fair trade benefiting farmers, especially in terms of sustainability?

For farmers, sustainability is fundamentally tied to securing a living income. Fair trade ensures that farmers receive a fair price for their produce, which is crucial in a market often dominated by middlemen who drive prices down. Beyond just a fair price, fair trade provides farmers with an additional premium for their produce. This premium is crucial as it allows farmers to invest in improving their social, environmental, and economic conditions. This helps create a sustainable future for the farming community. In contrast to conventional farming systems, where market forces largely control pricing, fair trade offers farmers more control over the pricing mechanism and access to a market that values their products ethically. The fair trade system also ensures that farmers can invest in improving their farming practices, maintain biodiversity, and adopt environmentally sustainable techniques, making it a holistic approach to farming.

With the increasing demand for organic products, how does PDS ensure transparency and traceability in the supply chain?

Transparency and traceability are core principles of the fair trade and organic certification process, and they are integral to our operations. At PDS, we ensure that every product we sell is traceable from farm to fork. This means that every batch of product we purchase from farmers is documented and tracked through every step of the production and distribution process.

This level of transparency helps build trust with consumers, as they can be confident that the products they are purchasing meet ethical standards, and the farmers involved in their production are receiving fair compensation. We also adhere to certification standards, which require traceability, and we work hard to support our farmers in meeting these standards through regular training and assistance with compliance.

How do you support farmers in obtaining organic certifications?

The certification process for organic products can indeed be complex, especially as regulations evolve and become more stringent. To ease the burden on our farmers, we provide a comprehensive support system. First, we conduct capacity-building programs and workshops to educate farmers on organic farming principles and certification requirements. Since the certification standards are often in English or Hindi, which many of our farmers cannot fully understand, we translate them into Malayalam, though the technical terms can still be difficult for them to grasp.

While our farmers have been practicing organic farming techniques for years, certification requires proper documentation of these practices, which is where we step in. We assist with the documentation process, internal inspections, and ensuring that all compliance criteria are met. Additionally, we offer group certification, which allows farmers to obtain organic certification as a collective rather than individually, thus significantly reducing the cost.

Over the years, have you seen an increase in the number of farmers transitioning to organic farming?

Yes, we have seen a significant increase in the number of farmers transitioning to organic farming, primarily driven by the promise of fair trade premiums and the opportunity to earn a living income. Farmers are also motivated by the knowledge that organic farming helps preserve the environment, protect biodiversity, and promote healthier living. While there are still challenges in meeting certification requirements, the benefits far outweigh the initial hurdles. The growing global demand for organic products also makes organic farming an attractive option. However, due to certification regulations, we can only accept farmers whose land meets specific standards. That said, more and more farmers are seeking support from organizations like PDS to transition to organic farming, and this trend is expected to continue.

What are your marketing strategies to reach consumers, especially with the rise of digital platforms?

Digital platforms have transformed marketing in the organic sector. In our case, storytelling is one of the most effective strategies we employ. By sharing the stories of the farmers, the process of organic farming, and the social impact of our work, we engage consumers who are interested in ethically sourced products. Additionally, we leverage social media campaigns, search engine optimization (SEO), content marketing, and influencer partnerships to increase brand visibility. These strategies help us build trust with our target audience, which includes ethically conscious consumers both in India and abroad.

We also participate in international trade fairs like BioFach, which is the largest trade fair focused on organic products, to connect with potential buyers. Furthermore, we've established a retail branch called Trubio, which targets specialty organic shops and supermarkets. This is complemented by our online presence on platforms like Amazon, Flipkart, and Big Basket, which help us reach a broader customer base.

Is there a particular type of product that consumers are most interested in?

In our range, coffee and tea are the most popular and fast-moving products, especially since both have a significant presence in the international market. That being said, organic vegetables are also gaining momentum, particularly as consumers become more aware of where their food comes from and the traceability of the production process. The demand for organic vegetables will likely continue to grow, especially as consumers seek more transparency and ethical sourcing from their retailers.

Your advice for those interested in fair trade and sustainable agriculture?

Sustainability is not a destination, but a continuous journey. You need to stay rooted in your core purpose— whether it's environmental sustainability, fair trade, or social impact—while being adaptable in your approach. The sector is dynamic and requires flexibility to deal with real-world challenges like climate change, price volatility, and changing regulations.

It's also important to collaborate and network with organizations and groups in the fair trade and organic farming sectors. This will help you create a meaningful impact. Additionally, advocating for policies that support sustainable agriculture and using your platform to educate and influence consumer behaviour can drive industry-wide change.

15. Sowing Resilience

Ms Seema Gupta

June 2025



For small farmers, every rupee saved is a step towards a better income, and that's where the true value of a cluster lies

Aromatic plant cultivation is rapidly gaining traction across India, driven by government initiatives, corporate partnerships and growing global demand for natural and wellness products, thereby promising higher economic returns per acre of land. Most of them are hardy, Pest resistant and use less water and chemicals. A combination of these factors makes them a sustainable, high-value alternative to traditional crops—especially in regions facing resource constraints or market volatility. But how easy is the transition for small farmers?

“That is where people like us come in. We work like a bridge that facilitates communication and execution between farmers and the State Medicinal Plants Board, along with their state units. It is not new that the demand for sustainably sourced aromatic ingredients has been on the rise and this ensures stable market demand, fetching better prices for farmers. For small farmers, cultivating aromatic plants alongside food crops not only regenerates soil and reduces chemical dependence, but also fosters biodiversity—making it a sustainable and resilient livelihood strategy in harmony with nature,” says Ms Seema Gupta, Founder of Narayan Sankalp Foundation in Raipur, Chhattisgarh.

Seema is an Economics graduate who followed her passion for interior designing. While building her career in design, she also began managing farming activities on her land—a journey she has pursued for over a decade. Early on, she recognized the potential of aromatic plants as a sustainable and profitable option for small farmers too. Through her close interactions with farmers and farmer groups in neighbouring villages, Seema understood the transformative role aromatic cultivation could play in rural livelihoods. Her vision is now focused on taking aromatic farming to small and marginal farmers, helping them diversify income, reduce input dependency and transition toward higher-value, environmentally conscious agriculture.

She founded the Narayan Sankalp Foundation in 2017 and employed the community approach to farming. In fact, the State Medicinal Plants Board promotes cluster-based cultivation model to drive sustainable farming and value-chain development among small and marginal growers. For small farmers, every rupee saved is a step towards a better income, and that's where the true value of a cluster lies. Farmers grow key medicinal and aromatic crops—such as pacholi, vetiver, stevia, brahmi, shatavri, etc —together on nearby plots of land, forming larger farming clusters that help them share resources, learn from each other and reduce costs.

“When we talk about clusters, it's not just about bringing contiguous plots of land together. It is also about building a support system—starting with nurseries that provide healthy, uniform planting material, and extending to shared infrastructure like drying yards, storage facilities, processing units, even distillation setups. These shared assets reduce postharvest losses and make it easier to process and sell products right at the farm level. When farmers come together, their collective strength grows—they can achieve more, negotiate better and reduce individual investment burdens. For small farmers, every rupee saved is a step towards a better income, and that's where the true value of a cluster lies,” explains Seema.

The Foundation works closely with the Board, enabling the buyback guarantee from the Board itself. While Seema and team train and prepare the farmers about cultivation, harvesting, processing practices, the Board drives the support system, with some schemes offering subsidies of 30–75% on planting, cultivation costs and infrastructure— depending on crop type and region. The Foundation, farmers and the Board work in synergy to take the initiative forward.

Seema has trained more than 6,000 farmers in Chhattisgarh. “I wasn't sure when I first started—Chhattisgarh has always been known as paddy land,” Seema quips. “When farmers began visiting my farm, I had no idea they'd see a new opportunity for themselves in what I was experimenting with. I certainly didn't imagine that I would end up leading a transition that could actually improve their livelihoods. But here we are—we've come a long way together.”

Shifting farmers from traditional paddy cultivation to aromatic crops in Chhattisgarh was no easy task, especially given the volatility in aromatic plant prices. However, Seema understood early on that staying committed to a single crop over the long term was key to stability and higher returns. As the first few clusters started to show results, farmers began to see real change—many have now doubled their incomes. The success of these initial groups inspired others to step forward and form similar clusters.

Through the Foundation, over 500 self-help groups (SHGs), involving nearly 5,000 women, have been trained in cultivation, harvesting and basic processing. These SHGs have now become ambassadors of the model, mentoring new farmer groups across the region.

To support this ecosystem, the Foundation also raises funds for its operations and expansion. Local engagement plays a critical role here – Sarpanches for example, help convene farmer meetings. This is followed by exposure visits, after which interested farmers formally consent with the Board to participate. Soil experts from the State Medicinal Plants Board assess each plot and recommend suitable aromatic crops, ensuring the transition is both economically and ecologically viable.

Seema understands the significance of farmers’ livelihood and strongly believes that diversifying farmer income is crucial not just for improving livelihoods, but for sustaining farming itself in the long run. The Foundation’s Cluster model is not just about supplementing farm income, but also facilitates better use of land and other resources. “We are gradually building a more stable, resilient farming system that supports both local economy and ecology. We are all right here, growing together,” she smiles.

- **Shanmuga Priya.T**

16. The Reach and Impact of Vetiver Grass Technology and Its Applications Have Truly Spread Like Wildfire

Mr.P.Haridas

August 2023



Haridas shares with Marie Banu his experience in introducing vetiver in tea plantations

Mr.P.Haridas was the coordinator of the India Vetiver Network until recently. He has been working as Scientist at Research & Development Department of Tata Tea Limited, Munnar, Kerala since 1984. He was actively involved in establishing R&D Centre of Tata Tea at Munnar. He served as Head of R&D, KDHP Co. (P) Ltd., which is the new company after restructuring of plantation operations of Tata Tea at Munnar and retired in December 2007.

Prior to joining Tata Tea, he worked at UPASI Scientific Department from 1969 to 1983, first as Assistant Botanist till 1975 and then as Advisory Officer at Munnar. He was responsible for introducing Vetiver in tea plantations in South India for soil and moisture conservation. Implementation of the Vetiver System Technology in all Estates of Tata Tea is one of his important contributions.

In an exclusive interview, Mr. Haridas shares with Marie Banu his experience in introducing Vetiver in Tea plantations.

Can you tell us about yourself and your background in agriculture?

Tea cultivation in southern India, particularly in hilly regions, often beset with challenges like soil erosion and landslides. I introduced Vetiver in plantations of Tata Tea.

In mid 1980s the company had initiated a Medicinal & Aromatic Project in which Vetiver was included. I observed that certain obnoxious grass weeds, such as Ginger grass (*Panicum repens*) Kikyu grass (*Pennisetum clandestinum*) etc. were unable to creep into Vetiver plot due its thick roots of Vetiver. This observation proved beneficial for organic tea cultivation as grass weeds wer not invading the Vetiver boundary and tea fields. We planted Vetiver along the periphery of tea fields to prevent soil erosion and landslides.

Tata Tea's enthusiasm for Vetiver grew further. The Company preferred Vetiver hedges to contour stone walls to combat soil erosion. Constructing contour stone walls was very expensive requiring 300 workers for one hectare for constructing contour stone wall at strategic locations. In contrast, establishing Vetiver hedges could be carried out with only 90 workers. Encouraged by this, Tata Tea decided to implement Vetiver planting in all their estates in South India.

From mid 1980s Tata Tea decided to replant low yielding fields. Instead of constructing stone revetments, we embraced Vetiver by planting it as hedge.

It may be noted that the first ever reference to Vetiver in Tea , dates back to the 1940s. A Tea Scientist, Dr, T Eden, who worked in Ceylon and Kenya, experimented with various grasses, including Vetiver, to counter soil erosion. Among the various grasses tested, Vetiver emerged as the most effective in preventing soil erosion. Eden's historical finding unfortunately went unnoticed and did not receive due attention. In essence, my deep interest in Vetiver developed from its strategic advantages in tackling various challenges, and over time, it evolved into a passionate pursuit.

What inspired you to introduce Vetiver Systems in tea plantations for soil and moisture conservation?

We utilised Vetiver by cutting it for mulching. Mulching with Vetiver brought forth numerous benefits. Firstly, it effectively prevented erosion. Secondly, it retained moisture in the soil. This also prevented weed growth. Eventually the mulch gets decomposed and helped in improving organic matter of the soil. This application of Vetiver proved to be of great significance.

I had the opportunity to interact with Mr. Richard Grimshaw from early 1990s. On seeing my interest, he proposed the idea of organising a National workshop on Vetiver and sponsored by The Vetiver International. (TVNI) We organised the workshop at Cochin in February 2008, drawing Vetiver experts around the world who presented their research papers.

I was presented with the 'Certificate of Technical Excellence' by Mr. Grimshaw himself. TVNI had begun awarding certificates of excellence. In 2005, I received the Class 3 certificate. It's worth noting that these certificates come in three classes: Class 1, Class 2, and Class 3. In fact, I was honoured to be the first recipient from India class Class 3. During the National Workshop I was awarded Certificate of Excellence under Class 1.

I was able to identify different cultivars of South Indian Vetiver such as VS-1, VS-2, VS-3, VS-4 etc. Among these, VS-1 stood out due to its vigorous growth and the superior quality of oil.

It's important to mention that globally and within India, two main types of Vetiver exist: North Indian Vetiver and South Indian Vetiver. The root system of North Indian vetiver is shallow, rendering it unsuitable for environmental protection. On the other hand, South Indian Vetiver is deep-rooted, with roots penetrating up to 2 to 3 meters. South Indian Vetiver doesn't produce viable seeds; hence it is propagated vegetatively using tillers / slips. In contrast, North Indian Vetiver can produce viable seeds, leading to the potential for it to become a weed thus causing problems to the farmer. In light of TATA Tea's successful implementation of Vetiver in Munnar and Anaimalais, other tea companies followed suit. Today, when you visit Anaimalais, Munnar, or Nilgiris, you'll find Vetiver plantings to combat soil erosion and landslides.

Have you noticed any other positive environmental impacts from implementing Vetiver System beyond soil and moisture conservation?

One of the most significant applications of Vetiver lies in its ability to enhance water quality. In our country, we have a multitude of water bodies ranging from small ponds to vast lakes, but the water often remains polluted and unfit for consumption.

Let me delve into the underlying reasons. Invasion of Algal growth in water bodies like ponds, lakes is mainly due to presence of pollutants and residues reaching water bodies from farmers' fields.. These residues contain significant amount of substances like nitrate, phosphate, and sulphate. Interestingly, when Vetiver is floated in water, it exhibits a remarkable capacity to absorb nitrate, phosphate, and sulphate far more effectively than any other plant. By absorbing these substances, Vetiver effectively starves the algae, leading to water purification.

Undoubtedly, this marks a crucial and impactful application of Vetiver contributing to the purification of water bodies and significantly improving water quality.

What advice would you give to other tea plantation owners or agriculturalists interested in adopting Vetiver Systems for conservation purposes?

The reach and impact of Vetiver grass technology and its applications have truly spread like wildfire, extending beyond the borders of India to numerous other countries. Presently, there are over 25 diverse applications for this remarkable grass. One striking example is the handicraft industry in Thailand, where handicrafts are crafted not from the root, but from Vetiver leaves. This industry has grown substantially and contributes significantly to the local economy.

Interestingly, the tender foliage of Vetiver serves as an excellent fodder for cattle, proving to be a boon for farmers. The distinctive aspect here is that mature leaves will not attract cattle, but they readily consume the tender leaves. Numerous scientific publications have highlighted the nutrient values and benefits of using Vetiver as fodder.

Can you share some specific results or success stories that demonstrate the positive impact of Vetiver Systems on soil and moisture conservation?

A farmer planted rows of bananas. Adjacent to these rows, another set of banana plants was cultivated, with Vetiver planted nearby. Surprisingly, the row with Vetiver led to the early flowering and fruiting of the adjacent banana plants by nearly a month compared to the untreated control. The yield also notably increased in the presence of vetiver.

Researchers observed that Vetiver roots exhibited a tendency to interact with banana roots, enhancing moisture levels at the root zone. Furthermore, scientists in Thailand discovered that Vetiver has the ability to foster the growth of beneficial microorganisms at the root zone. This characteristic allows Vetiver to thrive in various soil conditions, irrespective of soil fertility.

17. The Fragrance Of The Earth My Spiritual Journey

October 2025



My father was more spiritual than religious. He performed his Sandhyavandanam every day, twice without fail, but unlike many others, he didn't believe in elaborate daily poojas. His connection with the divine was quiet, personal, and deeply disciplined.

What I remember most vividly from those days is walking with him every evening to the Siva Vishnu Temple in Mambalam for spiritual discourses. I must have been only six years old, barely understanding what was being said, but he insisted I accompany him. There was never an excuse for staying back. Often, I would return half-asleep, leaning on him as we walked the short distance home. Looking back now, I realise those evenings were my first grounding in spirituality. As they say, what enters through the ear, stays in the conscious or subconscious mind—and those words, absorbed unknowingly, shaped my thoughts for a lifetime.

Even today, I enjoy attending spiritual discourses whenever I can. I particularly look forward to the sessions of Tmt. Vishaka Hari. Her storytelling, her voice, and her ability to weave the wisdom of the epics into simple life lessons always leave me feeling nourished and clear. Listening to such sessions, I believe, is like drinking distilled knowledge—you come away not only informed but transformed.

To me, spirituality is simple. A spiritual person lives with the awareness that there is more to life than what meets the eye. Humility and contentment—that, to me, is spirituality.

My father taught both these qualities by example. He repeated them often, until they became second nature to me. They have guided my thoughts and deeds for over sixty years.

During my years with Utopia, I often went to my farm and set up a small table and chair under a tree. I would handle my business calls watching the paddy fields sway gently in the wind. Those moments were profoundly spiritual—peaceful, grounding, and deeply effective. It was as if nature itself participated in my work.

One of my cherished practices is planting Nakshatra trees for the birth stars of friends I wish well. It is a sacred tradition connecting the cosmic energies of one's birth star with the earth, believed to balance personal energies and planetary influences. Each tree is planted with intention and prayer—it is both a gift and a blessing.

Over time, I have planted and nurtured many trees that carry deep spiritual symbolism:

Thiruvodu (Calabash): Sadhus use its dried shell to receive bhiksha; its white flesh is called the Elixir of Life.

Nagalingam (Cannon Ball Tree): A divine tree whose aromatic flowers are sacred to Lord Shiva.

Vilva: Its trifoliate leaves are offered to Shiva, and its fruit is highly medicinal.

Manja Kadambu: Believed to be the tree under which Krishna played his flute for Radha.

Each of these trees connects heaven and earth in its own way. When I walk through the grove, I feel their quiet power.

My journey into natural and organic farming has been equally spiritual. I learned to respect the soil—Bhoomi Matha—and to let her breathe. While many workers preferred a “clean” tilled field, I chose to let grasses grow naturally, cutting them just above the ground to protect the soil from the sun. “Respect the earth,” my father would have said, “and she will nurture you.”

As a Reiki practitioner, I was taught to be in harmony with trees—to hug them, talk to them, and pass energy to them. It may sound unusual to some, but spirituality is about sensitivity, not scepticism. When we allow ourselves to feel the life force in plants and soil, something shifts within us.

One of my most memorable experiences was when I had to transplant an orange plant that had already begun yielding. I gently dug it out, placed it on my lap, and gave Reiki energy, moving my hands from its roots to its tip. Then, I applied a paste of Agnihotra ash over its stem and leaves. My farmhand looked puzzled and whispered that I had lost my mind. Two weeks later, the plant stood upright and flowering. He was speechless. I just smiled.

Touching a plant with care and intention, believing it will grow well—that, to me, is spirituality in action. I often hug trees and offer Reiki energy whenever possible.

At the farm, I have fourteen cows and bulls. Feeding them bananas by hand, feeling their breath and the warmth of their heads, fills me with peace. The blessings of Gomatha are said to cleanse one's karma, and I believe it. Bhagavan Krishna says in the Gita, “I am the fragrance of the earth.”

This connection to the earth continues through my work with vetiver, the divine grass. Vetiver is one of Bhoomi Matha’s most generous gifts to humankind—its roots purify water, prevent soil erosion, spread fragrance, and offer medicinal and spiritual benefits. It is used in temple garlands, perfumes, and sacred rituals. Promoting vetiver has become a mission for me—a way of serving both nature and people.

Over the years, I have realised that spiritual growth is not about rituals or renunciation. It is about awareness, humility, and harmony—with people, with nature, and with oneself. By decluttering both the material and emotional aspects of life, we create space for abundance, growth, and peace.

As N. Karthikeyan, editor of *Vasudha: Everlasting Sustainable Living*, once wrote so beautifully: “By freeing ourselves of what we do not need, we create space for sustainability, growth, and peace.”

That, to me, sums up the essence of spirituality.

My journey continues—not in temples or scriptures, but in the quiet companionship of trees, the fragrance of earth after rain, the calm eyes of a cow, and the soft rhythm of the wind in the paddy fields. In every leaf and every breath, I see the same truth my father once taught me: life is sacred, and to live with humility and contentment is the highest form of prayer.

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-P.N. Subramanian

18. Unveiling The Enigmatic Vetiver

Mr. Sendhurvelan

March 2024



In a world dominated by conventional career pursuits, there are individuals who dare to venture off the beaten path and embrace their passions with unwavering determination. Meet Sendhurvelan, a spirited BE student, whose story defies expectations and embodies the spirit of true entrepreneurship.

Shunning the allure of a typical corporate job, Sendhurvelan took a leap of faith into the world of farming, driven by a fervent desire to make a meaningful impact in the agricultural sector. The captivating tale of Sendhurvelan stands as an inspiration for those who dare to chase their dreams against all odds. Let's delve into his remarkable journey and uncover the motivations, challenges, and triumphs he encountered along the way.

Vetiver, a plant with widespread use in Tamil Nadu and beyond, is highly esteemed for its various properties. Recently, it has garnered significant attention across multiple industries, including cosmetics, spas, and medicine. The plant's cultivation involves harvesting its seeds from the soil, replanting them, thereby imparting the plant its distinctive name. While traditionally used in religious rituals like Homams, Vetiver has now found extensive application in cosmetics, including oils and perfumes, as well as in spa treatments and medicinal products.

“Garlands, scrubbers, car mats, windows screens, and yoga mats are made using vetiver. Maintaining this crop isn’t easy, and it takes 12-18 months to harvest 42,000 to 45,000 plants in one acre of land,” he says.

As Sendhurvelan notes, soil aeration represents just one of its numerous applications that make it a highly sought-after plant worldwide.

When Sendhurvelan first ventured into Vetiver cultivation, he faced a daunting challenge – finding a market to sell his crop. It was the farmers in his village who took matters into their own hands and began to cultivate Vetiver themselves. However, the absence of a clear market connection posed a significant obstacle, leaving them unsure of how to sell their produce. He says “Amidst the uncertainty, a turning point arrived when Mr. C.K. Ashok Kumar, came forward and initiated a partnership with the farmers. This agreement provided a glimmer of hope and paved the way for the steady growth of Vetiver cultivation in the region”.

The month of October 2023 brought an unexpected setback when Vetiver buyers suddenly stalled their purchases. This left Sendhurvelan in a predicament, unsure of where to sell his crops. Later, the local Pharmacies, including those in Virudhunagar, Chennai, and Madurai, expressed their interest in purchasing the plant in substantial quantities. Encouraged by their response, he realised the untapped potential of Vetiver and decided to take it a step further.

However as demand continues to grow, he faced formidable obstacles. “The requirement for Vetiver oil surged, and the existing production capacity struggled to keep the pace. Despite the challenges, some companies managed to secure vast expanses of land dedicated solely to Vetiver cultivation, aiming to meet the ever-increasing demand for its oil,” he says.

While various industries may drive the popularisation of Vetiver, its foundation lies with the farmers and their advocacy. Through their knowledge, experience, and passion for the plant, they can inspire others to explore its untapped potential. By championing the profitability, versatility, and ecological benefits of Vetiver, farmers can play an instrumental role in its widespread adoption,” he adds.

With the exponential growth of Vetiver cultivation, the future looks promising for this once under-appreciated plant. Its medicinal benefits, combined with the increasing demand for its products, present a wealth of opportunities for farmers and entrepreneurs alike.

The journey of Sendhurvelan exemplifies the resilience and resourcefulness that lies within rural communities. His ability to adapt, explore innovative solutions, and overcome market hurdles showcases the indomitable spirit of Indian farmers. With Vetiver cultivation as a catalyst, he

has taken control of their destiny, transforming their lives and cultivating a brighter future for themselves and generations to come.

Through their collective efforts and innovative solutions, Sendhurvelan and his fellow farmers have created a sustainable market for Vetiver, enhancing their livelihoods and cultivating a sense of hope and empowerment within their village. As their journey continues, the ripple effect of their success serves as a testament to the strength and potential of rural communities across the country.

Sendhurvelan's journey with Vetiver cultivation offers a glimpse into the immense economic potential of this remarkable plant. As he seeks profitability and advocates for its popularity, he embodies the spirit of resilience and innovation that lies at the heart of India's farming community.

With its numerous applications and global potential, Vetiver is poised to transform the agricultural landscape on a scale unparalleled in its history. However, its success hinges on the efforts of farmers, researchers, and entrepreneurs committed to exploring its untapped potential.

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Bhavadharani & Iniyath Asmi

19. Vetiver Can Save Humans from Mass Extinction

Shri Patanjali Jha, IRS (Retd.)

June 2023



Shri Patanjali Jha shares with Marie Banu the benefits of Vetiver in farming

Shri Patanjali Jha, IRS (Retd.) has served as Commissioner in Indian Revenue Services in Bhopal, India. He also served as head of the Income Tax department of the Mumbai region. He has pioneered and experimented on the concepts of multi layered and no till farming at a farm called Vanya. Patanjali has worked with the Eco Task Force of the Territorial Army and has donated more than 12.5 million slips of vetiver, a grass that does carbon sequestration and helps fight both soil erosion and depleting groundwater. He has also tied up with the Ramakrishna Mission and Seva Dham, Ujjain, to whom he sends seeds for planting. Besides this, Patanjali goes all over the country delivering talks on his experiences as a food forestry farmer besides time spent at the farm explaining to visitors the benefits first-hand.

In an exclusive interview, Shri Patanjali Jha shares with Marie Banu the benefits of Vetiver in farming.

What was the inspiration for you to venture into natural farming?

About two decades back, I got to read *The One-Straw Revolution: An Introduction to Natural Farming* by Masanobu Fukuoka. This book changed my life! The book is full of philosophy and all about life. The punch line which moved me most is: “The cultivation or the growing is not about produce; it’s about perfecting a human being.” The journey started from there.

I was sure about no-tilling and learnt a lot from contemporary scientists and people involved in agroforestry. Above all, I have reverence for our Mother Nature. Every religion says that Nature is the available form of God, but no religion is doing enough.

We started to grow Vetiver in the centre stage making it an integral part of plantation, which otherwise people normally used to grow as a hedge or to stop soil from erosion. This was an incredible success so much so that my brother bought a piece of land in the interior areas of Madhya Pradesh where the soil was completely compacted and not a blade of grass was growing. However, I was very confident of the power of Vetiver and in three years' time this land has transformed.

Your efforts to promote natural farming practices?

Over the last 20 years I have created and developed Vanya Farms, a food forest spread across 100 acres of land situated in Madhya Pradesh and Bihar, with vetiver, moringa and a range of other trees and plants having commercial and medicinal value. The forest is self-sustained with pollinating bees and grasslands. The Vanya Farms has now become a proof of concept of no-till, no-external input, multi-layer farming and has been a source of inspiration for many to raise and switch to natural farming and raising food forests in place of traditional destructive farming practices that use tilling and pesticides etc. This has led to natural farming practices being followed on 1000 acres of land.

I have worked in close tandem with the Eco Task Force of the Indian Army in its afforestation efforts. Through my efforts to I have made known the effectiveness of the Vetiver System and have gifted over 1 crore Vetiver Slips for the afforestation and landscape stabilization and decontamination efforts of the Eco Task Force in Marathawada, Samba Sector, Banks of River Ganga etc. These efforts have also contributed to the revival of the Ganga river ecosystem.

As a natural farmer, I have been instrumental in creating a team of like-minded individuals from varied professional backgrounds and have proposed a composite solution to the global problems based on field experience and thorough study by synergizing the virtuous cycles associated with food forests and the Government's policy on compressed bio gas (CBG). This team is now acting as an advocacy group for the adoption of this concept and reaching out to the Government, Corporates, Voluntary Organizations and Individuals.

Can you describe the role of Vetiver in carbon sequestraion?

Vetiver does enormous amount of carbon sequestration, ranging from 15 to 50 kg carbon per square metre. Vetiver, when grown surrounding the trees, holds the topsoil and retains the moisture besides helping other plants to grow better. Vetiver also brings the micronutrients from the lower depths to the root zone of these trees.

We experimented and realised that it is the best companion plant that you can ever think of for its obvious advantages of its deep root system and mulching you get by pruning. So, you do not need to create a vermicompost or as it is in situ. Microbes flourish under damp condition, hence mulching and covering every inch of soil is important. This in turn preserves the moisture content of the soil, retains water in the topsoil and recovers groundwater levels, leading to less need of irrigation, and provides advantageous conditions for microbial growth. In our farms, almost every inch of soil is covered by live mulch. The thick cover of Vetiver mulch increases water infiltration and reduces evaporation, particularly important under the hot, dry conditions. It also protects the soil surface from the impact of raindrops, a major cause of soil erosion. The mulch on the ground makes the sunlight that does reach through the trees on the ground lose its harshness that could destroy the living organisms feeding on the mulch from trees.

The soil requires nitrogen, so we started planting Subabool, Tur and later with Agastya, tubers like sweet potato, black mustards to make the soil better.

Fukuoka says to prune the crops and grasses and add slurry of chicken poop so that the bacteria and fungi start working on it. The rain takes the decomposed matter deep inside this soil for micro-organisms and earthworms. Nobody has defined it better than him.

Vetiver grows 8 feet to 10 feet; 6 feet remains inside the soil. It not only prevents the topsoil erosion but also enriches the soil quality.

If you till a soil, the erosion of soil lost to the wind and heavy rains is nothing less than ten tonnes of soil every year per acre. On a slope, it is much more.

Since we practice no till farming, there are no carbon emissions and no nitrous oxide emissions and no methane emissions. Agriculture in its current form of industrial/ commercial farming is contributing around 30–40 per cent of the greenhouse gas (GHG) emissions. The fault is not of the farmers but instead of how they are taught to do farming in the conventional manner with tilling. These GHG emissions if released remains in the atmosphere for anywhere between 50 to 110 years.

On the contrary, if you don't till the soil you don't release these gases into the atmosphere.

Tell us some examples of how Vetiver has positively impacted farming practices.

Citarum is the filthiest river in Indonesia, like as bad as Yamuna river in Delhi. One NGO along with help of the army started planting vetiver on both sides of the river covering a stretch of 30 kilometers. This is the biggest measure to purify the water and make it drinkable because vetiver can sustain while being submerged in water.

We work closely with the Raah Foundation in Nasik. When I was posted as Principle Chief Commissioner in Mumbai, one of the Foundation members approached me after learning about my passion for natural farming and no till farming. She went back and tried multi-layer no-till farming on ten acres of land. She mentioned that her land had a big well which would run dry during summer months, but after she planted vetiver around the well it has nine feet of water throughout the year, till date. This is the effect of Vetiver!

Mr. Richard Grimshaw and others from the World Bank took Vetiver to the rest of the world and China has used it extensively in its infrastructure projects of railroads or in urban dumping sites. But, it is only in India that we use Vetiver for farming.

For the right reasons I can state that Vetiver can save humans from mass extinction. We gifted Vetiver to a friend who works in Bokaro Steel City, Jharkhand. He planted them in the steel city. In the first year, the difference in temperature where the vetiver was growing was less by 9 degrees celsius. We are now exploring various usages of the shavings of Vetiver and it would be a great breakthrough if we succeed.

What are the other benefits of Vetiver?

Vetiver water calms the nerves, aids better sleep and turns your body alkaline. The RO water is dangerous because there is loss of minerals. By adding Vetiver in the water kept in an earthen pot, the pH of the water would be perfect for the human body. This would save us from many health issues including cancer.

We were growing a lot of Moringa at that point of time. There is a Japanese study that states Moringa to be the highest carbon sequester on earth. When compared with the carbon sequestration that other 50 tree species would do in 20 years, two Moringa trees will do that in two years. It is this stark!

ISRO's satellite indicate that we are losing the soil at very fast pace and desertification is happening. That can be stopped in its track if we align Vetiver as it multiplies 10 to 40 times every year on its own. It also helps in recharge of ground water.

Vetiver can be said to have the potential of being the 'Saviour of Mother Earth'. Vetiver along with no till, no poison, permanent multilayer multi-species food forest can be beneficial in increasing biodiversity, reducing temperatures and global warming, carbon sequestering, controlling cancer incidence, water harvesting, rejuvenation of rivers and underground water recharge, and increasing farm incomes.

20. Vetiver Revival Project

October 2023



150 student volunteers, along with around 30 others, planted about 5,000 Tillers at a rate of 2 Tillers per pit.

The first phase of our project took place on October 8, 2023, where we successfully planted approximately 5,000 Vetiver Tillers. We were honored to have the following distinguished guests: Chief Guest: Shri Vikram Kapoor, IAS - Additional Secretary, Planning, TN Government. Guests of Honor: Shri Subramaniam, IAS - Commissioner, Agriculture, TN, Shri Lakshmiopathy, IAS - Sub Collector, Chingleput District, TN

The event was organized by Ms. Santha Sheela Nair, who played a pivotal role in its success. In addition to our esteemed guests, we were joined by: Dr. CK Ashok Kumar - Founder of First World Community (FWC)

Mr. John Alex - Director, Equitas Bank, and Trustee of Exnora, Mr. P. N. Subramanian - Vice President of India Vetiver Network and President of the Tamizh Organic Farmers Association (THOFA) and Mr. Ganesan - Vice President of THOFA

Ms. Santha Sheela Nair, IAS Retd facilitated the event and extended invitations to Senior Serving IAS Officers for the inaugural function. Ms. Tara Sudhakar, President of Padur Panchayat, was also present.

I shared the history of Vetiver, its origins in India, and the significance of reestablishing India as a global leader in Vetiver. This event was further enriched by the presence of a group of Organic Farmers from across the state who presented their issues and suggestions.

Manava Seva Dharma Samvardhini contributed 10,000 Vetiver Tillers to the project. Dr Anbu coordinated support from Akshaya Kalpa who provided complimentary buttermilk packets, bananas, and sandwiches for all attendees. Watsan Envirotech provided three natural water filters, free electricity, and drinking water supply to all attendees.

Dr. Sangeet from Padur Panchayat organised volunteers from Hindustan Arts College, Padur who selected a section of the lake and cleared it with the help of workers. Pits were dug for planting, and the Tillers were segregated and placed in open containers for easy access.

On the day before the inauguration, I briefed the volunteers about Vetiver, its history, applications, and planting procedures. Approximately 150 student volunteers, along with around 30 others, planted about 5,000 Tillers at a rate of 2 Tillers per pit. The inauguration was a collective effort, with all the dignitaries participating by planting a few Tillers each.

Mr. Lakshmipathy, IAS, Subcollector of Chingleput District, shared his positive experiences using Vetiver in his previous assignments in the rural development sector. He offered encouragement, and contact information was exchanged for future collaboration.

Ms. Santha Sheela Nair connected the team with Shri Vijay Kumar, IAS, Chairman of the River Restoration Authority, Chennai, who was equally encouraging and introduced us to his team. They had already planted Vetiver in the Adyar River and expressed interest in our project.

For the second phase, we cleaned up and dug pits on October 15, enlisting the help of volunteers from TREES Trust to plant the remaining 5,000 Tillers. We were also fortunate to have 10 Black Cat Commandos from the National Security Guard join us, allowing access to challenging planting locations in one part of the lake.

During this process, we observed that some of the previously planted Vetiver had grown well, while others were damaged by human activity and cattle. Given the open nature of the lake's surroundings, this challenge was difficult to prevent due to frequent visits by fishermen.

We express our gratitude to Ms. Santha Sheela Nair, IAS Retd, for her invaluable support in facilitating the event and extending invitations to Senior Serving IAS Officers to inaugurate and address the event. We were also honored to have Ms. Tara Sudhakar, President of Padur Panchayat, join us for this occasion. This event was further enriched by the presence of a group of Organic Farmers from across the state who presented their issues and suggestions.

We remain committed to our mission and hope to continue our efforts in rejuvenating lakes and the environment.

- **P.N. Subramanian**

21. Vetiver, For Me, Is Not Just a Cash Crop; It's The Main Root of Health and Happiness

Mr. C. Pandian

December 2023



Mr. C. Pandian shares with Marie Banu his experiences in the realm of Vetiver farming in India

Pandian, initiated his journey into Vetiver farming by collecting wild varieties of this versatile grass in the Sivagangai District of Tamil Nadu. Over time, he transitioned to cultivating new varieties, particularly those developed by the CSIR-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP), a prominent Indian research organization. Notably, Pandian has played a pivotal role in the dissemination of Vetiver saplings for both commercial cultivation and public awareness.

His contributions are substantial, with the supply of 1.5 crores of saplings facilitating widespread commercial cultivation. Furthermore, he has distributed over 60 lakh saplings as part of public awareness initiatives, emphasizing the importance of Vetiver in sustainable farming practices.

In addition to his cultivation efforts, Vetiver Pandian has diversified his portfolio, now producing over 100 types of value-added Vetiver products. This extensive range includes handicrafts, cosmetics, and medicinal items, showcasing the versatility and commercial potential of this wonder grass.

In an exclusive interview, Pandian shares with Marie Banu, his experiences in the realm of Vetiver farming in India.

Can you share your experiences in venturing into Vetiver cultivation?

Certainly. I hail from Sivaganga district of Tamil Nadu, where I own a 10-acre land. The decision to explore Vetiver cultivation was not merely a financial endeavor but a transformative chapter in my life, one that would redefine my understanding of agriculture and its potential.

Due to financial constraints, I worked for a brief while in Singapore as a cashier in a mall. When I returned to India and worked in Coimbatore, an article emphasising the role of agriculture in India's prosperity caught my attention, sparking a curiosity that would change the course of my life. In 2007, I stumbled upon Vetiver and its myriad uses, realising the untapped potential this grass held.

About your entrepreneurial venture?

The turning point in my journey came when I decided to set up a stall at the Agriculture Expo in Coimbatore. Distributing small packets of Vetiver and informative leaflets, we witnessed an overwhelming response. In just four days, we sold out all the packets and started disseminating leaflets on the benefits of Vetiver. This marked the humble beginning of my entrepreneurial venture.

How did you integrate traditional wisdom and innovative applications into Vetiver cultivation, and what unique products did you develop?

Recognizing the need for authenticity, I documented the medicinal properties of Vetiver from a laboratory and delved into Siddha books for additional insights. Names like "Vasiya Moligai" and "Nidhi Nayakan" from Siddha books found their way into our products, adding a layer of tradition to our offerings. Beyond traditional uses, we explored innovative applications, creating products like curtains and essential oils.

What challenges did you face in marketing Vetiver products, and how did you navigate them?

Unlike conventional marketing strategies, we chose not to give our products on credit, and we refrained from enrolling external marketers to minimise expenses. Instead, we focused on crafting products that catered to diverse health needs. This decision, while challenging, allowed us to maintain quality and profitability.

How do you perceive the multifaceted benefits of Vetiver?

Vetiver, for me, is not just a cash crop; it's the main root of health and happiness. With its diverse applications, from eye care to skin health, Vetiver addresses various health needs. Moreover, its use in preventing soil erosion, its moisture retention property, and its potential for groundwater replenishment make it an environmentally sound choice for sustainable farming practices.

Vetiver symbolises transformative change in agricultural practices. Vetiver's potential extends beyond profit margins to encompass environmental stewardship, community prosperity, and a redefined narrative for sustainable agriculture. It stands not just as a cash crop but as a symbol of harmonious blending—tradition and innovation, profitability, and sustainability.

How did your journey evolve into establishing Cm. Eco – Herbal Plantations?

In 2006, I took a significant step by establishing Cm. Eco – Herbal Plantations in Tirupattur, Sivaganga district. This venture involved contractual production of Vetiver in 60 acres and the promotion of Vetiver in my own 10-acre plot. Beyond cultivation, we ventured into value addition, developing various products from Vetiver. These products are actively marketed through online platforms and direct sales.

What initiatives have you undertaken to raise awareness about Vetiver cultivation?

My commitment to community development extends beyond my farm. I supplied nearly 60 lakh Vetiver slips for public awareness campaigns focused on soil and water conservation. Additionally, I distributed 1.5 crores of planting material of Vetiver varieties to fellow farmers, encouraging them to take up cultivation. These initiatives foster a sense of collective responsibility towards sustainable agricultural practices.

The essential oil distillation unit was a pivotal addition, allowing us to extract and market high-value essential oils derived from Vetiver. This innovation added sophistication to Vetiver products, creating new avenues for revenue.

Please tell us about your plans for furthering Vetiver in the coming years?

Looking ahead, I envision promoting Vetiver Farmer Producer Organizations (FPOs), connecting the fragrance market with FPOs, and obtaining Geographical Indication (GI) tagging for Cuddalore Vetiver. These initiatives, with the support of The India Vetiver Network, aim to propel Vetiver cultivation into a mainstream and sustainable agricultural practice.

Vetiver's potential extends beyond profit margins to encompass environmental stewardship, community prosperity, and a redefined narrative for sustainable agriculture. It stands not just as a cash crop but as a symbol of harmonious blending—tradition and innovation, profitability, and sustainability.

What overarching lessons can be drawn from your personal journey and the broader implications of Vetiver cultivation?

My journey is a testament to the transformative power of innovative thinking in agriculture. From financial constraints to international recognition, it underscores the potential of harnessing nature's bounty for the greater good. Vetiver's impact extends beyond profit margins to encompass environmental stewardship, community prosperity, and a redefined narrative for sustainable agriculture. It is a symbol of transformative change, illustrating how a humble grass can redefine the narrative of agriculture, becoming a source of innovation, entrepreneurship, and holistic community well-being.

22. Vetiver's Role in Promoting Soil Health Make It a Valuable Tool for Addressing Environmental Issues

Prof. Sara Parwin Banu Kamaludeen

October 2023



Sara Parwin Banu shares with Marie Banu her passion for research and her notable projects

Prof. Sara Parwin Banu Kamaludeen is an Environmental Microbiologist and Microbial ecologist involved in the remediation of soil and water bodies. She is involved in teaching, research, and farm advisory service services for the past 25 years at Tamil Nadu Agricultural University. She has expertise in remediation of toxic Cr(VI) utilizing the biotransformation potential of diverse aerobic and anaerobic microbial communities.

Sara has explored the microbial diversity in chrome contaminated zones and confirmed that microbial manganese oxides trigger reoxidation of Cr in remediated sites, a major challenge. Her main focus of research is Bio/ Phyto and Rhizoremediation of heavy metals and pharmaceuticals from municipal sewage and tannery wastewaters.

Currently, she is working on rhizofiltration in vetiver, exudation patterns, metabolites characterisation and role of biochars in wastewater treatment.

In an exclusive interview, Sara Parvin Banu shares with Marie Banu her passion for research and her notable projects

What is your educational and professional background? How has your academic journey and career evolved over the years?

I hail from Salem, which is also my native place. My educational journey began here with my schooling. Following that, I pursued a bachelor's degree in agriculture. I continued my academic pursuits by completing a master's degree in Environmental Sciences at Tamilnadu Agricultural University. Subsequently, I was awarded a John Allwright fellowship from the Australian Council for International Agriculture Research (ACIAR). This fellowship paved the way for my four-year Ph.D. program at the University of Adelaide, which was closely tied to the CSIRO (Commonwealth Scientific and Industrial Research Organisation). This extensive project, initiated in 1996, spanned a decade and focused on remediating contaminated soils in the Vellore region, with funding and support from Australia.

In 1995, I took up a role as an assistant professor at the university. Following the completion of my Ph.D., I remained dedicated to teaching for over two decades, amassing more than 20 to 25 years of experience in the field. Teaching has always been a great passion of mine, and I thoroughly enjoy being a teacher and lecturer.

In addition to my teaching responsibilities, I've been actively involved in research, primarily focusing on soil and water remediation. My research endeavors have contributed to addressing the challenges of contamination in these areas.

Could you describe the pivotal moments and influences that led you to pursue a career in environmental microbiology and soil and water remediation?

To begin with, there were two significant triggers in my journey. First, during my master's studies, I was relatively new to the world of research. I had a deep passion for insects and wanted to explore this further. This interest led me to the field of environmental studies. It was my professor, Dr K Ramasamy who noticed my enthusiasm and suggested that we delve into the gut microbiology of insects. We specifically examined the gut of the mango stem borer, a wood-boring insect. What fascinated me was the discovery of anaerobic microorganisms within the insect's gut that had the remarkable ability to break down cellulose. We decided to inject these microorganisms into biogas digesters, and this experiment resulted in a significant increase in biogas production. This marked my first realisation of the potential of microorganisms in environmental applications.

The second trigger came while working with Sakthi Sugars. The sugar industry faced the challenge of achieving zero discharge, and we had to find innovative solutions. We developed microbial cultures capable of decomposing the Bagasse and effluent from the sugar industry into biomanure that was in turn used by sugarcane farmers as fertiliser.

Another significant turning point was when I worked on a massive Australian project focused on the remediation of chromium-contaminated wells in Vellore. Even after two decades, we discovered that chromium contamination still persisted, despite extensive efforts such as afforestation programs in both India and Australia. This experience heightened my focus on the importance of soil and water resources, given their contamination, and prompted my concentrated efforts in this field.

What are the main areas you are currently focusing on in your research?

In recent years, I've shifted my attention to water remediation, particularly wastewater treatment, and explored the use of biochar from biomass to trap pollutants. Additionally, I've spent the last five years dedicated to studying the vetiver crop, which led me to collaborate with Mr. P.N. Subramaniam and the India Vetiver Network group.

Currently, I'm primarily concentrating on two areas of research; biochar and Vetiver. We have characterised and used biochars from agricultural residues for metal removal. I'm actively engaged in the remediation of water using vetiver. Over the past five to six years, my research has been focused on exploring how vetiver plant roots can effectively remove metals from water. Vetiver's roots have shown impressive metal-trapping capabilities in our studies. For instance, it can remove up to 80% of chromium, 60% of zinc, and around 70% of nickel from contaminated effluents. It also detoxifies carcinogenic Cr (VI).

When wastewater flows through vetiver plants, the plant's roots and associated microorganisms act to purify the water. This plant has a unique ability to oxygenate the soil due to its fine roots, which makes it effective in treating water with pathogens and organic compounds. We've also studied how the root exudation changes when the plant is exposed to different contaminants, and we're keen on examining the microbiome associated with vetiver. The ultimate goal is to understand why vetiver is so effective and find practical applications for this knowledge.

Our applications include the purification of water from a variety of contaminants, particularly heavy metals and organic compounds. Vetiver's ability to strip metals from water, its adaptability to different types of contamination, and its role in promoting soil health make it a valuable tool for addressing environmental issues. We aim to standardize the use of vetiver for water purification and work on improving monitoring systems to evaluate its efficiency in real-time applications.

Could you tell me more about your work in promoting non-food crops in areas affected by contamination, and what impact this has had?

Certainly. In regions affected by contamination, we've recommended the cultivation of non-food crops to mitigate the risks of metal and salt contamination in food crops. This guidance is based on research conducted in areas like Vaniambadi, Walajapet in Vellore, where we evaluated the suitability of various plants. Some of our recommendations have included Crossandra, which performs well in chromium-contaminated soils, and jasmine and mullai flowers, which have been effective in coping with metal contamination, including chromium. These non-food crops have the potential to absorb contaminants from the soil and, help to arrest the metals entering into food chain. Our efforts have also involved afforestation in contaminated areas to restore soil quality and promote ecosystem health.

What are some of the notable projects and achievements in your department related to soil and water remediation?

Over the last two to three decades, our department has undertaken several projects related to soil and water remediation with industrial partners. Remediation techniques were developed for tannery affected soils of Vellore region. One of the department project report on Loss of ecology has helped farmers to claim compensation in vellore region and helped to setup CETP. Baseline databases on tannery, textiles and dyeing effluents were documented to the state government. One noteworthy accomplishment is the development of microbial consortia, "TNAU Biomineraliser" that quickens the composting process to 35 days. We've successfully promoted these cultures among farmers to enhance composting efficiently.

Additionally, we've been involved in the installation of Vetiver Floating Wetlands in Coimbatore lakes and studying its applications. Our team has also been focusing on using floating wetlands as tertiary treatment for dairy effluent that showed promising results. Studying the vetiver root microbiomes of is an exciting avenue for future research. Moreover, we've explored the use of biochar, particularly in small-scale biochar filters for treating dyeing factory effluents. offering a cost-effective solution for removing contaminants and color from water. These achievements demonstrate our commitment to addressing environmental challenges, improving soil and water quality, and promoting sustainable solutions for the community.

23. Vetiver—The Divine Grass

June 2023



A Miracle Grass with origins in Tamilnadu and hence its name, also called Khus-Khus, *Chrysopogon zizanioides* is Nature's gift to the World with multiple end uses and benefits. It is now used by about 100 Countries in the world for its properties.

I attended the Seventh International Conference (ICV-7) in Chiang Mai, Thailand during 29th May to 1st June 2023 along with nine delegates. The event was extremely well organised with participation from more than 25 countries including India, Bangladesh, Thailand, Indonesia, Vietnam, China, Taiwan, Bangladesh, Malaysia, South Africa, Netherlands, UK, USA, etc.

There was an exhibition displaying various products from Vetiver and multivarious applications in Commercial scale besides Pilots, conducted by Thailand Government Her Royal Highness Princess of Thailand, Maha Chakri Sirindhom graciously presided over the Event and bestowed King of Thailand Vetiver Awards to Winners. We were excited to gift Her Royal Highness a Vetiver Saree produced in Anakaputhur, Chennai.

Agriculture World magazine belonging to Krishi Jagran published by Mr. M.C. Dominic, Founder and Chief Editor, carried a full June issue Dedicated to Vetiver and Mr. Dominic and family were part of the Delegation from India too.

World Bank Agriculturists Mr. Richard Grimshaw and Mr. John Greenfield promoted Vetiver Globally when the Duo was part of the Team in India. Historical texts reveal the King Raja Raja Chozha used Vetiver for its erosion resistant properties.

Though there is research going on for its uses and impact, Indian Government should become the forerunner and invest in R&D, Develop Policy framework to introduce VG (Vetiver Grass) in various areas. We are taking initiatives to Approach the concerned Govt Departments to bring policy initiatives.

Dr. C. K. Ashok Kumar, President of Indian Vetiver Association is guiding a Core Team to take Vetiver to Greater Heights in India and Globally. Mr. Richard Grimshaw, even at this ripe age, is contributing extensively in the Indian Vetiver Group and advising us various aspects

Use of Vetiver and its benefits

- Hedgegrows for Soil and Moisture Conservation
- Bio fuels (Bio mass , briquettes for cooking and ethanol)
- Thatch for roofing
- Handicrafts for home and markets
- Soil enrichment for Regenerative natural farming
- Livestock feed
- Mulching

Roots Below the Ground

- Essential Oil for perfumery, Aromatherapy
- Production of Crafts
- Soil stabilization
- Erosion control
- Ground water recharge
- Phytoremediation for waste water
- Removes Nitrates, phosphates, heavy metals and other contaminants
- Tolerant to Solids with high and low Ph, salinity and heavy metals
- Drought and fire resistant
- Carbon sequestering
- Mix vetiver with drinking water in earthen pots
- Vetiver curtains as eco-friendly alternative to A/Cs

Future Plans

- Identify volunteers who can allocate minimum of 1 Acre of Land to experiment and analyse multiple uses of VG
- Delve into Carbon Sequestration capability of VG and develop a Carbon Credit Model
- Lobby with Govt to plan and implement Policies including providing incentives, subsidies. etc to grow VG in many areas
- Develop nurseries in different parts of the country to cultivate different varieties and recommend them for various applications
- Declare a year for Vetiver, the Divine Grass like 2023 being a Millet Year
- Become a Global Leader in VG and support various countries using our Miracle Grass

P.N. Subramanian

Managing Trustee, MSDS,

President Thofa and a Passionate Regenerative Natural Farmer