

Agriculture & Industry Survey

India's Leading Business Magazine for Agriculture

Dr. Sudha Narayanan, Associate Professor, Indira Gandhi Institute of Development Research, Mumbai
"The three farm bills do not give anything great to celebrate. They were indeed necessary but could have been more effectively done in a different way."

Kailas Ramasamy, Managing Partner, Vrindavan Dairy
After 20 years of toil in the software industry, Mr Kailas Ramasamy decides to return to his roots – not just in shift of place but in profession as well.

Anil Patil, Managing Director, Shresta Seeds
"At Shresta Seeds, we breed, process and sell vegetable seeds. We also provide consultancy through agriprojectconsultants.in. We hand hold and support all horticulture projects as well as open farming."

Mani H K, Co Founder, Greenopia
Offers to bring a little bit of green into our inner spaces through Greenopia. If that is not wow enough, they bring in solutions that need little or no maintenance!



C.M.Suvarna Kumar, General Manager, Marketing, Karnataka Soaps and Detergents
Today leads in terms of sandalwood oil and soap production but sourcing sandalwood is not quite as simple as it used to be.



Robert de Bos, Director/Consultant, Bangalore Plants First Pvt Ltd.
Offers consultancy. A company popular among people in horticulture and floriculture business around the globe.



Kailas Ramasamy



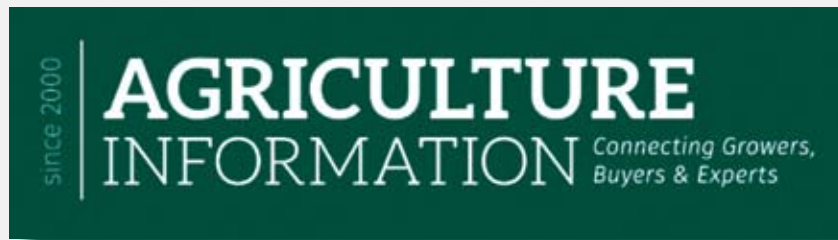
Anil Patil



Mani H K



Dr. Sudha Narayanan



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Farmers' agitation must end!

Better it ends right now!

There is as of now, as we witness massive trust deficit between the farmers and the government and this trust deficit must somehow be brought to an end. How is the unresolved question.

Farmers' agitation and the way the deadlock is going to be resolved.

The role of the media in creating mutual understanding and trust critical.

Why the farmers' agitation has taken the turns and twists it has done and thus vitiated the political environment so badly. It is really sad to see that a good package of farm reforms is thoroughly mis-turned into a total negative step.

Agriculture specially must be a great national priority and it is even now.

The agitations must have been foreseen when the bills were rushed through many sections of opinion felt so when the rush through Parliament took place.

However, the way the agitation was pushed forward is really unfortunate.

Now, what matters is the resolution of the overblown issues.

Many of the provisions in the three contentious laws are really good and conceived in good spirit. Some compromise and give and take is in place. And let us hope that instead of further hardening of postures on both the sides, much goodwill is brought to bear on the issues.

The media, both print and the news channels played a very restrained role and in fact we needed much more open expression of opinions from all sides and we are sorry to note that many those who participated in the TV debates almost people accustomed to participate in such debated and most of them seemed to have been based in Delhi and most of them if we can say, are professional speakers and commentators.

In a field like agriculture we need to reach out to people in the States and also those engaged in farming activities and local bodies, like Zilla Parishads and gram panchayats. We are really disappointed that senior leaders and authorities like former Prime Ministers, and even State Chief Ministers (like Deve Gowda, Kumarasamy and why even those from other regional parties and well-known farmers leaders were not interviewed and a diverse sections of people who are better placed to give the government and the public a better and balanced views on such matters like MSP and contract farming etc. Leaders like Sharad Pawar and Deve Gowda as Chief Ministers of Maharashtra and Karnataka have proposed many farm reforms like land ceiling laws and tenancy farming had long ago had spoken about such issues now covered by the three farm legislations.

Surely, the media comments on the ongoing controversial debated is in our opinion is an old hat, to put it bluntly and the farm issues now covered is still only a starting point. Much more in-depth debates are required to turn the farm sector into a reasonably profitable track.

Even in the current agitation we heard from many sections of the participating. Farmers, both men and even women agitators talking of the future of farmers in bleak terms.

Surely, farming for the marginal and small holder farming it is not a field for future for their heirs and we have to do many more things than what we have envisaged so far. There are other sociological issues that cover lives in the Indian hinterlands. So, let not the current urban-focused TV news content deceive us to think we know all the current realities.

We need more genuine spread of panchayat raj and much more modernisation, in terms of communications and why even in education and employment prospects and the very entrenched bureaucracy at the district and panchayat levels.

There are issues after issues in the Indian villages.

Let us all, both the government, the already enriched and entrenched political class learn to be humble and even make a partial withdrawal from the self-sure hardening attitude.

Let our brave farmers also learn some humility in taking the issues beyond the breaking points.

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Protests in a democracy okay!

But peaceful protests can't be prolonged or unlimited!

The current farmers protests in Delhi has created a new phenomenon from starting as a peaceful protest by farmers from Punjab and Haryana, mostly Jat-Sikh farmers who, as everyone in the rest of the country knows, are relatively well-off comparatively and well organised as a professional group, they have done well in pressurising the centre.

As we write this on the 14th day of the farmers agitation in which lakhs of farmers mainly from Punjab and Haryana and the nearby areas including western UP who have gathered in massive protests and creating a great deal of misery for the farmers themselves and also for the rest of the country there are concerns about the turn the agitation might take in the next few days.

Also the agitation by India's, perhaps the most powerful, by land holdings as well as the earning power, no less their political clout all add up to a new political dynamics, gives Indian politics its own dynamism in the world outside as well inside India.

Why this sudden upsurge in Indian politics when India is also caught up with its own inherent strengths and if any, its own vulnerabilities?

The time of the farmers' agitation seems to be a bit unfortunate. There is a widespread feeling, rather very extensively, both inside as well as outside India at the way Indian democracy's many very strong features are suddenly forgotten it seems, by our other friends and also the perceived unfriendly countries. Of course, Chinese is the one country and people who have suddenly gone off track and have sought to speed up its unfriendly moves by amassing thousands of new troops on the Line of Actual Control (LAC) and thus destabilising India's borders and the neighbourhood countries. areas and also entering into a new memorandum of understanding with the Pakistani army and other

unfriendly acts. And this is a subject on which much has been said and here there is no new comment to make.

Now, coming to the current issues that agitate the countrymen, we have to see that in our practice of democratic values we seem to be not so very sensitive. The recent happenings apart, the very passing of the three farm laws that are now holding up a fruitful outcome of the farmers-government dialogues, in a significant manners owing to the way we had enacted the very same laws.

tions are limited to few instances only. There is an air of tension and discomfort in the country. A Parliamentary democracy is like a mother ship, it must accommodate very many diverse opinions.

Indian agriculture sector has drawn disproportionately high irrational, politically driven cynical disbursement of high subsidies.

As per a latest RBI report India has disbursed (or written off) nearly Rs.2.12 trillion as farm loans since 2008 in 11



Why hurry in passing the laws by voice vote, not by due process of a parliamentary debate?

Also there are many other instances, in the recent past when we see many other important laws are also rushed through, why even the Question Hours an important feature of a Parliamentary democracy was done away with, debates are not conducted as they should and also some important and even controversial laws might have been referred to Parliamentary Panels so that many controversies might have been settled at the Panels stage?

There are a long list of issues that need to be referred to here but our observa-

years. This was done of course by the UPA regimes and one stark lesson is that this type of farm loan waivers should do any more in the future. So the current three farm laws were enacted in good faith we admit. But then negotiations' few amendments of the current laws are in ordering farmers must also see reason and withdraw the agitations in some good faith.

Democratic government is a government in dialogue with the citizen groups.

We appeal to all sections let us sit together, debate and engage in very broader consensus. Conflict resolution is the very essence of a democratic government.

Rolling back farm reforms would privilege a small but vociferous group over the silent majority

The current protests by Punjab's farmers hold many lessons. One of them is that politics is a short game, a T20 cricket match, while economics is a long term, five-day Test match. Punjab's farmers are playing the former while the government is playing the latter, which makes it frustrating for the two sides and for spectators in the stands.

Because of this mismatch, a second lesson is that it's difficult to reform in a democracy. A populist who promises rice at Re 1 per kg will usually defeat the reformer at the polls. Hence, successful reformers spend more time selling reforms than doing them. India's reformers have failed in this regard, which is why 29 years after 1991, India still reforms by stealth and Indians cannot distinguish between being pro-market and pro-business. They continue to believe that reforms make the rich richer and poor poorer, despite so much evidence to the contrary.

Prime Minister Narendra Modi, one of the world's great communicators, forgot this lesson and didn't win the nation's support for the three farm bills before enacting them in June. His government resorted to stealth, pushed the farm bills through Parliament without talking to the opposition, states, or farmer organisations. This led to false rumours that the price subsidy (MSP) and government procurement would go away soon and corporate farming would replace peasant farming. He can still repair this damage.

A third lesson is that a small, organised, and well-funded group in a democracy can hijack the nation's interest when the majority is silent and unorganised. Behind the protests are arthiyas, buying agents in APMC mandis, who stand to lose Rs 1500 crore a year in commissions, plus rich farmers of Punjab, who are part of the 6% of India's farmers who benefit from the MSP regime, according to the 70th round of the NSS. Both are powerful. The arthiyas finance elections, are often politicians and leaders of farm unions.

The three farm laws offer three basic freedoms to the farmer. One, he can now sell anywhere to anyone, freeing him from having to sell to a monopoly cartel at the APMC mandi. Second is the freedom to store inventory which was constrained so far by stocking limits in the Essential Commodities Act. This gives incentive for cold storages to come up, to whom farmers can now sell directly. Third, it gives



farmers freedom to make forward contracts, transferring their risk to businessmen, leading hopefully to a freedom to lease unviable lands for a job and a share in profits.

The Agricultural Produce Marketing Committee (APMC) is an obsolete institution from an age of scarcity, meant to protect the farmer but becoming his oppressor, a monopoly cartel fixing low prices for the farmers' produce, forcing distress sales. The reforms have broken this monopoly and since June, out-of-mandi farmer sales have grown sharply while mandi transactions have plunged 40%. This reform needs to be followed up with a stable policy on exports, unlike the present 'start-stop' policy, under which onion exports were recently banned. This is why farmers hanker after MSP.

It's good news that farmer unions and government have finally begun to talk. The main demand of Punjab's farmers and activists supporting them, is to make the minimum support price a legal right. This is a bad idea because it makes Punjab's farmers produce what people don't want and discourages them from growing what people do want. It results in overproducing wheat and rice and underproducing protein rich daal.

Every year, the nation groans under a mountain of excess grain, some of which is eaten by rats. Because of MSP, the Punjab farmer grows water guzzling rice, harms his soil, lowers his water table and kills thousands of people through air pollution from burning stubble. The Punjab farmer is not to blame. He behaves rationally – growing what he's incentivised to.

By giving farmers freedom from irrational controls, the reforms seek to raise farmers' incomes through higher productivity. Indian farm yields are only half or a third of our competitors. China, with half the arable land of India, produces double the crop. The problem is that 80% of Indian farmers own less than two hectares. These can become more productive by use of scientific methods and by growing high value crops. But it requires infusion of capital and technology.

The farmer, however, doesn't have the money to pay for it. Nor does the government. Hence, the next reform should give farmers freedom to lease their lands to agri-professionals

with capital and technology, and become in turn shareholders and workers on the same land, setting the stage for the second green revolution. The downside to this scenario is a fear of big business taking over agriculture.

Read full article @ <https://bit.ly/3m94typ>

Source : economictimes.indiatimes.com

This new soil can water plants all by itself!

A new type of soil can pull water from the air and distribute it to plants, researchers report. The self-watering soil could potentially expand the map of farmable land around the globe to previously inhospitable places and reduce water use in agriculture at a time of growing droughts.

As reported in ACS Materials Letters, the team's atmospheric water irrigation system uses super-moisture-absorbent gels to capture water from the air. When the soil is heated to a certain temperature, the gels release the water, making it available to plants. When the soil distributes water, some of it goes back into the air, increasing humidity and making it easier to continue the harvesting cycle.

"Enabling free-standing agriculture in areas where it's hard to build up irrigation and power systems is crucial to liberating crop farming from the complex water supply chain as resources become increasingly scarce," says Guihua Yu, associate professor of materials science in the Walker department of mechanical engineering at the University of Texas at Austin.

Each gram of soil can extract approximately 3-4 grams of water. Depending on the crops, approximately 0.1 to 1 kilogram (0.22 to 2.2 lbs.) of the soil can provide enough water to irrigate about a square meter (10.76 square feet) of farmland.

The gels in the soil pull water out of the air during cooler, more humid periods at night. Solar heat during the day activates the water-containing gels to release their contents into soil.

The team ran experiments on the roof of the Cockrell School's

- A team of researchers have developed a new type of soil that can pull water from the air.
- It works by using super-moisture-absorbent gels to capture the water from the air, which it distributes to the plants.
- The self-watering soil could potentially expand the map of farmable land around the globe, helping to tackle food insecurity.

Engineering Teaching Center building at UT Austin to test the self-watering soil. They found that the hydrogel soil was able to retain water better than sandy soils found in dry areas, and it needed far less water to grow plants.

During a four-week experiment, the team found that its soil retained approximately 40% of the water quantity it started with. In contrast, the sandy soil had only 20% of its water left after just one week.

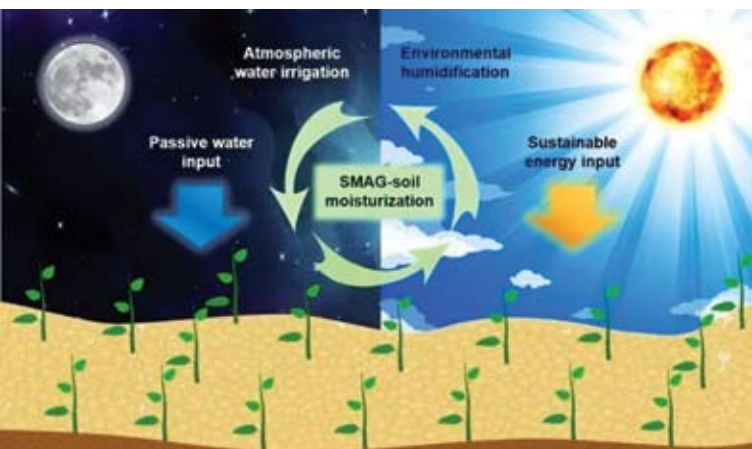
In another experiment, the team planted radishes in both types of soil. The radishes in the hydrogel soil all survived a 14-day period without any irrigation beyond an initial round to make sure the plants took hold. Radishes in the sandy soil were irrigated several times during the first four days of the experiment. None of the radishes in the sandy soil survived more than two days after the initial irrigation period.

"Most soil is good enough to support the growth of plants," says Fei Zhao, a postdoctoral researcher in Yu's research group who led the study with Xingyi Zhou and Panpan Zhang. "It's the water that is the main limitation, so that is why we wanted to develop a soil that can harvest water from the ambient air."

The water-harvesting soil is the first big application of technology that Yu's group has been working on for more than two years. Last year, the team developed the capability to use gel-polymer hybrid materials that work like "super sponges," extracting large amounts of water from the ambient air, cleaning it, and quickly releasing it using solar energy.

The researchers envision several other applications of the technology. It could potentially be used for cooling solar panels and data centers. It could also expand access to drinking water, either through individual systems for households or larger systems for big groups such as workers or soldiers.

Source : www.weforum.org



The world is facing an unprecedented hunger crisis. Here's why!

- **Hunger is a growing crisis in the US and around the world with a disproportionate amount of people of colour relying on food banks;**
- **COVID-19 could double the number of people experiencing food insecurity globally;**
- **Food banks are struggling to meet the demand as the pandemic worsens. Mutual aid organizations and hyper-local community-based networks in the community need our support.**

Since the first wave of COVID-19, food banks have been overwhelmed. Consumer Report's new publication suggests things are getting dire: one in five Americans has now turned to a food pantry, food bank or community food distribution at some point since the pandemic began – a 50% increase. Almost 10% of parents with children under five years of age reported high rates of very high food insecurity. This is a public health concern.

Globally, food costs have risen for four straight months as countries begin to stockpile. Individuals too are hoarding staples as they stay indoors, clearing shelves at local grocery stores. Despite stable global food prices, numerous countries have experienced a varying level of inflation at the consumer level. These rising food prices have a more significant impact on vulnerable communities since they spend a larger por-

tion of their income on food.

Unemployment and the increase in the cost of food make buying food difficult for more families. With winter coming, families must decide between keeping the lights on or feeding their families. According to the Household Pulse survey, the number of parents with children younger than five who reported that their children weren't eating enough is at a historic high.

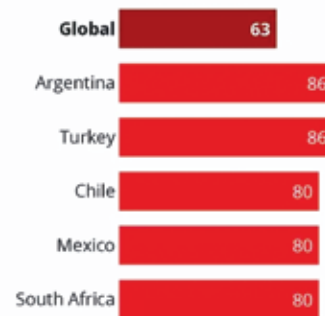
The loss of childcare and meals provided for free or at a reduced cost at school has exacerbated many families' food insecurity. As schools close, millions of kids, many families are losing their access to free or reduced-cost food programmes that these schools provide. In the US, about 35 million people face hunger – roughly the population of Canada. Food insecurities in families with children have more than tripled to 29.5% according to researchers at Northwestern.

The UN World Food Programme has warned that an additional 130 million people could face acute food insecurity by the end of 2020, because of income and remittance losses. This is in addition to the 135 million people who were already acutely food insecure before the crisis

As always, the people who had fewer means before an economic downturn suffer more during downturns and for longer. The crisis is worse for people of colour. More than a third of Black Americans and 22% of

Global Perception of Increased Food Prices

Percentage of people saying the cost of food, groceries and household supplies has increased since COVID-19



Source: Ipsos



statista

Hispanics have used a food pantry, food bank or community food distribution during the pandemic.

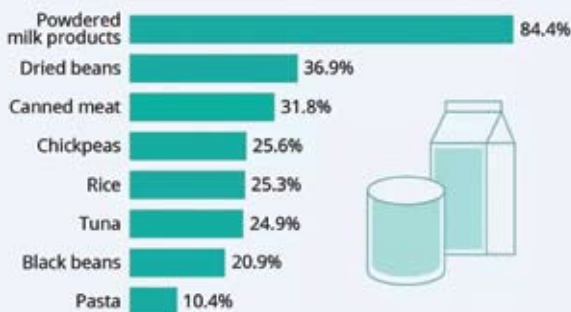
But to counter the usual narrative, at Feeding America, the largest hunger-relief not-for-profit in the US, 40% of visitors between March and June 2020 were new, says Executive Vice President and Chief Operating Officer Katie Fitzgerald.

There are immediate and long-term consequences from inadequate nutrition. Many families will go hungry this Thanksgiving. If you have the means, support the mutual aid organizations in your neighbourhood. These hyper-local community-based networks can offer immediate support and relief to families in need. Many local food banks and pantries are also struggling under this additional strain, do your research and help wherever and however you can.

Source: www.weforum.org

Americans Stock Up On Food As COVID-19 Concerns Rise

Year-over-year sales growth of non-perishable food items in the U.S. in the week ended Feb. 29, 2020



Source: Nielsen Retail Measurement Services



statista



ONLINE MEETINGS

@ www.agricultureinformation.com

Upcoming events

DECEMBER 16, 2020

11.00 AM

Mr. Mohan Urs on “How to make green house farming 100% success”

03.00 PM

Dr. B. Sahadeva Reddy on “All about groundnut production and economics”

DECEMBER 17, 2020

11.00 AM

Mr. Syed Nisar Ahamed on “Machineries and equipments for processing spices and herbs”

03.00 PM

Dr. N. Sasidharan on “Cultivation of sida alnifolia(bola) - the medicinal plant”

DECEMBER 18, 2020

11.00 AM

Dr. T N Balamohan on “How to get maximum yield from high density mango farm”

03.00 PM

Dr. Deo Shankar on “Production and processing of tikhur - a tuber crop”

DECEMBER 21, 2020

11.00 AM

Dr. Elain Apshara on “Coconut and areca nut intercrop – cultivation details and economics”

03.00 PM

Dr. Arun Chandan on “Issues and challenges in supply chain management of medicinal plants sector”

DECEMBER 22, 2020

11.00 AM

Dr. Leishangthem Jeebit Singh on “Health hazards of agro chemical inputs”

03.00 PM

Dr. Pankaj Singh on “Fertilizer adulteration – How it affects the soil fertility”

DECEMBER 23, 2020

11.00 AM

Mr. Rohan Agarwal on “Extraction of rose oil and rose water using copper hydro distillation stills”

03.00 PM

Dr. Raghavendra Achari on “Weather based management of pests and diseases in horticultural crops”

DECEMBER 24, 2020

11.00 AM

Dr. M. Gangadhara Nayak on “Development and management of cashew orchards”

03.00 PM

Dr. R. Murugeswaran on “Promotional schemes from National Medicinal Plants Board for cultivation of medicinal plants”

DECEMBER 28, 2020

11.00 AM

Mr. Altaf Aijaz Andrabi on “Lavender cultivation and lavender oil extraction”

03.00 PM

Dr. Srilatha Vasanthu on “Chrysanthemum- cultivation and economics”

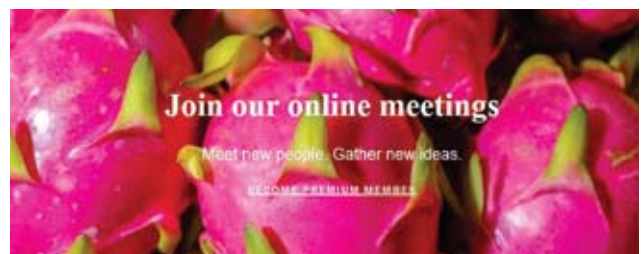
DECEMBER 29, 2020

11.00 AM

Mr. Ganapathy Ajeethan on “Opportunities in building value chain for banana in India “

03.00 PM

Dr. Kushalappa on “How agroforestry can make farming successful for farmers”



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Dr. Prashant Sharma on "Milk & milk products processing"

Dr. Prashant Sharma is the Managing Director of Foodtech Consults Pvt. Ltd. in Agra, Uttar Pradesh. His interests are post harvest management and value addition process. To know more view <https://bit.ly/37Hsac1>

Mr. Sanjay Chandak on "Adoption and certification of organic farming"

Mr. Sanjay Chandak is the Managing Director of Sheel BioTech Ltd., in New Delhi. His interests are agriculture and horticulture. To know more view <https://bit.ly/39qF9RL>

Mr. Mallinath Hemadi on "How to use weeds in farming to maximise profit?"

Mr. Mallinath Hemadi is an Agriculture Consultant from Kalaburgi in Karnataka. He is working on integrated farming where waste is used as resource. He says weeds are one of the waste in field and to kill them we are using chemicals and spending money. If we use them for economic benefit, cost will be reduced and profit maximised.

Dr. Bolla Joseph on "Teak plantation, economics and prospects"

Dr. Bolla Joseph is a Retired Senior Professor (Agronomy) of Jayashankar Telangana State Agricultural University and currently working as an Honorary Professor at Sri Konda Laxman Telangana State Horticultural University in Telangana. His interests are agro-forestry, forestry, afforestation, wasteland development, watershed management, avenue plantations and multipurpose tree species.

Dr. Prakash P. Ambalkar on "Potential agriculture engineering technologies developed by ICAR-CIAE available for commercialisation"

Dr. Prakash P. Ambalkar is the Chief Technical Officer (CTO) and Nodal Officer (Apprentice) at ICAR- Central Institute of Agricultural Engineering, Bhopal.

Ms. Sheelu Francis on "My experience in cultivating 20 crops in one acre"

Ms. Sheelu Francis is the President of Women's Collective in Chennai, Tamil Nadu. She is interested in food sovereignty of our Motherland – in an equitable society, which includes: 1) Recognition of women farmers 2) Food security at the household level 3) Ecological farming 4) Traditional seed preservation and she has got wide experience in multi cropping (20 crops on one acre of land). To know more view <https://bit.ly/369YO6l> <https://bit.ly/37cJNjF>

Dr. I. V. Srinivasa Reddy on "Patchouli cultivation and economics"

Dr. I. V. Srinivasa Reddy is Associate Professor at Agricultural College (PJTSAU), Aswaraopet, in Bhadradi Kothagudem Dist., Telangana. His interests are fruits, vegetables, spices and medicinal plants cultivation.

Mr. Nitin Kumar Goudar on "Ashwagandha has got immense demand - My experience"

Mr. Nitin Kumar Goudar is the Founder & CEO of Darvi Group in Hubali, Karnataka. Mr. Nitin Kumar Goudar says ashwagandha has got immense demand and it is easy to sell. During the meeting he will speak on ashwagandha cultivation & marketing techniques and share his experience with farmers. To know more view <https://bit.ly/33xERFd>, <https://bit.ly/3q1L2ul>

Mr. S. Ramakrishnan on "Pest management using beneficial insects"

Mr. S. Ramakrishnan is the proprietor of M/s. Cryptox BioSolutions, Kanyakumari District, Tamilnadu and he is also the Proprietor of Rynco Orchids in Trivandrum, Kerala. His interests are orchid farming, organic farming and pest control using predator & parasitoides. Rynco Orchids is the largest pot plants orchid farm in South India. To know more view <https://bit.ly/2VqiP2y> <https://bit.ly/2HP6mBK>

Mr. Murali G on "My experience in growing colour capsicum"

Mr. Murali G is the Proprietor of Padma Agro Products, Bangalore, Karnataka. His interest is capsicum cultivation. Padma Agro Products was established in the year 1960 and they are the leading producers of red capsicum, green lettuce leaf etc.

Mr. Surendar Reddy Namireddy on "Marigold farming in polyhouse"

Mr. Surendar Reddy Namireddy is a farmer from Nalagonda District, Telangana. For last 10 years, he has been doing farming of various crops like paddy, fruits and vegetable in open field and into cultivating marigold capsicum, english cucumber in poly house for 5 years.

He says, they follow the best practices of Shri. Subhash Palekar for some of the crops to avoid pesticides in fruit crops and as a farmer he is supporting other farmers to improve their knowledge / best practices for getting high yield by reducing the operational expenses.

Dr. Satyajit Roy on “Value addition in medicinal plants”

Dr. Satyajit Roy is the Director of ICAR – Directorate of Medicinal and Aromatic Plants Research in Anand, Gujarat. His interests are medicinal and aromatic plants. View <https://bit.ly/34YGc96>

Dr. P Manivel on “Basil cultivation, economics value addition and marketing techniques”

Dr. P Manivel, Principal Scientist and Head, ICAR-CTRI Research Station, Vedsandur, Dindigul, TN. His interest is basil cultivation.

Dr. Arati Pannure on “Beekeeping for beginners”

Dr. Arati Pannure is the Assistant Professor of Entomology at University of Agricultural Sciences in Bangalore, Karnataka. Her interests are bee pollination, bee taxonomy, beekeeping, insect Ecology.

Mr. Nishant Chowdhary on “Vegetable farming using light weight cocopeat based growing medium”

Mr. Nishant Chowdhary is the Director of Urban Kyari (Brand of Urb Kyaari Pvt Ltd) in Delhi. They are manufacturer of the wide spectrum exfoliated vermiculite, neem powder, drainage cell, cocopeat brick and also provide rooftop farming service, agriculture service, urban farmer service etc.

Dr. Kavitha Sairam on “Eco-friendly farming with less chemical inputs, using biotechnology as an intervention tool”

Dr. Kavitha Sairam is the CEO & Co-Founder of FIB-SOL Life Technologies Private Limited in Chennai, Tamil Nadu. To know more view <https://bit.ly/35a5bQQ>

Mr. Ashish Gupta on “Process of extraction of essential oils”

Mr. Ashish Gupta is the Director – Marketing of Kanta Enterprises Pvt Ltd. in Noida, Uttar Pradesh. They are the leading manufacturer, supplier & wholesaler of a wide range of high quality Natural Essential Oils, Spice Oils and Natural Crude Oils. To know more view <https://bit.ly/3e3mHyP>

Mr. Krutti Sundar Patra on “Agri startups financing and government policies”

Mr. Krutti Sundar Patra is the Senior Manager of Bank of Baroda in Vadodara, Gujarat. His interests are government policies, agri banking, startups and digitization. To know more view <https://bit.ly/3kxyAP9>

Mr. Ajit Ingle on “Automated fertigation for multi crops”

Mr. Ajit Ingle is the CEO of Atuofert Agrimations Equipments OPC Pvt. Ltd., in Nashik, Maharashtra. His interests are irrigation, fertigation system, precise fertigation system, nutrient management in agriculture crops. To know more <https://bit.ly/2U4ZnrA> <https://bit.ly/38jzSeg>

Mr. Ramesh S.Karisomanagoudar on “NHB schemes for horticulture - Fruits, vegetables, flowers, mushroom and tissue culture”

Mr. Ramesh S.Karisomanagoudar is the Deputy Director, (Incharge for Karnataka, Kerala & UT Lakshadweep) of National Horticulture Board, Bangalore, Karnataka. His interests are Commercial Horticulture for fruits, vegetables, flowers, mushroom, tissue culture; Protected Cultivation of fruits, vegetables & flowers.(poly house & shade net house); Post Harvest Management – like washing, grading, packing, conveyor belts, cold rooms, pre-cooling units, refer vans, retail outlets, collection centers, distribution primary processing etc.; Cold Storage for horticulture produce; Technology Development & Transfer for promotion of horticulture; Horticulture Information Services – like market information services/ bulletins etc.; Accreditation & rating of fruit plant nurseries, vegetable nurseries, cut flower nurseries etc.

Mr. Salman Nizamuddeen on “Successful dates farming using imported tissue culture plants”

Mr. Salman Nizamuddeen, Managing Director, Saliah Dates Nursery, Dharmapuri, Tamil Nadu has completed B.Tech (food processing and Engineering) in Coimbatore. He says, all the praise goes to god and his father Mr. Nizamuddeen who previously worked at several date farms across Saudi Arabia before returning to India to grow his own dates.

One fine day Mr. Nizamuddeen thought why such dates cannot be grown in India? Through his trial and errors, he found great success in cultivating dates using imported tissue culture plants from UAE, Saudi Arabia and France.

Mr. Varghese Koikara on “Nutmeg production, preservation & value addition”

Mr. Varghese Koikara is the Sole Proprietor of Green Diamond Agro in Kalady, Ernakulam District, Kerala. Mr. Varghese Koikara has done B.Sc. Chemistry and has worked for 38 years in Federal Bank and retired as an executive. He is a trainer in life skills, soft skills, nutmeg farming, preservation and value addition in fruits and vegetables.

Mr. Varghese Koikara owns a small production unit for value addition and preservation of fruits and vegetables. He also has a plant nursery, nutmeg drier making unit, nutmeg farm with more than 200 nos. yielding nutmeg trees and produce own organic manure and organic insect repellents.

Mr. Parth Tripathi on “Creating a market for Indian beekeeping community”

Mr. Parth Tripathi is the Chief Executive Officer of Beehively Group in Ahmedabad, Gujarat. His interests are agriculture, apiculture, creating farmer & beekeeper cluster, soil health, indigenous Indian tree species conservation, creating market for Indian beekeeper & farmers and honey quality control laboratory. To know more view <https://bit.ly/2UDgele>

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Talking to

MANI H K

Co Founder, Greenopia

How did you stumble upon this venture?
I come from a product design background and my entire founding team was based on engineering and the entire plant world was alien to us. We were quite scared if we would ever understand the nuances of this field.

We started with an IoT driven company for an urban gardening system for urban millennials to grow plants. These are young adults who are earning well and they want plants in their houses. But plants die due to lack of proper care and maintenance. We thought we should do something in that space.

Our fundamental idea was to make green easier. So, my co-founder started dedicatedly looking at various plant species and researching on it. In our exploration to look at low maintenance plants, we stumbled on many plant groups which are magical and amazing but we know very little about them since nurseries don't grow them neither is it part of the typical landscape. From thereon, we started focusing on moss as it was part of those plant groups.

We then started looking at moss for large scale projects etc. For the last 3 years we are India's single specialists of moss.

Tell us more about moss.

Most of us look at moss as the dirty thing that grows in damp places or in a garden that is not cleaned up. Surprisingly this is a global outlook of moss. But the historically moss has always been appreciated and is used in multiple contexts like:

1. Wound Dressing: During wars, moss used to be used to dress wounds because of its excellent moisture-absorption capability. It also comes with inherent antiseptic properties.
2. Crafts: It is used as a craft material owing to its lush green properties. Lot of wall hangings, exquisite village craftwork is done using moss in Northern Scandinavian countries.



Taking a break from work is as important as working itself. The rejuvenation and speed the break renders when you resume work is almost magical. The sad part about today is that we take a break from one screen and deposit ourselves in front of another.

In contrast, a walk in the woods or in open green spaces would be great! Going green is the buzz word today. But having greenery in outer spaces is a rarity for the urban folks. Mr.Mani with his design background and innovative venture, offers to bring a little bit of green into our inner spaces through Greenopia. If that is not wow enough, they bring in solutions that need little or no maintenance!

It all started when Mr.Mani and his founder team rediscovered moss.

3. Timber House Insulation: Moss contains almost 4 times its volume in air. It is a very porous material and so it is a fantastic insulating material. It does not conduct heat, temperature etc. It was traditionally used as insulation material in timber houses.

Moss can be used as a land cover because it can grow and thrive in all seasons. Moss can be used as a key ingredient in landscape designs.

How different is moss from other plants?

1. Moss is not a vascular plant: They do not have a vascular network that carries water from roots to leaves. Their roots do not do any nutritional absorption at all. All the absorption primarily happens through the leaves or the trunk.
2. High porosity: Most of the moss varieties are highly porous because of which it can absorb nutrients and moisture directly from the atmosphere.
3. Befriends humidity: There are moss varieties that thrive with low moisture content too but most varieties thrive in high humidity areas. It's reproduc-



tive cycle is highly dependent on water availability.

Moss has a lot of advantages:

1. It is highly resilient.
2. It has very less nutritional needs.
3. Limits exposure to pollution. Hence, it is a great pollution indicator.
4. Their spores are so light that they can travel far and wide.
5. They can grow on any surface as long as it is untouched for some time.

Are there different varieties of moss?

There are around 6000 species of moss. Some of them are more popular because of its ability to thrive in a green house or garden set up.

1. Fern Sheet Moss: It is an Asian variant of moss seen mostly in mountain regions. In India you see it in Kodaikanal, Kerala, Darjeeling etc. It also has another 30 subspecies to it. Most of it look like miniature fern sheet and it spreads far and wide between crevasses. It is highly resilient and some of the pieces we have collected have survived in boxed condition with misting once in three months. Even then they stay lush green.

2. Reindeer Moss: The most popular of mosses and in some sense it is technically not a moss. It is a hybrid moss - a combination of algae and fungi. It is very famous in cold parts of the globe like Northern Europe, Scandinavian countries, some parts of Northern China. It grows like coral reefs and it is super soft, extremely porous.

Of all the mosses, this one is the most suitable for this process and so it is extremely popular for interior design. It can also be colored with organic pigments and can be brought out in multiple shades of green and other colors. It is also made into tiles, panels etc for laying indoor moss gardens or bio walls. We at Greenopia have large stabilization facilities for this.

3. Bun/Cushion Moss: There are around 380 bun moss varieties in itself. This accumulates on bulk of soil or rocky crevices and spreads in semi spherical shapes. It is highly resilient and gives unique textures to your craft work. It grows in many parts of South East Asian countries.

4. Star Moss: This one is more a UK/

Europe centric moss. In some parts of Northern India you find this is in less proportions. There are variations of this such as kaleidoscopic, pentagonal mosses etc. Most of them are super soft and some are a little more hard to touch depending on the environment in which they grow.

How do you make revenue out of moss?

We build different products to give interiors a green and natural touch. We build partition walls full of moss. Moss can be utilized into amazing signage boards and incorporated into a wall. Lot of companies are looking at biophilic

walls.

We also process moss into deployable tiles which can be easily transported and fixed into walls. We largely do low/no maintenance green walls as our primary revenue stream.

With other plants for green walls you need to have irrigation systems, constant exposure to water running in that space, drip water etc. Moss addresses these problems elegantly and gives a lot of flexibility.

How do you grow moss on a commercial scale?

We currently work with lot of harvest farms across the globe to get raw moss



design which includes natural elements in their design.

Bosch is one such company and we work with all of the Bosch offices in India. We convert most of their conference rooms into a green biophilic room. This deodorizes the rooms, maintains moisture level inside the room and it gives the rooms a good feel.

We have done a mixed moss wall for a client which is currently under consideration for the Limca book of Records. It was an experimental project for us and we were quite happy with the outcome. These walls do not need any maintenance and they are 100% real. There are processed and then integrated into

to India. That is one of the reasons why finished products are premium at this stage. Most of the raw material is coming from outside of India and processed further by us in india.

We are confident that in time we will be able to grow it ourselves. We are also actively looking towards working with people who would like to research on moss.

What is the life of these plants once incorporated into structures or walls?

We are looking at 5-7 years of no maintenance no watering lifecycle. If there are other leaves incorporated, those leaves will have a 1-2 year lifecycle.





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After the given lifecycle, there may be discoloration and change in appearance due to environmental exposure. It simply needs to be treated again and reused. After it is treated, it will remain the same for another 5-7 years. We don't have to remove/replace anything.

Is having moss indoors a risk to health?

That is a popular misconception. There are variants of moss which are spores intensive. Those do create allergens for people who are susceptible to pollens or dust allergy. There are 10 species of moss and luckily those species are very difficult to grow. Owing to that they may not become popular in an urban scenario. The moss that we use for interiors is anti static, sterile, it doesn't attract pests and it is perfectly safe for pets and accidental human consumption.

Is your focus on moss smart agriculture?

No, I don't think so. We are re-imagining green for urban spaces. The word smart is overused these days and many companies claim to be smart and we personally feel that its a very vague terminology. We are bringing back something that is less known to people these days in a very new context.

What maintenance is required for green walls?

There is no maintenance required. Do not water or mist it. Watering infact voids the warranty. Just leave it as it is. We do certain feasibility tests before we do it for you which involves the rate of humidity in the environment, the exposure to sunlight, etc. If our feasibility tests indicate moderate to no risk then is when we install moss for you. So far we have not met a use case failure in our last four years of tenure. There has been issues of physical damage and premature discoloration which can be fixed and reversed. But as a product it has not failed.

Can moss be used as a fertilizer?

Yes, there are some kind of moss that can be used as fertilizers primarily because of their moisture retention capability and not because of nutritional benefits. They also allow a lot of microbial activity to happen in the soil. So, it is useful from a soil enriching perspective. The time it takes to grow moss is very long. So considering that it will turn out to be an expensive fertilizer there are far more cost effective alternatives available.

Can it be used on floors like an alternative to lawns?

One of the biggest limitations of moss is that it cannot be exposed to sunlight. It is used strictly indoors or semi outdoors.

Reindeer moss in a certain arrangement can be used as an indoor lawn sheet. We don't recommend it because of the other wear and tear that it can get subjected to. That has nothing to do with moss per say. But then you have to ask people to leave their shoes out, walk only bare foot indoors etc.

Other than on walls we have used it on pillars, ceilings, etc. We haven't used it for floors.

What can kind of expenses are involved in bringing in a

green wall?

It is typically 30-40% more expensive than a normal vertical garden system. It may come to around Rs.1800 – Rs.3800 per sq ft. price range.

Are you working on other plants as well or is it just moss?

We are primarily working on two categories right now:

1. Low maintenance plants, which is largely succulents. We use it to manufacture a lot of deco products.

2. Moss

We understand that there are a lot more things we can work with. But, based on our bandwidth this is what we do at present.

Having said that, we are gradually transitioning towards 100% moss. We look forward to setting up a factory and a stabilization unit much larger than the current one, etc.

The goal is to expand our exports as well, God willing. Thank you.

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Dr. Sudha Narayanan

Associate Professor,
Indira Gandhi Institute of Development Research , Mumbai

Dr. Sudha Narayanan, a doctorate holder in Agricultural Economics from Cornell university is currently associate professor at the Indira Gandhi Institute of Development Research, Mumbai.

Her current studies and articles is evidence that her research continues even today with the same zeal or more than when she was at the University. She is also an avid writer and brings out her views on the issues faced in the agricultural sector.

Today, India witnesses lot of protests by the farmers themselves regarding the 3 Farm Bills passed by the Center. Although these bills are quiet timely in terms of making a marked change in the direction of marketing reform it is a wonder why it doesn't seem to be welcomed.

According to her, the 3 Acts do not give anything great to celebrate. They were indeed necessary but could have been more effectively done in a different way.

"It is important not just to do the right thing but also in the right way. That is where these three bills fall short. I don't think farmers are protesting about what the bills say but they are concerned about the larger issues of what the Indian government is going to do to support agriculture."

Excerpts of the discussion that followed, given below.



This is a political game to abolish APMCs because the Center hasn't been able to take control of them. What are your thoughts?

I think many people share this view. Immediately after the COVID lockdown there was an urgent need for the ruling party to commit to long-term reform and economic growth at a time when we are not doing that well. In Karnataka for instance, across party lines there is deep nexus between politicians and traders. Despite that, they managed to unify issuing of licenses. APMC doesn't issue licenses - REMS does. I think there was an opportunity to learn how to do reform from many states that were already doing it. Unfortunately, the long-term interests of the farmers are being compromised.

Isn't sugar cane farming in Karnataka contract farming? Sugar cane farming is different. It was because of its high perishability and the need to have processing within 8 hours of harvest, it came under a regulation. Although in principle it is similar, if you look at poultry and gherkins and potatoes they are slightly different. In India, it is true, that in the last 20 years many contract farm projects

have failed. In fact there has been more failures than successes. There is a lot of research on successful contract farming schemes. Out of the 42 I listed while I was studying, only 4 had survived.

If it has been unsuccessful, how will a reform make it successful?

Absolutely! This is a very important point. If it doesn't go well, businesses can go away and start with another bunch of farmers but the farmers involved gets stuck. With gherkins I have noticed that at times the soil fertility is lost and after that no one wants to grow the crop but they can't switch to another crop easily either. These are the dangers of contract farming. This particular contract farming bill comes from a lazy understanding or an unwillingness to understand the exact grievances of contract farming farmers in India.

The reform comes out as a handover to private organizations to run the show and that is scary.

Corporates are all not bad at all. There are good corporates and there are bad corporates. The problem is that there is no mechanism or regulation to separate the two. That is bad.

Do you see these reforms as being an advantage to FPOs?

This is definitely good news for FPOs. Many FPOs have been struggling to find their feet. They have financial capi-





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tal problems as well as human skill to take them forward. This law allows them to deal with private players directly and start supplying and finding markets. But, even before this bill in reality they have been doing this. So, to what extent will this bill have additional benefits for FPOs is yet to be seen.

One cautionary note is will the FPOs eventually end up being one player in a long supply chain which is actually controlled by some big player. The big retailers who are constantly consolidating are contracting with small FPOs. In such scenarios will farmers be able to negotiate prices is yet to be seen.

To share an instance, Pepsico chose to contract potato farming in Jharkhand because they gathered that the farmers are weak there and they are more gullible. Pepsi used to reject small potatoes saying they couldn't process it. An NGO got into the scene, open a packet of Lays and showed Pepsi negotiators that you process small potatoes too. So, they demanded payment for the small potatoes as well. Pepsi responded by leaving Jharkhand and moving to West Bengal. So power inequities in supply chains is a reality. Yes, we all want to absorb the good thing out of laws and reforms but the good things don't happen automatically. It has to be supported by a lot of things.

Would you agree that while the law seems politically influenced, so does the protests because only some states are protesting?

We had a very interesting conversation with a farmer in Tamil Nadu when the Jallikattu controversy was on. The Marina Beach has mostly young urban men who were protesting. We went to the farmer and said how do you feel that it is your issue but somebody in the urban area is protesting. The farmer responded that if they don't speak for us who will?

If you look at the politization - not all of it is bad. In this con-



text, farmers' views have not been taken into account. In that context, if it was not for the politicians to put this forward and organize the protest no farmer would have been heard. So, not all of these are bad. It must be analysed separately. Per Constitution, "markets, fairs and agriculture" is in the State list. The Union is responsible interstate commerce. So, it could have been discussed with States and/or intimating them before the Act was passed. From that perspective it is not clear where the Union government's and State government's responsibility lie. Going forward we definitely should stay positive in how we manage this going forward.

The MSP could have been shown in the new law so that the prevailing operators do not buy lesser than MSPs, isn't it?

In the 80s when I did a case study on Hopcoms I realised that the very presence of Hopcoms gave farmers the notion of what is a fair price. APMCs are supposed to play the role. But, unfortunately they aren't.

Unless there are alternatives to APMCs the APMC will continue to be a rule book of prices. I think the bigger question is how can the farmers get to the consumers with as few middle men as possible? How can institution set up help us do that? If a farmer has a WhatsApp group, can you make that grow so that you get a better share for your produce? There FPOs are doing well.

Even community-based agriculture is good wherein consumers buy directly from farmers. But we can't wait for these things to happen. We need State supported infrastructure and institutional investment in supporting farmers to be able to do this. Not everyone can do this on their own. You cannot bet on private players to come in and solve all the prevailing problems. The benefit will not trickle to farmers by just waiting and hoping. The State needs to actively engage. MSP is also better institutionalised to bring in clarity.

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no difference to the small holders in remote areas where infrastructure is poor.

Will the commission agents disappear or will they end up stronger with these acts?

They will be resilient. I am not sure if they will be stronger. But, I think they will find their place in the new ecosystem.

Will the corporates monopolize the freedom of farmers?

They will try to monopolize and manipulate but whether they succeed or not depends on whether other corporates are fighting each other or colluding. In the absence of government regulation anything can happen.

What is your last driving statement about these bills?

Let us look at it constructively. I think the way forward the farmers should have a fall back option and that fall back option should be a national market that actually emits information and a sense of fair price. That is pretty much like Hopcoms to Karnataka. I would surely advocate a national electronic spot exchange and forward market for farmers so that there is transparency. Also, that should become the source to guide prices. This way the APMCs will become more disciplined drawing signals from that price. A national spot exchange will also give fall back options for FPOs and small farmers who struggle to connect to markets.

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What do you think of the Adani Agri Logistic rule in the new 3 bills implementation?

This addresses an important point that the traders and politicians have a nexus which will get broken by the new farm bills. The example of Adani, and others like them, suggests that the big players are also very politically linked. So, I think this is a very big worry and I speak on behalf of the farmers' organizations I have interacted with.

They see these three farm bills as just a facilitator for the large companies. The Food Corporation of India recently got into a 30-year guaranteed return agreements with Adani Logistics to stop food grinding up to 50000 tons with an assured return of Rs.97 per ton per month.

The farmers are not reading the bill alone. They are looking at the actions of the government overall, going beyond the bills. Companies like Adani are trying to control all forms of infrastructure - ports, airports, warehouses, storage and explanation of globalization suggests that consolidation is a virtue. So, farmers see, consolidation of businesses that are politically linked as the end game.

Are the bills in favor of farmers or not?

No. We are relying on private players to deliver benefits to the farmer when history of evidence suggests that this may not happen. So, these bills do not directly address farmer's concerns. It may address a few of them and we will need to be optimistic or request support to enable it.

Are you then justifying farmer's agitation?

I think it is more of an education for the rest of us about what the farmers' needs are. We are ignorant about what the farmers are going through.

Do you think small farmers will surely benefit by these bills?

Small farmers who have locational advantages around demand centres and cities will benefit hugely. This will make



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**Dr. K.K. Tripathy, IES
Director, VAMNICOM**

*applied to NBA for extension beyond June 2019.



DR. M VISHWANATH

Joint Director - Horticulture Department & Managing Director - International Flower Auction Centre

Is the auction done online?

It is not online. It is a different system of auctioning. It is on par with the Dutch auction system. There is an auction clock. The registered growers send their flowers to the auction centre. We have an auction hall wherein interested buyers participate.

These registered buyers are given a tab. On the tab they bid the amount. We have 20 parameters in which the flowers are auctioned. We have got varieties, quality parameters and a quality control supervisor who supervises the varieties. It is totally free, transparent and accountable. Any grower who sends flowers is sent an online payment on the 8th day through ECS.

Please shed some light on the cultivation aspects of flowers for local and export markets.

I will first brief about the floriculture status in Karnataka. Karnataka has got a total of 31,000 hectares of land under flower crops. Out of this, we have roughly around 750-800 hectares under poly houses. Poly houses are used mainly for the cut flowers. Cut flower means rose, carnation, gerbera, chrysanthemums, anthurium, orchids, lilies, etc. In terms of outside cultivation we have got Jasmine, Cassandra, Marigold, etc. We call these as loose flowers. Jasmine, Cassandra and Tube Rose are the three flowers that, apart from the button rose which we grow, in large areas in open cultivation. Cassandra requires a little shade. People here are habitual to grow plants as per the standard. Jasmine, since it is an open cultivated flower, requires very good sunlight. It is grown in quite much area here. People go for tube rose when there is surplus amount of water. Button roses are used for pooja purposes and for all decorations. These are the 4 loose crops.

Coming to cut flowers, the most major flower is Gerbera which is grown in large areas in Karnataka. Next in line is Rose. We have about 8-10 varieties of

rose. These rule the market now and we cultivate within poly houses. The third is Carnation and there are 10-15 varieties grown here. 4th is the cut Chrysanthemum that is also picking up even if we need artificial lighting etc. The cost for Chrysanthemum have been picking up since the last 2-3 years.

Does the cultivating practice differ for flowers which has to be exported vs. sold domestically?

Yes, definitely! For exports we need to go for the quality standards. Each country has a different set of standards listed. Likewise, people can plan their production well in advance.

The export of cut flower majorly happens during Christmas, New Year and Valentine's Day.

Where does the Horticulture department come into the picture when

Dr.M Vishwanath heads the Bangalore division of the International Flower Auction Centre. This includes a total of 9 districts.

“As the MD of International Flower Auction Centre I am in charge of the flower auction that is being conducted at IFAB. We look into the process of floriculture in the whole of Karnataka. It is approximately a 37 Crore company. We have got growers and buyers - both RESTART and IFAB.

On an average, we have about 2.5-3 Lac stems of cut flower being auctioned everyday. We follow the Dutch system of auction here. It is highly transparent, accountable and any farmer/trader can become a member of IFAB.”



one needs to export flowers?

The horticulture department has got several schemes wherein we are promoting quality production of flowers for export. One is the National Horticulture Mission also known as Mission for Integrated Development of Horticulture (MIDH). It is a government of India in partnership with State Government Scheme wherein we promote cultivation under poly houses. That is, the State Government will provide an assistance of up to 50% for anyone who establishes poly houses.

The State Government has made it mandatory that all farmers who establish poly houses should also have incorporated rain water harvesting on their farm. So, whatever pond that farmer prepares, it requires to have a plastic lining and whatever rain water falls on the poly house roof has to be directed into the ponds.

What is the technical and financial assistance your department offers?

We give assistance of up to 16 Lakhs per acre. For a small size farm pond - 10mt length, 10 mts width and 3 mts depth, we give Rs 75,000/- per pond.

Farmers who cultivate on open grounds, gets per hectare assistance. For example, for rose it is Rs.30,000/- per hectare. They also give drip irrigation assistance. Even farmers cultivating in open grounds can go for water harvesting structures. Farmers who opt for cold room facilities are given upto 5.25 L.

If farmers are interested in venturing into exporting of flowers they get assistance of 20% towards purchasing the reefer van. In terms of technical support, we have field officers at Hobli. We have got several Sampark Kendra and have Horticulture officers in each kendra.

What is the limitation of a Hobli-level officer towards helping the farmer in flower cultivation?

Hobli level officers share technical details with farmers, they inspect the field, help with budget preparations and impart whatever training they may need.

From Karnataka what type of flowers are being exported in general?

It is mainly roses. Rose is on highest priority for export. All others like chrysanthemums, carnation, anthurium,

etc. comes after roses.

In case of a natural disaster, where does the horticulture department come in the picture?

Owing to the COVID time now, we haven't been able to market our flowers because of the lockdown. The horticulture department from the Government of Karnataka offered an assistance of Rs.25,000 per hectare per farmer.

Are there any other general aspects on which you would like to advise flower cultivators?

Any farmer who wants to venture into floriculture, should be mindful of certain aspects:

1. Selection of site: If the plan is to cultivate roses, elevation of the place is of utmost importance. Anything more than 750mts above the sea level should be ideal. Higher the elevation, better the quality of roses.

2. Climatic conditions of the place: If the temperature of the place exceeds 38 degree Celsius, it is not advisable to cultivate roses.

3. Water quality

People who begin cultivating flowers in inappropriate conditions face a lot of issues in the long run which can get very difficult to resolve. So, it is best to consult an expert before you zero in on a property and the kind of flower you wish to grow.

Can we grow button roses as an intercrop within a mango plantation?

With high-density mango plantation it is not advisable to grow roses as an intercrop. Button roses require great sunlight. Also the spacing may not work well.

Lime should be a good option; but I wouldn't advise any flowers. Cassandra requires shade but it also requires certain standards to be fulfilled and it requires more shade than what can be offered in a mango/coconut orchard.

How is the horticulture industry thriving during the COVID time?

The horticulture market is not as vibrant as it used to be before the COVID times. My advise is to cultivate more Dutch flowers in our domestic markets. We should encourage people to use





Floriculture

IIPM



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these flowers at their residences, functions etc. This will help those farmers who are already cultivating it in poly houses/open cultivation. Majority of the flowers cultivated in poly houses are purchased to be used in functions, events etc. There is a stagnation in the market due to functions being stalled owing to COVID-19. So, I do encour-

and help farmers.

Are there flower varieties that grows well in higher temperature zones?

Place having temperatures above 37 degree are not advisable for floriculture. The major problem is dealing with thrips and mites. These pests are a threat to all flowers. They become high-

from 07th May 2020. In contrast to the 2.8lakh flowers per day in the past, during the current times we auction 80,000 to 1L flowers per day.

Our average price per stem last year was Rs.5.04/-. In the initial two weeks of re-starting our auction centre, the price was Rs.2.5 per stalk. Slowly the price is stabilizing. Today we could do a total sales of 60,000 flowers and the average price per flower is Rs.7.35/-.

Right now we are attempting to go on-line. Our software is ready and our real-time auction check is going on now. Most likely we will go live with the online system in the next 2 and half months. This way, anyone from any part of the country or globe can participate in our auction. We want to diversify and increase our business and extend our facilities to as many farmers as possible.

Any last piece of advise for potential flower cultivators?

It has been traditional to use flowers for ages together for multiple purposes. Karnataka is a florists' hub. We have the relevant climatic conditions, good amount of water and great technical know-how.

With COVID-19 setting in, there has been a recession in the flower market especially for cut flowers. I would advise new cultivators to step aside from venturing into floriculture temporarily until the COVID-19 situation is normalized.

Also, before plunging in, it is highly essential to seek technical advice from the local horticulture officers. Hi-tech floriculture involves a lot of cost, so lesser the gamble, the better.

age people to domestically use them to encourage and help our flower cultivators.

How much has the COVID situation affected the Karnataka flower cultivators?

It has had a damaging effect. We have lost about 7000 hectares of produce during the lockdown. In Karnataka and other parts of the country nowadays functions with smaller crowds are being permitted. So, people are encouraged to buy flowers for the functions

ly active in high temperature zones. Hence, maintaining the crops during summers will become extremely difficult. Chrysanthemums, marigold, button flowers, however, can be considered for growing during winters and early summer. Please avoid having any cultivation during peak summers. In such places, it is not advisable to cultivate in poly houses either.

Has the auction center restarted its activities post lockdown?

We have restarted our auction center

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Robert de Bos

Director/Consultant, Bangalore Plants First Pvt Ltd.

Mr Robert de Bos holds a Masters degree in International Agriculture and comes with extensive and rich experience in cultivation, local and export marketing and international consultancy. He has also worked around the globe in places that include Netherlands, Colombia, Spain, Sultanate of Oman, Kenya and India.

Along with Ms.Rajeshwari K, he offers consultancy through Bangalore Plants First Pvt. Ltd. - a company popular among people in the horticulture and floriculture business around the globe.

Mr.Robert de Bos has been in the Indian floriculture world almost from its stage of infancy.

“20-25 years ago when the entrance of hi-tech floriculture took place in India, the first difference was the entry of stemmed flowers in the market. However, the export had to be shelved. This was due to lack of strategy about development and cultivation. The investment required back then was very high. The flower business is a very competitive business where efficiency and production levels and quality has to come together. Also, you are competing against extremely professional countries like Africa and South America. There is a tremendous production in Europe as well.

So, export of flowers did not develop in the manner we expected it to happen in 1995. The quality of flowers were not good enough for the export market. At that time, traditionally flowers were only sold in kilos. Since the flowers meant for export were rejected, it went to the local market. Having said that it was quite a short phase and since then we have seen a tremendous amount of growth in the floriculture industry.”

When did things begin to change?

In the beginning of 2000 we entered a generation of great floriculture. More people, with prior experience, came into the business and their experience started showing on the production front. These people were more successful than the first generation of floriculturists in India.

But now again there is stagnation as we have not revolutionized since then. We still have the same green houses and cultivation methods that we had 20 years ago. This perhaps owes to the fact that people are unwilling to take risks to go to higher levels of growth.

However there are people who have got into substrate growing and today there are hi-tech fertigation units available to automate irrigation and fertilization and this is a good improvement because nutrient, pH and EC level of soil directly affects the quality of plants. So, I do see development but in my opinion it should be much faster than what it is now.

We have been exporting and also the local market has been improving quite a bit over the years. There is quite a high demand for flowers. When we compare the prices in India to that of exporting flowers we see that sometimes it is hardly worth exporting the flowers. To be highly competitive in the export market, the quality



Floriculture



of packaging, transportation etc. comes into play. Most often 20% of what you have gets rejected from being exported. People with large farms of course will need more than just the local market to sustain.

Cultivation, market, technology and management are the four most important points when it comes to the world of flowers.

In the current COVID-19 conditions, is it a nightmare for flower growers?

There has been many people who have opted out of this industry the world over because they were n't able to sustain the running cost of production. COVID is definitely a difficult situation but I do not believe that this is the end of the world for the industry. The market will pick up again and we will pick things up may be in a different manner owing to many restrictions that may come up. I think till around Valentine's next year there will be a shortage in the market. I think we can expect a good year after all this for the floriculture as well.

Coming to people in floriculture switching to essential commodities - that has never been the case. In 40 years it has not happened, flowers have their own market. It is a case of how the rates resurface and pick up. So, for people who do go to another field, it will only be temporary because the market will pick up and then you will see floriculture re-stabilizing. New entries into the vegetable growing however are taking place and often more revolutionary than in the floriculture.

Apart from polyhouse technology do you know of other technologies to grow flowers in India?

I believe there are many parts in India where net houses are cheaper and are very good and sometimes even better solutions than green houses. In fact in March, April, May, your crops are better off in net houses than in green houses. Again it is more experienced in the vegetable growing

For example, the company Triangle Farm and Simply Fresh - vegetable growers working with net houses which is in fact lower investment in terms of protection and increased technology in terms of soil environment. It promotes full control of nutrients and irrigation of the substrates. It is definitely a development which is appreciated. On the other hand, we have retractable roof green houses. For a country like India, with varied climatic conditions, green houses with retractable roofs would do a lot of good. I see that the net houses and green houses with retractable roofs are a tremendous development. There is only one point that I have to say- if you do substrate growing you need to have very professional people to calculate recipes and check equipment that is extremely precise to grow in relation to crop expertise in the conditions prevalent.

Please brief us about the services of Bangalore Plants First Pvt Ltd.

It started mainly as a company to produce plant material, focused mainly on grafted rose plants. In the last 4 years we have stopped producing plants. We

are now outsourcing making of plants to other nurseries and we are trading. We are much more in consultancy and I do the bulk of the work myself. I sign up for consultancy contracts especially for establishment of medium and high tech green house projects and cultivation processes of vegetables and flowers.

Do you grow rose plant material and offer consultancy for rose cultivation in open fields?

Yes, we do. It is just that we don't do rose plant material making anymore ourselves. We have outsourced that. But we do take full responsibility for the plant material we supply. We know that if we deliver plant material we have to help the grower and collaborate and deliver successfully. That is not just restricted to roses anymore. We have gone beyond that. I hope this year we can start a nursery with some other plant material. There are so many crops we can work on quickly and yes of course, we will provide consultancy and recommendations to make the crop a success.

Is there still scope for newcomers to enter the floriculture sector in India?

There is tremendous scope. There are professionals from IT and other industries who are normally quite strong in management and who provide higher efficiency. They can also bring in amazing ideas into the marketing part of the game. There are also so many crops to



grow other than the conventional ones. The country is so large with so much of population that marketing offers many opportunities.

How does the export market look nowadays?

Because of the very strong local market we set up green houses with simple equipment. That is what the investment is. We keep things much simpler. For export we need more technology to assure quality and high production. Do we still have a bit of trauma that high investment will lead to failure in the floriculture industry.

We have projects in Bihar, UP etc. that are not really attractive places for rose or carnation cultivation. For that we should move to the Deccan Plateau like in Bangalore, Maharashtra, etc. 700-1200mt above sea level is a very conducive climate for growing flowers and vegetables.

What is a good size project to start off with?

Always start small because there will be lot of learnings along the way. One shouldn't start with more than 5-7 acres or may be a max up to 15 acres, depending on your team.

How are Indian flowers rated in the Netherlands for quality?

Quality is often misunderstood. If we ask over here about quality, it is presumed that the flower should have a big head and a long stem. That is



not the main criteria. Of course, they fetch better prices than the smaller ones. But, the main criteria is that the flower is healthy. Owing to the climatic conditions of India, we have smaller bud sizes than in other countries. So, in comparison to other countries we get paid less. But if the flower is not healthy we stand even poor chance at making profit. We will lose out. So flowers should be grown in a healthy environment with no residue or spots on the flower. It should have a good opening and good shelf life. So there are people reaching that level immensely and they deliver good flowers to Europe. If you go to Holland on a given day for a flower auction, the number of Indian flowers are almost negligible.

Today, they are not looking at Indian flowers at all. But APEEDA did build a market for Indian flowers with good controls and so the good flowers are really appreciated in the export market.

Is it possible to set up a profitable floriculture model in India only catering to the domestic market?

To set up a 5 hectare project of bulk flowers - carnation, rose and gerbera - there is lot of scope in the market. If your flowers are of good quality then it is just about being on a competitive level to carve out a section of the Indian market for yourself.

Today, flowers are not grown on a huge scale owing to less subsidies that are available. At the moment, there is good opportunity to set up floriculture projects.

What are the reasons for flori-entrepreneurs failing in India?

Projects that are successful are the ones in which the entrepreneurs are involved in the cultivation on a daily basis. Sometimes people know what needs to be done, but they just don't do it. It can be because of lack of infrastructure but many a times it is because of the lack of commitment from the entrepreneur. The entrepreneurs commitment contributes immensely to the success of a project. That involvement is a very important thing. It is not just about paying your dues in cash.

Are any of the initial Israel/Netherlands units of the 1990s still operational successfully?

Few of them are still functioning. However, there has been a huge overhaul in terms of how flowers are grown as compared to what we used to do in the 90s. People have become much more professional. Earlier, this was not so and then the growers depended on foreign consultants who were too new to the country's conditions. When you work in a country, understanding the cultural side also matters a lot. That was a very difficult start. Few of these companies have continued and they are doing really well. There are a few in Pune and Bangalore who existed from the beginning who are performing really well today.

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Manasa P Satheesh

Partner and CTO, BCX Bio Organics

What are the advantages of tissue culture crops?

To understand the advantages, it is important to understand the issues a crop faces. Let us take the example of banana because it is the most popular crop in terms of tissue culture.

1. Most diseases faced by the crop is transmitted through the soil. This is something that farmers aren't aware. No amount of fungicides or pesticides that they then serve will save the crop.
2. Crop rotation is not something followed in regions where banana is cultivated in huge amounts owing to the climatic, soil and market conditions.
3. Farmers do not mark the mother plant, productive and non-productive plants.
4. Plant offsprings are formed at different points in time and so growth is uneven.

The advantages of tissue culture crop are:

1. Disease-free crops: The crops are disease-free not disease resistant. Tissue culture norms are regulated by the Government of India. They are not hybrid or mutated plants. They are naturally grown. Some varieties are imported from other countries. It is cultured for the Indian climatic and soil conditions as per set regulations.
2. Uniform harvesting
3. Uniform yield
4. Good quality crops

Tell us about the pesticides and fertilizers you produce.

We produce organic pesticides and fertilizers which are certified by Controll Union. Innovatively, our products have organic carbon based nutrients. Our products can be used by farmers who

grow their plants organically or otherwise. Our formulae is based on bio char based compost. We hence increase the carbon, which is not present in other fertilizers today. Also these ranges are human and soil friendly. They don't mutate the pest and disease causing organisms which gives sustainable and reliable solutions at better working cost.

Do you have any expertise in coconut tissue culture?

In case of coconuts, we have to work as per the gestation period. If we work with growth regulators, the plant may appear to grow well initially but finally at the stage of hardening, the plant will not support the system. Hence, we have to understand the gestation period.

Farmers often complain about the G9 and elakkai varieties of banana. Your thoughts?

Yes, that is right. The input prices have shot up.

Although there are certification programmes in place for tissue culture labs and although there are many now, the experts are not so many. We have very less technically sound personnel. Nowadays, most of these labs just perform like a nursery business. They don't try to educate the farmers on doing things right.

Farmers should also know that they should always choose first grade plants.

Like I mentioned before, since diseases are transmitted through the soil, I encourage and recommend soilless farming. This way infection is better kept away. Also, the credibility of the company from where one purchases the saplings are of grave importance. Book and choose your saplings in advance and pick up your saplings by yourself. Do not leave it to the company to deliver it to your farm.

Can tissue culture be done for fruit



When majority of the world is focussed on problems in various fields, it is highly enriching to realise that Dr. Manasa Satheesh and her team began BCX Bio Organics - a solution-oriented firm.

Mrs. Manasa Satheesh, particularly specializes in tissue culture and fertilizer formula-tor.

“My expertise in tissue culture dates back to 2009. In 2017, we ventured into production of organic fertilizers and pesticides. We first test our products in vitro and then only do we resort to things like multi-location trials etc. We produce about 8 varieties of bamboo and have worked with about 114 species of plants.”

BCX Bio Organics is a team of environmentally focused agriculturists who strive to come up with innovative solutions for the agri-world. The team possesses more than 500 acres of plantations and work on carbon negative solutions. They encourage and practice residue-free farming.

“Today, my focus is into organic agriculture. We strive to guide farmers through the agricultural process. We also support them in marketing their produce as long as they are organic produce. We work with inorganic farmers as well if the produce is residue-free.”



trees as well?

Yes, it can be done. Having said that, I would advise going for grafted trees rather than tissue culture thinking of long term benefits and profitability. In grafting you take a part of the stem and plant it - the root being the old one itself. Grafting is best for fruit crops.

Tell us about the garden kit you have advertised on your website.

The garden kit is for people who are interested in gardening but lacks the knowledge to go about it. Our kit contains all kinds of things that is necessary to develop a kitchen garden including things required to keep those plants free from pests without the planter having deep rooted knowledge of pests. The things within the kit is absolutely organic so that they can produce residue-free products. We have made kitchen gardens an easy process.

Do you offer practical applications for onion formations and farming?

Planters very often are not aware of when to apply what inputs and to what plants. For example onions do not require much potash at all. That is the main cause for non-effective farming. We have step by step procedures to grow onion effectively which we can share. Planters can use this as a guide to plant and harvest effectively. We have similar procedures for tea, coffee, banana, pomegranates, papaya, timber, maple trees etc. We take care of 800 acres of tissue-cultured teak wood.

What other services do you offer?

We also suggest crops based on the soil and water of the vicinity. We also guide people to genuine places from where they can source their plants/plantlets. We have innovative solutions for correcting the PH of the soil. Most people use bore water due to lack of rivers or streams for irrigation. Owing to this, the PH levels of the soil would be 8.5 rather than 6.5. This is one reason why people begin pumping nutrients into the soil. We have come up with a very cost-efficient solution for correcting the PH level. It has replaced the use of limestone, gypsum etc. Our product increases soil aeration and increases the carbon content in the soil

as well. Farmers using our products have effectively brought down fertilizer usage by about 50%. People can approach us for any kind of agricultural issue they are stuck up with.

Do you have any marketing advise?

When you consider growing a plant, it is important to first understand the market for your produce before you plant it. For example, in the Mysore region Yellaki is what sells the most. In Karnataka the consumers usually go for yellaki banana. Whereas in Tamil Nadu and Andhra Pradesh, G9 sells well. Hence, unless you have a specific buyer and plan to package and transport effectively, if you grow G9 bananas in Karnataka you are setting yourself up for failure. G9 is also a good choice for exporting. So, if you are producing G9 in an area that doesn't have buyers for it locally, go for higher production like 5-10 acres. This way it is also viable for you to transport it to big cities where corporates like Big Basket, etc. will take it up and get consumers for it. G9 has a good shelf life in comparison with other species of banana. So, that helps.

What would you say is the prescription for good yield?

Prescription for good yield is it to know what exactly you are doing on your farm. Today most farmers are in a vicious circle. As soon as they see a pest or a problem, they go their fertilizer shop instead of an Subject Matter Expert (SME). The fertilizer folks, who are just waiting to sell their products, will sell inputs that is necessary and not necessary. This increases the farmer's production cost. This cycle keeps continuing. This makes it important to work with precision and awareness. It is also important not to damage the soil because that is the most important part of origin. It is okay to use calculated amount of soluble fertilizers. Using the wrong type and amount of fungicides and pesti-



cides is what attracts pest attacks like locus problems etc. that we see today. Normal creatures begin behaving in an irrational manner due to the undisciplined use of chemicals. Lack of awareness can become irrationally expensive and threatening in many ways than we can imagine. So, if not organic or natural farming, care should be taken to at least practice residue-free farming.

Any last piece of advise for our readers?

It is extremely important to rear the next generation farmers to think in the right manner. Also, every family should begin to become a contributor rather than just a consumer. It is important.

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Prabhu Shankar

Chairman, Uyir Organic Farm Market
Erode, Tamil Nadu



Talking to Mr. Prabhu Shankar and his team gives a positive and zealous vibe. What can possibly stop you from achieving success? Nothing.

A group of 16 organic cultivators cherished a goal of creating a market for their produce at competitive prices. Getting started is always the hardest.

“Initially it was very difficult. We began by meeting every Sunday and got our produce together to sell it. We started a simple market near Erode town. Gradually, we realized that we didn’t have any system in place. So, we decided to go formal and build an organic society. But since societies deal with a lot of issues, like members randomly joining/leaving, political intervention, etc. we collectively took the decision to start this as a Pvt Ltd company. Hence, the birth of Uyir.”

Then, there was no looking back. They then proceeded to promote their brand on Facebook, YouTube etc. To bring in work discipline they divided themselves into 7 teams.

“We formed 7 teams - digital marketing, accounting, farm visiting, purchasing, farm support, quality control and price fixing teams. Every team works separately and in collaboration with each other.”

Rs 2500/-. In a few months we saw small increases to this amount. All of us farmers then began doing door-to-door canvassing to make people aware of our brand.

We built our network also by visiting homes, participating in social functions like melas etc. We then formed a WhatsApp group on which we posted our produce information. On this group we also do things like interviewing our farmers etc. All this contributed to bring up our sales. Today, we do a per day sales worth Rs 1 Lakh.

We attained this in 3 years. Now, we have 7 branches at Erode, Coimbatore, Salem, Tirupur, etc. We also do online business through uyironline.in.

We aim at exporting our produce next year.

Do you sell to both wholesale and retail markets?

We do not sell our produce to the wholesale market. We work on a farm to fork basis. We realised that if a group of farmers decide to join hands and start a business with a brand, it benefits farmers and customers equally. We get a decent price and customers get good produce.

How did this idea come about?

We realized that all farmers need is a platform to confidently sell their produce. We farmers realized that we cannot sell our produce individually at a good rate.

Today I am a farmer, a transporter and I also jointly run a business too. By farming alone you cannot make a good life. It’s not enough to produce, we have to sell at good prices too and for this we need to own a business mentality.

In our group we have a few people who are business personnel as well. So, when it came to things like accounting and marketing we didn’t have to seek any consultancy support. If you have quality products, customers will flock around. It is very essential that quality of the produce is consistent and also to maintain your accounts clean.

How do you manage your payments?

It is important to have very clear and

strict policies in terms of payments and expenses. We have a strict policy of paying farmers every week.

Farmers whose sends produce to our warehouse by Friday are paid via bank transactions the following Friday itself. We don’t make cash payments and don’t sell anything over credit. Everything is done via bank transactions. Customers are also requested to make digital payments at the time of purchase.

We segregate our accounts into three - farm produce, grocery and value added products. We encourage value products so that farmers mitigate losses and make more profits. For value added products we extend the credit period with the consent of the farmers and ensure that we make the payment by commitment. This is our modus operandi. We also follow GST norms very strictly. We have registered suppliers and unregistered suppliers. Every registered supplier gets invoices for all the supplies that come in through them. We file our returns also on time.

Has branding benefitted you?

Branding has indeed helped us. Branding helps in marketing your product with confidence. But, you should also be strict about your quality controls. Quality has to be ensured right from sowing the right seed. Quality is the only path to ensure repeated customers.

Initially we only had a per day sale of



Have you registered your company as an FPO or Pvt Ltd Company?

We are a Pvt Ltd company. In 2016, the requisite for starting an FPO was to have a group of 1000 farmers. We couldn't network that many farmers at the time and so we opted to register as a Pvt Ltd Company.

We were 66 people who came together and began this venture. It included 80% farmers and 20% people who had experience from other fields as well.

Is the produce you sell certified as organic?

Yes, it is. In 2016 itself we went through the certification process. We complete three years since then this year and so we look forward to exporting as well. We had chalked out whatever we needed in the beginning itself and started all our processes at the initial stage itself. We also have a software in place into which farmers are required to register their produce. So, if somebody registers to farm tomatoes, for instance, our team will check who all have registered for tomatoes. If there is a lot of registration for a produce, we advise farmers to try and sow something else next season. Likewise, we strive to maintain a balance.

We have also a Minimum Supporting Price(MSP) in place due to which farmers are ready to trade with us and also turn organic.

Wouldn't the MSP vary with market conditions?

No, we maintain it at a constant. We plan for produce at the beginning of the year. Farmers bid for what they should grow.

What were some of the challenges you would have faced initially?

Our main challenge was to get the word out and make our brand known. Like I mentioned earlier, initially we only had sales worth Rs 1500/-. Everybody involved in the project decided to get friends and family to our store and then with word of mouth our brand picked up.

Do you deliver your produce only within Erode or do you deliver to neighboring towns as well?

We have shops in Erode, Tirupur,



Coimbatore and Salem.

We also trade through uyironline.in. We have tie ups with professional courier companies who delivers of us throughout India.

Do you have farmer members and non-members as well?

We have 66 organic farmers registered with us. We only register farmers who do organic farming. We have farmers who have land holding from 5 acres to 300 acres as well.

We also have a society set up in every district through which we encourage farmers to join us provided we are convinced that they are organic cultivators. So, other than produce from our 66 farmers, we also get produce from these societies.

What is the registration process for a farmer to join you?

Through our societies we do soil testing etc. If the land has been used for inorganic farming, we advise them to mulch their soil and get it to condition for a year. When the soil is ready they can join us.

How do you come up with the amount of each produce you will need?

We have a software solution for that. We feed our sales data into the software. To that we project a 20% for each produce. That is the demand data we work towards in the upcoming months.



We plan 5 months in advance and this data is looked into regularly. We increase our branches with the increase in products and demand.

Do you collect data only from your store or from neighboring stores as well?

No, we only check the data of our store because we are the highest selling store in Erode, Coimbatore and Tirupur. We do an approximate sales worth 1L everyday per store. Our rates are also very competitive.

How did you foresee the demand when you started this initiative?

Initially we were just 66 organic farmers and we sold our produce through other sources at the time. Gradually we decided to set up our store where we only sold part of our produce. For instance, if we had 100kg brinjal to sell, we would only take 2 kg to our shop. We kept tracking our sales and started full-fledged when we believed we were ready.

Have you have adopted zero budget natural farming promoted by Subhash Palekar?

We have adopted Nammalvar's farming methodologies.

Do you network with farmers from outside Tamil Nadu as well?

Of course! We are ready to join hands with farmers from other states too. We get wheat from farmers in Madhya Pradesh and North Karnataka as well. These farmers are part of our programme through the societies we have there.

How do you ensure that all farmers whom you associate with produce organic products?

Farmers are allowed to join us only after we inspected their fields and were convinced about their cultivation methods. We visit even their storage yards and houses to check for farm inputs that they store. With all the experience that we have, we understand once we are on the farm if they are organic or not. If in doubt, we send their soil for soil testing etc. We have labs in Chennai and Hosur where we keep sending samples



Dairy

for testing. That is how serious we are about the produce we source.

In rural areas farmers are not capable enough to get their farms certified because neither are they aware of such processes nor can they afford it.

The Central Government has a body called ATMA who encourage organic farming by supplying farmers with agricultural machinery, equipment etc. We also check with them to make sure that these farmers employ organic methodologies.

Shouldn't farmers who have an organic certification get a better price than the ones without it?

That is right but with the organic farming techniques that is prevalent today have really brought down the cost of production. We have techniques that give you more output than the chemical farming. The concept of organic food being costly is gradually being erased. We have priced our products only slightly higher than the market prices unlike the usual 200%-300% above market price. We do this so that organic produce is affordable by common man as well.

With our MSP we ensure that the farmers entrusting us with their produce is not at any kind of loss. For example, even when the prices of tomatoes fell to Rs 5 per kg during harvest season, we paid our farmers Rs 20 per kg.

We keep our customers also acclimatized about our pricing patterns and farming practices. Likewise, even when market prices skyrocket; for example Rs 100 per kg for tomatoes, we sell it at Rs 80 per kg. Our farmers readily accept this because we ensure they are not at a loss during downfall prices. Hence, A balance is maintained.

What is your advice to farmers?

Farmers should take marketing into their own hands. Be systematic, organized and consistent in quality.

Get into groups to ensure that you have at least 200 - 300 products to give away because nobody would want to come to a store to buy just a thing or two. You should have a range of products.

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Kailas Ramasamy

**Managing Partner
Vrindavan Dairy LLP**



After 20 years of toil in the software industry, Mr.Kailas Ramasamy decides to return to his roots – not just in shift of place but in profession as well.

"Since childhood I enjoyed working in the farm and grazing cows. After school, this is what I would do. So I was always inclined towards that kind of life. I spent a good 20 years in the software industry and then I decided to get back to my roots and do something that I love."

It is remarkable that Mr.Kailas has made good use of the skills one hones from the software industry like collaboration, negotiation, leadership, employing technology etc. He just doesn't set an example by doing what he loves. He also works with other dairy farmers, encourages them to rear desi cows instead of hybrid varieties and collectively they succeed.

"Initially we worked with one farmer and educated him about why cows shouldn't be sent to the open market etc. We feel cows are like mothers and they shouldn't be abandoned after their milking period. Then, I just gradually got merged into this life and this profession. Our main intention was to protect and promote desi cows."



Tell us about your dairy farm?

My farm is located at Chittor, Thirupati. This has been a passion I wanted to pursue. I was quite interested in desi cows. So, I purchased land near Chittor Tirupati. We have about 3 and half acres of land here. Initially I got two small desi cows and gradually added more cows. Currently, we have about 12 cows including calves and bulls. Here in this farm, we grow our own organic fodder. We don't use any chemical pesticides but use the cow dung and cow urine from our farm to grow the fodder. We pretty much do everything here.

It is essential that a dairy farm is equipped with good infrastructure. We have a decent cow shed in which the cows are tied. During the day they are tied outside and we have land where they are left to graze. Our cows are not tied in one space. Here, they have enough space to move around. Cows need that.

We also grow our own fodder, which is very important to have at a dairy farm. Buying fodder from outside will prove to be expensive. We grow native grass, maize and we have dry stock like ragi grass, etc. We feed our cows with 60% green fodder and the remaining 40% we do with dry fodder. We also have naturally formulated cattle feed. It is a mix of different grains, wheat husk, etc.

We use the cow dung and cow urine we get from the dairy farm to grow the grass. We have a pit to collect the cow dung and urine. It is all washed into a pit. When cow urine mixes with the soil, it produces a lot of micro-organisms. After a week of collection, we have a slurry motor which is connected to a borewell line. We switch on both the motors and feed the farm with water and cow urine. Cow urine is very effective and so we don't need Urea or any fertilizer to grow our fodder. For the past 6 years we have been using only cow urine to irrigate our farm and grass grows very well.

In this farm I have two kinds of cows - Gir cows and Kankrej cows. These are from Gujarat. In India there are about 37 types of desi cows. Each state has its own breed of desi cows. Gir cows and Kankrej is known to give more milk. Three cows out of 12 are milking. We

have our own bull - A Gir and Kankrej for breeding. We don't use AI because it is not a very effective method. The offspring born out of artificial insemination is never very healthy. Hence, the bulls on our farm.

On my farm, we of course have milk but we don't focus on it much. We get other farmers to supply a lot of milk for us. In this farm we focus more on breeding and so we want the calves to have as much milk as they can. We focus on the cow urine and cow dung. From cow urine and dung we make a different types of organic fertilizers. We compost the dung for a few months and sell the manure to people who do landscaping or gardening etc. Other than irrigating our farm, we also sell cow urine in bottles. People buy it for various purposes. We also make dried cow dung patty which is used for homas etc. It is also quite common to burn it in some ghee to cleanse your home environment. We promote this dried cow dung cakes a lot.

We are planning to make other desi cow products like distilled cow urine, agarbatis, soap etc. Hence, milk is not the only thing you can sell from a dairy farm. There are plenty of opportunities and these are profitable too.

Why desi cows?

Desi cows are quite native to India. For thousands of years, they have been part of our farming culture. In the last 50 years owing to White Revolution, desi cows slowly began getting replaced with imported hybrid cows. This was to churn more milk. At that time, farmers weren't aware of the uniqueness of desi cows and how they can be of help to farmers in multiple ways.

In the recent years, studies revealed the unique properties and supremacy of desi cow milk and milk products. Desi cows milk have A2 protein, which is quite essential and good for health. Hybrid cows' milk has A1 protein which can contribute to long-term side effects like diabetes, heart diseases, etc. Owing to health benefits, desi cows are getting popular again. I do my bit in protecting cows and help farmers procure desi cows.

We also have a dairy company where we collect milk from various farmers, chill and package and distribute it to cus-

tomers in Bangalore. We are a group of around 200 farmers who work together. We also do other dairy products like curd, paneer, ghee, butter milk etc.

What does your farmer community do?

The farmers in my community are highly traditional farmers from rural villages. Most of them do not have Gir cows. They have Hallikar cows and some have Malnad Gidda and Amrit Mahal. Hallikar cows are multipurpose cows. They can work in farms and give you milk. They are highly sturdy cows. We work in these farmer communities



in order to help each other in terms of marketing the milk etc so that they don't switch to non-desi cows for the need to produce more milk. So we find different ways to support each other.

Is it true that Gir cows are not the best choices for Bangalore?

In my experience Gir cows do well in Gujrat. When they are brought to Bangalore, their milking capacity falls, drastically. For example, in Gujrat a cow that milks about 10L, will only milk about 4L when in Bangalore. The main reason should be the weather.

I have Gir cows in my farm because I am personally very fond of them. They are very human friendly, I feel happy with them around. Research also say that Gir cows has more micro-organism in their cow dung and urine. So, it is more effective in running a dairy farm if you are interested in growing plants etc.



Dairy

Is the milking high when in Gujrat perhaps because of some unique farming practices done there?

I think it has got to do with the weather because Gir cows thrive well in hot and humid conditions. I have also seen some cows in Tamil Nadu giving more milk yield. That is how I concluded that this has to do with the weather.

It can also be due to the fodder. In Gujarat I think they use a different fodder. They don't use maize and the grass that I feed the cows here.

Do you use mineral blocks?

We don't use mineral blocks. We use mineral rock instead.

How has the trade off been, given that you hail from the IT industry?

It has been a good experience so far. Like I mentioned, this life is not totally new to me. So, dairy farming and everything about it brings me joy. I was also very interested in working for cow protection. We feel cows are like mothers and they shouldn't be abandoned after their milking period. Likewise, I gradually got merged into this life and this profession. I was also particular that my farm becomes self-sustainable at the same time. We don't want to go for donations, etc. So, we began sourcing milk from dairy farmers and marketed it about 6 years back. That is how we evolved.

We now have a plant near Varthur, Bangalore where we chill the milk, pack it, make other dairy products etc. Unlike in the software industry I have to deal with people at multiple levels from farmers to agents etc. You get to deal with dishonesty and many other hurdles. But so far we are gratefully doing pretty well. In the near future we are looking towards having better infrastructure and automation in place so that business can run with hardly any intervention. It is very fulfilling and I am very happy despite all the challenges.

Have you considered Neem trees on your farm for shade?

That is something that I am looking forward to doing. We are figuring out which trees to grow and yes, Neem is a good suggestion!

What feed composition would you suggest for desi cows?

In addition to green and dry fodder,

there is the need to give them cattle feed for better protein. So, you can give them wheat husk, rice husk, oil cakes - groundnut oil cakes are recommended or cotton seed oil seeds, you can also give horse gram if you can afford it, etc. We manufacture natural cattle feed on our farm with nil chemicals with 7 types of grains and oil seeds.

What is the cost of cows and calves?

Gir cows are slightly expensive. Good Gir cows will cost you Rs.80,000-1L. Finding Gir cows in Bangalore is difficult. Most farmers who have it won't publicize it. I got them from Gujarat. I went to Gujrat and purchased cows from there. You can look for cows from different farmers there. Look for a good bloodline. Over there you can get the cow at the rate of Rs.50,000- Rs.60,000 per cow and add another Rs.15000 per cow for transportation. Calves are difficult to get. Most farmers won't sell calves. I also haven't bought calves. So, I don't know the price of calves. People sell pregnant cows though.



Which cow breed is the best for Bangalore weather conditions in terms of lactation?

I hear that Sahiwal does best if your intention is to milk and sell milk.

Given the cost, how can an ordinary farmer keep and maintain desi cows?

Gir cows can prove to be expensive. But farmers can always go for local breeds to cut costs. Hallikar, for example, is a local breed cow and is not expensive. You can get a good Hallikar cow at about Rs.40,000. There is of course a milking capacity difference between Gir and Hallikar cows. I work with a lot of local dairy farmers in Karnataka and acquiring a local breed cow is not difficult.

Have you taken in any special training before you started this venture?

I had the basic knowledge because I grew up in a farming background. But if you are interested in desi cow rearing, you don't need to go through any training. Find a good desi cow farm, check with the farmer and stay with them for a few days. That is the best, effective way to learn - on the job. In training programs, you get to learn a lot of technical things but you don't get a practical picture at all.

How much does the medical expenses on your farm amount to?

Medical expense for desi cows is very low compared to hybrid cows. In my farm, we administer FMD vaccines once a year because desi cows are also prone to Foot and Mouth disease. That is all we do. Otherwise they don't require treatment usually. You need to be careful about mastitis. It is a disease that develops in the cow's udder. If your farm is clean, that is automatically taken care of. Keep things natural and the shed and surrounding places clean to avoid such diseases. That will keep the medical expenses to a bare minimum. In general, desi cows are more sturdy, disease resistant and hygienic than hybrid cows.

How would you advise a new farmer venturing into cattle rearing / animal husbandry?

I have many people who come to my farm with the same dilemma. My advice is if you are really passionate about desi cows, you start with one cow. Even before you do that, find a good farm and spend time there. Help them out with chores etc. so that you get used to that kind of life and you see it close. Spend a few months with them so that you get the flow of things. Then gradually, start your venture with one cow. Always start small and build things up. That way you will learn and also build your farm with your confidence.

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Dr. Vikash P S Bahdauria

Assistant Comptroller, Rani Laxmi Bai Central Agricultural University, Jhansi



Please tell us more about CIBRC.

There are many divisions under CIBRC - Bio-Efficacy Unit, Chemistry Unit, Medical Toxicology, Packaging and Labelling unit, Legal unit and administration. Any pesticide related registrations can be taken under two broad categories of registration viz. under Section 9(3) and 9(4).

9(3) New Registration: 9(3) is all about original registrants, i.e. if there is a new pesticide invented or new pesticide prepared, new formula developed or new technology imported/exported. This registration is for products or sources, which are not registered in India yet. Any first time registration of a molecule or of a source will be under this category. To register under 9(3) you need to submit all kinds of documents - bio efficacy documents, a complete chemical analysis of the product, medical toxicological data, the packaging and labelling information, legal documents concerning the new product/formula, etc.

9(4) Me-too Registration: This is for product and source, which are already registered in India. 9(4) is the easiest method of registration.

How does CIBRC conclude and give away the certifications?

Every month the CIBRC has meetings during which they decide which products need to be registered and which needs to be rejected or resubmitted after some clarification. The CIBRC publishes minutes of meeting indicating the rejected and approved list of products on their website along with the reasons for a product to be approved or rejected from being registered.

How does one begin the registration process?

It is an online process. You need to submit a form online. Go to CIBRC website, and submit your application. There are no offline form submissions possible.

Is it the same process for bio-pesticides?

Bio pesticides are also registered under

Dr. Vikash who is the assistant comptroller at Rani Laxmi Bai Central Agricultural University has 2 years of experience in Registration and Regulatory Affairs of Pesticides / Insecticides. He comes with rich experience in terms of Pesticides formulation development and has been associated with Institute of Pesticides Formulation Technology, Gurugram. Dr. Vikash Bahdauria brings to light the nuances on the Registration and Regulatory Affairs of Insecticides / Pesticides / Biopesticides.

“The Central Insecticide Board and Registration Committee (CIB & RC), Faridabad is the institution that deals with all registration issues of insecticides, pesticides and bio pesticides all over India. For any kind of pesticide work you begin, you need to seek permission from CIBRC. CIBRC is a department that features under this called Directorate of Plant Protection, Quarantine and Storage, Faridabad (DPPQS) that come under the Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare.”

CIBRC itself. This one will only fall under 9(3). It doesn't feature under 9(4). 82-85% of the pesticide and agro-chemical industry depends a lot on China. So, right now this industry is much affected due to the prevailing conditions that China is going through. Hence, there is a lot more focus nowadays on bio pesticide usage and is being highly promoted. It is also environmental friendly and is going to be of high value in the coming future. The regulatory board will also go slightly easy with the registrations of bio-pesticides. Bio-pesticides are only registered under 9(3). So, you have to only submit chemistry data for registering bio pesticides. Bio efficacy and toxicology data needn't be submitted for already registered strains.

What is the difference between pesticides, insecticides and bio pesticides?

Pesticide is a broad category under which herbicides, insecticides, bio pesticides, etc. get featured.

With farmers' interests leaning towards bio-pesticides, how do you think pesticides etc. will fare?

Usage of bio pesticides are being highly promoted by the government these days. All registration difficulties that used to be related to bio pesticides has been eased out by the government. Like you said, there is a shift occurring towards organic farming these days. This is not an easy feat to achieve. Farmers do not easily adopt this methodology. There are farmers who are educated and also the ones who think diligently and want to try new things.

Does Jeevamruth feature under bio pesticides?

There are several different kinds of jeevamruth available in the market these days. If the one which you are using is registered under CIBRC, it is a bio pesticide. So, it is good to check. There are some companies making jeevamruth. There are so many versions of it. There are soil health enhancers as well. But to use those you do not need special permissions.

How strong are these rules and regulatory boards in India?

It is very strong indeed, but most people use pesticides etc. without awareness of these registered protocols, and when there is a problem, they come to know about it. Regulatory boards should have a wide-ranging awareness campaign about using pesticides.

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Sericulture



Successful Rural Enterprise for Self Reliance

Silk is the unique natural fibre that is regarded as the Queen of Textiles. It is a high value, low volume, luxurious product. Asia is the main producer of silk. India is the second largest producer of silk, after China and also the largest consumer of silk in the world. Silk production is a labour-intensive and high income generating industry that churns out value added products of economic importance and earns foreign exchange.

There are five major types of silk of commercial importance - Mulberry, Tropical Tasar, Oak Tasar, Muga and Eri. While Mulberry silk accounts for over 80% of silk produced in the world, other types of silks, collectively known as Vanya silks in India are wild in nature.

India is the only country that produces all the known varieties in the world and Muga silk is endemic to Assam. In India, mulberry silk is produced mainly in the states of Karnataka, Tamil Nadu, Andhra Pradesh, Jammu & Kashmir and West Bengal, while the non-mulberry silks are produced in Jharkhand, Chhattisgarh, Odisha and north-eastern states. During 2019-20, the country has produced 36151 MT of various types of raw silk (Fig. 1)

Sericulture – Farmer’s friend

Sericulture is an agro-based industry with a high employment potential. It comprises of food plant cultivation, rearing of silkworms that spin the silk cocoons and reeling of the cocoons for unwinding the filament for making fab-



M N Ramesha
Former Deputy Director

ric. Sericulture provides vibrancy to the village economy and rural mass can always depend on sericulture for regular income. It generates high income and women-friendly opportunities. It is an ideal project for weaker sections of the society owing to its low investment. There are no pollutants involved and so it is highly eco-friendly too.

It is estimated that 8.6 million people are engaged in various activities of sericulture in our country. It generates an estimated 11 mandays per kg of raw silk produced, inclusive of both on farm and off farm activities. No other industry can generate this kind of employment in rural areas with such a minimum investment, specially in rural areas and hence, sericulture is used as a tool for rural reconstruction.

Low Gestation, High Returns

Sericulture is an avocation which the farmers can practice alongwith agriculture. Mulberry plantations take only 6 months before the farmer can

RAW SILK PRODUCTION IN INDIA 2019-20 (MT)



Fig 1 :
* Provisional, Source : CSB



STAGES

- Mulberry Cultivation
- Silkworm Seed Production
- Silkworm Rearing –
 - Chawki Silkworm Rearing
 - Late Age Silkworm Rearing
- Cocoon Harvesting and selling
- Silk Reeling
- Twisting, dyeing and allied processes
- Weaving
- Marketing

Women-friendly industry

Sericulture is more of women-oriented activities. 60% of rural women are involved in sericulture activities. This is mainly because mulberry garden management and silkworm rearing requires smooth and careful handling which is best done by women. Even at the post-cocoon sector, silk reeling and weaving industry activities are also handled mostly by women.

Support available

A lot of technical and financial support is offered by both the State and Central governments to the stakeholders of sericulture industry. Central Silk board has extension centres in most parts of the country. Training programmes to learn/practice sericulture and silk activities and also to upgrade the existing skills are provided by States and Central government agencies. NABARD and nationalized banks extend financial support under various schemes of the government (Table 1).

Several Subsidy schemes are available to the stakeholders to adopt new technologies, machines and other facilities. The subsidy pattern is such that farmers need to spend only a small portion of money. For example, in case of rearing in Karnataka, a farmer needs to spend only about 25% of the cost. The State and Central governments are supportive in this matter and farmers can approach the officers of extension centres of these agencies in their village or districts to gain support as per their requirement and capacity.

start silkworm rearing. Mulberry once planted and maintained well can go up to 15 - 20 years. In normal Indian conditions, farmers can take up to 5 crops a year. If he is able to adopt new practices and technologies as per Central Silk Board recommendations and can have 2-3 levels of garden, he can make better profits. For an investment of Rs.15000/- per crop, excluding land, labor and rearing space, he can take care of one cycle of the silkworm in an acre of irrigated land. The pre-requisites to be a successful sericulturist are land to host the mulberry garden, water - bore well or an irrigation facility, rearing house and rearing equipment to rear the silkworms and training in latest technologies of sericulture.

If a farmer has one hectare land, for example, of mulberry garden with irrigation, it will take about 1.5L to maintain the garden. Silkworm rearing will cost about 2.8L. Total cost of production will come up to about 3L. This unit enables the facility to grow about 2000 DFLS of silkworm (2500 DFLS in case of cross breed). One DFL will have about 40,000 worms. If the process is diligently followed for 25 days to one month, the income generated will be about 1.89L in case of cross breed and about 2.35 L in case of biovoltine breed. The net cost benefit ratio is 1.61L for cross breed and 1.76L in case of biovoltine. With the adoption of the latest technologies available today, almost 90% of success is assured in silkworm cultivation.

Table 1 : SILK SAMAGRA SCHEMES

Pre-cocoon Sector	Post-cocoon Sector
<ul style="list-style-type: none"> • Development of Kissan Nurseries • Mulberry Bush and Tree Plantation Development • Irrigation /Water Conservation methods • Construction of Rearing Houses • Rearing Appliances/Equipments • Support for Prophylactic Measures • Chawki Rearing Centre • Adopted Seed Rearers • Adopted Private Graineurs • Establishment of Basic Seed Production Units in Vanya • Production units for Biological inputs/Door-to Door Service of disinfectants/poly clinics 	<ul style="list-style-type: none"> • Motorized charka, Up-gradation of cottage basin/domestic basin • Establishment of Multi-end, Automatic Reeling Units, Automatic Dupion Reeling/ twisting units • Establishment of Eco-Degumming Machine, Pupae processing units, • Support for various types of improved Vanya Silk Reeling, Twisting and spinning Machineries • Services of Master Reelers / Technicians • Electrical, Multi-fuel, Conveyor hot air driers • Modified Region Specific Silk Handlooms, Loom up-gradation through Jacquards, Pirn winding and other equipments, Pneumatic Lifting mechanism • Electronic Jacquard (480 hooks) with Pneumatic Lifting mechanism, Computer Aided Textile Designing Unit (CATD), Common Facility Center (CFC) for silk yarn dyeing and fabric processing • Effluent Treatment Plant (ETP) and Fabric Finishing Units



Sericulture



CENTRAL SILK BOARD

Central Silk Board is the apex organization in India for the overall development of sericulture and silk industry. It was one of the earliest commodity boards constituted by the Union Government in 1948. The responsibility of planning and development of the sericulture industry at the national level lies with it. The Central Silk Board has R&D organizations and extension centers all over the country. Sericulture is a concurrent subject in the Constitution. The research and developmental activities as well as basic silkworm seed production/supply is taken up by Central Silk Board whereas the extension activities are taken care by the state sericulture departments. So, there is a close liaison between central and state governments for the overall development of the sericulture industry.

New concepts for farmers

The CSB research institutes, besides their main research of development of new high yielding varieties of host plants and silkworm breeds, will regularly be working on development of newer, cost-effective and time and labour saving technologies and equipments/tools for the benefit of sericulturists including the required disinfectants, pesticides etc. Villagers, especially the women, are also encouraged to have self help groups in their villages and incorporate these activities and become self sustainable. Chawki rearing is a new concept wherein farmers can rear younger silkworms for 10 days and

can supply the growing silkworms to farmers. This is one of the latest concepts which is very popular in Southern India. Farmers are also relieved of rearing young silkworms in their houses. In this, young silkworms are reared using latest technologies and crop success is almost 100%. A new concept of adopted seed-rearers is also going on in Central Silk Board where they will handpick seed rearers, give special training and support with latest technologies. Silkworm cocoons



grown by these adopted seed rearers will be taken up for basic seed purposes which fetch them a premium price. This has benefitted many.

Training

Central Silk Board and state sericulture departments are offering both academic and vocational training programmes in different centres across the country. Entrepreneurs may acquire the technical knowledge and knowhow by attending to such training programmes. India is one of the main centers to offer training programmes for Asian and other developing countries.

Conclusion

Thus, Sericulture can be practiced even with very low land holding and by adopting stipulated package of practices, a farmer can attain a net income levels up to Rs.30000 per acre per annum. It is also an ideal programme for weaker sections of the society and women in the rural India which not only assures regular income but also promotes self employment. For any details and guidance readers may contact the nearest

Eri Silk

Eri silk is grown in the North-eastern region. Here, the silkworms grow on castor. The worms after they come out of the cocoon, become butterflies in their natural lifecycle. The cocoons are processed subsequently. Eri silk is not reeled - it is spun like cotton, while all other types of silks are reeled to get the silk yarn. The whole process of spinning is different. Eri silk is like high quality cotton. It has a unique market due to its affinity to dyes. There has been a lot of research into Eri silk and diversifying its product range, especially for the export market.

centre of state sericulture department or central silk board or visit www.csb.gov.in

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Photo/data courtesy : Central Silk Board

“At Shresta Seeds we breed, process and sell vegetable seeds. We also provide consultancy through agriproject-consultants.in. We hand hold and support all horticulture projects as well as open farming.”

Agriculture was originally considered as a way of life in our country. That was a different time. Today, it is a business and so it is important to focus on higher profits. The investment connected with these projects keeps on rising. Once there is an investment in place there should be a higher ROI also.

Mr Anil Patil, through his consultancy firm and Shresta Seeds, strives to help to make farming a profitable business.

“Like in any business, if all the parameters connected to profitability are managed, profits can become a reality. As a consultant, I first look at the conceptualization of the project after which we go into a detailed project report before plunging into execution. I always plan on structuring a minimum of 35% ROI.”

ANIL PATIL

Managing Director, Shresta Seeds Pvt Ltd



his article is excerpts from the online interview held with Mr. Anil Patil

What are the issues that Indian agriculture faces today?

1. Land Holding: In the Indian condition, the land holding is comparatively smaller, which means area of production is less. To overrule this issue, efficiency should be sharpened. Hence, per unit production should become higher.
2. Labor issues: This can be sorted out if you plan on using labor all around the year. Labor issues crop up when you involve labor seasonally. Labor problems can also be tackled through mechanization and automation, wherever possible. You can also consider sharing resources for which you can approach Agriculture service centers authorized by the government of India who hire agriculture machinery.
3. High Investment: To reduce cost of production, one should reduce wastage. So effective utilization of inputs is an absolute must. It is important to understand soil conditions before deciding on the inputs.
4. Pesticides: Pesticides chosen should be appropriate and good quality and should be fed to the plants at the right timely so that it is effective. There are people who opt for organic farming and have come up with self sustaining models which helps farmers to manufacture their own pesticides.
5. To curb water wastage, everybody should ensure that every drop of water that falls on your ground is absorbed by the soil and made available to the plants, with no soil run off so that water is harvested effectively.
6. Seeds: It is highly influencing factor of production towards profitability. Different breeds of seed have got different capabilities. Select the correct variety depending on the need so that it works in your favor.

7. Irrigation methodology chosen should be efficient and effective. Irrigate considering soil type, texture, water table, season, temperature, evaporation losses and plant type. Do not over and under irrigate the soil. Excess water also can lead to lower yield. Excess irrigation washes out/leach fertilizers provided at the root zone.
8. Knowledge and common sense: For example, if you are cultivating plants like tomatoes under high temperature, pollination will not take place which will, in turn, reduce yield. Hence, basic knowledge is much required on agronomical aspects.
9. Pests: Opt for integrated pest management.

What is integrated pest management?

Understand lifecycle of pests to counter it is very essential. Pests breed, multiply and thrive in certain temperatures and humidity. If that factor can be changed using technology or choosing the right season, pests can be controlled below economic threshold. If the leaves are dry and the plant is healthy, the cuticle- the upper surface of the leaf will be thick and more waxy, this will prevent any entry of fungus or bacteria and also insects attack when plant's turgidity level is optimum.

Understanding the breeding place of these pests is an important aspect. It can be inside or outside your field. Your farmyard manure pit can be a source where some of the insects multiply. It can be over bunds and borders on boundary trees where they may be multiplying. They may be resting or hibernating in soil.

All these put together contribute to integrated pest management along with proper use of pesticides. Pests can be overcome by using light traps, sticky tapes or employing crop



Seeds

friendly organisms to counter it. One can use catch crops also. Opting pest resistant crops is a good way of managing pests. Humidity is another important thing one should be wary of. At the break of dawn, at about 3-4 am is when fungus spores spout and enters the plant. That can be controlled by keeping the humidity around plants lower and leaves dry. This is true especially for green houses. Traditional green houses are totally covered on top which increases the humidity inside the green house. Modern technology has brought in polyhouses with retractable roofs that open up at the night to keep humidity under control.

How can marketing of agricultural produce be made more effective?

For marketing to be effective, post harvest activities should be strictly adhered to. Once harvested, produce needs to be passed through cold water bath to remove field heat. It can then be kept in cold chain, if required. If you store it in cold storages, take care to transport the produce in refrigerated vans to the market. You can also pack them in plastic bags along with nitrogen, ozone or vacuum to preserve the perishables.

Excessive produce can be preserved and converted into value added products so that there is less wastage and more profitability. Government offers up to 70% subsidy for investing into such processing units. FPOs can take initiative to bring in such processing units into their taluks.

With simple marketing techniques, farmers can ensure better profits. For example, vegetables are sold at say Rs.8-or 9/- or lesser at farm gate. On the other hand, the consumer buys the same produce for Rs.30-40. Now, on the other hand if you put in some more amount for transportation and marketing, you can sell your produce at your own retail outlets at higher prices. Farmers should come together and ensure that retail chains are formed by FPOs for better income.

Then, there is financial management which is something that is overlooked. Financial management comprises of deciding the crop, high yielding varieties of crops, etc. that one has to take into consideration for producing qual-



ity produce and better profits.

I often suggest farmers to have a retail outlet of their own. This can be done by single farmers or by a groups of farmers. This way middle men are avoided and instead of paying them, you put extra little amount into your store and make it a success. This is the best that I can suggest. But there are many other alternatives to improve your profit.

Are there any short-term courses to understand farming?

Apart from agricultural university courses, there are schools that give supervisory training. In Lal Bagh, Bangalore they have a training center as also at different taluk level schools. There are small private organizations where they teach hydroponics but not general farming. As agriculture is a vast subject, short courses are not very effective. The best and effective method would be to get in touch with a farmer, work on their fields and get some hand holding from him. This will be learning on the job, which is the most effective. But one may not learn the basics and science behind in proper way.

What are your professional charges?

That depends on what you need. If it is only a visit and support it is Rs.5000/-. You may require 2 visits per month for ongoing support. Every farm should be planned, designed, structured for success and profitability. The aim should be 35% ROI. So professional charges will vary depending upon the service opted. It can be conceptualization, prefeasibility report, detailed project report preparation, loan syndication with banks, vendor selection, staff recruitment, execution supervision, growing support, process audit at pre fixed interval etc

Do you help with marketing?

In terms of marketing we are putting in a collaborative effort because we see that the market is quite fragmented. To go into deeper zones /regions where the product might work, we need to have collaborative efforts. Being into this field for about 4 decades, we are trying to create a market for other complimentary start ups as well. The problem and the solution that we are looking at is not to just work for one organization.

There is a lot of spraying done in today's agriculture which is abusing the soil and environment. What are your thoughts?

The spray that you are going to use on leaf must be always lower in quantity and that should not harm the humans. Sometimes, people drench the soil to control soil borne pest. They give the soil a pesticide bath. That is around 100 to 200 ml of chemicals poured to the root zone. That renders a lot of damage to the general soil flora. That is why I promote integrated pest management in which we suggest using things like neem oil cakes, using catch crop, light trap, sticky tapes, crop rotation, pest resistant varieties. The oil cakes has the capability of acting like fertilizers and anti-fungal/pests agents. When it comes to treating the plants, you should use the right quality pesticides, in correct concentration and timely application with proper periodicity so that only the required concentration can be used effectively. If you are using an inferior quality pesticide, one has to use double or triple quantity. Furthermore, you can employ other plant friendly organisms that eat the pests. If you plant mustard in the field, it will catch all the aphids and only

the mustard crop needs to be sprayed. Similarly if you have marigold in your field, it catches the nematodes in the soil and holds it in the root system of the plant.

rate of Rs 70-80 /kg. So, before you choose your crops, research on the price is of utmost importance.

Do you provide any buy-back agreements with your clients?

Buy back guarantee can be provided only by those who market products. For example, Metro, Big Basket, More etc. Even they will have a clause that they will buy from you only based on what they need. We give marketing ideas but not buy back agreements. Buy back is given by firms requiring a particular produce for a long term. They enter into contract farming. For example producing tomatoes for Kissan, gherkin processing units, seed companies etc.

Piece meal consultancy generally fails.

How do you keep up with consultancy requests across the country?

My services are similar to services of a surgeon. When we go to a surgeon we wouldn't want his assistant to operate. we go to him for a reason, his experience, skill. The reason behind this is that each expert has his own logic and his own reasoning for his approach to farming. So, I generally operate in person as consultant throughout India. Having said that, we have local supervisors at the site and I will give that person necessary instructions and that person will need to perform farming requisites based on my inputs. That way we keep things in control. The supervisors on the farm are well



What is the minimum investment required for a processing unit and cold storage unit?

Investment depends on various factors - the produce, the volume of the produce, how much automation do you want to bring in, type of processing, economies of scale etc.

In agricultural crops processing besides capital cost, operational cost proves to be huge. Example, if you invest 2-3 crores in a mango juice factory, you will need a working capital of 10 crores. So, this is something that needs meticulous planning and research to arrive at the cost involved. Anyway, to quote a figure you will need about 4-5 crores capital investment and about 4-6 crores of working capital.

What combination of vegetable crops would you suggest for cultivating on the outskirts of Bangalore?

All vegetables are equally important. One should check which of them are sold at a good price. For example, the traditional bitter gourd is sold at the rate about of Rs.40/kg. Then there is a chu chu version which is sold at the

Have all the projects you have undertaken been successful?

For anything to happen, all elements should come together in the right manner. If there is any gaps, the project becomes a failure. So, it is the ability of the entrepreneur or the farmer to put things together. Some people end up compromising and cutting corners and this shows up in the results. For example, some people do everything but don't fence their farm. They end up bearing losses. It is very important to go in for services of good consultant from conceptualization stage, even before buying lands and continue his services even when growing crops.

skilled and experienced people in farming operations.

Do you get into any kind of MOU with your clients?

No. My clients' success is my success. No document can make that commitment stronger or weaker.

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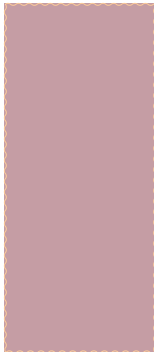
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Spirulina

Dr. Murugan Thiraviam

Founder, Namday Spirulina Consultancy Services



His research thesis for Ph.D in Medical Microbiology was on the exploration of medicinal value of Spirulina. Since then he has had a strong bond with Spirulina. Dr.Murugan Thiraviam has also founded Namday Spirulina Consultancy Services.

“Under my guidance, about 250 farmers are getting trained and they have begun their business which is running quite successfully. I published more than 10 research paper on spirulina cultivation and exploration of medically important bioactive compounds. Also published 3 books on spirulina cultivation(2 in Tamil and 1 in English) I offer support during the production and sometimes even in marketing the products.”

How is Spirulina cultivated?
Cultivation of Spirulina is quite easy. It is formed from water stagnation.

To produce it commercially, we construct 4000 litre 20x10 tanks. To this we add 16 gms of sodium bicarbonates. We then need to add a nitrogen source like sodium nitrate or potassium nitrate. I recommend potassium nitrate as sodium nitrate can sometimes get toxic. We also need ferrous sulphate and potassium sulphate in meagre quantities. Bicarbonates is not just a source of carbon but it is also responsible for the buffering action. Buffering action is absolutely essential because when you opt for the open system you tend to attract a lot of contaminators.

What is the time period to process this into Spirulina?

After establishing the cultivation tank, we add the mother culture to the same tank. Then, keeping the plant temperature normal, after 15 days you get Spirulina and thereafter everyday you can harvest Spirulina early morning by 6:30 am -7:00 am. You can harvest it using a simple net. After 8 a.m. Spirulina does its own photosynthesis and disperses throughout the media. So harvesting should be done early morning. From a 4000litre tank, you get about

3-5kgs of wet biomass daily. After drying, it comes to 300-500 gms a day per tank.

For up to how many days can you harvest Spirulina continuously?

You can harvest for up to 6 months continuously. After harvesting, you will have to replace the media and you need to top up the water because evaporation takes place in the process. Seeding culture is not required to be added again.

What are the benefits of Spirulina?

Spirulina is a single cell algae. It contains 70% protein. It has high medicinal

values. It is a brain activator and has the ability to kill cancerous cells. It also contains essential amino acids and vitamins. It is usually given away in the form of tablets and capsules. I recommend 6 capsules per day. It also takes away lethargy that can set in a person - gives them energy and the drive to do things. We have given it to people who have had high blood pressure, etc. and they have all been happy with the product.

What is the challenge you face in this space?

Cultivating Spirulina is quite easy, but



the trick in increasing the market potential and the key to this is bringing in value added products. We have been producing handmade Spirulina soaps, Spirulina biscuits, peanut wafers (chikki) with Spirulina in it.

Besides this we can also use it for making different cosmetics like soap, creams, etc. Then, we can make juices like lime juice with spirulina, for example. I am personally also interested in phycocyanin - a commercially viable pigment derived from Spirulina. It is used as a fluorescent dye in commercial diagnostic kits. We are also interested in an algae called Chlorella Vulgaris. I encourage farmers to go for pigment extraction - beta carotene / Phycocyanin. Phycocyanin is the costlier material. One gram costs about Rs.1 Lakh. To extract this pigment of course one would need highly skilled personnel. The initial investment to set up a unit for the extraction comes up to 1 crore which is why people do not come forward to start the business. But, it is on high demand.

Tell us about the market potential for Spirulina.

Market potential is very good but repeated orders are difficult to come by. We think this has to do with the quality of the product. There are international and Indian standards. The farmers must adapt to the standard requirements based on where they want to sell their produce. Today, only Parry produces Spirulina which is of international standards. If the set standards are followed, the market potential is truly high.

Does the water to be used need to be tested?

Yes, it should not contain heavy metals. It is ok to use hard water as well and it can be converted into water that is appropriate for cultivation. Presence of heavy metals in water can prove to be disastrous.

How much bicarbonate is required for 4000 litres of water?

You need 16 grams per liter of water, as per Zarrouk's formula. For commercial purposes 8 gms/litre of water is recommended.

From where can the seed culture be sourced?

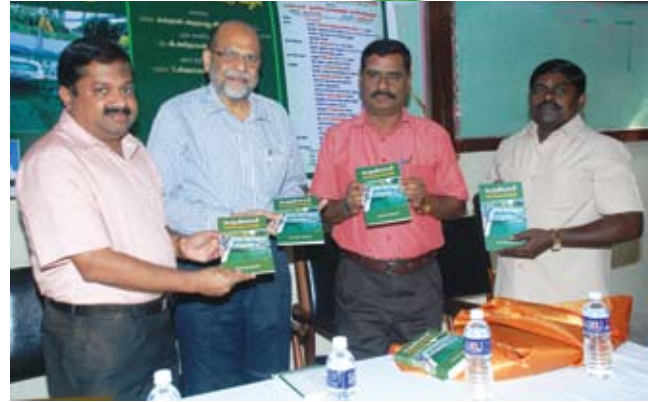
I can give you seed culture. There are people who sell seed culture in Coimbatore. There are people in Bangalore and many cities who sell seed culture.

How can a beginner gauge the quality of the culture?

Lonar variety is quite good to adapt to environments within India and abroad. Usually people go for Spirulina platensis which is also a good variety. If you want to focus on protein as the main aspect, Spirulina Platensis is a good variety. If your target is the phycocyanin pigment, it is best to go for the Lonar variety.

What all services do you offer through your consultancy?

We help in establishing the tanks, purchasing chemicals, etc. We also offer technical support for up to 2 years. We assist with marketing based on how the farmers conduct the cultivation. If the quality of the product is good, and if they follow the standards we set, we take up marketing as well. If the standards are not met, then we will only assist in marketing.



What is the economy of one cycle of production?

The initial investment is 30L and land requirement is 2-3 acres. Media costs will be about 1L per month. Power consumption would come up to around Rs.50,000. Labor cost can be approximated to Rs 2L and we can set aside 2L for any other contingencies. At the rate of Rs.800 per kg, you can earn up to 1 crore and 80L. After a total expenses is 30 L, you get a remaining 1 crore as the projected net profit per month. 30 L is your initial investment. Moving forward cost of production decreases.

Is it possible to produce other forms of algae as well with the same equipment?

Yes, you can switch over to any other algae cultivation. Today you may be growing Spirulina and tomorrow you may want to switch over to other forms of algae cultivation. You can use the same unit. You can produce 2-3 types of algae at the same time as well.

Is the produce sun-dried?

Sun drying is optional. If you are looking to enter the international market, then I would recommend to go for spray drying. Spray drying gives you high-quality produce. But, for people who are not willing to invest in a spray drier, the next option is to sun dry. If you want to have spray drier as well, the cost would go up by another 25L.

Do we require to any license to manufacture this product?

For manufacturing the value-added products, there is a license requirement. You can get it from the district office.

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Manoj Kumar

FRUITFUL FUTURE

A data recovery professional who chooses to divulge into agriculture and environmental protection activities as per his deep-rooted research, with no fixed agenda, that is Mr. Manoj Kumar.

"I believe man is just a part of nature and the moment we separate ourselves from this ecosystem, we begin to create problems. I love Nature without expecting anything from it."

Manoj has converted one and half acres around his home to a fruit forest. There is no segregated space for each of the plants grown in the space. He mulches his land, converts his seeds into saplings, plants it around and just lets it be. Even weeds have a role to play in the development of land and plants according to him.

"We need to understand each plant. Normally we consider many as weeds. But, the reality is that most of them are edible – may be not for us. Nature is not just for human beings. We often forget that we are part of an ecosystem."

He is also guardian to an ancestral property which in Kerala is referred to as the Sacred Grove.

What inputs did you give for this forest to take shape?

I do not use any insecticides or pesticides – not even organic ones. The saplings in my forest are planted very closely and I do a lot of mulching. I get my daily produce from this forest. I also collect as many seeds as possible. Whatever seeds I get, I let them grow into saplings and replant it into the forest or sometimes I even give them away to friends and family. 10 minutes before we decide to cook, we go pluck something and cook it. That is our way of life here.

How did you start this?

This was not a planned activity. I used to collect seeds. The

area around my home is 1 and half acres and my objective was to convert it into a natural organic food forest. I started in 10 cents of land and started by mulching the 10 cent space. I began by collecting organic material that we burn like dry leaves etc. Whatever waste got generated in our kitchens used to be collected and used for the 10 cents space. I also collected seeds like those of mango, jackfruit etc. - whatever I could get hold of and put them in the mulch. The seeds sprouted and within one year I had small saplings. Gradually I took this forward to the rest of my plot and now it is like a small forest. We get lot of fruits like jackfruit, mango, guava, star fruit, banana, passion fruit, pineapple etc. We also had leafy vegetables. There is no separate space for each plant.

Tell us about the Sacred Grove.

The Sacred Grove is part of my ancestral home. I stay in Vypin - an island near Kochi, Kerala. Ours is the biggest sacred grove in Vypin. It is around 300 years old. It has four groves and there is a pond adjacent to each of them (total 5 ponds). Also, there are two small shrines there. We have a banyan tree in the sacred grove which is huge. Normally no-



body enters this space. We go there only for performing some rites and rituals. We preserve it as it is. Today, there are very few sacred groves. I draw inspiration from the sacred grove in my attempt to build the fruit forest.

How do you prevent people from encroaching and cutting trees from your place?

Our neighbours and everybody in this vicinity knows the importance of sacred groves. Hence, nobody will brave up to do such things. It is a common belief that nothing should be taken from the sacred grove. It should remain untouched. So, nobody dares to go there without our permission.

Nowadays, some students do come because I am interested in using it as a learning space. We humans usually give a lot of importance to rites and rituals. But I think we should consider it as a model for bio-diversity. So, we do get children to come and experience this ecosystem. These are things one cannot learn within the classroom. It must be experienced.

What varieties of plants do you grow in your Sacred Grove?

We will not plant anything in the sacred grove, it is allowed to grow naturally. I took inspiration from the sacred grove to model the forest around my house. I have planted around 300 to 400 jackfruit saplings. Then, there are different varieties of native mango species. I grow all saplings from the seeds I collect. I am not aware of the English names of most plants I have here. But I do have all forest trees. I plant all seeds I can get hold of. I have rambutan, mango, guava, coconut, papaya, Artocarpus hirsutus (Anjili), palms etc. We also have medicinal plants, herbs. Normally, after monsoons, people will clear all saplings. But I do not do that. I don't burn a leaf or touch any tree or saplings. I allow it to grow naturally.

Do you earn anything from your forest?

No, I do not sell anything other than coconuts. We give excess produce of everything else to our neighbours, friends and relatives. Of course the birds can have them too. I am a fruitarian and so I would like to share whatever we can to our friends.

Do you do anything to maintain this farm?

My objective is to grow things naturally. I do not use any fertilizers - organic or inorganic. I do a lot of mulching, sprinkle some cow dung. You can make jeevamrutham at home and sprinkle it over the mulch. I collect cow dung and urine, brown leaves, kitchen waste and I deposit it as a mulch under each tree. My objective is to mimic a rain forest. Nobody waters plants in a rain forest, life just happens. After 10 years even watering will not be required in my forest garden. If mulching is done, these plants will take care of themselves in 10 years time.

The only thing is, you should have a diverse variety of mulch. You must grow as much plants as possible. Then, I do not remove weeds, I cut the tops and let it drop (chop and drop).

How would you advise someone who wants to build something similar?

It is essential to plant as much native trees and plants as possible in the space. Don't plant exotic species. You can have vegetables, fruits, trees, medicinal plants, herbs and whatever you need. Just keep it native and collect whatever seed you possibly can and put it into the mulch.

It is important to have a deep-rooted non-violent attitude. Each organism that comes to this space is important for the space to develop. Hence, there is no concept of pesticides. I welcome earthworms and microorganisms into this space. That should be our approach. We fear that certain insects will affect our produce. It is not like that. We have to observe and respect the way nature builds up. You can convert any barren land to a forest within 5-6 years. But, the things you should take care of is:

1. Do not burn anything
2. Do not add any chemicals into the soil.

Let us take the sacred grove, for example. Why do you think it is called so?

It is because each plant is important. The issue one faces

when one farms, is that you keep creating and destroying at the same time. You do not allow anything else to grow on your field except what you want. That is a different scenario altogether. Even in case of the food forest, you may need to intervene sometimes. But very rarely and minimalistically. Mother Nature has all the techniques available for growth in itself.

How do you ensure that wild plants growing do not hinder the growth of other trees?

I do see wild plants propping up. I chop it and use it as mulch, I don't discard or burn it. These weeds and wild plants help in protecting the top soil.

Monsoons are very heavy in Kerala. If you remove all the unwanted plants, the top soil will get washed away. So, these weeds help in protecting the top soil. It is like Mother Earth's skin.

Likewise, each grass is important. Do not remove it. There is no hindrance to growth for one because of another plant. In nature, there is no competition, there is only co-operation. I have a collection of documentaries about soil, protecting bio diversity, etc. There is a scientist called Suzanne Simard who explains what happens underneath the soil. Every microorganism helps in improving the fertility of the soil. It is a scientifically proven fact. It is important that we do not harm any of these beings.

What prompted you to start this journey?

I am not sure how it all started. I used to visit Prof. John C Jacob who was a zoology professor and used to stay in a place called Ashtamichira in Thrissur after his retirement. I used





Fruit Forest



to visit him very often. At that time, his area of interest was eco-spirituality. I learned the basics of eco-spirituality from him. I wanted to create something called do-nothing farming. My inspiration was predominantly Prof. John C Jacob.

What changes have taken place after you let this food forest happen?

I fought my father for the last 20 years. He never used to understand this concept. He used to burn a lot. I used to plant and he used to burn. That was the situation. I started this 23 years back. But it couldn't progress because of the burning. For the last 7 years, I didn't allow anyone to touch even one leaf. It is very difficult to convert mindsets.

Approximately how many trees would you have added?

I have planted around 700 saplings. Then there are saplings that have naturally taken root. During the monsoons the seeds which are transported by birds, grow here. I have even created small fruit forests in schools, colleges, private plots... as well.

Do you produce saplings in bulk or in small quantities?

I am making a lot of saplings (minimum 6000 saplings a year). I get a lot of enquiries from schools, colleges, small environmental groups. I have distributed about 500 saplings during Vishu. I give it away free of charge.

I am basically a computer hardware en-

gineer. I do data recovery. I use a lot of my income to create saplings and I personally plant saplings in schools.

Offlate I am not interested in free distribution of saplings. So, I ensure that students plant the saplings with me. I do not just give it away but make sure they are planted.

By now, how many saplings would you have given away?

I think I would have given away approximately 50,000-1 L saplings. I do not keep a record of it. But, like I said I do not distribute it anymore, I help plant it. I will plant it only if I feel it will be protected. I have seen a lot of the saplings I gave away, wasted. So, I give saplings only if there is one person willing to take the initiative. I will provide all support. I will even personally go over and plant it for them. All they are required to do is water it regularly during the summers. I convert all seeds I get into saplings. Nowadays, I get seeds of medicinal and forest trees from the Kerala Forest Research Institute (KFRI). KFRI has around 30 types of seeds - mainly that of forest trees.

I am also creating fruit forests, butterfly parks, bamboo groves, medicinal gardens and sacred groves.

What are your future

plans?

The length of Vypin island is 25kms. This is a coastal area. The sea level today is rising owing to global warming. We will be the first to be submerged within perhaps 20-30 years. I do not see Vypin's life beyond that.

The government is creating sea walls. But that is not the solution. Rocks won't help. I am planning to plant trees and mangroves on the sea shore and create an organic wall. We are trying to create a small model for sea side coastal restoration. It is not a simple thing. There is a lot of support from the local folk for this to evolve. We have started with trees that are native to the coastal area and bringing mangroves as well.

We have around 400 acres of mangrove forests in Vypin. We want to increase it. We also plant bamboo (*Bambusa vulgaris*) which grows in the seaside. It will be like a 3-4 layer organic wall. It was mangroves that protected us from Tsunami. So, I see an urgent need to increase it. It is as important as the rainforests we have in the Western Ghats.

This is our response to the rising sea levels.

Being part of nature for no remuneration may feel noble. A little dive into our soul and we realise it is the way to be. The initiative of one person, can be infective and contagious. For our sakes and for the sake of our planet, let us wish people like Mr. Manoj Kumar all success.

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C.M.Suvarna Kumar

General Manager, Marketing, Karnataka Soaps and Detergents

Karnataka Soaps and Detergents perhaps may sound more familiar via the name Mysore Sandal Soap. The company goes a long way back in history.

“Karnataka Soaps and Detergents is a Government of Karnataka undertaking which started in the year 1916 by the Mysore Maharaja, Nalvadi Krihshnaraja Wodeyar. The concept of producing sandalwood soap was conceived during the World War times. India used to then produce huge amounts of sandalwood, particularly at Mysore. This used to be exported to France, Germany, USA, UK, etc. With the World War, export ceased and the piling amounts of sandalwood.”

Hence, began the sandalwood oil extraction process in our country and a year later we took on to soap manufacturing as well.

Today we lead in terms of sandal wood oil and soap production but sourcing sandalwood is not quite as simple as it used to be.



How easy is it for you to source your raw material today?

Today, Karnataka purchases sandalwood mainly from the Kerala Government. Hence, we have come up with a policy called Grow More Sandalwood in Karnataka. Through this policy we encourage farmers to grow sandalwood with the agreement that after 15-20 years whenever the heart root forms we will buy their wood. This has promoted sandalwood trees and we have been buying from those farmers as well.

How easy is it to grow sandalwood and what is its scope?

The Indian species of sandalwood is called Santalum Album. This tree is a parasite by nature. It takes about 20 years after plantation to form the heart wood beginning from the 15th year. For commercial purpose, a tree lesser than

20 years doesn't serve the purpose of extracting sandalwood oil. The heart wood formation is extremely good after 20 years. Today we have huge commercial value for this tree. The heart wood fetches about Rs.40 lakhs to Rs.80 Lakhs per ton. A 20 year old tree will have a heart wood of about 20 kgs. A 25 year tree will have a heartwood of about 35 kgs and a 40 year is an extremely matured tree which can offer heart wood of about 670kgs per tree. Recently in Bangalore, one person in Bangalore sold us a 60-65 year old tree. We made him a cash payment of Rs.69 Lakhs. A lady at Nandidurga Road also sold one tree which fetched her Rs.28 Lakhs. There is a person called Namdhari who has began sandalwood farming, he has recently sold us about 60-70 20-year old trees that fetched him Rs.60-70 lakhs, Hence, the opportunity is enormous. Also, the South of India is a great place for growing sandalwood trees. Having

said that, we have seen sandalwood growing in Maharashtra, Gujarat, Assam, Manipur, Agarkala, etc.

What is the biggest challenge about this crop?

Growing sandalwood is not at all difficult. Growing it doesn't require anything much. There are no extra inputs required. You can grow it in any form of land. You can also have intercropping because it is a parasite by nature. You can grow gooseberry, Moringa, pomegranate etc. along with it. That way you can increase your profits as well.

Protecting sandalwood trees is a challenge though. After the 10th year to safeguard it for the next number of years is quite a challenge.

Do you help farmers to start sandalwood cultivation?

Since we are a State Government organization, we have sanction from the



Organisation

Government of India to have legal agreements with farmers to buy their sandalwood if they are within the Karnataka State. For farmers outside Karnataka borders, we help them understand the growth process etc. But we cannot make a buy back agreement with them because this will require for us to have sanctions from other State Governments. We are ready to buy from farmers out of the state who have trees to sell now. Buying isn't a problem, but we cannot make agreements with them.

What type of agreement do you make with the farmers?

The agreement states that we do hereby agree that they are growing sandalwood saplings and that after 20 years or when the heartwood forms, we will buy the trees from them at the commercial rate declared by the Forest Department at that point in time.

The rate will be dependent on the rate declared by the State government at that point because the rate is not fixed by the company but by the forest department. The forest department inspects the heartwood at the time of sale and they fix the rate. We simply make the payment.

Do you offer financial support to farmers?

No, there is no security/financial support provided. We help them identify good saplings and provide information on where it can be found. Indian Wood Science Technologies (IWST) provides saplings. There are farmers in Kolar that provide saplings. We also grow in small quantities in Mysore and Shimoga.

Does having a contract with Karnataka soaps give farmers an edge to access financial help from financial institutions?

One can of course show the agreement but dispensing loans is based on the sole discretion of the financial institute. We don't give any guarantee that our agreement can fetch loans.

Are there insurance schemes available for sandalwood cultivation?

We are not into insurance and don't offer such service. We are also not aware of any such schemes.

All sandalwood-related products get manufactured from sandalwood oil is it?

No. We only procure the heartwood after we buy the whole tree from the farmer. The whole tree is dressed and the sap and heart gets separated. The heart wood is kept with us and the sap wood is sold to the firewood manufacturers at a small amount of around Rs.5-10 per kg. After extracting sandalwood, the spent wood powder is used for making sandalwood agarbatis.

What else can sandalwood oil be used for?

The main usage is making of sandal soap. Besides that it is used in the perfume industries, cosmetic, ayurvedic and pharmaceutical industries as well. Sandalwood by nature is a fixative. Anybody who wants to make high-quality perfume should add sandalwood oil as a fixative because it is a very good fixative agent.

Can you give us some statistics based on your production aspects?

Mysore Sandal Soap is a pan India product which is not just sold in India but across the globe as well. It is sold in USA, Australia, entire Middle East, Singapore and Malaysia.

We produce around 17,000 tons of sandalwood segment soap alone. For this 17,000 tons, we consume around 3500-4000 tons of sandalwood oil per annum. From one ton of matured heart wood we get around 40kg of sandalwood oil. When we require 4000kg of sandalwood oil we will acquire about 100 tons of sandalwood per annum. We do acquire this currently but we can buy more trees because we want to extract and keep it as an inventory stock.

Is the Government doing anything to revive Karnataka's status of being a Sandalwood hub?

Yes. The government has indeed taken this up as a large scale project. The government and the forest department has been growing sandalwood in about 2000 acres of land. In Karnataka already about 1200 acres of cultivation is happening through farmers. About 50% of these trees have become 15 years old now.

In the next 5 years we estimate to procure enough sandalwood from Karnataka itself. Karnataka State Handicrafts also use this in making handicrafts and they also purchase a lot of sandalwood. They also have direct permission to buy this from farmers. The difference between Karnataka soaps and Karnataka State Handicrafts is they need flawless wood without any damages or spots because it is used to make handicraft items. For Karnataka Soaps, we extract the root as well because the root also has a lot of oil in it. For us the shape and flaws of the wood isn't important.

Do you think the quality of saplings affects the crop?

Yes, it does. The quality of saplings depends on the seed. The seeds from an original tree will vary in quality as opposed to the ones obtained from replanted trees.





Are there any proven methods to protect sandalwood trees?

Pests and insects don't affect this tree much at all. It can grow in any environment. The major issue is theft owing to the value of this wood. The first 10 years doesn't pose any threat at all. Threat begins after 10 years when the small tree begins to grow. It is difficult to protect one individual tree. If there is a group farming, CCTV cameras, security, modern and proper fencing or any modern surveillance method can be used.

What is your opinion about using sensors to protect the sandalwood trees?

We are not clear about the technology. According to the manufacturers, they can embed a sensor into the tree and anybody going next to the tree will trigger an alarm to be sent out. The success rate is something we are not very aware of.



Does the rate of the tree vary with respect to the quality of the tree?

The rate only depends on the formation of the heart wood. The government of Karnataka has fixed a rate of Rs 40L - 60 L. There are times we pay 1 crore as well when we buy on auction from Maryoor. The risk involved is you will know the quality of the heart wood only after 20 years of cultivation. Nevertheless, nothing can be done to improve the quality. To some extent the soil and the place the tree grows is of value. Sometimes, the tree would have grown to an extraordinary size, but upon extraction we would realize that the heart wood formation is not there.

There also have been times when the tree would seem very weak, but the heart wood formation would be excellent. There is also a mechanism to check it after 15 years of plantation.



What is the process that Karnataka Soaps follows to extract sandalwood trees?

The planter should write to us to inform about the tree(s). Our officers will come and inspect the tree(s) at your place and measure the girth of the tree. The girth should be a minimum of 55 cms. If the girth size is suf-

ficient, they check the scalp of the tree to check if it is smooth or broken. They will bore the tree a little in the oil formation area to understand the depth of oil formation. Once this is done, we will agree to buy the tree in writing. With our agreement the farmer needs to approach the forest department to apply for a storage, cutting and transportation permit. This is obtained from the local forest department. Besides this, a tree can be cut only in the presence of a forest official. We then take it to our Mysore division and make 20% of the payment immediately. We need to allow the tree to dry up for 6 months before the heart wood can be chipped out. Then, the heart will be extracted and weighed in the presence of a forest official and the farmer. Depending on the weight, the amount is calculated and payment is made immediately. Till date we haven't received any complaints.

Which is the best host crop for sandalwood?

The host plant's leaf should not be bigger than sandalwood's leaf. That is the best way to choose the host plant. At the beginning of cultivation, the ideal host plants are toor dal, drumsticks, gooseberry plants and pomegranates. When the tree is 4-5 years old, there is no host plant requirement. It will find out its nutrition from other plants and trees. It practically grows on its own after that.

Are you, in any way, involved in selling of sandalwood seedlings?

We do not sell seedlings. It is available at Maryoor Forest Department, IWST at Malleshwaram in Bangalore etc. Buying a seed and germinating it is a very difficult process. There is a lot of expertise required to grow trees in that manner. It is always advisable to go for saplings and transplant it to your plot.

Do you have any procurement team operating in all districts of Bangalore?

We have our registered office only in Bangalore and so is our procurement team. Farmers can liaise with our Mysore factory as well but everything ultimately gets routed through our Bangalore office. It is said that Australia has begun growing santalum album as well...

Yes, but the fragrance is no match for the Indian species. It doesn't have the woody note which our trees offer.

Are there other products in the offing for Karnataka Soaps?

In the sandalwood segment itself, we used to make the regular sandal soap then we came up with the Premium version - Mysore Sandal Gold. Then, about 4 years back we launched Mysore sandal Millennium which costs Rs.810 for a 150g soap. That too is selling very well. Besides this we are manufacturing sandalwood body wash, etc.

CONTACT : Mr C.M.Suvarna Kumar, GM (Marketing),

KARNATAKA SOAPS & DETERGENTS LTD

(A Govt of Karnataka Undertaking)

No.27, Industrial Suburb, Rajajinagar, Bengaluru - 560-055

PH: 080-23377691 Mobile: 9449871400

email: ksdmris@gmail.com



01

HOW TO GET RESOURCES AFTER I CLEARED MY FARM LAND?

tejas57: I am new to the game and I started my first game ever a few days ago. I was wondering where I get all the resources from in the future, after I cut down all the trees, grass and rocks from my farm land? Will they just spawn again?

Answer 1 : vermaaditya: what's the location? If there is enough water, grass would keep coming... how much area do you have? can you send some pictures so that we can reply appropriately?

Answer 2 : sharkins: Periodically explore new places

Answer 3 : gunda : Why should one think of this. This is throwing away the resources and then crying for the loss

Answer 4 : muraly menon : Agriculture is a spiritual work and the result or end product is "Prasad". Farming is not a "game" like cricket or rummy. You must consider your land is your mother, who pays everything you need including money and peace of mind. You have made a mistake that destroyed all inhabitants at a time. In future, receive advice from Krishi / agriculture officers and from senior farmers. In future, you have to find out your required resources from your farm and from your village. Before that try to learn, understand and practice farming from an expert and experienced farmer nearby you.

02

WANTED COMPLETE PAPAYA RED LADY FERTILIZING

nenalela: Please tell me about red lady papaya complete fertilizing

Answer 1 : garao56: Nutrient Management for Papaya After a month of planting, 5 kg 19 : 19 : 19 and 2.5 kg urea / ha need to be applied through drip fertigation. After 15 days the same dose should be repeated. After two months of planting basin should be made around the plant and fertiliser at the rate 250 kg DAP, 500 kg neem cake and 188 kg urea/ha should be applied.



After 3 months (250 kg DAP + 500 kg Neem cake + 750 kg MOP + 25 kg micronutrients mixture) should be added.

From 4th month to 6th month drip fertigation was practised as follows:

(a) At the beginning of 4th month 12 : 61 : 0 – 30 kg /ha

(b) After 15 days 30 kg/ha 0 : 0 : 50 mixed Fertiliser

(c) 15 days after that, 30 kg/ ha 13 : 0 : 45

(d) 6th month 30 kg/ha 0 : 0 : 50

(e) 15 days after that 30 kg / ha 12 : 61 : 0

(f) At 7th month again 250 kg DAP + 188kg MOP + 25 kg micro-nutrients + 37.5 kg S/ha should be applied on ring.

Foliar spray

Spray zinc sulphate (0.5%), ferrous sulphate (0.2%), copper sulphate (0.2%) and borax (0.1%) at 3, 5 and 7 th month after planting

roryroma: Thank you very much for your reply !! It is very valuable.

SOILLESS CULTIVATION

nand7ab9: Dear Group Members....!

Namaskaram, would like to focus on the 'Soil Less' Cultivation methods, tips and tricks for scaling up revenue for the farmer / agripreneur. Thanks & Regards,

Answer 1 : garao56 : All essential macro and micro nutrients are supplied to hydroponic plants in the form of nutrient solution, which consists of fertilizer salts dissolved in water. The success or failure of a hydroponic techniques depends primarily on the strict nutrient management programme. Carefully manipulating the nutrient solution pH level, temperature and electrical conductivity (EC) and replacing the solution whenever necessary, will lead to a successful hydroponiccultivation.

Answer 2 : bettiein: Technically, coco coir and peat moss are soil-less, but you can grow most succulents or other plants in hydroponic media pretty easily. Leca clay balls, pumice, scoria, al's gritty mix, bonsai akadama, whatever you can get you can use as long as you have a system that lets the soil dry out between watering. Perlite isn't that great because it floats and gets everywhere.

PLANNING TO START ALOEVERA CULTIVATION IN ANDHRA PRADESH

agnaveen: Hi, I am an Agri Grad currently working as Quality Manager in a Agritech company. I am planning to start Aloe vera cultivation in Andhra Pradesh, we acquired lands in Srikakulam and Rajahmundry currently planning for trail cultivation in 20 acers if successful we will increase scale to

03

04



thousands of Acres. Currently we are conducting soil tests and want to acquire market details and planting material.

Answer 1 : garao56: Please inquire with nurseries at Kadiyam for planting material. If aloe vera is produced on large quantities marketing arrangements may be explored. Or start your own juice manufacturing unit and market it as the juice is highly beneficial for health.

Answer 2 : goliya: Please contact me

05

DRUMSTICK CULTIVATION

jomathew: Hi All, I've a plan to start moringa cultivation in 6 acres of land in Theni district, Tamil Nadu. Before starting, I would like to get your advise on the marketing potential of moringa pods. I would like to know if you can connect me with someone who offers buy back. If I start the cultivation now, pods would be ready by June 2021.

I heard there is a big price fluctuation if I sell as pods as they fetch good price only during Nov/Dec/Jan/Feb months. I won't get good price for the pods during the remaining months. This is the reason I'm searching for someone who can offer a fixed buy back price regardless of the market price fluctuation. They can use it for oil production or any other value added products from the pods. I've heard about different varieties like MOMAX3, PKM-2 and ODC3. Would you please suggest me the best annual variety of moringa plant for producing pods and where to buy the seeds.

Answer 1 : garao56 : The best annual variety of moringa plant for producing pods is PKM 2 and please buy the seeds from Ressearch Institute , TNAU, Periakulam, Tamilnadu

jomathew: Please advise if moringa leaves cultivation is better than pods. Shall we get some assured buyers for moringa leaves or can someone please share me the contact numbers of some moringa leaves processing companies. Also, pls advise if PKM2 is suitable for leaves production or is there another variety for leaves.

Answer 2 : garao56: Usage of dry moringa powder by house holds are yet to be adopted/used for cooking . A lot of publicity and marketing effort has to be made for selling the powder. Export potential for moringa powder is yet to be explored. Only organically produced leaf powder will be accepted by European countries . All Annual types of moringa is suitable for leaf production, as the same is planted closely like grass production Please contact me

06

MUSHROOM HYDROPONIC FARMING

gosampada: We want to setup a hydroponic mushroom farming farm. Will appreciate any help in consultancy etc.

Answer 1 : garao56: Hydroponic production of mushrooms may be for domestic use and commercially may not be viable

Answer 2 : dhayaagrowers : Mushrooms in hydroponics not possible

Answer 3 : garao56 : Normal practices for mushroom cultivation is easy and better. Hydroponic system is cumbersome not economical

07

FARMING OF MOSAMBI

maheshkumarpatel: Kindly advice for the plantations of satgudi mosambi in Gujarat.

Answer 1 : garao56: Please contact us for project report and for technical guidance

Answer 2 : maitys : Mosambi and Satgudi are two different citrus varieties commonly grown with almost similar fruit characteristics. Mosambi, has prominent streaks on the thick rind and a circular groove at the styler end or base. Fruit shape is sub-globose and has more numbers of seeds mostly cultivated in Maharashtra . It lacks flavour and sometimes it can be almost insipid due to unbalanced sugar acid ratio.

Sathgudi fruit surface is smooth, spherical in shape, rind is thin, semi glossy, finely pitted and has segments , mostly cultivated in Andhra Pradesh . Telangana & Tamilnadu. This variety is a high yielder (16-18t/acre) and popular in South India because of wider adaptability and better consumer acceptance.

Batavian (Bathayi) another lesser known variety of sweet orange mostly grown in the coastal districts of Andhra Pradesh . Batavian variety closely resembles Sathgudi. It develops yellow patches on green background when it is basked to protect itself from fruit sucking moth



Soil : A well drained loamy soil of uniform texture upto depth of 2-3 m having good fertility is considered ideal for cultivation. The plant is highly sensitive to waterlogged situation. Heavy soils, if well drained, yield good crops but the cultivation becomes difficult. Soil pH of 6.5 to 7.5 ideal.

Climate : Tropical climate with moderate annual rainfall of i.e., 750 mm are ideally suited to Sweet orange and Acid lime. They can be grown successfully even upto an elevation of 900m above mean sea level and the best growth performance occurs around temperature of 32 deg C.

08

NEED GUIDANCE TO START-UP HORTICULTURE FOR SOUTHERN KARNATAKA

dadsdream:Hi, this is Sreenivas, planning for horticulture cultivation. I have a piece of land which measures about 4 acres and has ample free time (3 days in a week to be precise), I am planning to rejuvenate the land. Please share any relevant information on what I can do with that land. All kinds of suggestions are welcome. Thanks in advance

Answer 1 : garao56 : Dear sir, Please inform hitherto what are the crops/fruit plants taken up on the land. If new development is to be undertaken you have to develop the land by providing the following developmental activities.

1. Jungle clearance
 2. Leveling
 3. Bund formation
 4. Development of well/Bore well
 5. Pumpset
 6. Fencing
 6. Farm house /worker's quarter
 7. New crops/Fruit crops proposed to be planted on the land
- Please inform the above particulars to enable us to prepare project report for availing any term loan from Banks

dadsdream:It was previously cultivable land, left uncultivated for 4-5 years and there was a dried-up small river, which has been filled up with trees and bushes and topped up with mud about 3 years ago. The average rainfall is about 250-400 mm per year. I have borewell with about 2.5-inch water output.

Answer 2 : garao56 : Please take up land development like fencing, leveling, bunding, filling with earth etc and take up plantation of fruit crops. Which type of fruit crop you are interested please inform to guide you

Answer 3 : purnachan : Sir, where exactly is your land located? We can guide you in setting up a profitable horticulture farm in less than 2 months

Answer 4 : kskarnic: Please provide location of the land available facilities on site like irrigation facilities farm animals topography of the land existing crop or is it Barn would you be an absentee landlord or stay at the site. Availability of labour. Nearest market and any other information about the land status etc. All this information is essential to suggest activities that can be taken up without hassles.

Answer 5 : garao56: Please take up land development and planta-

tion of taiwan gua, apple ber, custard apple, pomegranate or any other fruit of your choice. If term loan is required from bank for meeting the expenses call on us.

09

VERMICOMPOSTING PROJECT

sumukha:Namaste, I need both inputs as well as raw materials to start a vermicomposting project in 1-2 Acre land near Bangalore (Magadi). Looking at a trial project and want it to be inexpensive to start with until I feel confident and comfortable doing it in effective, efficient and methodical way.

The farm already consists of 100 coconut trees, 50 mango trees and 100 silver oak trees. Can any of the leaf from these plants be used as raw materials?

Thank you in advance for your inputs and support.

Answer 1 : vtnaren:Hi, I have a team which undertakes vermicompost training. I have been involved in training more than 5,000 farmers across Karnataka. Please give your contact details, Thanks

Answer 2 : garao56:Dear Sri Sumukha, Please contact nearby dairy farms for supply of cow dung for vermicomposting, the leaf material and other debris available on the farm is limited supply. If you are taking up the vermi-compost unit please approach us for project report for availing loan from bank. Also subsidy can be availed from KVIC under the PMEGP scheme



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SHRIMP FARMING IN KARNATAKA

avinashmj:Hi All, Myself Avinash from Bangalore, Karnataka want to start shrimp farming in Karnataka and am looking for suggestions and shrimp farmers for guidance, I would appreciate if somebody can give genuine information on shrimp farming process. Thanks in advance.

Answer 1 : garao56: Dear Avinash ji, please inform as to whether you are planning to take up in brackish water prawn culture (Vannamei culture) or Fresh water prawns

Answer 2 : raaj0bd4:Pls advise the best from the both

Answer 3 : garao56:Dear Sri Avinashmj, Please inform the location of the farm and if you are developing the farm afresh there is subsidy scheme for getting subsid from Pana Mandthri Mathya sampada Yojana scheme (40%). Please confirm to enable us to help you.

Answer 4 : lisaross:Please share your contact details

spbrar: @garao56, I would like to know a first hand input on the vermi-compost setup and avail financial support form government scheme. please share your contact details to speak direct. regards

Answer 3 : purnachan : Sir please visit GKVK, Bangalore-65 It is a Government Institute.



BAJRA AS CATTLE FEED ?

navinhona: I want to know if anyone here has used Bajra as a replacement for cattle feed.

How do you use it? what do you mix it with.

For my current cows, we use cattle feed from the market, mixed with maize. But I am not satisfied with using external market based feeds.

Wanted to develop my own feed using Bajra.

Also where do you buy it from? Please advice

Answer 1 : garao56 : Dear sir Navinhona, I mean you are using pure Bajra crop or Hybrid Napier grass developed from Bajra . Let us see the facts about hybrid napier grass which is best for feeding dairy cattle.

Hybrid Napier - Cumbu Napier Ottupull / Bajra Napier Hybrid: This is a perennial grass fodder.

It possesses more tillers and leaves than Napier grass and is more vigorous and higher in fodder yield and quality.

Crude protein ranges from 8 to 11%.

Co.CN4 is a recent hybrid Napier grass released by TNAU, Coimbatore, which is a cross between Cumbu Co.8 and Napier grass FT.461. Yield range is 380-400 tons/ha. It produces more tillers with soft and juicy stem, free from pest and diseases and non-lodging. It can be cultivated throughout the year under irrigated conditions.

KKM-1 Cumbu Napier: This is a hybrid grass that gives average green fodder yield of 288 tonnes per ha per year. The quality is good with high calcium, magnesium and phosphorus and very low oxalate content.

Pusa Giant, NB 21, NB 37, IGFRI 5, IGFRI 7 and IGFRI 10 (developed from Indian Grassland Research Institute, Jhansi) are superior hybrids developed in India.

Co1, Co2 and Co3 are also superior varieties released from Tamil Nadu Agricultural University. These varieties are suitable for growing throughout the year in all districts of Tamil Nadu.

40,000 slips are required to plant one hectare.

First harvest is to be done on 75 to 80 days after planting and subsequent harvests at intervals of 45 days.

HN grass can be intercropped with Desmanthus at 3:1 ratio and can be harvested together and fed to the animals.

All the best

Answer 2 : venkatadri49 : Bajra cooked is a good food especially for milking animals. It is available in Andhra if you want you can contact me

Answer 3 : gunda: Bajra is used as human staple food. Kadaba of bajra is the cattle feed. It is in use by us since generations

Answer 4 : garao56: Hybrid napier grass is developed from Bajra (Parent)

Answer 5 : ramyamsuddi: THANK YOU - for your invitation.

GUIDANCE TO START DAIRY FARM IN JAMMU & KASHMIR

12

mehmoodqa: I want to open a dairy farm in Jammu & Kashmir. I want to whole procedure to open a dairy farm.

Answer 1 : garao56: I mean you are a farmer holding some land. You can start the dairy with two milch animals to 100 animals depending up on the funds availability and land holding.

Cows or buffaloes (we are from south India having sub-tropical climate) please inform as to whether buffaloes like Neeli - Ravi can withstand winter climate at Jammu & Kashmir

Fodder crops are to be raised on the land, in winter green grass availability is not there you have feed silage, roughage etc Please clarify and not to hesitate to ask for project report for availing term loan from Bank

Answer 2 : spregmi : I can help you in business planning

Answer 3 : garao56 : Please confirm whether cows or buffaloes

spregmi: Cow

Answer 4 : garao56 : If cows, whether HF Jersey or any cross bred HF or Jersey with local indigenous breeds, please inform



What is your contact no.? We want to know more about your products and highly interested for purchase.

Answer 6 : garao56: Generally veterinarians will not recommend cooked foods to the milch animals as their rumen is adapted to digest only roughages like grasses, dry grasses, silage, concentrates like rice brane, gingelly cake, coconut cake etc . Don't feed cooked foods as the animals digestive system will be affected .



HOW TO GET THE POTENTIAL YIELD OF TURMERIC IN ORGANIC FARMING?

infinitag: How to get the potential yield of Turmeric in organic farming? Can we use any biostimulant for increasing yield?

Answer 1 : garao56 : First of all convert your land into Organic farm by proper cultural practices, it will take atleast 3 years for getting standard yield. Get organic certification for quoting higher price for the produce.

Answer 2 : yogikm : Strictly increase the aeration and micro nutrients content of soil. Use only organic manure from your own land. Never uses chemical ,use drip irrigation for soil to retain moisture content.

Let us celebrate Democracy in India!

Democracy and democratic traditions must be defended by all means and upheld much more extensively. Today, both inside India as well as in the outside world, the cause of democracy is not having a positive environment. The so-called big powers are not shining examples of a vigorous Democratic world, far from it, there is a distorted picture of a world in turmoil. See the great democratic country like the USA with its well-defined features.

An elected President is held up at the doors, so to say, by a loser with his own ego and much else. This is a great shame to the entire world that pins hopes on a world open to multi-cultures and very enriched democratic traditions and history. And see the US has a written, rather well-written constitution and yet the one who wins a popular mandate must be gracefully welcome by the one who loses the mandate. See what Donald Trump is doing!

As for other big powers, in Russia and China and for that matter others who are middle level countries, in the Middle East and elsewhere, there are many deficiencies in terms of what we would call the very many democratic traditions and values.

In India, we have a very strange scenario of contradictions and very many discomforts too. See, the Indian Prime Minister on the occasion of laying the foundation stone for a new Parliament complex, what should be a very appreciative tones from many sections, we have a prolonged farmers agitation going on and the very foundation stone ceremony is marked with a Supreme Court stay order and the injunction that no physical alteration can take place before the apex court gives its final verdict.

Of course this is a discordant note and also the Opposition parties' criticisms are far from complimentary. The PM has observed that India is the mother of democracy, fine! It requires a more thought-out observation that would have made a wider appeal.

India is of course a great democracy. It has the largest written Constitution and also, it has incorporated the best features of values and documents from other countries and a secular democracy. Why bring in the Hindu priests in the ceremonies and give a rather less than full robust secular feature?

Exercise of power

Exercise of power is a very tricky affair. Running a State is not an easy option. The office of the Prime Minister in a democracy and that too in the size of Indian democracy to put it bluntly has never been practised before in any other country and that too in a country under an elaborate Constitution like that of India has no precedence in history. We are a new country with just less than a century of actual practice of democracy. The last 70 odd years of Independence, now looking back we can say with some confidence is far from satisfactory seen from several points of view.

Pandit Nehru perhaps was fairly successful to uphold and even taught in a way many aspects of Parliament behaviour. But after Nehru's things went out of hands and Indira Gandhi most destroyed the very fabric of democratic

norms, arbitrary exercise of power took the fairly democratic foundations off the track and since then we have been not proceeding on any sound path with coalitions intervening. We have also to note very seriously the damage done by the great nationalist party, the Indian National Congress which starting from Indira Gandhi to her successors, from dynastic heirs to other cronies had the unfortunate impact of further destroying the democratic values and leading the very apparatus of the party and the government machinery into the unforeseen path of further ossification of both the party and the government institutions.

This is also very critical for any further efforts for the revival of the institutions.

So we have to accept the harsh fact that in the eyes of the outside world, wherever democracy and democratic values are upheld the deficiencies of Indian democratic institutions would be seen critically and we have to introspect seriously the short-comings in our democratic practices.

Democracy has many more meanings, liberal atmosphere is the first condition for an open society.

Today we don't find any such atmosphere. There is a pervasive fear everywhere, at many levels.

The critical feature of democracy is an open debate and a free criticism in the media. We have to also refer to the many deficiencies in the media freedom, there is the phenomenon of social media restrictions, fake news and an atmosphere of aggressive polarization of issues, many other social and religious issues.

The Economy

India is not only the world's largest democracy with the largest population, India is also a very large economy, the world's fifth largest. So, Indian economy's performance matters a great deal not only for signing the living standards of the Indian people, we have one of the largest poor people, malnutrition and the socio-economic condition of the largest number of people is of serious concern.

How is the Indian economy performing?

Considering India also has a peculiar distinction of a large professional economists population fortunately or unfortunately most of these clever population have now migrated and we don't have the expertise of such high nature are settled in the USA and they at best make periodical visit to their mother country and give sporadic advice and thus we are deprived of some of the high quality expertise.

We have poorly viewed this pool of abundant talents and one of the suggestions here is that our Prime Minister must sit with the experts who might not support the new ideology of Hindutva and so we have to make special efforts to get this talent to serve the country.











Surely, professional economists alone won't suffice but we have to go beyond the current practice of slogan-based catch phrases to pull the economy out of the present negative GDP growth paradigm. Economic growth is not as straight, as we find the pronouncements of the government functionaries.

V.Isvarmurti, Chairman & Managing Director
Vadamalai Media Group, isvarmurti@gmail.com

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- We hire a wide range of people (from freshers to senior experts) in a wide range of industries
- We offer full time, part-time and work from home jobs
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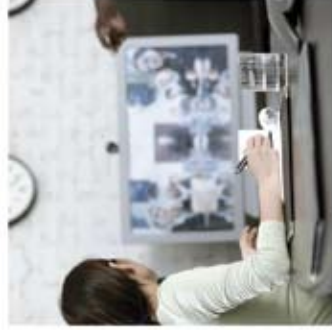
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Interested to work with us?

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