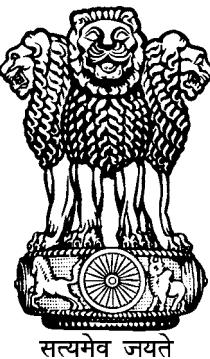




20
Mission Driven
Social Impact
Innovations



Economic Diplomacy Division
Ministry of External Affairs
Government of India

Edited by :
K. Nagaraj Naidu, IFS
Joint Secretary (Economic Diplomacy)

कर्मण्येवाधिकारस्तेमाफलेषुकदाचनं ।
माकर्मफलहेतुभूर्मतिसङ्गोस्त्वकर्मणि ॥२-४७

You have the right to work only, but never to its fruits.
Let not the fruits of action be your motive,
nor let your attachment be to inaction.

Bhagavad Gita Chapter 2, Verse 47

|| This publication is being brought out to commemorate Mahatma Gandhiji's holding of a Social Innovation Design Competition in 1929 through the Akhila Bharatiya Charkha Sangh Worker's Samiti to come up with a Charkha that must be light weight, easy to move and operated using either hand or one's leg ||

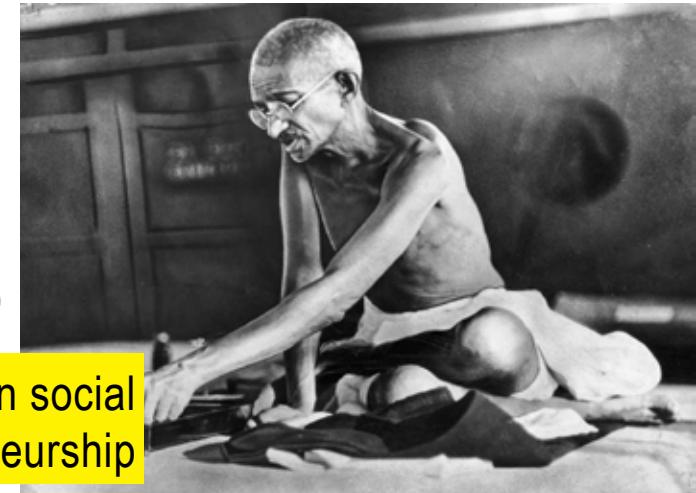
**The National Contest on Social Innovation - 2016 is a joint initiative of
the Ministry of External Affairs and NITI Aayog.**



**“Start-ups are more than commercial success stories.
They are powerful examples of social innovation.”**

- Prime Minister Narendra Modi

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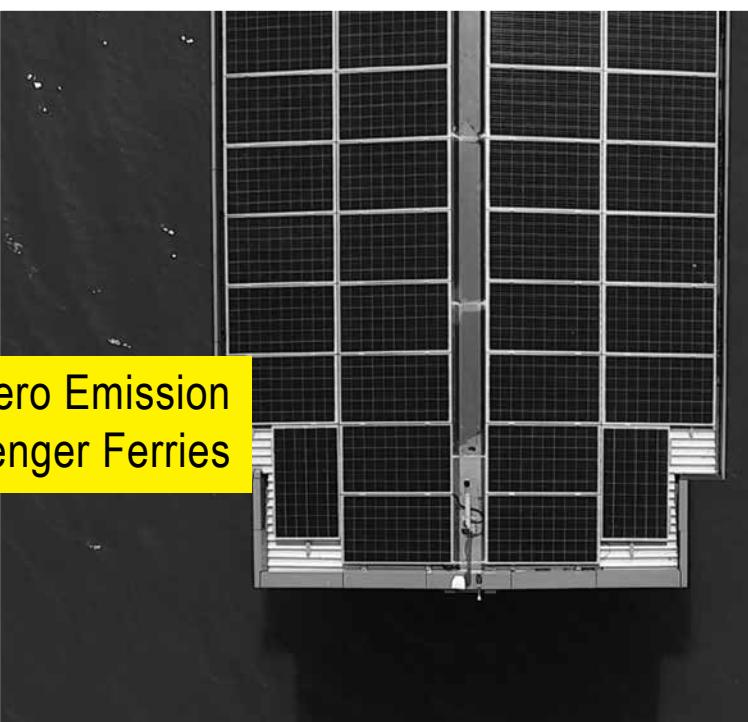
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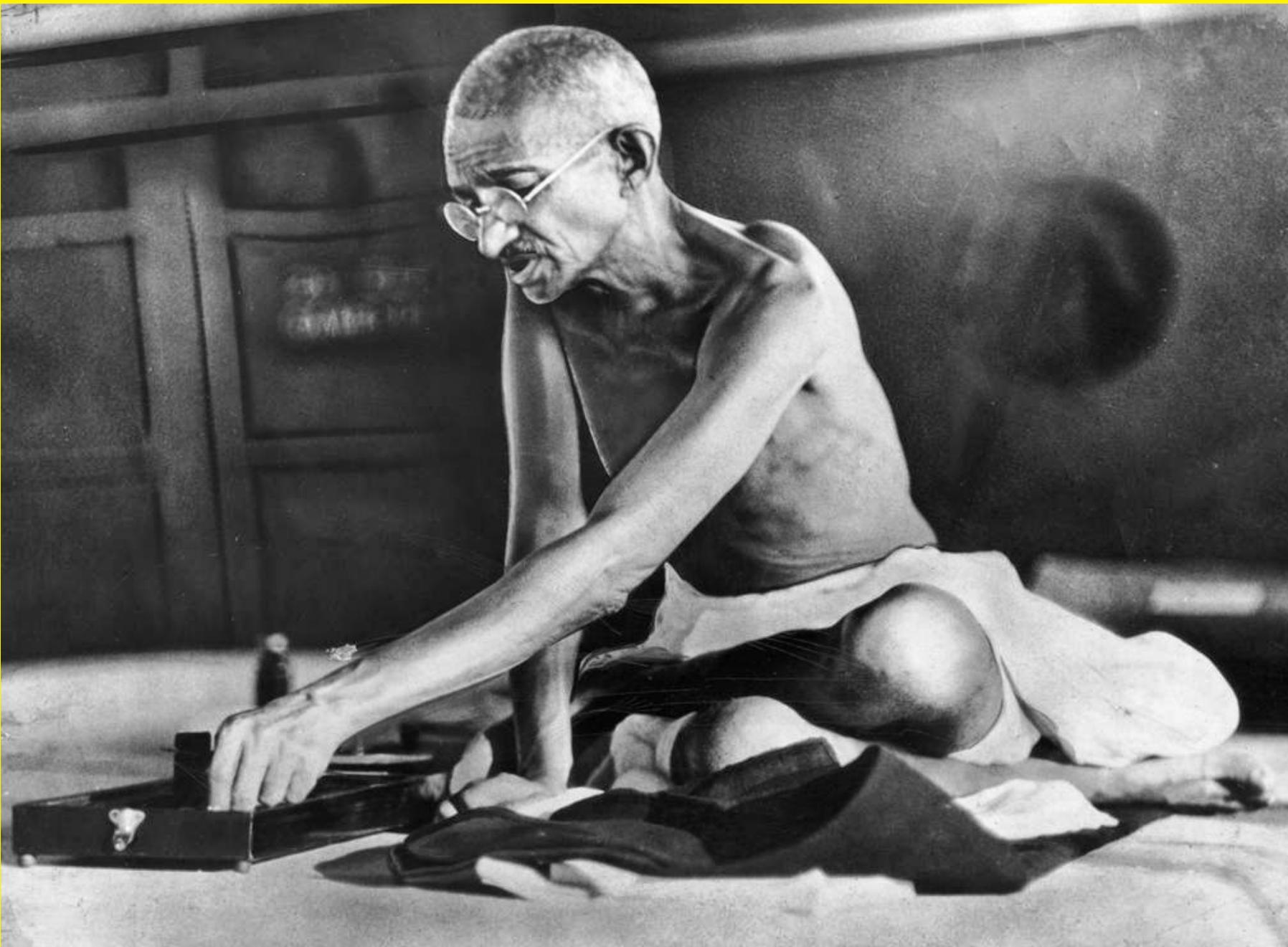


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Social Innovation



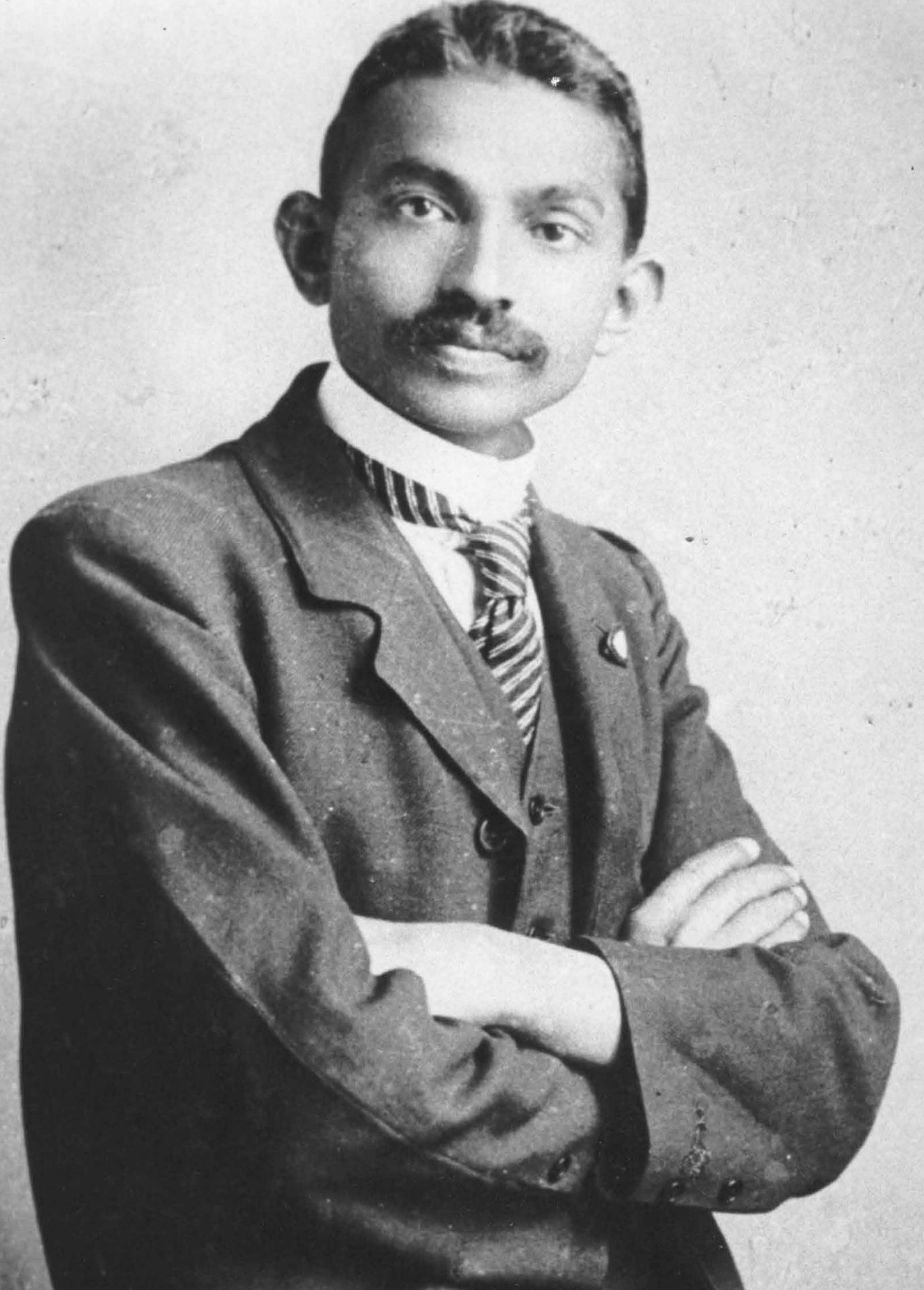
**“ If I have the belief that I can do it, I shall surely acquire the capacity
to do it even if I may not have it at the beginning. ”**
- Mahatma Gandhi

Birth of Indian social entrepreneurship

From time immemorial, there have always been a few individuals who have risen above mere personal gain, to devote their lives to solving pressing social and environmental ills plaguing society. They did this by employing innovative new methods that were hitherto unknown, or known but not applied. Going by that definition, the Father of our nation, Mahatma Gandhi, can be considered as one of India's first social entrepreneurs.

Gandhi : A Pioneer in Social Innovation

The pioneer of voluntary action and social innovation in modern India was Mahatma Gandhi. If experimentation is at the heart of innovation, then the Mahatma was the habitual experimenter. While in Johannesburg in South Africa, Gandhi started the newspaper – Indian Opinion. And it was not an easy beginning. In a 75ft x 50ft corrugated iron sheet building, typesetting was done by hand. Every time the decrepit oil engine broke down, Gandhi and his team arranged a wheel to run the printing machine. The size of the newspaper was also reduced to foolscap size so that in case of emergency, copies might be struck off with the help of treadle. The paper had just 887 subscribers by the end of its first year and subscriptions were not enough to meet costs which included the wages of 13 staff members. To cut down costs, in true Start Up style, he moved the operations to Phoenix, a settlement that he established in 1904.



To institutionalize the idea of khadi, Gandhi established the All India Spinners' Association. This organization constituted the beginning of voluntary action in India for livelihood promotion. Soon an entire network of local voluntary institutions emerged around the country to promote khadi and village industries. Post-independence, these organizations received support from the Khadi and Village Industries Commission (KVIC), a case of social innovation going to scale with state sponsorship.



Between 1951 and 1967, Acharya Vinoba Bhave, Gandhi's foremost disciple, undertook a 25,000 mile long padayatra, to persuade landowners across India to voluntarily give part of their land to the landless. Bhoodan was a major social innovation for more equitable distribution of land.

Inspired by the call of Mahatma Gandhi, Anasuya Sarabhai laid the foundation for Gujarat's oldest labour union, Majoor Mahajan Sangh (Ahmedabad Textile Labour Association or TLA) in 1920. Anasuya's personal concern for workers, her open approach towards the mill owners, and her belief in non-violence ensured that a harmonious relationship evolved between the workers and the mill owners.



K. Kamaraj, who was Chief Minister of Tamil Nadu between 1954 – 1963, was well known for the mid-day meal scheme that he had launched for tackling the issue of low literacy rates and malnutrition in kids. Today the midday meal scheme has been adopted by many State governments.



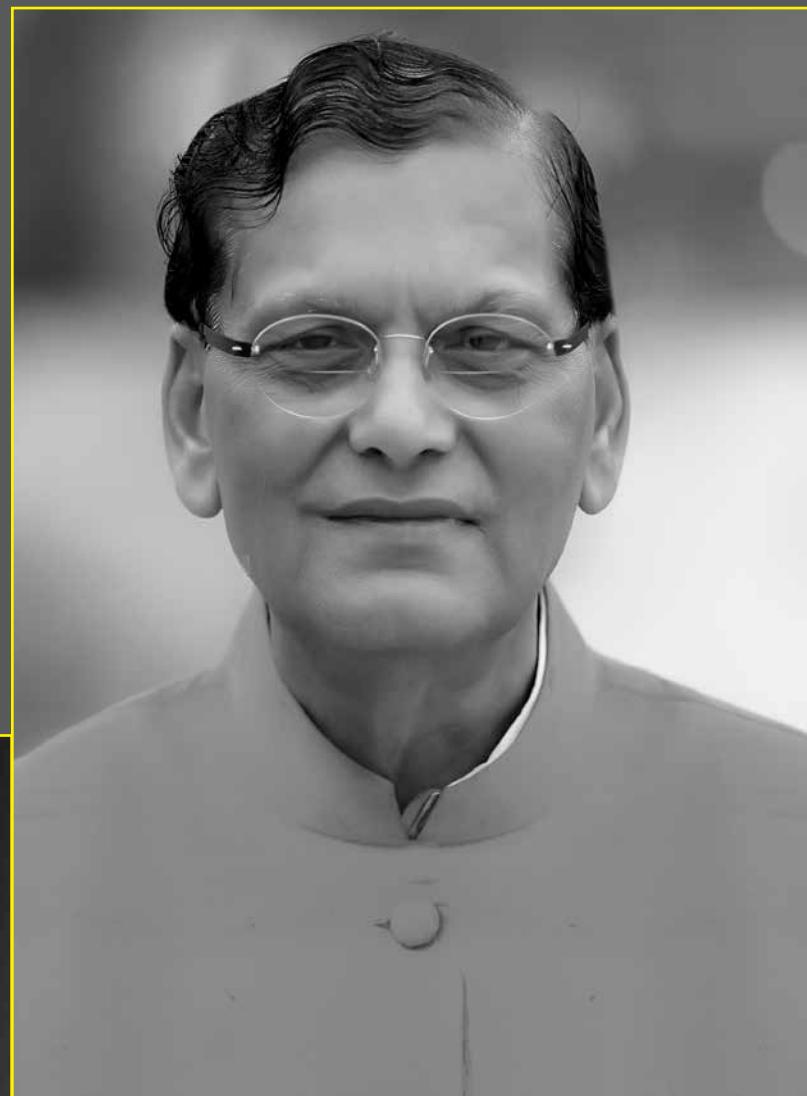
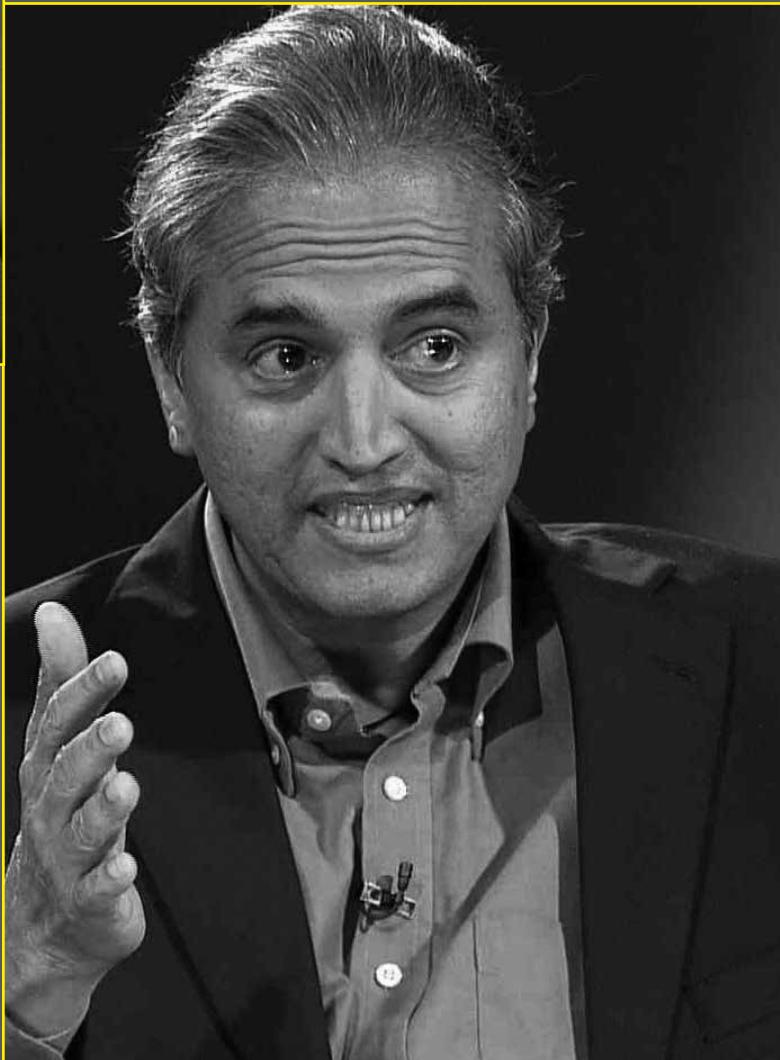
Dr. Verghese Kurien singlehandedly turned India from a milk importing country, to the largest producer of milk globally. Deeply inspired by the spirit of the cooperative model of dairy collection pioneered by his Guru – Mr. Tribhuvandas Patel (the then Chairman of AMUL), Dr. Kurien created millions of micro entrepreneurs, and lifting them out of poverty.





P. K. Sethi, who invented the first affordable prosthetic foot called the Jaipur Foot, allowed millions of amputees in developing nations to live normal lives. He created a foot that is very flexible, allowing the wearer to run, climb, and pedal.

Dr. Devi Shetty, founder of the Bengaluru-based affordable healthcare chain Narayana Hrudayalaya, pioneered inexpensive cardiac surgeries by creatively and efficiently driving down costs, thereby putting life-saving surgeries within the means of thousands of poor Indians.

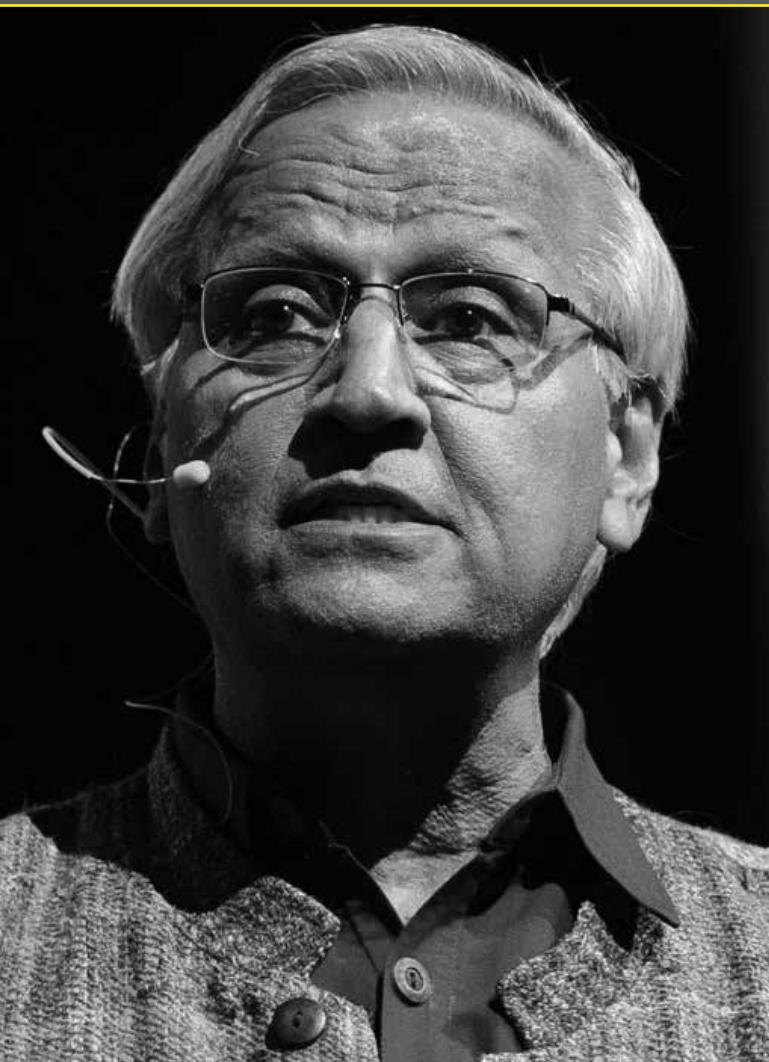


Bindeswari Pathak, founder of Sulabh Shauchalaya, a large network of pay toilet facilities in the country, provided much needed services to the public while improving sanitation in cities.



Ela Bhatt founded Self-Employed Women's Association (SEWA) in 1972. SEWA is a trade union for self-employed workers. With over 2 million members, SEWA is the largest organization of informal workers in the world.

Bunker Roy through his Barefoot College designed new ways to nurture and empower rural women by demystifying and decentralizing technology and putting new tools in the hands of the rural poor with a singular objective of spreading self-sufficiency and sustainability.



Harish Hande founded SELCO, a social enterprise established in 1995 to provide sustainable energy solutions and services to under-served households and businesses.



Priya Naik is the Founder of Samhita Social Ventures, which brings all stakeholders together to create impact in the social development sector.



Sunitha Krishnan, founded Prajwala an NGO devoted exclusively for eradicating forced prostitution and sex trafficking.



Aditi Gupta is the founder of Menstrupedia, which is shattering the taboos surrounding menstruation in the society.

Pooja Warier is the Founder of UnLtd India, an incubator for social entrepreneurs to become leaders.

MEA-NITI Aayog National Contest on Social Innovation

In 1929, Gandhiji through the Akhila Bharatiya Charkha Worker's Samiti organized a Social Innovation Design Competition that was open to inventors and engineers. The challenge was to come up with a Charkha that must be light-weight, easy to move, and operated using either hand or one's leg. The prize money was Rs. 1 lakh or £ 7,000 (which is roughly equivalent to Rs 10 crore, in today's currency value).

In order to commemorate Gandhiji's holding of the competition on Social Innovation, the Economic Diplomacy Division of the Ministry of External Affairs, as part of the overall activities for the 14th Pravasi Bhartiya Divas in Bengaluru from 7-9 January 2017, partnered with the Atal Innovation Mission, NITI Aayog to organize a National Contest on Social Innovation. The objective of the contest was to identify and showcase 20 of India's most promising and socially relevant, and scalable innovations.



Pic: Core members of the Economic Diplomacy Division of the MEA who organized the National Contest on Social Innovation - 2016



National Contest on Social Innovation



India's national search for the top 25 socially relevant and scalable innovations



Calling all innovators
(Individuals & Organisations)



The top 25 selected innovations
will be showcased at Pravasi
Bharatiya Divas, 2017

The Key focus sectors :

Cleantech, Education, Health, Housing, Public Transport, Skill Development and Livelihood, Waste Management, Water and Sanitation, Women Empowerment

Last Date : 7th December, 2016

**Joint Initiative of Ministry of External Affairs &
NITI Aayog to Support Startup India**

— For more details and to participate in the contest visit —

<https://innovate.mygov.in/social-innovation-contest>



NITI Aayog

(National Institution for Transforming India)
Government of India



Economic Diplomacy Division
Ministry of External Affairs



ATAL INNOVATION MISSION



**my
GOV**
मेरी सरकार



Pic: Members of the Atal Innovation Mission who were associated with the National Contest on Social Innovation - 2016

The contest was publicized through an advertisement published in 48 Indian dailies (including Hindi, English, Assamese, Punjabi, Telugu, Tamil, Marathi, Gujarati, Odia and Malayalam languages). The response to the contest has been overwhelming; a total of 774 applications were received by the closing date of Dec 7, 2016.

A Screening Committee, comprising of officials from the Economic Diplomacy Division of the MEA and experts from the Atal Innovation Mission, National Research Development Corporation (an enterprise under Ministry of Science & Technology), Ministries of Urban Development, Health, Women & Child Welfare, New & Renewable Energy, Road Transport, Skill Development, and Drinking Water & Sanitation selected the most promising 20 social innovations.

The winners of the contest were announced on December 22, 2016. All the winners exhibited their innovations in a custom-built pavilion at the Bengaluru International Exhibition Center from January 7-9, 2017. The 20 innovators were given a one-time fund support of Rs. 1 lakh each, a Certificate of Recognition and a Memento. This Coffee Table Book was also released on the occasion.

Breaking to Accelerate

Sanjeev Arjun Gaur, even at the age of 5, had the mind of a tinkerer, prying open his toys, to figure out the mechanics under the hood. It came as no surprise when he went on to pursue his dreams of becoming an engineer. However, much to the shock of his father, who retired as the Chief Medical officer of District Gautam Budh Nagar, and mother, a Government school teacher, he dropped out of college a few months later as he felt that he was wasting his time there.

Sanjeev did a variety of things after. He worked

in the Sales department in an Advertisement firm, entered the marble business, started an event and exhibition management company, and also joined the team of Padma Shri Aamir Raza Husain, a well-known name in theatre, and dabbled a bit in acting. "While working with the theatre company, I created a moving and revolving platform that could carry about 700 people for the famous plays like 'The Legend Of Ram' based on Ramayana and 'Fifty Days of War' based on the Kargil war," says Sanjeev.









One day when his car had been sent for servicing, he took a cycle rickshaw. Sitting behind, his trained curious eye noticed that the rickshaw peddler struggled to pedal and tried his best not to brake in traffic because it meant that he had to expend extra energy to get the rickshaw moving again. At that moment Sanjeev realized that maybe he could create a device for storing the pedal's energy, which could be released later when the peddler needed the rickshaw to move forward. A regenerative braking system was the answer.

Over the next several years, Sanjeev kept tinkering away. He spent six years to arrive at a prototype that he was satisfied with. During this time he made over two dozen configurations on the computer and finally made a working prototype, which weighed a bulky 22 kilos. He worked on four more prototypes to finally arrive at a practical device that is about 7 kilos now. Sanjeev named his invention,Dhakka(push) brake. He tested the brake with rickshaw peddlers in Noida and their response has been extremely positive.

He is currently working on a separate design, to develop a wheel, which comes pre-fitted with the DhakkaBrake and will be lighter. Sanjeev anticipates that it will be ready in the next six months. He also hopes to bring down the cost once he starts manufacturing.

Sanjeev is looking for funding upto Rs 50 to 60 lakh to start a separate social enterprise, although he is in talks with a few funders for this, but the process is taking time. A serial innovator, he also made designs for trash management and energy generation systems but is unable to develop them further due to a paucity of funds.





Garima is an economist-lawyer by education and a development professional with earlier stints in NGOs and the World Bank. Her passion for WaSH (Water, Sanitation and Hygiene) developed during her field visits to peri-rural and remote villages in India. Lack of safe and secure WaSH access prevented young girls from attending school and women who defecated in the open, often suffered from harassment.

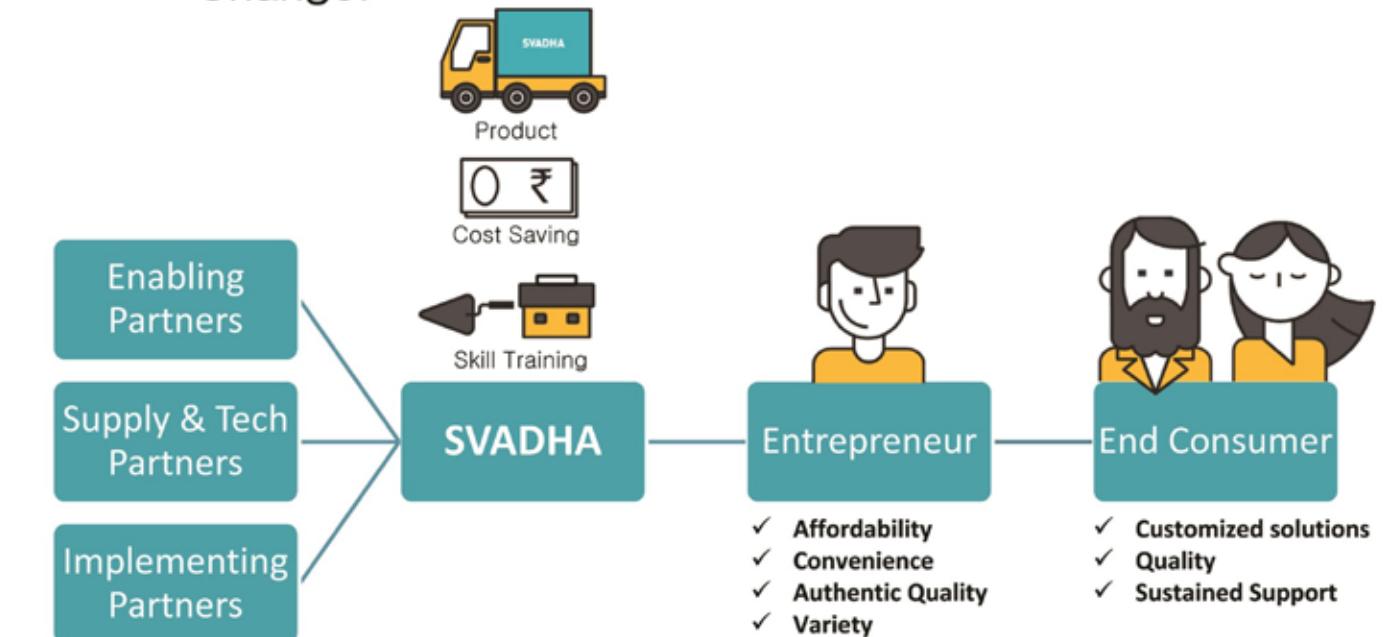
Holistic solution to rural sanitation

Garima felt that the problem was the lack of easy, customized, quality and sustained access of sanitation products and services in rural India due to a highly fragmented unorganized sanitation market. She soon quit the World Bank and co-founded Svadha WaSH in 2013 with veteran social entrepreneur, K.C Mishra, based on an ecosystem integrator model in an effort to organize the rural sanitation market and create rural entrepreneurs. However, things were not that easy, the players in the ceramic industry tried to block Svadha's entry in the market because of the better quality, and affordable products that Svadha was offering. To add to those woes, Svadha WaSH had issues finding the right manpower in the social entrepreneurship sector, who had the required business acumen, exposure to rural markets, and experience in sanitation.

Impact Numbers
91,000 + Beneficiaries, 18,200 + Total Packages, 240 + Entrepreneurs

SVADHA – The Ecosystem Integrator

Bringing Dignity. Creating Livelihood. Shaping Change.



SVADHA

Svadha's comprehensive solution to rural sanitation includes:

- **Svadha Total:** This package includes high quality toilet elements for toilet construction and is provided to the doorstep of entrepreneurs with free delivery (unique in the market and removes last mile penalty).
- **Svadha Green:** Svadha Green is a bio-toilet that converts human waste to compost using Tiger Toilet worms, while also reducing reducing pit odour, pit-emptying frequency, and limiting the space required. These features save households money. To date they have built close to 400 bio-toilets.
- **Toilet Insurance:** This protects the investment of Svadha's customers from natural hazards like cyclones, fire, and falling trees for just a one-time payment of Rs 60 rupees for 5 years of coverage. Created in partnership with Bajaj Alliance, they are the only company providing it.
- **Svadha Care:** This is a suite of hygiene products for maintaining toilets and also diversifies Svadha entrepreneurs' revenue streams.



Svadha collaborates with leading national manufacturers to ensure quality products and services at affordable prices. These are then offered to the customers by Svadha trained rural entrepreneurs. Svadha also leverages digital technology across its value chain to increase efficiency.

Future Goals:

- Provide solution for electricity and water access for sanitation.
- Create 8,400 rural entrepreneurs and impact 1.6 million customer households.
- Launch a WaSH Software as a Service (SaaS) platform that can be used by their entrepreneurs.





Making Cotton Picking Easy

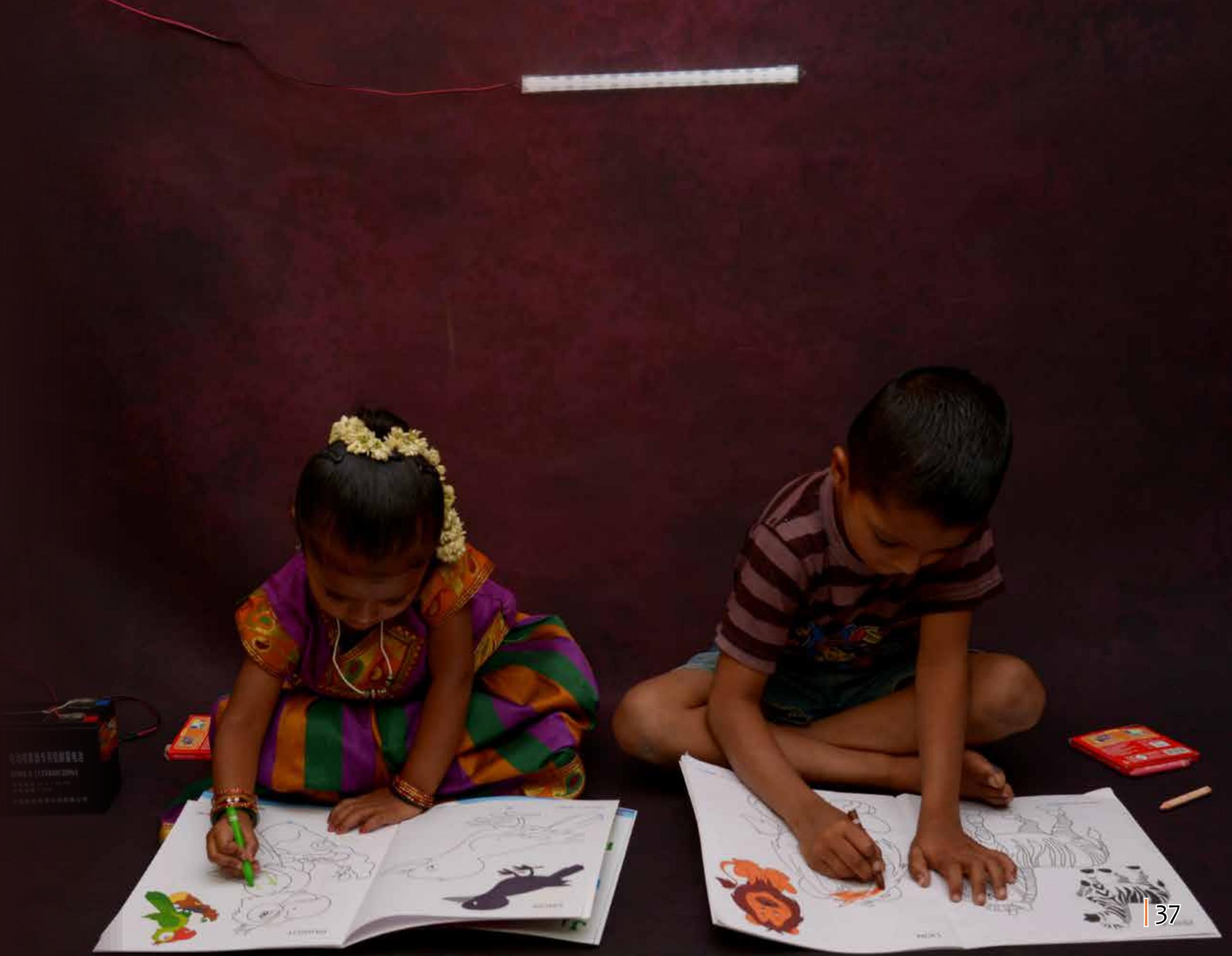
In 2012, when Sunil Kumar brought home a Chinese made cotton harvester, stripped it down in his study, and claimed that he wanted to build a better cotton harvester, his wife and kids were sceptical. They had every reason to be. He had tried his hand at entrepreneurship, twice before, and had failed. It all started when Sunil, an ex-Monsanto executive was working on a consulting assignment in Ghana, where he saw the challenges faced by farmers in the cotton fields during harvest. There was not enough labour, and those available, were mostly women and young children as young as 10 and 11 years, and to exacerbate matters, the cotton bolls were pest-infested. While stripping the Chinese cotton harvester, Sunil realized that the device in the absence of electricity and spares was of no use. He then thought of combining the harvester with a solar panel.

Sunil soon converted his study into his tinkering lab and with the help of a friend, who was a software developer and specialist in solar power, he built the initial crude prototypes. When they made some more progress, they moved the tinkering lab, to a more equipped set-up in Kochi. Sunil incorporated his startup idea, into



a company, Agventures Corporation. One of the first ones was a large solar panel, which farmers could access from a central location, but this proved to be a challenge logically. Moreover, the first model they tested was flimsy. This led to accessories getting damaged, cotton bolls got stuck, which led to the fuse getting blown. Then they built a solar panel pack that a farmer could carry on his back, which was connected to the cotton picking machine that can work with it. In addition to the solar pack and the cotton harvester, they also provided multi-pin community mobile charger, LED lights so that the farmers could harvest in low light, and also use the excess solar power to light up their homes.

Over the years through intensive consultation with the cotton farmers, several tweaks were made in the design of the device. The current version, the patent-pending Virat Portable Solar Cotton Picker & Home Power System, is sleekly designed and is sturdy enough for all kinds of cotton bolls: those that are ripe, shrunken by rain, and even those that are pest infested. The cotton collection bag has been improvised and replaced with a nylon one. The current version can pick 200 kg cotton in 6 hours compared to 50 kgs through handpicking leading up to 30 percent in cost



Solar-mounted Helmet
powering the cotton picker



savings due to increased productivity, time saving and zero electric costs.

Sunil decided to launch his product in Burkina Faso, because the African continent has just a handful of distributors, unlike India which has thousands of distributors. Having already sold 2000 units in Africa and 500 in India, Sunil is hoping to rope in the State governments of Gujarat, Karnataka and Haryana to underwrite some of the costs so that farmers can buy the device at a subsidized price. Agventures expects to sell 5,000 units in the next three years.

Cognizant of the fact that there might be competition brewing in the horizon, Sunil is already planning for the future, and is readying a new product that will give Agventures a significant competitive advantage in case there are new launches. While the backpack solar panel is lightweight, sleek and sturdy, it has a disadvantage in countries where women carry their newborns on their backs. A new model will have the solar pack mounted on a helmet.

Sunil's wife and children, who were initially sceptical, support him 100 percent now. Venture capitalists, who had earlier refused to fund his venture, are now knocking on his door, ready to invest.



Zero Emission Passenger Ferries

Sandith Thandasherry's biggest inspiration is his father, who started off at the lowest level in the Department of Fire and Rescue Services (Thiruvananthapuram) but rose through the ranks, through sheer hard work and dogged determination over 33 years, to become the department's Chief. Armed with that same ambition, Sandith is harnessing the fire of the sun to build solar ferries that will save money and protect Kerala's fragile coastline that is choking with toxic fumes released by the hundreds of diesel guzzling ferries that ply on its rivers, lakes and backwater canals.





After graduating as a marine architect from IIT-Madras in 1999, Sandith learned shipbuilding and design trade at Alcock Ashdown, a small shipyard in Gujarat, and at OMI Marine Services, in South Korea. In 2006, he joined INSEAD to supplement his technical knowhow with business acumen, post which he founded Navgathi in 2008, to build ships. Navgathi's first port of call was to prove solar boats can be as quick as conventional boats. Navgathi developed the prototype of a small 10-seater solar powered boat which made headlines after it entered the Limca Book Of Records in 2010 for being the fastest solar boat in India. Fast it may have been, but it was economically unfeasible. After further experiments in fishing sector it became clear that retrofitting boats was a tough preposition.

Meanwhile, Sandith started looking at the application of renewable energy in the marine sector to make cleaner and greener boats. He believed that for the ferry to be commercially viable, a completely new prototype had to be built from scratch. For this Sandith zeroed in on designing a solar passenger ferry, and formed NavAlt as a new venture, partnering with French companies, AltEn and Eve Systems. But building this was not easy.

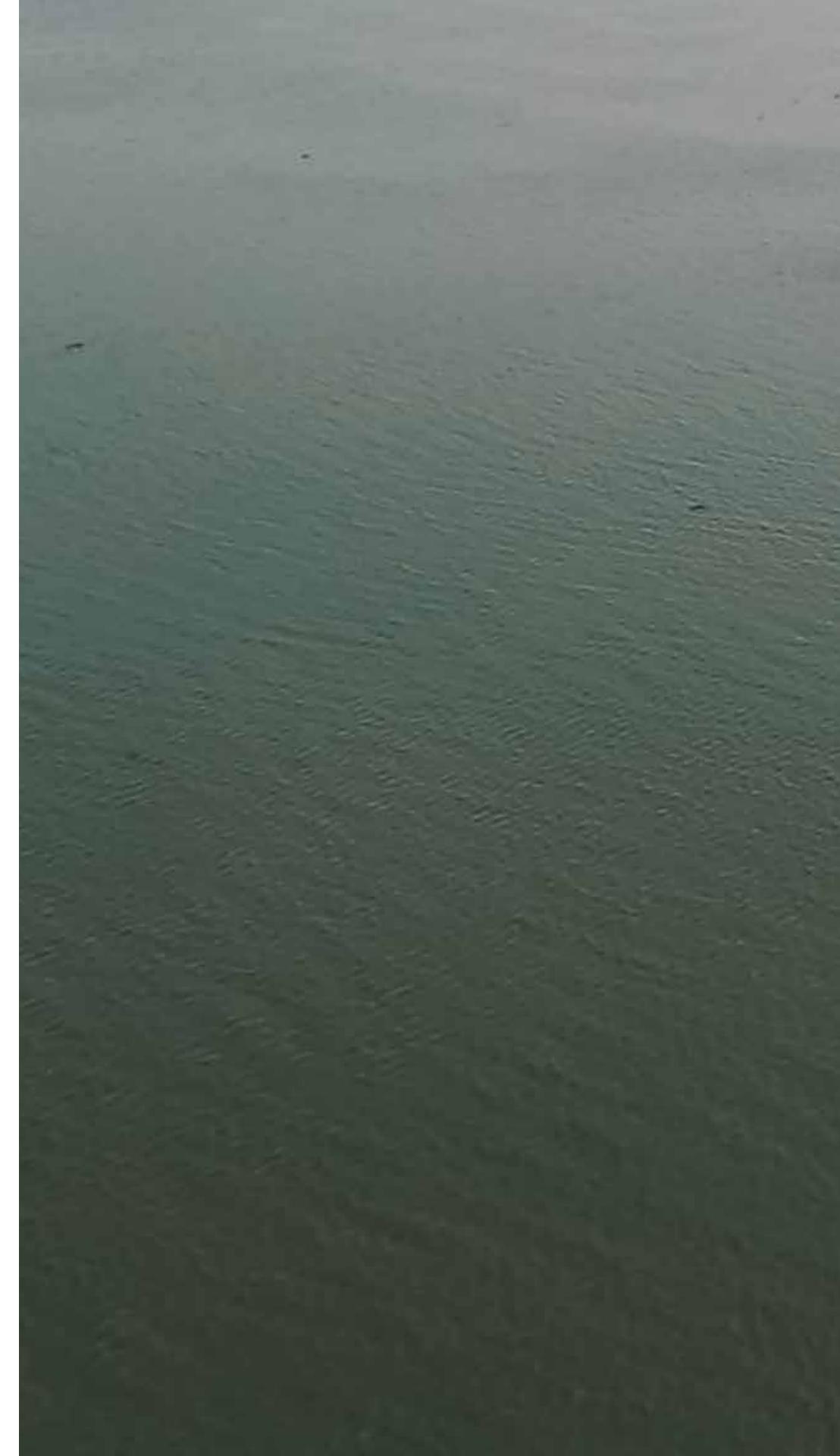


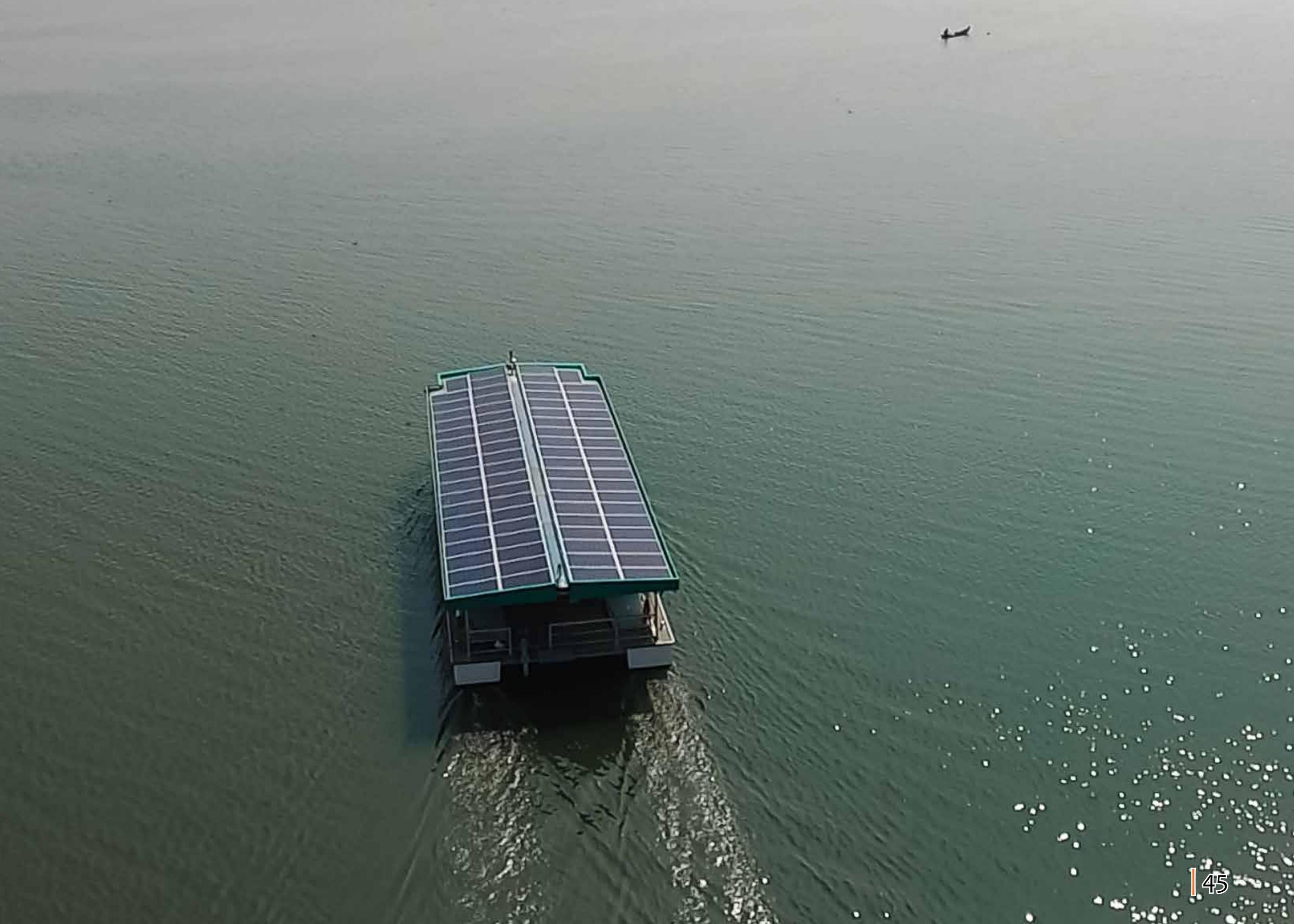
Sandith's biggest challenge was to manage the working capital as he quickly exhausted his R&D budget of Rs 50 lakhs. When none of the banks were willing to support his venture, his friends came to his rescue and invested in NavAlt. The result is Aditya, India's first solar ferry: a 75-seater passenger ferry that has been commissioned by the Kerala State Water Transport Department (KSWTD)..

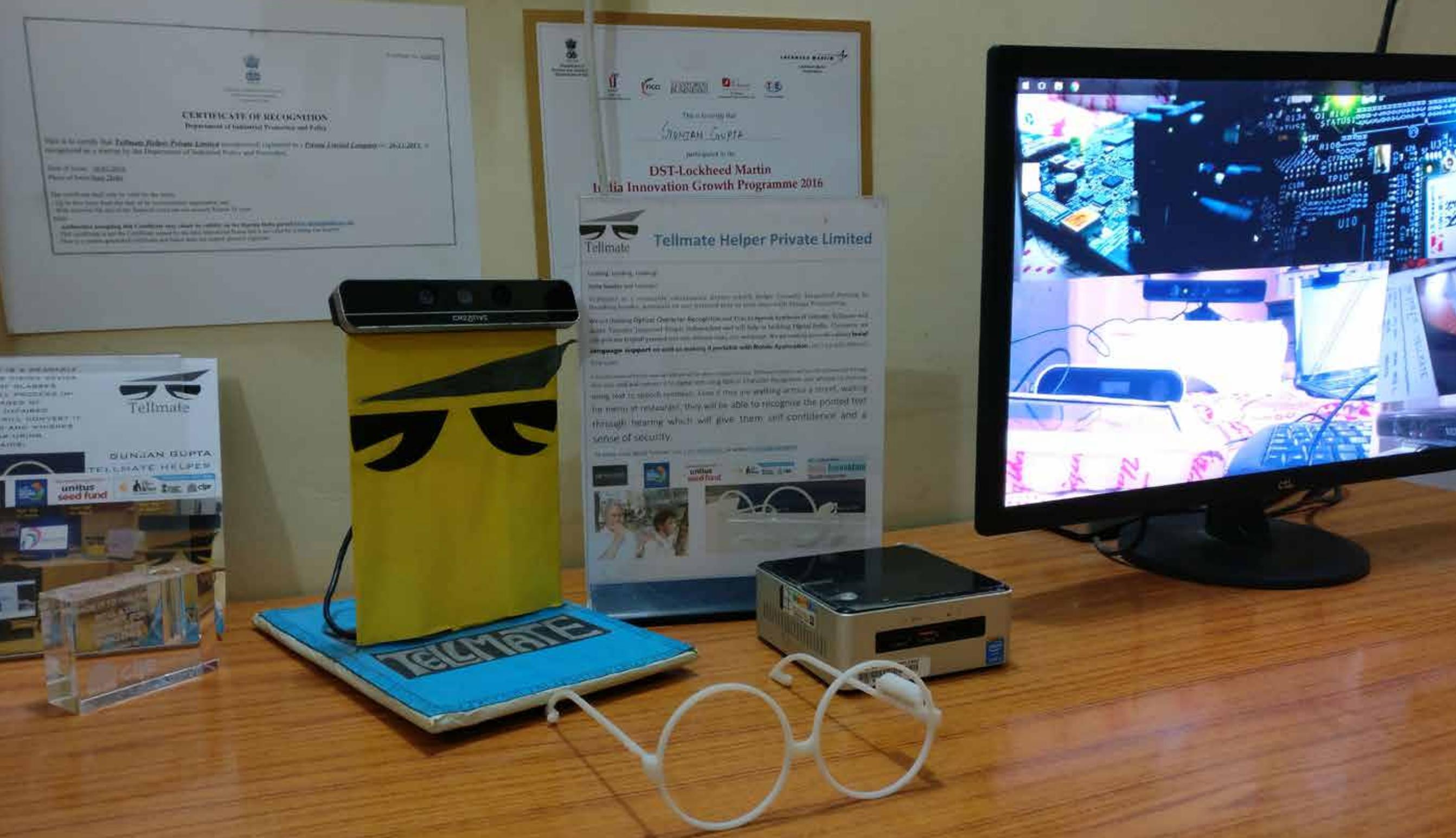
The boat which runs on 78 solar panels on the rooftop is made of fiberglass can cruise at a maximum speed of 7.5 knots. The ferry also has a 50-kW lithium-ion battery to store energy for sailing on cloudy days or during nights. Sandith's lithium battery powered ferry costs Rs 2.5 crore, compared to a diesel ferry that costs Rs 1.5 crore, for the same size. Aditya's annual running cost is expected to be Rs 1.5 lakh with a life-span of 15 years. Weighing 16 tons, the ferry has noise levels that are less than 60 decibels and releases zero carbon dioxide. In comparison, a diesel-powered ferry has annual running cost of Rs 30 lakh, weighs 35 tons, has noise levels of 80-90 decibels and produces 160,200 kg of carbon dioxide a year.



Trial runs of the 20 meter long and 7 meter wide, Aditya Solar Ferry powered by two 20-kW motors were successfully conducted on 25th November 2016. The official launch will take place on January 12th, 2017. Not willing to rest on his laurels, Sandith has identified 10 different design modifications that would improve the performance of Aditya by 25 percent in the next version. NavAlt is also developing a technology for autonomous (self driving) boats for the future, and in the near term is looking at boats that provide parking assistance and have auto-pilot features. "Our aim is to ensure that all the ferry boats built going forward would be solar-electric," says Sandith.







Third Eye

As part of his undergraduate studies in Electronics and Communication, Gunjan Gupta was working on a project at Idea Labs, in Nirma University, Ahmedabad, and spent time at Andhajan Mandal (Blind People Association). As he studied the daily routine of visually impaired people and interacted with them, he became aware of their pain points, and was surprised to know that while they received assistance to read, they were helpless when it came to processing visual information in terms of a moving vehicle or an obstruction like a stone or a ditch. This restricted movement and hindered their autonomy.



gunjan@ubuntu:~/Desktop/Projects/basicOCR-master/basicOCR\$./OCR

Basic OCR by David Millan Escriva | Damiles

Hot keys:

- r - reset image
- + - cursor radio ++
- - cursor radio --
- s - Save image as out.png
- c - Classify image, the result in console
- ESC - quit the program

System Error: 11.00%

Info on Pic. Below : First working prototype of Tellmate

| Class | Precision | Accuracy |
|-------|-----------|----------|
| 8 | 60.00% | 6 of 10 |
| 3 | 80.00% | 8 of 10 |
| 0 | 100.00% | 10 of 10 |
| 1 | 80.00% | 8 of 10 |
| 6 | 80.00% | 8 of 10 |





According to the WHO, there are 285 million visually impaired people globally. India has 62.6 million of them. With a keen desire to address the handicap faced by the visually impaired, Gunjan picked this as his final year project, and worked on it at the Idea Labs in his college. He created a prototype and submitted it. But soon after graduation, found himself a high paying job as a software developer. However, fate had other plans. Gunjan soon quit his job to pursue social entrepreneurship.

His strong desire to help the visually impaired process visual information resulted in the Tellmate, a wearable vision device (glasses) which converts images to digital text using optical character recognition (OCR) and converts text into audio and transmits it to the user via hearing aids. Also, called the 'Third Eye', Tellmate helps the visually impaired to walk around unfamiliar places by helping them avoid obstacles and read books, newspapers, hoardings, or any text thereby boosting their self confidence giving them a sense of security. At present the prototype is being tested on 600 visually impaired students and employees at the Blind People Association, Ahmedabad to test precision and accuracy of the device. Tellmate hopes to start selling the product commercially by the end of 2017.

Currently, Tellmate is able to read printed English text and provide output in English only. Gunjan plans to add other Indian languages so that the device can have greater reach. Gunjan is also working on making the device portable by developing a mobile app and connecting it with the wearable glasses. Future plans include adding navigational support, whereby on verbal instructions Tellmate would figure out the route to be taken and suggest choice of mode of transportation.



Tellmate Helper Private Limited

Running, Loading, Loading!

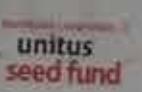
Hello Reader and Listener!

Tellmate is a portable electronics device which helps Visually Impaired Person in Reading books, journals or any printed text in real time with Image Processing.

We are checking Optical Character Recognition and Text to Speech Synthesis of Tellmate. Tellmate will make Visually Impaired People independent and will help in building Digital India. Currently we can process English printed text with different fonts, size and design. We are working towards adding **local language support** as well as making it portable with Mobile Application. Let's try with different font sizes.

It would be great for our visually impaired people to read printed text. Tellmate's camera will see the printed text through their eyes and will convert it to digital text using Optical Character Recognition and whisper to their ear using text to speech synthesis. Even if they are walking across a street, waiting for menu at restaurant, they will be able to recognize the printed text through hearing which will give them self-confidence and a sense of security.

To know more about Tellmate visit www.tellmate.in, or write at contact@tellmate.in





One of the most interesting and innovative initiatives that has been developed by Sanjay Kumar Patel's company SPRE is the affordable "air pillow" type, Flexi Domestic Biogas plant technology made using high density polymers.

Flexi biogas plant technology

In February 2010, when India became the global leader in milk production (producing 17% of the total milk in the world), Sanjay Kumar Patel, a clean energy entrepreneur from Gujarat, called Dr. Verghese Kurien, father of India's White Revolution, on a whim, to congratulate him. Much to his surprise, Dr. Kurien invited him to his home, offered him lunch and spent four hours chatting with him. Sanjay asked him about how he had managed to build such a massive organization like Amul despite all the challenges he had faced. Dr. Kurien told him that the secret was the initial support that he had received from Mr. Tribhuvandas Kishibhai Patel, the founder of the Kaira District Co-operative Milk Producers' Union, who helped him galvanise the dairy farmers by connecting them with the cooperative movement.

During that conversation, Sanjay proposed to Dr. Kurien that he wanted to build a biogas (primarily using cow dung) powered electricity plant in Anand district that will be owned and run by the dairy farmers. Dr. Kurien was all ears, as he had thought of doing something similar when he was the Chairman of the Gujarat Electricity Board. Within a few months after that conversation, the Thamna Bio-power and Organic Producers Company Ltd. had taken off, with Sanjay employed as the technical consultant. Thamna Bio-power was set up with a seed capital of Rs 15 crore and a share holding of 2,000 farmers, who had 44% stake by contributing Rs 10,000 each. 30% stake was taken by big farmers, as individual stakeholders and the Power Purchasing company held the remaining 26%.

Since then Sanjay has been involved in many projects, both in India and abroad. One of the most interesting and innovative initiatives that has been developed by his company SPRE is the affordable "air pillow" type, Flexi Domestic Biogas plant technology made using high density polymers. Unlike the conventional biogas plant, the Flexi Biogas plant does not require any civil construction and can be installed in just about a few hours, even in hilly and remote locations. The technology

can use multiple feedstock like agro waste, press mud, poultry waste, kitchen waste and cow dung. It has a digestion period of 15 days. SPRE has also come up with a complete kit for ready-to-install biogas plant at homes and farms. The portable biogas kit, which is currently being pilot-tested, is about 40% cheaper compared to alternatives in the market. SPRE has already installed more than 250 flexi biogas plants in villages of India and overseas.





According to Sanjay, current domestic biogas technology in the market is not practical because of cost and complexity. To commercialize the innovation, SPRE is seeking US\$4 million as debt financing for capital investment and working capital requirements. Sanjay believes that the investment will help provide access to clean cooking fuel to around 1.14 million people covering 228,000 households over a period of 5 years. The investment will also help SPRE provide 200 direct jobs and 5,000 indirect jobs, mostly to women. Sanjay is confident that his technology will get him the required funding.



Connecting Rural Artisans to the Global Market

In 1986, Neelam Chhiber, after graduating in industrial design from the National Institute of Design, Ahmedabad spent sometime documenting stone crafts in 14 states, and later worked as a consultant with numerous government craft organizations including the Handicrafts and Handlooms Export Corporation of India and the UP Export Corporation. Working closely with artisans, she found that India's 60 million plus creative producers, largely women, were subjected to poor working conditions with irregular, low incomes due to an ill-structured value chain and as a result, face distress migration, forced labour and trafficking. These women depend on middlemen for access to key resources and markets, and in the process receive a low margin of the end value of the product sold to the customer.



Neelam co-founded Industree Foundation in 1994 along with her friend Geetha Ram. Industree works towards building up the production base, enabling artisans to become owners of their enterprises.



Neelam states, "I worked for over two years in parts of rural and remote Bastar, and the ethos of the spaces and people I saw there made me determined that we need a pluralistic India, where there is a tonal counterpoint to urban India and urban Indian values, which are slowly morphing into a globalized whole. Indian diversity lies in our hands, and we need to protect it."

Realizing that there was a need for a comprehensive approach to help communities assess their traditional skill base, organize them into production units, develop products that appeal to modern markets, and create consistent demand to create sustainable businesses at the lowest possible costs, Neelam co-founded Industree Foundation in 1994 along with Geetha Ram..







Industree Foundation has developed what it calls the 6C model - an enabling ecosystem that connects producers to markets and in the process empowers them economically and socially. It comprises of facilitating producers with access to training in hard & soft skills (Capacity), working capital (Capital), design inputs (Create), infrastructure & handholding support (Construct), markets (Channel) and linkages with the value chain through digital technology (Connect).

Among those collaborating with Industree to build out the 6C model are Mindtree, Sonata Software, Mastercard, Social Venture Partners, NSDC, Srishti Institute of Art, Design and Technology, among others.

Industree's approach has tripled the incomes of artisans in non-farm occupations. Over 30,000 producers have received training from Industree in the creative manufacturing sectors across India and Africa. The Foundation has incubated two producer companies Greenkraft and Ektha in the handicrafts and apparel sectors respectively, servicing customers like Mother Earth and Ikea, and impacting 2000 women. It is also in the process of setting up a third producer company impacting 15,000 producers in Narsapur, Andhra Pradesh.

By 2026, Industree Foundation, through 'Mission Creative Million' aims to create significant social and economic impact for one million producers by setting up 30,000 inclusive micro-enterprises tied together on a single digital platform, harnessed by the power of technology, the smartphone revolution and skill development with a focus on gender balance. Neelam feels that her work has just begun.





Tata Consultancy Services (TCS) - Innovation Lab - Mumbai, focuses on mobility and social innovations, aiming to be a pioneer in providing innovative services to improve livelihood, education, skills and quality of primary healthcare of the masses and to establish leadership in Rural Mobile Human Computer Interface (HCl), in India and the subcontinent.

mKRISHI Fisheries: An App Aiding the Fishing Community



TCS undertook an elaborate study of the problems faced by fishermen and came up with a solution - mKRISHI® Fisheries, the first app to provide information on the Potential Fishing Zone (PFZ), wind direction-speed, wave height information on Java and Android phones in the local language.

TCS collaborated with the Indian National Centre for Ocean Information Services for developing this app. Pilot results have shown a 30% increase in catch and 30-50% less diesel usage.





The mKRISHI® Fisheries App is easy to use. Fishermen can check the PFZ maps every evening and get into the sea only if PFZ is in their proximity. The information helps the fishermen planning their sailing time and avoid unnecessary trips, saving diesel, ice and labor expenses. The Central Marine Fisheries Research Institute, Mumbai carried out a series of impact studies under the World Bank's National Agricultural Innovation Project (NAIP) and found that the mKRISHI® Fisheries app was extremely helpful in not only saving diesel, government subsidies and other expenses, but also precious lives of the fishermen.

TCS is constantly working with the fishing communities to improve the App. In 2013, with the help of Tata Teleservices and World Bank funding, mKRISHI® Fisheries did a pilot to expand the mobile signal in deep sea for up to 30 km along the coast of Raigad district in Maharashtra. Other than being able to receive information in the sea, this led to better bargaining power for the fishermen, as they could now directly talk to buyers while they were at the sea. While TCS initially tried to charge Rs 30 per month through Tata Teleservices for the services they offered on mKRISHI® Fisheries, they realized that the service is best given free. TCS is confident that going forward mKRISHI® Fisheries will immensely contribute to the overall development of the lives of communities that are largely dependent on the sea for their survival.





Pic: A. Ramesh Kumar, CMD, Swarna Pragati Housing Micro Finance

Swarna Pragati: Revolutionizing Rural Housing Finance

A. Ramesh Kumar was School Captain at Besant Theosophical High School, Varanasi, Uttar Pradesh where as an all-rounder he excelled in academics, sports and extracurricular activities. Being in Scouts and having received the President's Scout Award, instilled in him a strong sense of community service and patriotism. Ramesh went on to university to study Physics at the University of Delhi on full scholarship. Following graduation he joined the State Bank of India (SBI), where he was one of the first cohort of hires to be trained to expand SBI's activities into rural markets. During this Ramesh got in-depth exposure to building linkages between mainstream finance and rural needs and how to leverage finance as a developmental tool.



In 2004, during his tenure as the head of SBI's Western India Division (Mumbai Circle), he found that the primary issue was that rural branch managers were burdened with regular responsibilities, and had no support or recognition, to prioritize lending to self help groups (SHGs). To resolve this issue he started a sensitization program for employees to be SHG Mithras (Friends of SHG) and brought about awareness of the importance of micro-finance to the work of SBI. In 2005, NABARD invited him to be the Chairman of the National Committee on Rural Habitat, to address the deficiencies in the rural housing finance, where he helped develop the Draft National Rural Habitat Policy for India.

According to Ramesh, the formal banking sector has been denying access to finance for housing to rural populations primarily because existing housing finance products and mortgage structures are not built to serve rural populations, due to their long term nature, collateral requirement, difficulty in establishing creditworthiness of the borrower, and high cost of outreach. In order to solve the problems in rural housing finance, Ramesh started Swarna Pragati Housing Micro Finance in 2009.



Swarna Pragati Housing uses a unique model with innovative solutions including:

- Incremental housing finance in multiple cycles and short duration affordable EMI loans adapting to rural needs.
- Use of Village Panchayats for creating Para-legal title for a revolutionary Para-legal Mortgage, thus bringing inclusion to the excluded by accepting community recognized rights.
- Use of group social collateral in housing loans through use of self help groups (SHG) / joint liability groups (JLG).
- Door step lending and Grass root partners - use of Partnership model and networking with rural Non-profits and MFIs to create access and reduce transaction costs.
- Use of Productive Housing Loans with a component for livelihood enhancement.
- To be eligible households must have two sources of income; and have a bank account.
- Housing construction is monitored via photos taken at different points of construction.
- Costs of labour and materials must also be disclosed to SPHM and the local MFI partner.





S. INSTITUTE - SDG

S. INDIANA PRIVATE HOUSE MICROFINANCE PVT. LTD.

11th STREET - 9th

11th Jan 2016

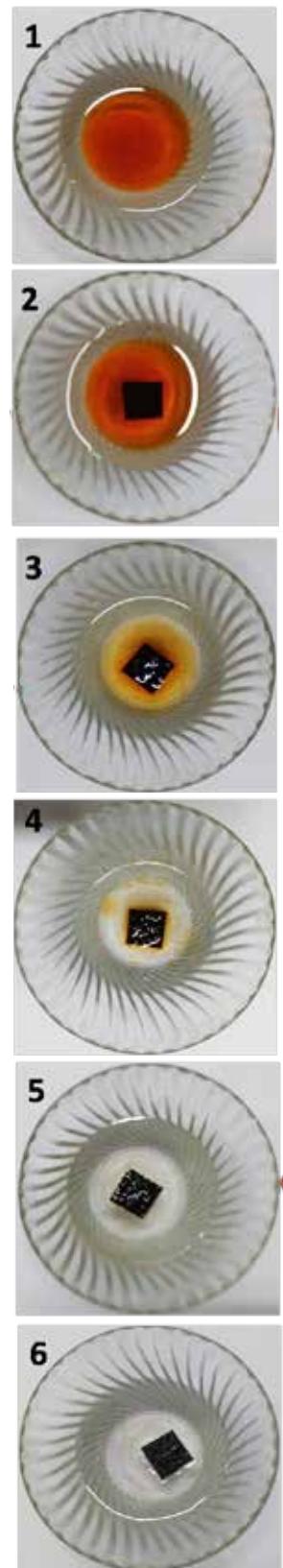


Nan01Sorb: Cleaning up Oil Spills

Machhindra Bhalerao, comes from a small village called Rajuri, close to the holy town of Shirdi in Maharashtra. But that didn't stop him from dreaming big. His father, a farmer, and mother, a housewife, always stood by his decisions. As part of his PhD program in Chemistry at the Institute of Chemical Technology, Mumbai under the guidance of Prof Anand V. Patwardhan, Machhindra decided to develop an environmentally friendly way of cleaning up oil spills.

The most environmentally-friendly approach to cleaning up after an oil spill disaster is to absorb the oil and recover it. While oil booms and oil skimmer vessels are often used to clean up oil spills, they are not very efficient. Machhindra says that his invention "Nan01Sorb" is a novel way of cleaning up oil spills.

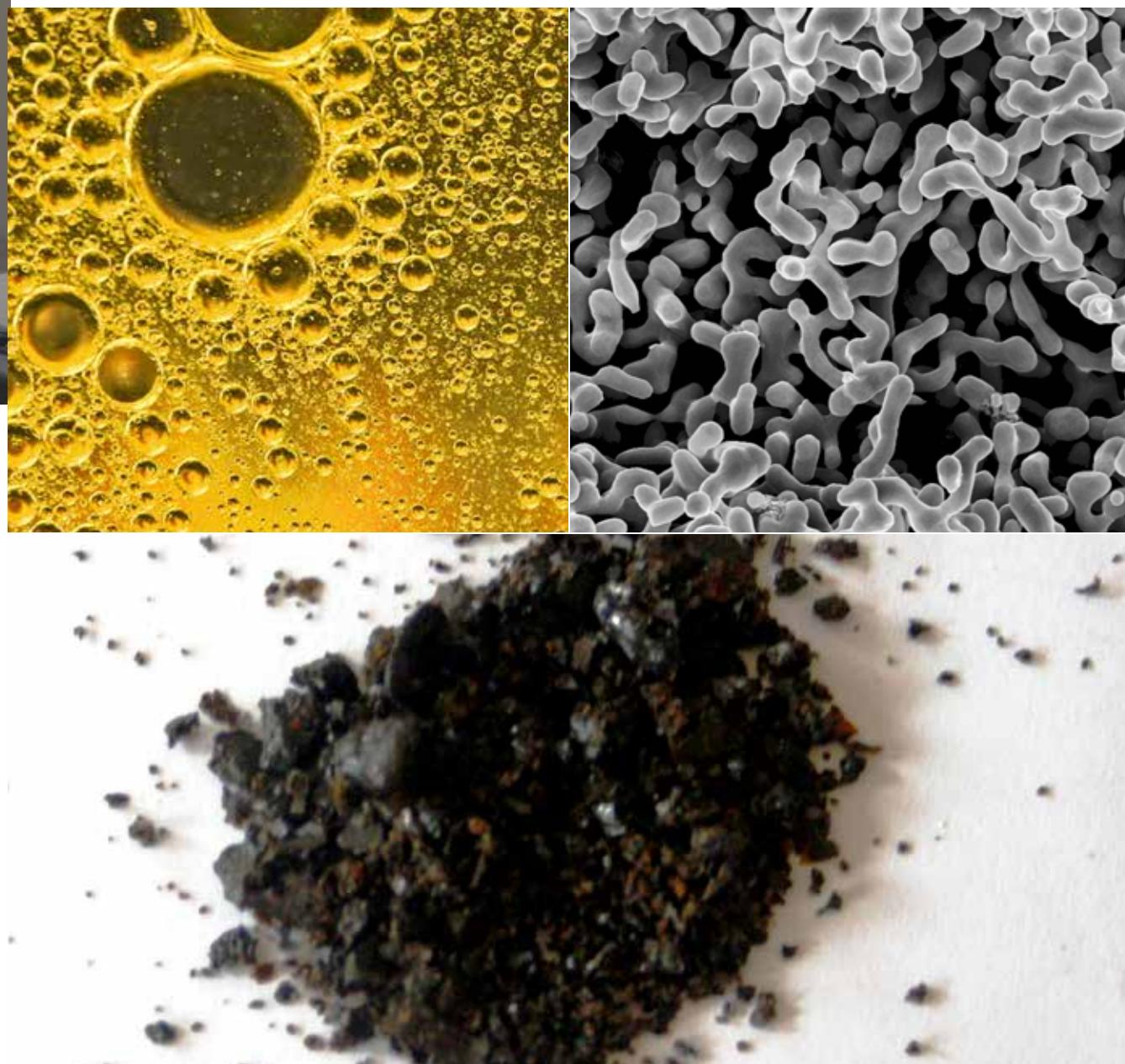
Serial Numbered Pics to the Right from 1 to 6 demonstrating the oil absorbing capability of Nan01Sorb





NanOISorb was created by utilizing waste cooking oil and nanomaterial. The waste cooking oil provides an infinite feedstock, as it is cheap, and widely available. NanOISorb absorbs oil and other hazardous solvents due to its micro-porous nature, large specific surface area and hydrophobicity. "By transforming NanOISorb into thin sheets, synthetic fibers, flax or other materials, NanOISorb could be applied to other areas" says Macchindra,

Machhindra is conducting tests to check the applicability of NanOISorb as a membrane for water purification from heavy metals, such as arsenic, lead, zinc, iron and manganese. Other applications being tested are in the absorption of industrial waste reactive dyes (azo-reactive dyes, reactive blue 4), and in the cosmetic industry for clean oily skin or for makeup removal.





Left Pic: NanDISorb
Research Group at the
Institute of Chemical
Technology, Mumbai

NanDISorb is still in the proof of concept stage, and needs to demonstrated on a commercial level. Machhindra is looking for financial support for commercialization, and has approached companies for a possible collaboration. The approximate cost for commercializing the innovation is about Rs 1 to Rs 1.5 crore. The funding will be used to design a NanDISorb Oil Spill Kit which could be used to clean spills caused by petroleum based solvents, plant based oils and other water insoluble chemicals. Meanwhile, Machhindra continues to tinker away in the lab to improve NanDISorb's performance. Looking ahead, he is confident about the future of his patent pending innovation.

Designing Flood-resistant housing for the poor

Founders of architecture, urban design and landscapes firm MAD(E) IN MUMBAI - Kalpit Ashar and Mayuri Sisodia finished their undergraduate education from Kamla Raheja Institute for Architecture in Mumbai. After graduation, Mayuri went to The Bartlett, University College London for a Masters in Urban Design and Kalpit to the Institute for Advanced Architecture of Catalonia, Barcelona for a Masters in self-sufficient habitats, digital tectonics & emergent territories. Both returned to Mumbai, a city which majorly shaped the philosophy of their practice and thinking towards cities and architecture. After working for Charles Correa Associates on various national and international projects, the two set up their own firm - MAD(E) IN MUMBAI.

At MAD(E) IN MUMBAI, the duo offer a wide variety of services including territorial planning, self-sufficient habitats, landscape urbanism, digital tectonics, infrastructure etc. The Studio has won a number of awards including 'Rethinking Kala Nagar Traffic Junction' organized by the BMW Guggenheim Lab; 'Revitalization of Banganga Crematorium' organized by the Rotary Club; and the International Design Competition for Sustainable Community Center organized by International Conference for Humane Habitat.

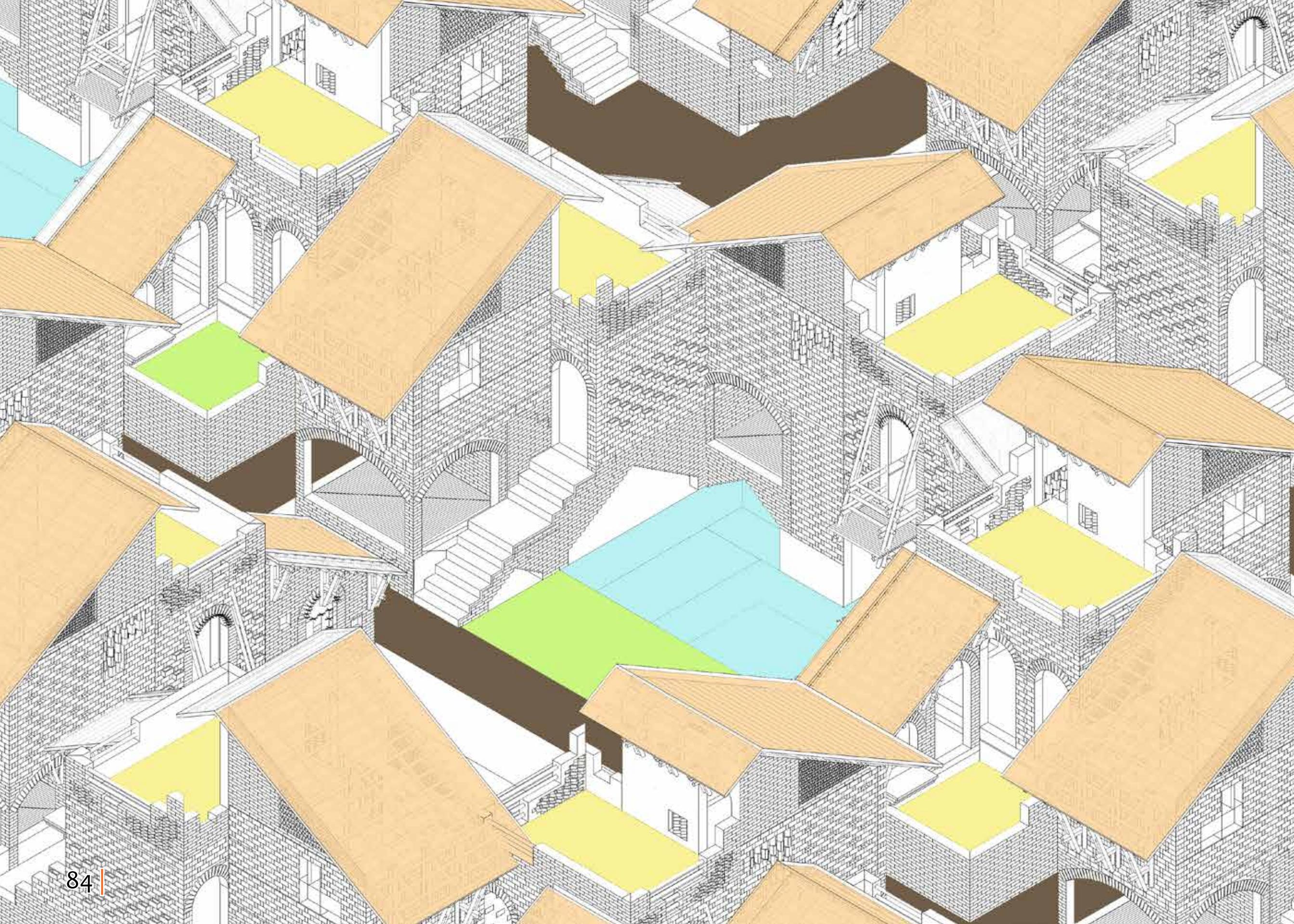
The Mumbai floods of July 2005, that submerged the city with 37 inches of rain in 24 hours and impacted millions of people had a profound impact on Kalpit and Mayuri. Unplanned residential developments that interfere with the natural path of water was one of the prime causes of the floods. The duo felt that, if the residents of Mumbai had respected the hydrological processes of the topography and allowed the water to make its way to the sea, the devastation of 2005 could have been avoided. They are also of the view that during natural calamities such as floods, poor communities and the urban poor suffer the most.



The duo has come up with a design for flood resilient habitats for the urban poor that mitigates risks of waterlogging, asset loss, extreme temperature, poor water supply, and spread of waterborne diseases. The prototype consists of three low income houses of 75 sqmts each that accommodate rhythms of water. Each residential plot is designed to develop 20% of its land as a water body that could soak flood and rain water. The houses grow around the water body. The cost for each unit is estimated at US\$6,500 and can be brought down to US\$4,500 if a cluster of three units with a shared infrastructure are constructed.









The houses will be built by the community itself using the design manual in local language. The house adopts load bearing construction with local materials such as brick, bamboo and terracotta. Rather than RCC slabs, the brick funicular system will be used. The cost of the house is reduced further by using rat trap bond for walls and constructing built in furniture such as shelves, seating and storage. By enabling a vegetable garden and a small shop in the porch, the house enables the family means of food production and livelihood. Kalpit and Mayuri, are looking to convert the proof of concept and build a prototype to demonstrate its viability.



Meghshala: Encouraging learning through Technology

When Jyoti Thyagarajan, a teacher with a background in nuclear and high energy physics met Sridhar Ranganathan, an ex-Yahoo India COO and successful serial entrepreneur, there was instant synergy. Sridhar who had started working on a Learning Management System called CloudOn, found a believer in Jyoti, who was one of the first users, and was convinced of the enormous potential of the platform instinctively. Being a teacher with 40 years experience, Jyoti understood that the cloud-based learning platform would be a boon for teachers, and could revolutionize teaching, especially for government school teachers, who have limited access to new learning resources.







The inspiration for Meghshala may have had its origins in Africa, where Jyoti spent a few years working as a teacher in Lusaka, Zambia. She was once on a walking safari in Kenya with a tall Maasai warrior, who handed her a "magic" herb that cures indigestion, colds and coughs. "I smelt the crushed leaf. It was tulsi! He was Masai and I was Indian. There was an ocean between these two civilizations and yet, the knowledge was the same," says Jyoti. She realized that Kenya and the rest of Africa have the same problems in their education system that India has, and to solve this a return to old knowledge was needed, along with an application of modern technology. "If not me, then who? If not now, then when? grew to fill my universe," recalls Jyoti. After that serendipitous meeting, an idea germinated, leading to the founding of Meghshala Trust, in December 2013. "The organization is completely rooted in the philosophy that when like-minded people come together it can lead to profound change," says Jyoti.



Meghshala works with teachers and equips them with processes that would make classroom learning interactive and interesting. They also work with the teachers by providing teaching ideas, in-contextual training and instructions to effectively execute these lessons in class. Meghshala's Teachkits leverage world class pedagogic practice and create multimedia lessons designed for classroom usage. They use the national curriculum, divide them into individual subjects, then split each subject into individual units, which are further split into lessons. These lessons are loaded on the Meghshala cloud, which can be accessed by teachers through tablets and projectors and taught to the students.

Using images, videos, activities and strategies, Meghshala converts the classroom into an active learning space. Meghshala has also created an Android App, which is used to collect usage data, enabling them to provide personalized teacher reports to implementation managers, who tailor their intervention accordingly. The App works offline and online and has multi-lingual capabilities. Currently, the Trust has a team of 26 members who work with more than 120 government schools and low-income private schools in both urban and rural demographics and 300 plus teachers. Meghshala's mission is to empower 100,000 teachers by 2020. In the future, Meghshala will focus on the need to write teach-kits for a differentiated classroom that involves music, drama and cartoons as first influences on lessons.



Increasing School Attendance through Handwashing

Simanta Kalita did something strange after winning the Gauhati University Gold Medal, for securing first position in his Master's Degree in Zoology. He decided to switch tracks, and do an undergraduate degree in education, as he wanted to learn more about child psychology. This was doubly puzzling because he did not have the financial means to pursue his new-found passion. Undeterred, he enrolled for a Bachelor of education (B. Ed) program in a night college, and worked part-time in two colleges during day time to meet his education expenses.







After graduating in 2002, he worked as a lecturer for a few years, before joining the Centre for Environment Education (CEE) in 2005 as a Programme Officer. A year into the job, Simanta was promoted to lead all of CEE's efforts in North-East India. While implementing a pilot project for CEE aimed at creating a child friendly environment in 20 schools in partnership with UNICEF and Sarva Shiksha Abhiyan (SSA) in the Kamrup district of Assam, the issue of frequent absenteeism among children and the link to diarrhoea cropped up. On one of the days, when it was time for the school midday meal, Simanta noticed that many children skipped handwashing not only because the lunch queues were long, but also because they had limited time for lunch break and wanted to play. It struck to Simanta that he needed to devise ways to reduce the time taken for handwashing, and develop a system to monitor the whole activity.



In 2012, Simanta through CEE, and in association with UNICEF and SSA-Assam piloted the DHaAL (Daily handwashing for an ailment-free life) project. The DHaAL project innovated different low cost group handwashing stations (GHS) to suit local needs of schools where 20 children can wash hands simultaneously. The innovation reduced the time taken for handwashing by 90% and water consumption by 38%.

Engaging all the stakeholders for operation and maintenance of water, sanitation and hygiene facilities like Student Council, Mothers' Group, School Management Committee and teachers, was key in ensuring that every child washed hands before the midday meal with soap. The Assam Education Commissioner also issued an order allocating a specific time for handwashing and provision of soap from midday meal budget increased soap availability by 92%.

Simanta and his team motivated communities to join the movement. They identified natural leaders in the communities and reached out to difficult target groups through them. Simanta and his team also explained to them the importance of handwashing with soap at critical times, especially before meals and after defecation and taught them the five steps of handwashing. The DHaAL pilot was first done in 422 schools in Assam. A post project survey, reported that the intervention had reduced water borne disease and increased attendance in schools. The Government of Assam has now scaled the project to cover 26,800 additional schools, with group handwashing stations integrated with new toilet blocks, and the midday meal kitchen. Taking a cue from the Assam government, the DHaAL concept is being replicated in Maharashtra, Karnataka, Bihar, Gujarat, and Rajasthan.



Rooftop Organic Fertilizer Maker

After finishing his Master's in Pharmacology in 2012, Prakashbhai Vaghasiya started his social enterprise - Molecule Agri, which manufactures a wide range of plant growth promoters, plant nutrients and bio-pesticides used in agriculture, horticulture and floriculture. Prakashbhai's dream of running a social enterprise nearly died twice. First, he faced severe cash flow issues because the dealers would not pay on time. And in his second year in business, his manufacturing unit was ravaged by a fire, and he suffered huge losses. Like a phoenix, he managed to rise from the ashes and rebuilt the unit, thanks to the help from his father and relatives. His company Molecule Agri's superior product quality, and efficient customer service, has helped in turning the business around.



Beginning 2015, Prakashbhai became obsessed with organic agriculture and its benefit to the farmers, consumers and the environment. He turned his terrace into an organic farm and began growing organic vegetables in an attempt to learn how to produce organically on a terrace. Farming was in his roots. Prakashbhai's father was also a farmer but had to give up the profession because of financial issues. The family which used to farm in Rajkot had to move to Surat, where Prakashbhai's father found work in the diamond business. However, thanks to Prakashbhai, the family once again returned to farming. It's been a family affair since.



Other than Prakashbhai, his wife, brother, and parents are also involved in the organic project. The terrace project may have started as a way to grow organic vegetables, but it lead him to experiment with many organic fertilizers, bio fertilizers, and organic and natural pesticides during production. Among all that he tried and tested, the most highly effective organic fertilizer was the one derived from banana peels.



Banana peels are widely available in India. India is the world leader in banana production with an annual output of about 29.7 million tonnes against the global output of 102 million tons. At present, banana peels are not being used for any other purposes and are mostly dumped as solid waste at large expense. It is thus significant and even essential to find applications for these peels as they can contribute to real environmental problems. Peels are good sources of polyphenols, carotenoids and other bioactive compounds which possess various beneficial effects on human health. Banana peel is rich in dietary fibre, proteins, essential amino acids, polyunsaturated fatty acids, potassium, phosphorous, and other micronutrients like calcium and iron.

Prakashbhai expects to sell the banana fertilizer at a rate which is 20% cheaper than alternatives available in the market. "The market potential is Rs 150 crore and the product can also be exported," explains Prakashbhai. To commercialize the idea, Prakashbhai requires an initial investment of Rs 15-20 crore. With this setup, he expects to convert 3 lakh tonnes of banana peel annually into organic fertilizer used for farming. He expects to generate 100-200 direct new blue collar jobs and about 200 indirect jobs for the poor, who will help with the door to door peel collection.



FIA: Banking for the unbanked

Seema Prem's father was a Colonel in Indian Army, and this led to her childhood being spent crisscrossing the country. Some of these postings were in terrains like Leh in Ladakh where communities were sparse because of the harsh winters and development was low, and in Assam where the frequent floods uprooted the lives of the poorer sections of the society. One common thread that bound the poor everywhere was that they were non-beneficiaries of a growing economy. Seema was inspired to create models of inclusive growth, which through further research during her days at the Massachusetts Institute of Technology (MIT), coalesced into an award winning financial inclusion business model. Seema co-founded Financial Inclusion Advisory (FIA) Technology Services Private Limited in MIT in 2012, with fellow MIT student, Sameer Mathur.

श्री खुम्बा विद्यापीठ
श्री खुम्बा विद्यापीठ
SRI KHUMBA BIDYA PITH
ESTD. - 2006

VILL: TAMULIKUCHI,
DIST. KAMALpur
NORTH EAST PLYWOOD





Pic Above: Soldiers of the Indian Army availing banking services at an FIA outlet (set up in partnership with SBI) in Uri Jammu & Kashmir

Globally there are 2.7 billion people in the world who don't have a bank account. In the first-ever Index of Financial Inclusion to find out the extent of the reach of banking services among 100 countries, India is ranked 50. During the course of her research, Seema discovered that the formal banking does not help people whose annual savings are a few hundred rupees. "I met people like Susanta, a taxi driver from India who earned about Rs 300 daily and lives with his family in an urban slum. He keeps money under his mattress and hopes that it will be safe. His wife has joined a community "chitti" to save for their children's education. He drives past banks all day but cannot access their services," says Seema. There are 395 million people like Susanta who have no bank accounts. "The problem is that the cost of serving people like Susanta by private banks is not feasible because of their low deposit base," adds Seema. That's where FIA comes into play, by acting as bridge between private bankers and poor customers like Susanta, and making the economics work for both.



Through biometric enabled authentication system and a network of friendly neighborhood inclusion centers, FIA provides access to banking, in areas where it is not viable for banks to set up branches. FIA's award winning model for financial inclusion combines innovative technology and an extensive distribution network to bridge the huge demand-supply gap for banking in underserved geographies. "We have incorporated innovative practices across and a series of technology interventions at various juncture of the value chain which taken together confer a tremendous competitive advantage in this industry," explains Seema.

FIA is currently the partner of choice for 21 banks in India providing financial access to over 7 million unserved customers through its network of 20,000+ Agents in 524 districts of 22 states in the country. FIA's future roadmap for deepening financial inclusion is to set up 25,000 financial inclusion centers covering 1,25,000 villages and servicing 10 million households by 2017. FIA also wants to pioneer a next-gen digital highway by expanding its portfolio of services to become a full services firm for socially impactful products and services in verticals like education, affordable health care, clean energy, clean water and sanitation.





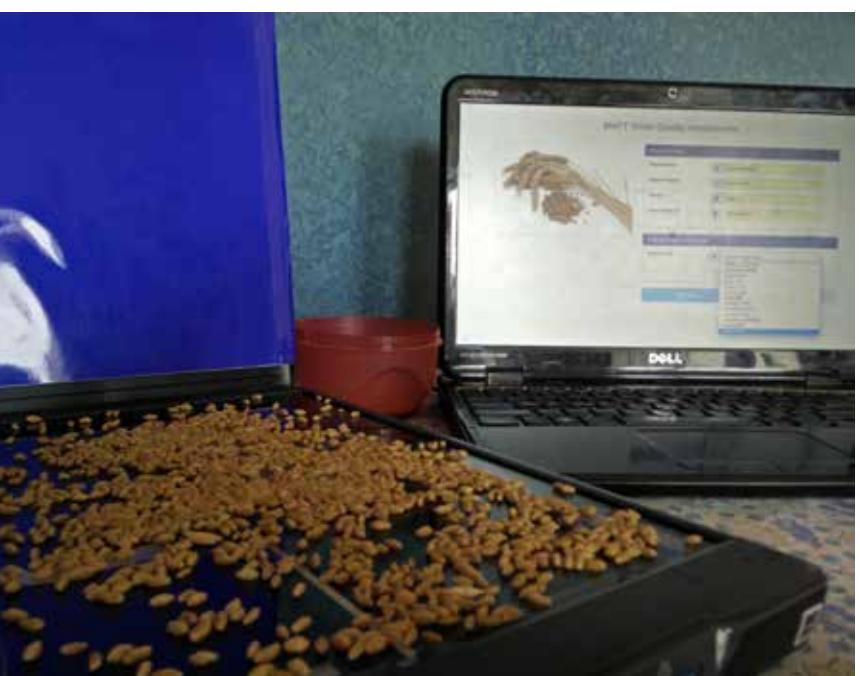
MATT: Giving Voice to the Farming Community

Tanmay Sethi and Mohit Dadhich have been friends since their college days at IIT-Jodhpur. During their final years they too caught the startup bug, but unlike a lot of their peers who were running after eye-popping valuations, they were more grounded and wanted to solve grass-root level problems in the country. "It was more like trying to establish a system synonym to that in West instead of using their intelligence to solve a local problem. We had this feeling that we need to change this trend," says Tanmay Sethi. After graduating, Mohit and Tanmay established a startup named Aha-3D that designed, fabricated and manufactured 3D Printers. Their aim was to make India's largest and most intelligent 3D Printer. "Our 3D printer played a critical role in India's first joint cerebrovascular surgery enabled by 3D Printing. This was a year long stint which gave us a deep insight of technology and its role in India. After this experience we had plans to do something even bigger," explains Tanmay.

They started tossing around ideas that would leverage technology, but result in substantial developmental impact. They zeroed in on agriculture, as they considered it the heartbeat of the Indian economy and a sector that has traditionally been tech deprived. The very first idea that came up was to create a way to cut down the middlemen between the farmer and the buyer. Farmers, in the absence of information on the quality of their produce, have to take the entire produce to the mandi paying for the transportation cost. If the price offered at the mandi is not up to their expectations, they are forced to accept the price offered by the middlemen because they cannot afford to take the produce back. The duo then decided that building an automatic grain grading device could be their first product. They felt that the device would empower the farmers by giving them information about the quality, thereby increasing their bargaining power and in the process they will also obtain large amounts of raw data that can be processed to provide inputs to improve farming practices. Enthused, they set up a company called Nebulaa Innovations.

Pic: Tanmay demonstrating the working of the MATT device in a local mandi.





To begin their research they started visiting mandis and talking to existing online marketplaces in Karnataka and Rajasthan. The duo realized that for a mandi to rely on manual assessment is not only technically unviable as thousands of farmers come to the mandi daily, but also not feasible to spend 30 minutes testing a single sample. Even at the National Commodity & Derivatives Exchange (NCDEX), they were told that the Exchange relied on manual assessment for determining the grade quality of commodity samples.

While the problem looked relatively easy at the technical level, they soon realized that releasing a commercially viable product would be challenging. They had to figure out as to how to take the image in a standard manner, process the image, segment each and every grain separately, and then process them to classify each of them. And all of this has to be done in less than one minute. Moreover, since the device will be deployed in a mandi, the device cannot rely on internet and hefty computational devices like the GPU (graphics processing unit).

To tackle some of the technical challenges, Nebulaa hired two more engineers - Yogesh Gupta and Tapish Rathore and together they took five months to prepare the first working model, called MATT, which allows farmers and buyers, to morphologically analyze crops using a flat-bed scanner and a computer.

Currently, the device works for wheat and soyabean, but is expected to be scaled to all commodities. Nebulaa's dream project is to have MATT work on mobile devices as an App, whereby through a simple click, a photograph will be uploaded to Nebulaa's server, and the user gets instant results. This innovation will give the farmer the power of information anywhere.





Pic: Dinesh Chawla, Founder, Water World Supermart

Water Purifier that beats the RO

The genesis of Water World Supermart began with conversations that Dinesh Chawla had with other players in the water filtration and treatment industry, who complained that there was no-one stop solution for all their requirements. Dinesh set up Water World Supermart in 2000, to be the Walmart of the water filtration and treatment industry, and began supplying residential Reverse Osmosis (RO) systems, filtration equipment, and also setting up residential water treatment plants and industrial RO (reverse osmosis) plants. He also started designing and manufacturing various water-treatment products with sizes ranging from 50 gallons per day to over a million of gallons per day. In the first few years of operation, Water World had innovated on a number products for both domestic and industrial use, including an economy model for residential RO system and a water cooler (hot and cold) with RO.

Water World's EWP systems are currently being tested at the offices of Airport Authority of India. The company is already in the process of developing larger industrial scale units and targeting to export the systems to the neighbouring countries and beyond.





Water World Supermart became known as the youngest devil in the water treatment world with a reputation for high quality products and timely service. Our customer base included domestic consumers, designers and executors of water treatment plants," says Dinesh. Dinesh's obsession with constant improvement, and keeping his ear close to the ground, listening to the requirements of his customers led him to start developing an innovative water purifier in 2005.

Dinesh realised that the existing RO technology was fully demineralizing the water treated, depleting it of a number of essential minerals. "We live in a time when nations are facing severe water shortages and access to clean water is limited. Despite the shortage, wastage of water is increasing with growing urbanization due to increased usage of RO technology in homes and offices," says Dinesh.





The amount of water that is wasted in RO purification systems is in the ratio of 4:1 (i.e., for every 4 liters of water, one liter gets purified). "RO system providers acknowledge that their systems create a waste stream. However, the websites and the data they provide are far from reality of actual efficiency when a system is operated in a household environment. Reduction of Total Dissolved Solids (TDS) changes the taste and pH (numeric scale used to specify the acidity or basicity of an aqueous solution) of water, and it is not good to reduce the TDS too low. The water produced from RO systems is acidic in nature thus to some extent is not good for the human body," explains Dinesh.

Dinesh developed a machine that not only wastes less water than traditional RO systems but also retains the minerals. The electronic water purifier (EWP) technology uses a hybrid electrode comprised of activated carbon, nano-materials and a semi-permeable coating. These hybrid electrodes are electrically charged using a DC power supply and have different polarities. The minerals and metals in the water have polarity charges, which are attracted to the opposite polarity of the electrode, thus removing the unwanted minerals from the water. The EWP is capable of producing up to 80% pure water with minimal water wastage of 20%. It also retains some amount of essential minerals that are required by the human body.





Pic: Nyayika workers in the field

Nyayika: Franchise-based Legal Centers

In November 2014 at a public event in Delhi, "National Meet on Social Lawyering", organized by the Centre for Social Justice and Lawyers for Change, a book titled, "Nyayika – Making Professional Legal Services Accessible was released. The book talks about how Nyayika, a chain of multi-speciality law centres offering affordable professional legal and quasi-legal services, carried out its unique experiment over the last one year of its existence. Nyayika is a hybrid of different models - the franchise business model, social enterprise (for profit) model and the non-profit business model. A combination of components from these models to create something new is what makes Nyayika an innovative and unique initiative. Nyayika's tagline "Atpatu banave sahelu", which translates to "simplifying the complex", indicates the belief in the need to simplify and demystify complicated legal and bureaucratic procedures so as to make approaching a court of law, seeking redressal in the legal system and claiming entitlements under State schemes less intimidating for the general public.

Formally commencing its operations in October, 2013, Nyayika is currently operational in eight districts of Gujarat with centres at Ahmedabad, Ahwa, Amreli, Bharuch, Mandvi, Modasa, Palanpur and Vadodara. It is a pioneering project and brand owned by IDEAL Foundation for Social and Economic Development (IFSED), registered as a non-profit private limited company, operating under the aegis of Centre for Social Justice (CSJ), an organization that helps vulnerable communities get access to justice. The Founding Directors of Nyayika include Mr. Arup Basu, Chairperson of the Board of Directors of IFSED, Mr. Gagan Sethi, Founder of Janvikas and Centre for Social Justice; Ms. Nupur, Executive Director and Founder member of the Centre for Social Justice; and Mr. Rajendra Joshi, founder of SAATH Charitable Trust.





Nyayika has adopted the 'law centre' model of Centre for Social Justice (CSJ). Nyayika law centres offer legal aid and advice in all types of legal matters including civil, criminal, revenue, consumer, labour matters. A central 'helpline' service has been operationalized to enable access to legal assistance and for registration of grievances. A law centre, like a franchise, is an office comprising of associates, managers, lawyers, paralegals, volunteers and support staff. These law centres can be owned by committed individuals, group of people, or organizations. The franchise model promotes entrepreneurship at the local level and provides empowerment opportunities to people at large. Nyayika, as a training, technical and marketing partner provides handholding support and direction to the local units that utilize its trademarked brand name and expertise to provide access to justice to all.

Pic: Ms. Premila Varmora, Associate, Nyayika Bharuch.

Nyayika law centres charge a fixed and affordable fee for its services to ensure sustainability. Nyayika believes in being accountable to the client for its services irrespective of the amount of fees charged, the type of service rendered and the socio-economic profile of the client. This is ensured by a Monitoring and Information System (MIS). In the first year of its operation Nyayika centres collectively handled 1217 cases. In the coming years, Nyayika envisages operating at least 30 centres in the state of Gujarat and expand to other States including Madhya Pradesh, Chhattisgarh, Jharkhand, Uttar Pradesh, Karnataka and Punjab.





RiVER: Re-engaging Teachers and the Taught

Padmanabha Rao and Rama met each other while pursuing their Masters in English from the Kakatiya University, Warangal, Telangana. Both come from strong rural progressive family backgrounds. What drew them together was their search for a worthwhile mission. They were certain though that conventional careers were not for them. They got married and went away to a village – Sidhipet, to try their hands at farming. While Sidhipet did not turn them into great farmers, they realized what they wanted to do with their lives.



"Primary education in India suffers from many problems, including lack of teachers, disengaged students, irrelevant textbook content and chaotic classrooms incorporating multiple grade students under one or two instructors. Overburdened teachers have little creative control of classroom content and teaching methodologies. Left with little external support, teacher absenteeism can be as high as 50%. We wanted to explore ways of changing the existing educational scenario, so that children could learn in freedom," says Padmanabha.

The day they saw an advertisement asking for teachers at Rishi Valley School (started by the renowned educationist and philosopher Jiddu Krishnamurti) to make education fun, creative, collaborative, humane, and a celebration of individual differences, they knew they had found their calling.





Rama and Padmanabha joined Rishi Valley School as teachers in 1987. A year later they were put jointly in-charge of the School's Rural Education Centre, where they conceptualized the RiVER (River Rishi Valley Institute for Educational Resources) Multi-Grade-Multi-Level (MGML) model, an activity-based learning programme, where government curricula are adapted for local context and organized into smaller modules that align with each student's ability. Children from different levels learn together in a self-directed fashion, enabling teachers to spend more time with weaker students. Local teachers gain ownership over their learning materials by developing School-in-a-Box sets, consisting of cards, charts and songs customized for their students.

"RIVER gives teachers extensive support through training, information exchanges and distance learning tools in their network. It also engages parents and local communities in the education accountability chain, creating feedback loops for quality control wherever its model is replicated," adds Padmanabha. The next innovation on the core product is use of technology. At the front-end, students and teachers will have low-cost Android tablets that will allow them to access content and conduct assessments. At the back-end, the data collected will enable decision makers to make timely interventions on learning outcomes, fine-tuning of course material, innovations in program design and conduct teacher training.

The RIVER model today has reached a critical mass of over 9 lakh teachers, who are replicating the model in 3 lakh plus schools, in 15 languages and impacting over 20 million children. RIVER methods have led to an 80% increase in attendance, dropout rates are 30% lower, and student-learning levels are 40% higher than those of public schools. This has been corroborated by independent UNESCO reports that confirmed the improved math and verbal scores of RIVER students. The RIVER approach is being experimented for adult literacy in tribal areas; in early childhood education for ages 3-6; for children with special needs; and for children and adults in crisis areas like refugee camps, war zones etc. Collaborative education projects modelled on the RIVER approach are already operational in Ethiopia, Bangladesh, Sri Lanka, Germany, Kenya and Nepal.



Mushrooms from Coffee Waste

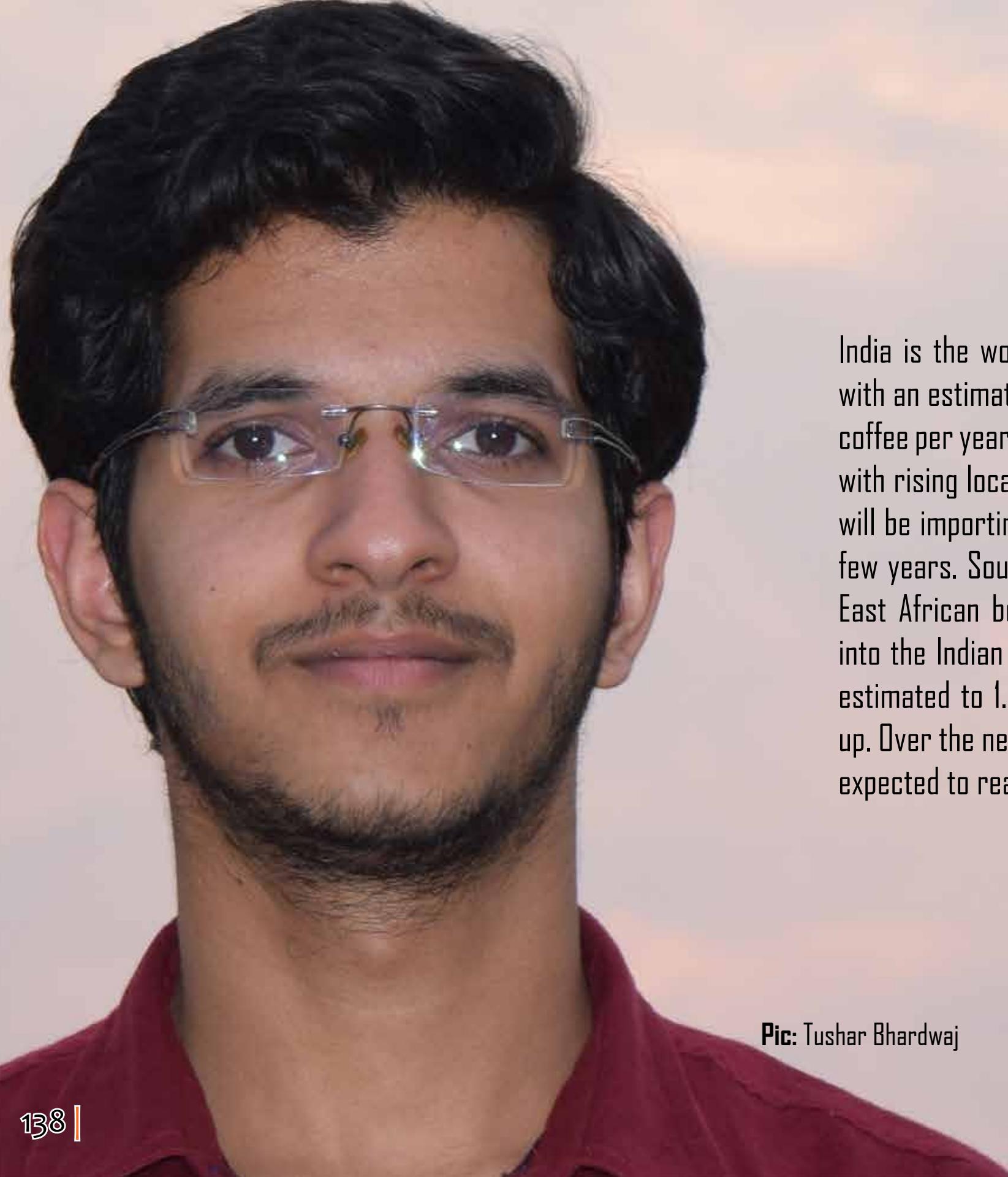
For 20 year old Tushar, a final year student of B.Sc. (H) Food Technology at Bhaskaracharya College of Applied Sciences, pursuing entrepreneurship always held appeal. The prospect of taking his ideas to the market and in the process creating social impact enthused him to no end. Luckily for Tushar, his professors in college have been supportive of his dreams. When Tushar came up with the idea, called 'Grow-Free,' utilizing coffee waste to grow mushrooms, his Professors helped him with technical knowledge and provided infrastructure required for experiments. Through guided research, Tushar found out that coffee waste is an excellent substrate for growing mushrooms. The substrate is rich in nitrogen and antioxidants.





"In the past 10 years, per capita consumption of coffee in India has increased 40 percent. The problem with coffee is that only 0.2 percent of total produce ends up in our cups, the rest 99.8 percent ends up as coffee waste," says Tushar. Tushar's innovation takes coffee waste and uses it to produce protein rich mushrooms. The ground that would otherwise rot or incinerated and become a pollutant could be productively used to cultivate mushrooms. Tushar felt that popularizing the practice could give many small landholders, in coffee growing areas of India, a nutritious subsistence crop and an alternate source of revenue. While there are people who were experimenting with this idea elsewhere, Tushar plans to implement this on a large scale.





India is the world's sixth largest coffee producer with an estimated yield of 4.7 million 60-kg bags of coffee per year, most of which is Robusta. However, with rising local coffee consumption demand, India will be importing high quality coffee in a matter of few years. South and Central American as well as East African beans are already finding their way into the Indian market. An already built demand is estimated to 1.2 million bags each year and going up. Over the next 15 years the per capita demand is expected to reach 1 kg.

Pic: Tushar Bhardwaj



According to Tushar, mushroom cultivation, may not require a lot of infrastructure but is challenging. Maintaining optimal temperature, moisture, ventilation and other conditions for mycelium growth and fruiting, is the most challenging step. Humidity levels are important, so water needs to be available, and the temperature controlled according to the variety of the mushroom. The crop should also be protected from sunlight. Moreover, since the mushrooms are grown in an enclosed environment, it is also important to monitor the crop on a daily basis for incidence of pests and diseases. With coffee consumption in India growing, and cafés springing up everywhere, Tushar believes that growing mushrooms using coffee waste will have a bright future. He is also focusing on improving the shelf-life of mushrooms by improving packaging using bio-degradable material.

Acknowledgements

Mr. Nelson Vinod, Moses

Mr. Akash Gupta, IFS

Mrs. Priya Nair, IES

Mr. Rajesh Parihar, IFS

Mr. Gautam Wahi, IRS

Ms. Tishara Garg, MEA

Ms. Aarti Singh MEA

Mr. Ashendra Varma, MEA

Dr. Arun K. Tripathi, Ministry of New and Renewable Energy

Shri. J D Ravinder, Ministry of Urban Development

Ms. Vinita Aggrwal, Ministry of Skill Development & Entrepreneurship

Shri. Sandeep Kumar, Ministry of Skill Development & Entrepreneurship

Shri. Gaurav Jain Ministry of Skill Development & Entrepreneurship

Shri. B.K Chakravarthy, Professor, IIT Mumbai

Mr. G R Zargar, Ministry of Water and Sanitation

Shri. P.S. Ananda Rao, ASRTU

Shri. Ullas Babu, ASRTU

Dr. Satish Kumar, National Health System Research Centre

Mohd. Ameel, Health Care Centre

Dr. Ayesha Chaudhary, NITI Ayog

Dr. Sanjeev Kumar Majumdar, National Research Development Corporation

Dr. C Muralikrishna Kumar, Atal Innovation Mission, NITI Ayog

Dr. Ayesha Chaudhary, Atal Innovation Mission, NITI Ayog

Mr. Gaurav Dwivedi, CEO, MyGov

Ms. Eittee Gupta, FICCI

Dr. Anil K Gupta, IIMA

Mr. Naveen Jha, Deshpande Foundation

Mr. Pramod Jha, AFE Consultants Pvt. Ltd.

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This publication was released on the occasion of the
14th Pravasi Bharatiya Divas Celebrations
in Bengaluru, Jan 7-9, 2017



Economic Diplomacy Division
Ministry of External Affairs
Government of India