Honey Bee

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Towards Grassroots to Global: Fifth ICCIG

Giving Voice, Visibility & Velocity to Grassroots Innovators & Traditional Knowledge Holders

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Editor
Anil K Gupta
editor@honeybee.org

Editorial Advisor
Vijaya Sherry Chand

Associate Editor
Anamika Dey
anamika@gian.org

Editorial Support Team
Mahek Amitabh, Ramesh Patel, Chetan Patel, Rageshri Thoriya, Anupam Dey, Dhyanesh Mistry

Graphic & Design: Unnikrishnan Nair

Cover Page: Dr. Anamika Dey & Palash Graphics

Administrative Team: Bhoomi Shah, Alka Raval, Sumitra Patel, Akshay Shah, Kishore Solanki

International Collaboration

IGNITE Atlantic
Reilley Perrins, Site-lead
345 Temperance St, New Glasgow, NS B2H 3P7, Canada

Serge Rohmer
Enseignant Chercheur/Teacher Researcher
Bureau F205, Université de Technologie de Troyes
Institut Charles Delaunay, 12 rue Marie curie, CS42060, F-10004 Troyes Cedex, France

Honey Bee Regional Newsletters

Loksarvani (Gujarati) and *Sujh-Bujh Aas Paas ki* (Hindi)
SRISTI, AES Boys Hostel Campus, Near Gujarat University Library & SBI Bank, Navrangpura, Ahmedabad-380 009, Gujarat
loksarvani@sristi.org

Aama Akha Pakha (Odia)
Dr Balaram Sahu
Keshari Enclave, B- Block, Flat No-401 Nayapalli, Bhubaneswar-12 Odisha
balaram.sahu@gmail.com

Num Vali Velanmai (Tamil)
Mr P Vivekanandan
45, T P M Nagar,Virattipathu, Madurai - 625016 Tamil Nadu
vivekseva@gmail.com

Ini Karshakan Samsarikkatte (Malayalam)
Fr Jilson James
Peermade Development Society, Peermade, Idukki - 685531
Kerala fjkpds@gmail.com

Palle Srujana (Telugu)
Brig Pogula Ganesham VSM (Retd)
C/o Ms. Aruna Ganesham, 102, Vayupuri, Sainikpuri Post
Secunderabad-500 094
Andhra Pradesh
ganeshpogula@hotmail.com

Honey Bee Network Initiatives

The Honey Bee Network - HBN (Estd. 1988), is a crucible of like minded individuals, innovators, farmers, workers, scholars, academicians, policy makers, entrepreneurs, and non-governmental organizations (NGOs) that aims to recognize, document and celebrate traditional knowledge and innovations at the grassroots level. It gives voice, visibility and velocity to grassroots creativity and innovations and connects innovation, investment and enterprises.

Shodhyatras: A week-long learning walk for scouting, and dissemination of innovative ideas; honouring local achievers, farmers, children, teachers, women, artisans and innovators and centenarians at their door step.

Ignited Minds: The Dr. APJ Abdul Kalam Ignited Mind Children Creativity and Innovation Award is an annual competition that accepts entries from students up to class 12 and from school drop outs up to 19 years of age to encourage children to find creative solutions to local social problems.

HBNCRIIA Awards: The Honey Bee Network Creativity and Inclusive Innovation Awards (HBNCRIIA-National) is an annual competition for adults in the formal and informal sectors, domestically to recognize creative innovations, ideas and knowledge practices that aim to address unmet social needs; HBNCRIIA-Global is held internationally once in 2-3 years.

GYTI Awards: The Gandhian Young Technology Innovation Award celebrates student innovation in the field of engineering, science, technology and design through frugal solutions having social and industrial applications.

Sattvik: The Sattvik traditional food festival celebrates traditional nutritious food and associated knowledge systems while putting lesser known, millet and other foods on the plate of urban communities; and encouraging organic farmers to conserve agro-biodiversity and connect with consumers.

Centenarians: HBN strives to tap into the wisdom of our centenarians and document their stories, ideas and solutions to motivate the youth and wider society to adopt more sustainable practices and develop frugal solutions inspired by their experiences.

PFOI: The People Festival of Innovations is organised in partnership with C-Camp to cross-pollinate ideas across deep tech and grassroots innovators every year.

Please scan this QR code to access our open databases which hold a repository of knowledge on grassroots innovations, abandoned patents, student tech projects and other knowledge systems carefully collated by HBN volunteers over the years.

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Scale, Sustainability and Inclusive Collaborative Future

If we want to make a difference to the lives of millions, then inclusive grassroots innovations must diffuse widely. Some indeed do, but a very large majority remain localized. Should then one stop encouraging them? A large number of top down interventions have failed in making a difference to the community's lives. But we still try to promote them, but when it comes to grassroots bottom-up innovations, our standards seem to vary. We don't ask how many of these innovators were given support for prototyping, testing, redesigning, fabricating market ready models, and supported with low cost, long duration, patent risk capital to scale? Local innovations often emerge from recognition of local unmet needs, guided by *samvedansheelta* (tendency to internalize the pain of the people affected by the absence of innovation; the word, 'empathy' is a poor substitute for this feeling). These are driven by a desire to solve problems through affordable and accessible innovations. We don't want to lose this trigger for problem solving.

In this issue, we will find innovations which are designed *for* the grassroots but also emerging *from* the grassroots. We need both sources of innovations to make this world more inclusive and caring of the economic and environmental wellbeing of communities. Agroecology based food systems driven by communities as well as corporate agri businesses face paradoxical tensions. First one may be guided by the need to keep soil healthy and water extraction within the limits of recuperation. But a consistently declining water table, increasing waste and declining soil micro nutrients indicate that high production gains by agri-business are at a high agro-ecological cost. Our grandchildren will have to bear the consequences of this often with very few options of reversing the damage. But here too we need both, the supply chains for managing the movement of surplus food from rich regions to poor ones as well as market space for biodiverse, organic or non-chemical input based products grown by small, scattered and often segmented farmers. The scale can not be managed by small producer groups unless they follow a cooperative model like Milk co-ops run by Amul or network entrepreneurship model by pooling their products in a common catalogue, individual production but collective marketing, becoming mutual franchisee etc.,

We are very proud that many of the grassroots innovators scouted and honoured by Honey Bee Network Institutions have been given the highest civilian award by our country. This does help in creating appreciable role models. But most textbooks for school and colleges still have to incorporate the lessons of their journey. Similarly, many grassroots innovators have become millionaires in the last 20-25 years but the majority have remained small or medium sized.

The Fifth International Conference on Creativity and Innovation at Grassroots in January, 2025, hopefully will generate more examples of authentic engagements among creative communities, outside supporters, supply chain members, public policy makers, investors and entrepreneurs.

GIAN's golden triangle for linking innovation, investment and enterprise still holds true for scaling grassroots innovations. Similarly, the SRISTI's logo signifies the power of conservators of biodiversity, particularly women provided the formal science and technology insights are blended with community knowledge. NIF - National Innovation Foundation - established by HBN and supported by HBN volunteers till 2018 opened many doors for the innovators and traditional knowledge holders in taking these ideas forward. It continues many activities. While protecting the intellectual property rights of the creative individuals and communities was encouraged, these rights were never asserted to prevent fellow farmers and mechanics from learning from them, even if original products have been patented. For *community use*, the innovations were *open source* but for *corporate use*, these were *licensable*.

Though a journey encompassing the values of open sharing and blending these with IPR protection was a kind of unique experiment in the annals of the knowledge economy. All databases of HBN are open source and don't require any obligation on the part of the users. If users share more innovations or traditional knowledge practices, they are welcome but if they don't they can still use these databases without restrictions.

A question has often been asked, with so much content, if we don't monetize it, how will we run the network? This is a question which bothers me also. But we have so far refrained from putting any restrictions in the hope that beneficiaries of this knowledge will find an answer to this question and try to sustain all the initiatives that HBN took over the last 36 years. We would like to hear from you, if you think our utopia has a future. We are also trying to create a Global Inclusive Innovation Foundation (GIIF) alongside the Academy of Inclusive Innovations and Knowledge Augmentation (AIIKA) to operationalise the Grassroots to Global (g2G) model to deliver frugal solutions worldwide.

You can be part of this effort of HBN to recognize, respect and reward creative innovators, frugal problem solvers and generous traditional knowledge providers worldwide. Will you be?

Anil K Gupta

The pain behind the glitter!

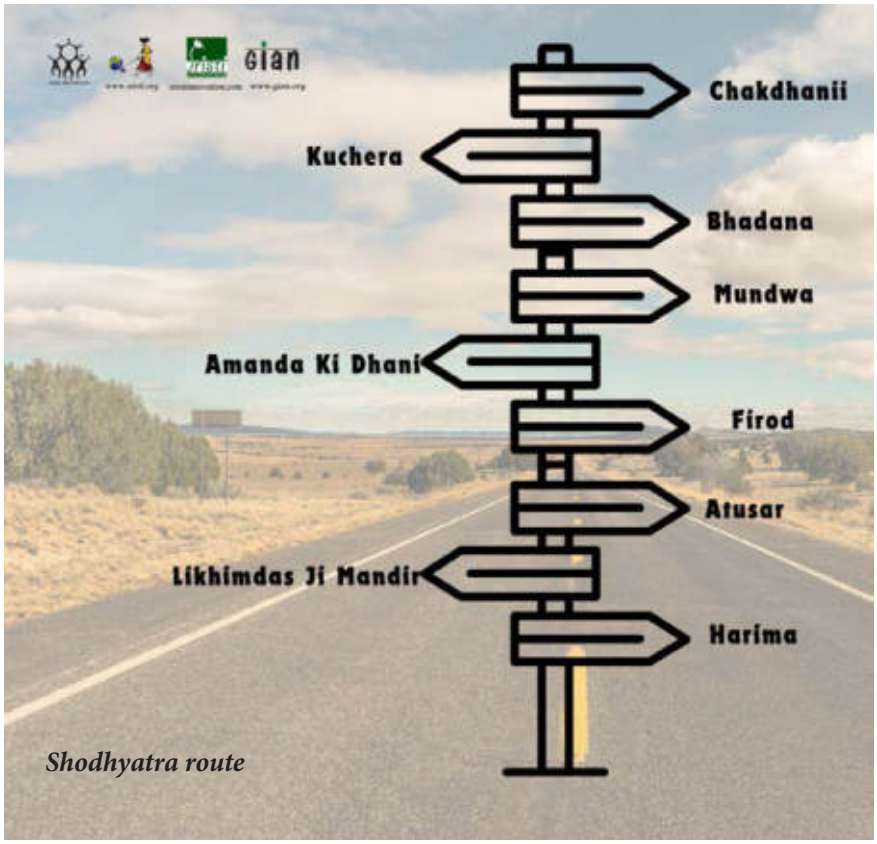
51 Shodhyatra: June 17 - 23, 2024, Harima-Chak Dhani, Nagaur | Rajasthan : Part-II

The week-long journey of the Shodyatris, took them through nine villages in the Nagaur district in Rajasthan. Yatris had the chance to meet children, villagers, educators, innovators and centenarians. The objective was for people to learn from local communities, each other, nature and their inner selves. Meetings were held with villagers at every stop. The purpose was to absorb the creativity and innovative activities in a rather spontaneous and impromptu manner. The people were curious to see us walking in hot weather.

The Shodhyatra, organized by SRISTI, supported by GIAN and the Honey Bee Network, is an attempt to reach out to such parts of the country, where hardships and challenges of the natural surroundings motivate people to reproduce and develop frugal solutions.

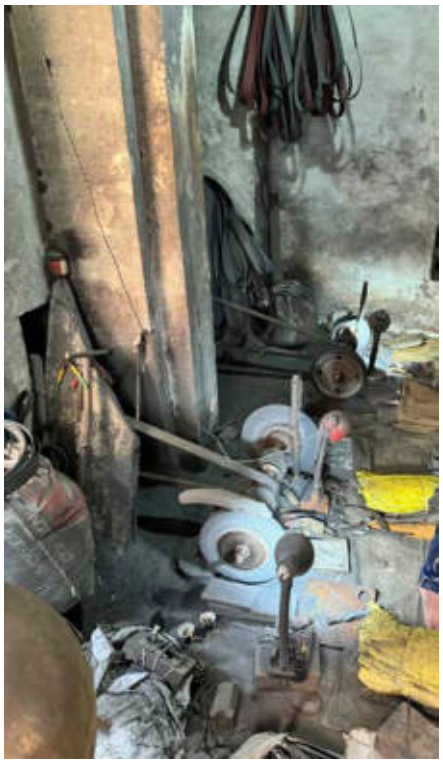
The yatris experienced the flora and fauna of semi-arid regions and met innovators and farmers who had developed innovative ideas and tools to survive and thrive in such a climate. They encountered a unique amalgam of cultural fusion, social service, study centres for students, methi processing center, mostly dry but some filled up water bodies etc. Meeting farmers like Sundaram Vermaji and Himmat Ramji Bambhu helped yatris learn more about their efforts to conserve the biodiversity of the region. Mr. Ashok, an entrepreneur, promoting organic farming and giving employment to women and Mr. Rawalchand Panchariya who showcased his innovations in organic sweet potato cultivation and millet-based products. The innovator, Mr. Rameshwar Lal ji developed a thornless variety of the Khejri tree (*Prosopis cineraria).*

What is the best thing you learnt from your grandparents or an elder?



Shodhyatra route

Along the way, yatris also met centenarians like 108 - year old Sarju Devi ji and 91-year old Kanaramji who shared stories from their lives. They gave everyone tips on staying healthy and living a long life by waking up early, eating healthy and avoiding any addictions. Many traditional healers from the village shared their insights and knowledge with the Yatris. A sandstorm at night threatened to put a damper on the yatra experience, but the group steeled themselves and soon fell asleep despite the difficult conditions.



Yatris chanced upon Ram Chandra Sirohi who has made study rooms equipped with tables and A/Cs for the children of the village to study comfortably. This was reflected in the number of academic toppers in the village, most of whom were girls. The local communities took pride in the achievements of their children and yatris spent time talking to the children about their aspirations and even listening to their stories, like that of two students in the 8th and 10th grade who had made a rudimentary robot. Local youth opened up their houses for the yatris to rest and freshen up in , acting as a reminder for every individual to be more generous. Indulging in conversations with fellow yatris, villagers, children in the vast arid landscape made up for an experience that everyone will carry with them for a long time.

Interactions with students along the way allowed them to express their creativity and learn from the experts among the yatris. Vishnu, a teacher who taught archery to students belonging to tribal communities and helped them compete professionally. He shared the journey of these children and the effort that it took for them to be recognized by the state. While most of the yatris left after the sixth day, few visited Loharpura, Nagaur city. It is home to around 500 blacksmith families, specialising in crafting precision tools for making jewellery. The group interacted with the artisans and tried to understand their work. The artisans face several challenges, including the use of small coal-based furnaces, non-ergonomic working positions, poorly ventilated and congested workshops, and inadequate protective eyewear. Despite these issues, artisans often downplay their difficulties and focus on creating something worthwhile for society.

51st Shodhyatra pools local Knowledge

Some of the traditional knowledge practices and contemporary innovations

collected during Shodhyatra: Rameshwar Lal ji specialised in grafting khejri to make it thornless. Despite being a bad year in terms of flowering and bearing pods, he noticed a tree full of flowers. He proceeded to collect its seeds as it had flourished in a dry year unlike other trees and might be able to produce fruit in the future even in bad years *(refer to p 23)*.

To store the khejri seeds, they were first washed with cow dung and cow urine, then stored in ash to prevent insect attacks.

Sunda Ram Verma has perfected a technique to grow trees with just one litre of water once. During the first rain of the season, he would deep plough the field. When the last rain came, he would plank and ladder to break the capillaries. He would then make 4x4x10 inch pits, plant saplings in them, and fill the space above them with soil and add one litre of water. Water that has already charged the sub-soil can not easily be lost by evaporation now. The saplings planted in October-November send the roots downwards where the moisture is and catch the next rain. This method has an 80-85% success rate.

Some farms had tree plantations grown in a way that there were four types of trees growing side by side such that there was always some kind of fruit available for birds and animals to eat.

Rawalchand Panchariya spoke to people about the five varieties of sweet potato that he had developed. He used a selection process over seven years for developing varieties of sweet potatoes that need less water to grow. Some of them had developed a deep red hue.

Ram Ratanji sells tractors to farmers at the starting cost of Rs.50,000. Farmers can then pay back the rest of the amount at their ease.

Sathika moth ki daal (*Vigna aconitifolia* or turkish gram) gets ready in 60 days and grows even if there are only two or three rains in the season. However, again, the taste of the crop has reportedly decreased. Similar results were seen with Moong dal and other similar pulses.

Shree Kanaramji, a 91-year old, shared his traditional remedies for animals. He mentioned that after giving birth to a calf, if part of the umbilical cord remains stuck in the cow a piece of old bamboo should be ground, boiled in water, strained with cloth, and given to the cow to drink after it cools. And for loose motion, isabgol soaked in cold water should be given to the animal.

Key Takeaways:

Yatris identified that commendable work was being done in the district of Nagaur in agro-ecology to protect the biodiversity, yet these strategies and solutions were limited to the local areas and proper dissemination had not occurred. Channels like the radio and social media could be used for spreading localised knowledge. Recognition for innovators like Himmatramji Bambhu who has helped conserve the landscapes and waterscapes for many wildlife species is important to understand how similar models can be replicated elsewhere. Additionally, access to learning and education pathways, through citizenship documentation, for children from nomadic communities (like students of teacher Vishnu) will ensure that their talents are recognized and they get an equal opportunity for education. And finally, encouraging organic farmers in producing value-added products, such as snacks from millets can enhance their economic stability and help them purchase essential farming inputs.

Honey Bee Network Creativity & Inclusive Innovation Awards HBN CRIIA-India 2024

Honey Bee Network has been engaged with grassroots innovations for more than four decades. The Honey Bee Network Creativity and Inclusive Innovation Awards campaign was launched with the help of Amazon India in different parts of the country to mobilise more than 2500 innovations in different fields. Out of this pool we shortlisted around 100 innovators and met them personally in different regions of the country. We had earlier organised seminars to popularise the campaign in the same fashion. After meeting most of the shortlisted innovators for the first time we further reduced the list to 33. These were reviewed by a very eminent jury of experts from institutions like IISc, IIM, AcSIR etc. A jury chaired by Dr. RA Mashelkar and attended by Director IIM Ahmedabad and Director AcSIR besides other distinguished experts reduced the list to 12 consolation awards and three winners.

Honey Bee Network dedicates the ongoing campaign for bringing best of the innovations from and for grassroots together.

We thank Amazon India for their support without which we could not have pulled it through at this scale. We invite partners to join hands in taking the grassroots innovations movement, forward for meeting the unmet needs of communities globally.

Here, we present the innovations from our top three award winners who were felicitated during the ceremony.

Next year, Shri Anand Mahindra is likely to support these awards.

First Prize Winner:
Suneel S1 Walnut Variety
Suneel Singh
Kishtwar, Jammu & Kashmir

Problem Addressed: Increasing walnut yield and quality and making procurement easy.

Technology: The Suneel (S1) walnut variety, developed through grafting, produces uniform, soft-shell walnuts that are high-yielding, pest-resistant, and organic. Each mature plant, 15-22 feet tall, yields 100-150 kg of walnuts. Unlike conventional varieties that grow 50-55 feet and take 6-8 years to mature, Suneel S1 starts bearing fruit within 2-3 years, reducing risks during harvest. Bud grafting ensures a 98 per cent success rate and higher productivity.

Current Status: Working on walnut breeding. Planning to work on hazelnuts and pecan nuts as well.

Protection of Plant Varieties and Farmers' Right Authority status: In process

Societal Impact: Better yield for farmers and more income.

Second Prize Winner:

Farm Yard Manure Spreading Machine
Late Ashik Husain Mohammadali Gani
Banaskantha, Gujarat

Innovation Video

Problem Addressed: Traditionally, if any farmer wants to spread farmyard manure on their farm, they need help from the service provider who comes with their tractor, trolley, and labour. They pick manure from the farmer's dumpsite and make piles in the farms. Afterward, farmers need to spread piles in the field. The innovator came up with a machine that can do both operations simultaneously to save farmers time, money and effort.

Technology: The machine is a trolley-type machine made of a hydraulic

system. It has a control wall, panel box, hydraulic motor, oil pump, gearbox, etc. To operate the machine,

the trolley has to be attached to the tractor, then the PTO joint has to be installed. A battery wire is provided in that trolley which has to be connected to the tractor battery and the remote control has to be given to the driver.

Farmyard manure is loaded into the machine using a JCB or Loader. Once in the field, the PTO joint is turned on. The remote control has four switches: two to raise and lower the rear gate and two to move the fertilizer forward and backward. After loading the fertilizer, the gate is opened first, followed by pressing the switch to reverse the fertilizer. The tractor is started in the first low or second low gear. As the tractor advances, the fertilizer is spread evenly. Once the fertilizer is emptied, the remote control is used to lower the rear gate, and the machine is reloaded.

Societal Impact: This machine helps farmers save labour costs, time, and the amount of fertilizer used in the field, along with increasing crop yields.

Current status: The unit cost of manufacturing this machine is Rs. 5,12,000/- including labour, energy, and other costs. Twelve to fifteen units can be manufactured every month. It has a patent granted.

Third Prize Winner:
The Clipper (Fruit tree safety holder)
Ishfaq Ahmad Wani
Jammu and Kashmir

Problem Addressed: The loss of fruits due to the branches not being able to sustain the weight of ripe fruits or getting damaged and unbalanced due to snowfall, heavy wind, and rainfall.

Technology: The mechanical safety holder is an agricultural and horticultural invention designed to support fruit trees against, wind, rain, snowfall, and fruit load. The clipper is used to connect and balance the multiple tree branches at once. It holds them irrespective of the load it experiences. It grips the tree branches nicely so that at the same time, it can be used to shape the tree as per convenience.

This device helps save four-five boxes of fruits per tree. There are two types of holders available, break wire and rod type, both are durable and adjustable, providing multipurpose support for fruit-bearing trees.

Societal Impact: Saves produce by giving trees more support and preventing fruits from falling or touching the ground. Contributes to increasing farmers' production and income.

Current status: Three thousand units sold. There are three products under testing. A patent has also been filed.

Appreciation awards

Groundnut Thresher
Sanjay Dhirajlal Tilva
Gujarat

Innovation Video

Problem Addressed: Reducing the time and labour required for the threshing of groundnuts, automating the process and significantly reducing the labour costs and time involved.

Technology: The pickup and threshing machine can be attached to the tractor. It can collect the groundnut and do the threshing, separating the groundnut

from the fodder, and also re-pickup the uncrushed material left. It lifts the dugout crops and automatically threshes them. There are separate storage compartments for groundnut shells and leaves. This machine can be operated non-stop as long as the weather is dry and sunny and there is no moisture. Having sold three of these machines, it was noticed that the tiny twigs or waste material was not yet getting completely separated. For this, a destoner machine is also in the process of being developed.

Societal Impact: Making the process fully automatic with no labor requirements saves time, cost, and effort on the part of the farmers.

Current status: Three machines have been sold and trials are ongoing for further improvement. The machine costs Rs. 11,50,000/-. A patent has also been filed.

Golden Feathers
Radhesh Agrahari
Rajasthan

Innovation Video

Problem Addressed: The innovator identified the issue of disposal of chicken waste, which often finds its way into rivers, leading to water pollution and health hazards, especially in desert regions.

Technology: Through its innovative processing and production technology Golden Feathers, converts chicken

butchery waste, mainly feathers, into natural fabric, transforming textiles and paper. The organization collects butchery chicken waste from local slaughterhouses to use as raw material. To ensure hygiene and quality, they employ 27 natural sanitization processes to sanitize the waste.

They also convert chicken waste into superior woolen fibre. Their feather wool is used not only for textiles but also for crafting eco-friendly paper.

Societal Impact: The organization has generated livelihood opportunities and has impacted the lives of 200+ tribal women paying them 20 times more than average, up-skilled 375+ semi-skilled/Unskilled workers and empowered more than 2000+ tribal women through Handloom activities. This process technology helps in significantly reducing carbon footprint. Merging the ancient 2500-year-old art of weaving with modern commitments to sustainability and design. It redefines the traditional Indian textile experience.

Current status: They have sold 5000+ units.

Low-power cold storage solution for fruits and vegetables
Vishal Singhal
Telangana

Problem Addressed: Vishal aims to solve the problem of fruit and vegetable wastage, which amounts to more than Rs 1 lakh crore every year in the

Innovation Video

country due to a lack of cost-effective cold chain facilities. This directly reduces farmer incomes, erodes their bargaining power, and forces them to sell their produce at throwaway prices. It also lowers availability and causes higher prices for fresh produce in urban areas.

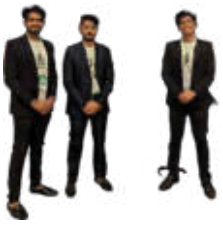
Technology: Vishal and his team have developed a new cooling technology, called dew point cooling. This technology consumes 80 per cent less energy than refrigeration systems to cool to the desired temperature range to store fruits and vegetables. Dew point cooling uses indirect evaporation to cool close to the ambient dew point temperature and much below the wet-bulb temperature. For the ambient conditions of 40°C temperature and 30 per cent relative humidity, it cools to 22°C directly without any refrigeration system. It can convert any regular room into a cold storage room. They have

developed a heat and mass exchanger made of plastic instead of metal to reduce product price. Temperature can range between 18-25°C.

Societal Impact: This innovation increases farmers' income by decentralizing post-harvest solutions such as cold rooms and increasing the shelf life of fruits and vegetables by 3-5 times.

Current status: They have done 27 installations and their clients are satisfied with the product mainly because it keeps fruits and vegetables fresher for longer, and maintains crop weight. Out of the four applied patents, they have been granted two as of now.

(RUT3)Rim With Suspensions
Mitesh Rasal
Maharashtra



Innovation Video

Problem Addressed: Improvements in the quality of life of wheelchair users and reducing the risk of back injuries and discomfort due to wheelchairs lacking suspensions

Technology: RUT3 has created an innovative wheel called the Damsus wheel. It has integrated suspension inside the wheel. It is a multi-axis suspension system that provides comfort [reducing back injuries], safety [taking impact from the front during accidents], and efficiency [forward movement helps to reduce the efforts to drive]. The conventional spokes are replaced by a suspension system inside the rim. When traveling over an uneven terrain the flexible ellipse expands and compresses providing suspension action and when it gets back to its initial position it

provides forward movement reducing efforts to ride.

Societal Impact: The innovation impacts people with physical disability and mobility issues and their movements on every terrain. It has the potential to drive the automobile industry into a new generation of safety wheels, reducing the risk of losing life, inducing back injuries, and also making the vehicle efficient. The product addresses issues like spine/back injuries, and safety during accidents. The comfort of these wheels enables people with limited mobility to travel over any terrain creating a huge impact on their lives.

Current status: Sold 270 products to the Gov. of Maharashtra and also sent a proposal to the Department of Social Justice and Special Assistance, Maharashtra for 15,000 wheelchairs. Patents have been granted in both India and the US.

FASAL AMRIT (EF Polymer)
Ankit Jain and, Narayan Lal Gurjar
Rajasthan

Innovation Video

Problem Addressed: The innovator Narayan Gurjar's family has faced crop losses due to water stress in Rajasthan. Narayan once lost his entire maize crop due to water scarcity. To tackle this problem, Narayan started experimenting with various natural materials like plant bio waste to see how more water can be retained in farms.

Technology: Fasal Amrit is a natural soil conditioner made from fruit peels sourced from fruit processing industries and is processed using patented technology. Fasal Amrit granules can absorb water up to 100 times their weight, retaining water from irrigation or rainfall and

preventing fertilizer leaching. The product releases water based on plant needs, improves soil structure, increases nutrient availability, and promotes healthy root growth. It is entirely organic, 100 percent biodegradable, and suitable for all plants. Its application increases farmer income by 30 per cent by cutting down water requirements by 40 per cent and fertilizer application by 20 per cent, leading to a 40 per cent increase in yield.

Societal Impact:The innovation enables farmers to grow more crops in less water, leading to an increase in yield. Fasal Amrit also acts as a shield for crops during unforeseen drought conditions and also absorbs excess water during high rains which prevents stem rot in crops. Thus it protects farmers from the impact of extreme weather events.

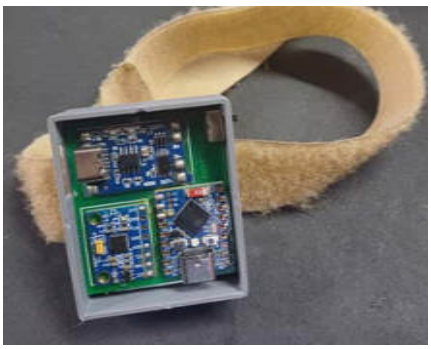
Current status: Fasal Amrit is now present in more than 7 states and multiple countries. 222 metric tonnes of Fasal Amrit have been sold globally. It has successfully gained the trust of 10,000+ farmers and improved the quality of 8000+ acres of land while saving 80 crore litres of water. Most importantly, Fasal Amrit users have generated additional Rs. 5.4 crore in income.

PhysioMize
Yash Parkhi
Maharashtra

Innovation Video

Problem Addressed: To provide easily accessible and affordable physiotherapy treatment.

Technology: The device seamlessly integrates cutting-edge 3D joint simulation technology with advanced motion tracking, allowing for enhanced remote physiotherapy. It accurately records joint angles, pain localization, and range of motion. The immersive 3D joint simulation allows patients to engage in therapeutic exercises while the device accurately records their movements. This enhances data accuracy and allows physiotherapists to have a more detailed understanding of patients' performance during sessions.



Societal Impact: The device enables remote physiotherapy sessions, overcoming geographical barriers and making healthcare more accessible. The real-time feedback allows physiotherapists to track patient performance and adjust treatments accordingly.

Current status: It is currently in the R&D Stage. To provide comprehensive support for various physiotherapy exercises, the software needs to be developed further to include all intended joints.

Able Glasses for deaf, mute and blind
Pratik Raghuwanshi
Maharashtra

Innovation Video

What is the best thing you learnt from your grandparents or an elder?

Problem Addressed: Able Glasses are helping a large population of deaf, mute, and blind to listen and see the world at an affordable price.

Technology: Able glasses enable the deaf to hear sound by using a patented dome bone conduction transducer which is 98 percent less in weight and 95 per cent power efficient. Using their bone conduction technology, the deaf can hear conversations and ambient sound. The integrated AI translates sign language into spoken audio. For the blind, image processing creates audio descriptions of their environment. Able Glasses is a non-surgical and non-adhesive type smart hearing aid for conductive and mixed type hearing loss. Its double battery life reduces the weight of the glasses making it comfortable for users to wear all day long without worrying about recharging and weight fatigue.

Societal Impact: It breaks the social stigma around wearing hearing aids in public and helps a large number of people in need of affordable listening and visualizing solutions. This device also helps these people become more independent and able to earn a livelihood.

Current status: The product Able glasses is in the minimum viable product stage and after August it will go for clinical trial. They have also developed the Able Assistant app that complements the glasses by providing users with a suite of hearing health resources and features. Launched recently on the Android Play Store, the app includes a hearing screening test graded by WHO standards, a virtual audiologist powered by AI to answer hearing care questions 24/7, and real-time subtitles that convert speech into text for easier conversation comprehension.

Fusion Saree from Water Hyacinth
Gaurav Anand
Jamshedpur, Jharkhand

Innovation Video

Problem Addressed: Converting a common aquatic weed into sustainable and unique handloom sarees, offering an eco-friendly alternative to traditional fabrics.

Technology: First, the stems of the plant are collected and dried in the sun for a week. The soft cover of the stem is kept to make paper while the pulp is used to make fibre. Fibre from the stem is extracted after hot water treatment to remove insects from the pulp. These fibres are used to make yarn, which is then coloured. Weavers then weave the saree on a handloom. They need around 3-4 days to make one saree.

Societal Impact: They work with women's self-help groups and provide employment for rural women.

Current Status: Over 1,000 sarees have been sold through online platforms, reaching customers in Delhi, Bangalore, France, Italy, and Dubai. He is also focusing on paper products.

METAL (Molecular Magnetic Technology for Arsenic Removal)
Arpit Kumar
Udupi, Karnataka

Innovation Video

Problem Addressed: Tackling Arsenic contamination. Arpit recognized the urgent need for effective arsenic removal technologies, particularly in rural areas where access to safe drinking water was limited. Arsenic contamination of drinking water is invisible, tasteless, and odorless, and the effects of ingestion are not apparent in the short term. Continuous exposure to arsenic dramatically increases the risks of morbidity and mortality from cancers and heart, lung, kidney, and liver diseases that are not necessarily preceded by arsenicosis.

Technology: METAL (Molecular Magnetic Technology for Arsenic Removal) leverages Molecular Magnetic Treatment to address arsenic contamination in groundwater. It employs an external magnetic field to induce magnetic susceptibility in arsenic-containing compounds, facilitating their extraction from water. The process involves the application of a targeted magnetic field, which aligns and isolates the arsenic molecules, enabling their removal through subsequent filtration or separation techniques. This method is eco-friendly, requiring no chemical additives, and is designed to be low-maintenance and user-friendly.

Societal Impact: This achievement has directly improved water quality and provided safer and healthier water for communities previously exposed to arsenic-contaminated

water. Recognizing the importance of sustainability, Arpit has prioritized developing a solution that is eco-friendly, cost-effective, and requires minimal maintenance.

Current status: The technology has been implemented in regions with high arsenic prevalence, notably in Bihar, India. Their Minimum Viable Product (MVP) has successfully treated 300,000 liters of water during pilot trials, directly benefiting 2,300 children across nine schools. This achievement is backed by approval from the Jal Shakti Mantralya and is available on India's Government e-Marketplace (GeM). 30 Unit Order from SBI CSR and 2 Units from Rotary Club and two Units from Water Aid, as of now. By 2028, they aim to deploy METAL® technology across India, Asia, and Africa, reaching municipal, commercial, and residential users. The units, spanning from community-scale to large-scale, underscore the adaptability of the technology and facilitate its integration into diverse societal settings, thereby creating positive impacts and enhancing awareness in the broader community towards water conservation.

HOOK: Friction Drive Mechanism
Priyank Dodhia
Mumbai, Maharashtra

Problem Addressed: Making daily travel less exhausting for people who use cycles daily such as delivery person etc. to reach their destination because of distances, hilly terrain or slopes, lack of fitness, motivation & speed.

Technology: HOOK uses the friction drive mechanism to propel the bicycle forward by a modular clipping mechanism with which you can attach and detach the product within seconds. The basic principle involves a motorized roller that comes into contact with the bicycle tire, transferring torque through friction to propel the bicycle forward. This method is different from chain-driven or hub motor systems, offering a simple and often more modular solution.

Societal Impact: Converting existing bicycles to electric ones at less cost. Making opting for e-vehicles more accessible and affordable.

Current status: MVP is ready. On-road testing is ongoing. They have also started to plan the production and are going to launch a pilot soon with Mumbai Dabbawalas and other food delivery platforms

CASE- Intelligent Cloud-connected Battery Pack
Darshan Nitin Meher
Ahmednagar, Maharashtra

Innovation Video

Problem Addressed: Adiabatic Technologies ensures your battery pack in electric vehicles is monitored precisely to ensure the safety and efficiency of the battery pack. Evidently, the battery packs used are not compatible with the high temperature which is expected according to the Indian climatic conditions. There is constant anxiety prevailing among EV users regarding their batteries running out of charge mid-journey. The OEMs are unable

to use their battery mileage to its full potential.

Technology: "CASE" is an Intelligent Cloud connected battery pack with a novel Phase Change Material (PCM) based thermal cooling system which is integrated with the in-house designed intelligent Battery Management system (BMS) while complying with the new norms for battery packs in India. With the help of predictive machine learning based algorithms, CASE can accurately predict the state of the charge (SOC), state of health (SOH), range, and state of functions (SOF) of the battery pack. The developed cell balancing technique helps in extending the life of the battery pack further by 50 per cent, hence reducing the total cost of ownership (TCO) of the battery pack by 33 per cent.

Societal Impact: More than 1400 battery packs have been deployed on ground, covering more than 20 lacs green kms till date and have offset more than 160 million tonnes of CO2 from the environment.

Current status: Have received a contract to deploy 5000 battery packs from two major Indian EV fleet operators. They have sold more than 1400 units. The innovation has been commercialized with revenues of more than Rs 25L. and the first manufacturing facility has also been established.

A few other innovative entries that stood out from the submissions are:

Earth Tatva
M. W. Shashank Nimkar
Ahmedabad, Gujarat

Innovation Video

Problem Addressed: Earth Tatva works to reduce the mining of natural resources by up to 60 percent by recycling post-industrial fired ceramic waste into a ceramic material. By re-using ceramics that do not biodegrade for centuries, Earth Tatva aspires to achieve zero-waste manufacturing, adhering to the principles of the circular economy.

Technology: Earth Tatva procures post-industrial fired ceramic waste and uses it with pure clay that acts as a natural binder. It works with mono-material, which one can use for many production cycles without downgrading its quality. On the contrary, it keeps getting better. The material has also been tested by the Ceramic Research Institute. These materials are 35 per cent stronger as per the reports.

Societal Impact: Earth Tatva can develop any product from waste material. Though ceramic does not affect ecology adversely, it just lies there like a dead weight, unutilized. Earth Tatva is solving this massive waste problem.

Current status: They have started with making recycled ceramic tableware. These are 100% food-safe, as the team does not use any heavy metals for their glazes. More than 1200 products sold and they have a patent granted.

nimkarshashank@yahoo.in

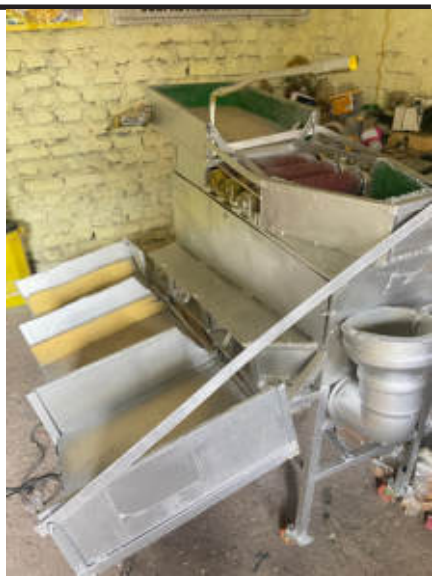
B Naik Uprising Agro Industry Pvt. Ltd. (Multiple fruit grading machine)
Abdul Qayoom
Anantnag, Jammu and Kashmir

Innovation Video

Problem Addressed: Building a more efficient and less labour-intensive technology for fruit grading.

Technology: The multiple fruit grading machine has an adjustable grading section which makes it versatile to be used on different fruits, even on walnuts which is the smallest. Currently, no other solutions like this exist. This eliminated the need for having different grading machines for different fruits. The machine has a rolling section that cleans the fruit first and then grades it. Design improvements have also been made. Earlier to operate the machine, the operator had to bend but with the addition of a foot lever, now operating is easier. Another add-on has been added for the segregation of damaged and diseased fruits. This works based on an AI module available separately for Rs. 20000.

Societal Impact: This machine will empower growers with a cost-effective solution that enhances the value of their harvest without imposing financial burdens. By embracing this technology, farmers can not only



enhance the market value of their harvest but also contribute to a safer and more sustainable food production process. Automation of the grading process will make farmers' lives easier and more comfortable.

Current status: Not being able to go into production due to funding issues

BiliSURE (Device for neonatal bilirubin level measurement)
Jitesh Pande
Lucknow, Uttar Pradesh

Innovation Video

Problem Addressed: BiliSURE addresses the critical problem of delayed and invasive bilirubin measurement in newborns. Traditional methods often involve painful blood tests, causing delays in identifying jaundice. These delays can lead to severe health complications, including brain damage.

Technology: BiliSURE is an innovative non-invasive device that measures neonatal bilirubin levels through the skin's response to multi-spectrum light. The device consists of a sensor module that emits and detects light signals. When the light interacts

with the skin, it reflects and absorbs, revealing bilirubin concentrations. These readings are processed using our proprietary algorithms to provide accurate bilirubin levels in real-time. This eliminates the need for painful blood tests, ensuring timely and accurate jaundice detection. The user-friendly solution enhances neonatal care outcomes while reducing the risk of complications and readmissions.

Societal Impact: BiliSURE's impact goes beyond accurate measurements; it ensures early detection, timely treatment, and improved quality of life for newborns and their families. It significantly reduces the dependency on highly skilled healthcare professionals for bilirubin measurements, leading to optimized labor allocation and cost savings in healthcare facilities, especially in resource-constrained areas where trained staff may be limited.

Current status: As of November 2024, Medblue Innovations has successfully deployed three Bilisure devices in healthcare facilities across India. These installations have enabled over 1,000 newborns to receive non-invasive jaundice screenings, facilitating early detection and timely intervention. They are actively working to expand their reach and increase the number of installations in the coming months.
Patent Details: Applied

Valved Asthma Inhaler
Arvind P
Coimbatore, Tamil Nadu

Problem Addressed: Addressing issues with traditional inhalers,

Innovation Video

Valved Asthma Inhaler tackles synchronization and efficiency challenges.

Technology: The innovation is a passive asthma inhaler that synchronizes the airflow inside the inhaler and the release of medication, and ensures proper mixing of air and medicine. It comprises a lever mechanism, a valve, a loaded spring, and a single air passage. The lever mechanism effectively coordinates the opening of the valve and the airflow with the medication release. The closed valve creates a negative pressure region during inhalation by the user. Upon activation of the canister, the lever mechanism and loaded torsional spring swiftly prompt the valve to open. These combined actions enhance the overall drug delivery efficiency of the inhaler.

Societal Impact: This asthma inhaler not only eliminates the time lag between inhalation and medication dispersion but also ensures seamless mixing of medicine with air,

enhancing the inhaler's efficacy and helping countless asthma patients. The solution is also more cost-effective with unit cost being just Rs. 180/-.

Current status: Has not yet undergone clinical trials or received official medical approval from the government. Mankind Pharma had offered to conduct free testing of our working prototype at their state-of-the-art R&D center. Direct feedback from end-users is yet to be obtained.

Patent Details: Indian and US patent filed
arvindpalanikumar@gmail.com

Castor Oil-Based Polyurethane Urea Polymer
Sanjay Bambhaniya
Junagadh, Gujarat

Innovation Video

Problem Addressed: The traditional reliance on petrochemical-based polymers for architectural fabrics poses significant environmental challenges. By eliminating the reliance on petrochemical-based polymers, this eco-friendly innovation not only contributes to environmental preservation but also caters to the specific requirements of the Indian army, sports authorities, exhibitors, and economically disadvantaged communities.

Technology: The innovation involves the careful synthesis of a castor oil-based polyurethane urea polymer. Castor oil, a renewable resource, serves as the primary building block for the polymer, ensuring a sustainable and environmentally friendly foundation. This novel polymer is then expertly coated onto high-tenacity fabrics, including polyester, nylon, fiberglass, and kevlar, creating a robust and durable composite material. Other chemicals for polymer synthesis

include isocyanates, chain extenders, catalysts and solvents.

Societal Impact: They have developed three PUU-coated fabric variants: one with polyester for general shelters, one with fibre glass for permanent structures, and one with Kevlar for cut resistance. All variants are fire-retardant and UV-resistant, ensuring high durability. The next steps involve fine-tuning these products and preparing for scaled production to meet diverse market needs.

Current status: By creating affordable and sustainable options for shelters, the innovation addresses the needs of economically disadvantaged populations, by providing a dignified living environment. The adoption of biomass-based architectural fabrics contributes significantly to environmental preservation by reducing the carbon footprint associated with petrochemical-based alternatives.

Patent Details: Granted

Eco-Wood from Lantana
Dr. Binish R. Desai
Valsad, Gujarat

Problem Addressed: Converting *Lantana camara,* an invasive plant species into eco wood while helping tribals. Lantana is one of the world's ten worst invasive species and a species of high concern for India. It competes with native plants for space and resources and also alters the nutrient cycle in the soil. This invasion has resulted in the scarcity of native forage plants for wild herbivores.

Technology: Removal of Lantana from 75 acres in the villages outside the Mudumalai Tiger Reserve. Converting this cut Lantana to plywood as a way of up-cycling. The material is environmentally friendly and 100% recyclable, strong and durable, compatible with laminations, fire, and pest resistant, has natural thermal insulation, and is suitable for all weathers and regions. During the process we also create a community-based conservation network to map critically endangered vultures in the area.

Societal Impact: Recently, made a tabletop and are taking trials on the wooden flooring. They have sold 780 pieces of different lantana products, for furnishing and gifting till date. The current constraint is to make the material more accessible and spread education to the tribes for them to start treating lantana as an asset for which an incentive program is being created to buy material from the tribes.

Current status: A circular economy project that can be scaled anywhere there are invasive species and lead to a sustainable habitat restoration project. Creating a market for the use of this widespread invasive species and employment to men and women in the region.

Patent Details: Patent for the binding material.

binish@eetechgroup.com

Fully Automatic Cotton Wick Tapper Machine
Prakashbhai Rameshbhai Vala
Rajkot, Gujarat

Innovation Video

Problem Addressed: Providing more independence and earning opportunities to people with handicaps.

Technology: Automatic machine, easy to handle and capable of manufacturing 40,000 units or 4 kg of cotton wicks/day. It has remarkable efficiency through continuous operation, minimizing downtime, and maximizing output.

Societal Impact: Making disabled people more independent. Creates earning opportunities for handicapped people. This machine also improves the quality of the product.

Current status: Not being able to meet the existing demand due to lack of funding and capacity.

prakashbhaivala07@gmail.com

Kadam Multiple Drug Detector Machine
Kavya Mistry
Ahmedabad, Gujarat

Innovation Video

Problem Addressed: There's an increase in cases of drink spiking being reported each day. These drugs are used to disable a person's sense

of choice and alertness, making it difficult for them to notice or resist a potential sexual assault.

Technology: "Kadam" is an initiative that prevents drug-facilitated crimes by providing early detection in terms of a personal safety device. It is a 3 component spiked drink detection system consisting of a strip to be dipped in the drink, an optional use lateral flow reader to detect the band formation on the strip and for product

usage in places of reduced visibility like night clubs, and an app to interpret the result using trained artificial intelligence models. The product also has location-sharing features to saved contacts and on detecting spiked drinks, it will immediately send the location and result to the saved contacts. The reader is universal and can be used to interpret other such strips as well.

Societal Impact: "Kadam" empowers personal safety by providing early detection of spiked drinks.

Current status: The product is in the R&D Stage. A patent has been granted.

kavyamistry22@gmail.com

Dudh Rakshak: Zero Spillage Milking Can for Farmers
Harshal Patil, *Mumbai, Maharashtra*

Problem Addressed: Solving the issue of milk spillage during milking, which results in the wastage of milk.

Innovation Video

Technology: Dudh Rakshak is a milking can with an auto-locking system. When an animal kicks the can the blocking device blocks the flow line, preventing any spillage. The innovation is an affordable, simple solution for preventing spillage of milk.

Societal Impact: Helps increase farmers' income due to less milk wastage.

Current status: The product is currently undergoing field trials, and marketing strategies are in development

Handheld Spectroscopy Food Safety Device
Harsh Rajput and Shreyas
Patna, Bihar

Problem Addressed: The innovation addresses the pervasive issue of unsafe food consumption due to excessive pesticide use. Motivated by a personal health focus, the innovation aims to

Innovation Video

empower consumers and promote safer farming practices.

Technology: The Food Safety Device employs advanced spectroscopy, measuring near-infrared and red light absorption in fruits and vegetables. By measuring light absorption, it detects pesticide levels, offering a non-destructive, cost-effective, and user-friendly solution.

Societal Impact: This device caters to global concerns about food safety, providing consumers, farmers, and retailers with a tool to make informed choices. The innovation has the potential to revolutionize agricultural practices, contributing to a healthier and more aware society.

Current status: The innovator has been focused on improving the accuracy of the device by refining the sensor design and optimizing data processing algorithms. Efforts have also been directed toward creating a more intuitive and user-friendly interface.

harshrajput96525@gmail.com

Dextroware/Mouseware (Head wearable computer navigation device)
Pravin Kumar
Chennai, Tamil Nadu

Problem Addressed: Dextroware Devices addresses the challenge faced by individuals with motor difficulties in using computers and phones.

Technology: Through a series of assistive devices including glasses, finger triggers, foot pedals, and buttons, the user is given facilities similar to a mouse or trackpad. Based on a plug-and-play concept, the assistive tech can be paired with computers, phones, tablets, television sets, etc. They have developed a device called Mouseware. It is a head wearable device that enables the hands-free operation of computers and smartphones with simple head movements.

Societal Impact: The innovator has made the products affordable and user-friendly. The process of arriving at the innovation involved research within communities to understand the common obstacles, and address specific needs that are often ignored by most commercial technology. They market the product to those with chronic as well as temporary motor problems.

Current status:The team has sold over 250 Mouseware devices, empowering individuals with upper-limb disabilities to access digital tools and opportunities more effectively. They are actively developing customizable control options to make Mouseware more adaptable for users with varying needs. Additionally, collaborations with international distributors, NGOs, and CSR initiatives have been expanded to enhance the accessibility of Mouseware. Project Samavesh, an ongoing initiative, aims to extend the reach of Mouseware by providing beneficiaries with training and job placement guidance, fostering greater independence.

hola@dextrowaredevices.com

Kibo by Trestle Labs
Akshita Sachdeva and Bonny Dave
Bengaluru, Karnataka

Innovation Video

Problem Addressed: Kibo 360 Trestle Labs aims to assist individuals with low vision and blindness by converting printed, handwritten, and digital text into voice audio across all languages, offering a more organized solution. It also transcends language barriers.

Technology: Kibo, an acronym for Knowledge In a Box. It is a tool that allows users to: Listen: printed, handwritten and digital content
Translate: content across 60+ languages. Digitize: download in searchable and editable formats. Audio'tize: download in MP3 audiobooks

It provides kits for scanning documents and real-time translation, empowering individuals facing language or literacy barriers.

Societal Impact: Kibo by Trestle Labs ensures that no school, college, or office denies or discontinues education/employment for anyone facing disability, language, or literacy barriers, especially when the individual is capable, but the ecosystem is not.

Current status: Through Kibo 360, more than 1 lakh people have been helped to uplift their lives with solutions. This innovation has been commercialized and has been purchased by 600+ institutions in 22 countries.

Website: https://www.trestlelabs.com/

WHE-PLAST
Neha Chaudhari
Vadodara, Gujarat

Innovation Video

Problem Addressed: Solving the problem of agricultural waste management like Paralli- which is burned every year causing air and land pollution. Hence, biodegradable materials made from renewable agricultural resources such as carbohydrates, starch, and proteins are attracting much attention for sustainable development and environmental conservation.

Technology: Using agricultural waste Neha has created an alternative to plastic from Paralli called WHE-PLAST. The process includes a raw material collection that is waste wheat grains/paralli followed by pretreatment and starch extraction from the waste. Then a starch slurry is formed by the addition of plasticize, film forming

agent, and a suitable solvent. Once the slurry of required concentration and property is obtained, a thin layer is prepared, which on drying gives a thin film of plastic. Plant proteins have the possibility for usage as films and plastics because of their abundant availability, low cost, biodegradability, and suitable properties like rheology, water sensitivity, sound absorption, thermal behavior, etc.

Societal Impact:WHE-PLAST is set to bring a revolutionary change in the field of agro and plastic industries and how they deal with food waste. Being able to derive plastic from the agriculture field and storage wastage is a big achievement. This method of producing plastic from waste wheat using a hybrid process to utilize maximum wastage can be hugely impactful.

Current status: The product is still in the R&D stage and is not yet commercialized.

Email: nehaychaudhari16@gmail.com

Crimeria Apple Variety
Amir Abas Ganie
Kulgam, Jammu and Kashmir

Innovation Video

Problem Addressed: Creating a better apple variety with better fruit quality.

Technology: The innovator developed the Crimeria apple variety by grafting a branch from a Crimson apple tree onto a Bulgaria apple tree. Crimeria apples are larger and bear more fruit than Crimson. The trees bear fruit within one to three years of planting. A single tree can yield about 200 kg of apples after five years. and they begin flowering by April, producing fruits by August.

Societal Impact: Farmers earn well from the in-demand Crimeria apples that sell at Rs. 80-200 per kg. The innovator claims that this variety is not disease-prone and reports minimal use of pesticides.

Current status: The innovator has guided many farmers about grafting, within the district. He is yet to register it under PPV&FRA. He aims to export it outside Kashmir, and GIAN is supporting him in developing a larger market.

Email: aamirabass50@gmail.com

Saffron Processing Machine
Tariq Ahmad
Srinagar, Jammu and Kashmir

Innovation Video

Problem Addressed: The current saffron processing method relies heavily on manual labor, resulting in time-consuming and labor-intensive efforts to remove the root part from each saffron flower. This labor-intensive process not only slows down production but also poses health risks to workers.

Technology: The Saffron Processing Machine automates the process. It can process 1 kg of saffron in just one to two hours, a significant improvement over the manual method that can take an entire day for the same amount. The machine is designed with simplicity in mind, making it easy for operators to use and maintain.

Societal Impact: Reduces manual labor and increases saffron processing output by offering an affordable solution. Also improves working conditions and income of the workers.

Current status: The prototype model of this machine has been developed and lab testing has been done. There is no saffron processing machine available in India. The innovation is yet to be commercialized. A patent has been granted.

Contd... on page 20

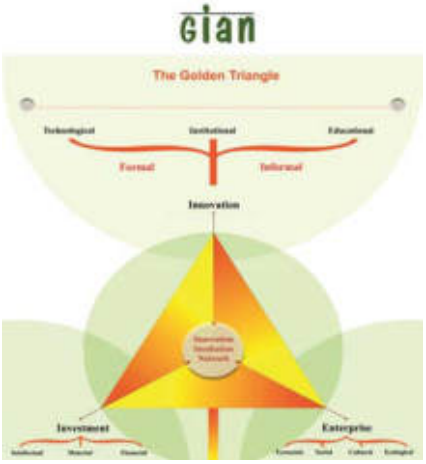
Honey Bee Network 36 Years on: ICCIG Over the Years

As we gear up for the 5th edition of the International Conference on Creativity and Innovation, here is a look back at its origins and legacy that continue to be driven at/for/with grassroots innovators and communities. The first International Conference on Creativity and Innovation at grassroots [ICCIG] was held in 1997, the ideas from which resulted in the birth of the Grassroots Innovation Augmentation Network (GIAN) in the same year. Unaided, self-triggered and self-inspired solutions by grassroots innovators are the guiding lights for the pursuit of inclusive development by the Honey Bee Network. The ICCIG conference encourages the network to identify milestones that should be pursued in the coming years. The second ICCIG conference in 2012 aimed at expanding the global outreach and part of it was held in China and part at IIMA, India. Each successive edition of the conference was a celebration of the inclusive and empathetic innovations across the country and the world. The main objective was to pool insights from the ground and global playfields of ideas, institutions, and initiatives. The Honey Bee Network (HBN) has lived this philosophy by creating a network spread over 115 countries, bringing together grassroots innovators from various fields across the world. In the three and a half decades of its existence, the HBN, has initiated and spawned many efforts to highlight the untapped potential of grassroots innovators in alleviating poverty and generating sustainable development.

Late Elaben Bhatt, Founder SEWA, Ahmedabad: ICCIG-I, 1997

The know-how on generating frugal solutions, systems and attitudes can be best learnt from grassroots innovators who have found solutions in severe material resource constraints. These lead to solutions that almost close the loop, weaving a circular economy. HBN hopes to reinforce the heuristics of frugality in the formal sector too and build a sustainable innovation ecosystem. Large corporations have also begun to realise that internal research and development is not enough to generate frugal innovations for society; which is why an effort should be made to move towards open innovation models, an idea advocated by the Honey Bee Network since its establishment. This leads to the creation of sustainable solutions that can be reproduced at scale within a (mostly) circular economy encouraging further reflection and problem solving.

The golden triangle of Innovation, Enterprise and Investment rewards creativity and supports a grassroots innovator in their journey towards being a social and/or economic entrepreneur. However, these three capabilities are often not available with one person, institution or at one place. Connecting them may help scale up innovations while reducing ex-ante and ex-post transaction costs. HBN institutions institutionalized



the idea of recognition, respect and reward for grassroots innovations ensuring fair and just benefit sharing. ICCIG conference acts as a platform to discuss innovative ideas around biodiversity conservation, technological, marketing, institutional, cultural, educational and ecosystem innovations.

Past editions of the conference culminated in certain key declarations to drive the innovation ecosystem and find ways to serve grassroots innovators and traditional knowledge holders.

Key points of the Tianjin and Ahmedabad declaration:

Innovations, strategies, challenges and solutions need to become a legacy that are passed onto the next generation for preservation and for them to build on with respect to changing contexts. Incentives, support and an ecosystem of conservation can ensure that the younger generation is inspired to sustain the movement.

An international open repository of knowledge on traditional wisdom and propriety innovations is made in multiple languages so that the global community is able to gain access to affordable solutions. Similarly, a database of challenges faced by individuals and local communities can be made and used by local academic institutions to encourage children and the youth to actively participate in the innovation movement.

To invigorate the promotion of grassroots innovations and traditional knowledge, at least four kinds of gaps have to be filled: *(i) creation of mechanisms at national and international levels to scout and document grassroots innovations and traditional knowledge in a national and international registry, and to give awards as well as to provide support for value addition through design and technological and product/service development, ii) provision of micro-venture capital investment to convert grassroots innovations and traditional knowledge into economic and social enterprises, iii) arrangements for diffusion of social technologies developed by grassroots innovations and traditional knowledge. It may help to create a global innovation commons so that relevant proprietary technologies developed by grassroots innovators and traditional knowledge holders are acquired for licensing at no, or very low cost to small artisans and farmers, pastoralists and other producers around the world; and iv) enabling and empowering the grassroots innovators with modern tools of fabrication so as to enhance their capacity to do R & D and innovate through an international network of Fab Labs run and managed by grassroots innovators.*

Special efforts to highlight, recognize and celebrate innovations by women is needed. The science underlying the knowledge domains in which they excel should be brought within the purview of R&D studies and policies and not treated with lesser attention and respect as has been the tradition so far. Mentorship and other kinds of social, economic and financial support through the provision of risk-capital is essential in supporting particularly vulnerable innovators. A model of advance payment in part or full for an innovation yet to be actualized can be used to incentivize them and reduce the risk of product development.

To pursue the creation of an international treaty to protect the rights of grassroots innovators and traditional knowledge holders around the world through new instruments, mechanisms, and by blending the relevant features of existing IPR systems with lessons of the open source movement. To persuade science and technology academies to have dedicated sessions in their annual research conferences to explore ways of engaging with local creative communities and individuals to humanise science and also empower knowledge rich, economically poor people.

Grassroots innovations should be aligned with the newer and emerging concepts of natural resource manangement and their impact on climate change should be taken into consideration.

Thematic recommendations in the previous declarations are:

Cultural

Culture is a wide spectrum of ideas, practices, and economic and social systems where skill recognition is as important as skill development.

Children should be involved in the mapping of local history and culture, which should be displayed in public spaces to engage with the wider communities.

A cultural database should be maintained to protect traditional knowledge; documentation through *Shodh Yatras* may be one way to do it.

Technological

Technology is the first step in validating the innovator's claims to facilitate closing of the gap that may exist between traditional knowledge holders and scientists. The speed of this knowledge transfer should be increased to reduce the time it takes for products to reach the market.

State of the art technology should be put to use to help grassroots innovators and thinkers develop a shared repository of knowledge to produce 'affordable excellence' through high technology and low cost solutions.

Use of social media and other broadcasting channels to share innovations, ideas, recommendations and challenges should be encouraged in both formal and informal institutions to identify market gaps and drive consumer-led innovations.

Changes in policies and implementations of IPRs for grassroots innovators are required, to reduce the time of IP approval to encourage innovators.

Institutional

Institutional innovations are extremely important for sustainable management of scarce resources, often through commons. To replicate such innovations, instead of spreading the specific components or their sequence, one may have to disseminate the heuristics of problem-solving models. Building capacity to abstract these models and apply them to location-specific conditions requires considerable effort.

Periodic conferences by 'member countries' to support the consolidation of developments and provide an opportunity to discuss strategies and strengthen the globalisation of HBN is required.

A culture of 'empathetic design' which is already a feature of informal sector innovations should be emphasized as a practice in the formal sector. One mechanism for achieving this would be the development of lifestyle design courses across different sectors.

Every country needs to set up GTIAF (Grassroots Technological Innovation

Acquisition Fund) so that innovators don't subsidise the societal cost of learning and accessing new ideas and innovations. State or some other agencies should pay for acquiring the IP rights of selected technologies to make them available at no or low cost.

Taking grassroots innovations to the market

A greater emphasis needs to be put on gathering market intelligence and pushing grassroots innovations in the mainstream market. 'Grassroots marketing scouts' whose role is to identify potential consumers of existing products and services and alerting GRI of market needs not yet met can be particularly helpful for this approach.

The agricultural and industrial extension centres have to be mandated to provide space for demonstration/ trials of grassroots innovations so that local communities can experience the innovations. If necessary, an appeal to Members of Parliament needs to be made so that they recognise the value of this suggestion for their own constituency development.

Replication of the HBN in other countries of the Global South is needed, keeping in mind the differences in institutional, economical, geographical, social and political contexts to build a global network of innovators.

Education

A culture of innovations should be encouraged in village level schools to ensure that the awareness of GRIs and traditional knowledge is part of the education experience.

A global electronic platform with open access to databases in multiple languages is a requirement to support the transfer of traditional knowledge and know-how.

The Inverted Model of Innovation implying innovation by children, prototyping by technology students and other fabricators, commercialisation by companies and social diffusion by other agencies needs to be developed worldwide.

Gamification can help in problematising inertia and spur people into creating solutions. Games can encourage collaborative problem solving and new ones can be developed to explore different applications of existing innovations.

Contd... from page 16

Zyenika - Soumita Basu

Soumita Basu
Kolkata, West Bengal

Problem Addressed: Designing clothes that make dressing easy, comfortable, quick, and painless, for everyone including people with chronic or temporary disabilities and the elderly

Technology: Design (re)thinking takes centre stage, using already available material to deliver different openings and shapes that are adaptive. These garments incorporate features like magnetic closures, velcro fastenings, and strategically placed zippers, enabling ease of wear for those with limited dexterity or mobility. Societal Impact

Societal Impact: There are more than 435 million people in India who need such adaptive clothes temporarily or permanently. Inclusive and adaptive fashion gives them more dignity, and confidence and allows them to engage in professional and public spaces.

Current status: The Zyenika website is currently preparing to unveil a new collection. It emphasizes their commitment to inclusivity with the slogan "Every body matters!"

Email: basu.soumita@gmail.com

The Third People's Festival of Innovation

The People's Festival of Innovation, 2024 was celebrated at India International Centre, New Delhi, November 25 - 29, 2024. It is a platform bringing together deep tech and grassroots innovators to learn from each other. Some deep-tech innovators might find grassroots innovators to partner with and focus on scaling up respective solutions that align with various SDGs. The event was organised by C-CAMP, GIAN & IIC New Delhi. Some of the innovations displayed at PFoI are reviewed here:

Nirati Robo
Mende Srinivas, Telangana

Problem Addressed: Farmers struggle with managing irrigation motors, requiring frequent visits to market for various contingencies. Despite using multiple gadgets and controllers, the need for constant monitoring persists and each controller consumes energy, adding to the burden.

Technology: The NIRATI ROBO innovation enables automatic motor ON-OFF based on farmer requirements, using air and water without any energy consumption. NIRATI ROBO can be installed near borewells to fill ponds automatically when they are dry, providing an unsupervised water supply for animals year-round.

Cole crop harvester cum weed uprooting device
Aryan Prasad, Uttar Pradesh

Problem Addressed: Harvesting crops like cabbage and sugarcane and uprooting weeds like carrot grass (*Parthenium hysterophorus*, also known as Congress Grass) required significant time and effort. When uprooting carrot grass manually, hands often become red, develop blisters, and may even get infected. Carrot grass competes with the crops planted in the fields and prevents their growth. Farmers are at risk of diseases like asthma, skin infections, and even cancer due to exposure to carrot grass.

Technology: The machine streamlines the cole crop-cutting process, reducing farmers' workload and saving them valuable time. This machine allows farmers to harvest crops like cabbage, sugarcane, and corn without bending, making the process more efficient and less labor-intensive. By changing its blade, they can also uproot carrot grass, other weeds, and harmful plants without direct contact.

Wood splitting machine
Jignesh Patel, Gujarat

Problem Addressed: The inefficiency and labor-intensive nature of traditional wood cutting methods require significant manual effort and time. Automating the wood cutting process aims to improve productivity, reduce physical strain, and enhance precision, making the task more efficient and cost-effective.

Technology: The innovator has used a part of the JCB compressor and built a machine to cut wood. The length of the bark to be put in the machine for cutting has to be 2-5 ft. in length. The breadth of the wood is no restriction. There are multiple versions of the machine, 3 HP, 5 HP, 7.5 HP, and 10 HP.

Coconut Shredding Machine
Alladi Prabhakar, Telangana

Problem Addressed: Used coconut shells, often discarded in dump yards, contribute significantly to environmental pollution. The water retained in the empty shells fosters mosquito breeding, leading to the spread of various diseases. To address this issue, a compact coconut shredding machine has been designed. This machine enables the reuse of

waste coconut shells by producing coco peat and cocofiber, which can be utilized to create products such as coir ropes, mats and scrubbers

Technology: The coconut shredding machine is equipped with a highly efficient motor and gearbox, designed to be compact and movable for easy use in rural areas. Powered by a 3 HP induction motor connected to a 30:1 ratio gearbox, the machine operates in two stages. In the first chamber, raw coconut shells are crushed with steel blades. The crushed material is then transferred to a pulverizer, producing coco fiber and fine coco peat, which can be used to create various useful products.

Multi Use Seed Transplanter and Robotic Sprayer
Sharwan Kumar, Rajasthan

Problem Addressed: Farmers face high costs for labor-intensive onion transplantation. There is a need for separate machines for different crops, to avoid seed wastage due to imprecise traditional seed drills. The manual spraying of pesticides in polyhouses exposes workers to hazardous chemicals, leading to severe health risks, including respiratory issues, skin diseases, and long-term ailments. Additionally, manual spraying is time-consuming and inconsistent.

Technology: The Multi-Use Seed Drill offers versatility, capable of sowing a wide range of crops like onion, cumin, coriander, radish, mustard, ashwagandha, and cabbage directly in the field. Its efficiency reduces seed usage by up to 40% and eliminates the need for nursery setups in certain conditions.

The Robotic Sprayer operates through pre-programmed instructions or remote control, ensuring precise pesticide spraying to reduce wastage. It is battery powered, minimizing reliance on fossil fuels, and features customizable settings to suit different crop needs and polyhouse sizes.

Vineeth Mulberry Cutting & Binding Machine
Kodimunja Praveen Kumar, Telangana

Problem Addressed: Silkworms require precise specifications and timing for feeding on mulberry leaves throughout their life cycle. Due to erratic and undependable labor availability, mulberry farmers struggle to meet these requirements, pushing them towards shutting down or reducing operations.

Technology: This mulberry leaves harvester attaches to a tractor, integrating seamlessly into the rural ecosystem. Mulberry plants, pruned monthly to encourage regrowth, require extensive harvesting over their 15-year lifespan. This innovation automates the entire process, including pruning, discarding bad parts, re-pruning, collecting leaves, and bundling them for sericulture.
Key specifications are: Weight: 350 kg, Material: MS, Fuel: Diesel, Dimensions: 8'x3'x3', Operating System: PTO to Pulley drive, Maintenance: Grease & oil every 6 months, Parts Replacement: Blades & belt (locally available), Repair & Maintenance: Easy DIY, ₹5000 per year, Pruning Level: 3" to 3' from ground level

Thornless Khejri
Rameshwar Lalji, Rajasthan

Problem Addressed: Rameshwar Lalji is a Khejri expert in Rajasthan and has been researching Khejri for a long time. In every part of Rajasthan, there are different varieties of Khejri available. During his search, he found a variety of Khejri which is naturally thornless. He has grafted that variety with a commonly used Khejri variety and created two new thornless varieties, named Thar Harit and Dhoro ki Tarkari

Societal Impact: This can be easily planted in rows. It is easy to pluck without farmers' hands getting wounded because it has no thorns. It also provides for good fodder for the animals. Farmers who have grown this variety have benefited a lot. These varieties are of less height and therefore also easier to harvest and give better yields.

Sattvik, HBNCRIIA Awards & learning expeditions, near and far

Sattvik Traditional Food Festival: Celebrates traditional, nutritional foods and the associated knowledge systems. This edition of the festival in Ahmedabad organised, in December 2024, by SRISTI Innovations and supported by HBN, SRISTI and GIAN; saw over 50,000 visitors and over 400 dishes to savour. More than 90 organic farmers from across nine states were present. A recipe competition was

organized where the top three prizes went to - Hardik Kumar Bhatt, Nina Naresh Desai and Bansi Thakker.

Ignited Mind Awards, 2024: The APJ Abdul Kalam Ignited Mind Awards were hosted where children from 23 states sent over 16,500 ideas on creative, empathic solutions for meeting the unmet needs of society; bringing them into the mainstream innovation network.

Paris Delegation Visit: A delegation hailing from the office of Paris Club of Chief Innovation brought together leaders from the largest innovation companies around the world to visit the People's Festival of Innovation 2024. The delegation included Marc Giget, President of the European Institute for Creative Strategies and Innovation, Florent Patlong, Dean of Sorbonne School of Management, Florence Sanson, Leader Car studio Innovation - Mobivia Group; Dominique Leglu, Editorial Director of the Science Division of Challenges; Cristopé Liénard, Group Chief Innovation Officer; Stéphane Engel; CEO of Étandex; among other leaders, thinkers, academics and policy professionals who specialise in innovation leadership across various fields.

HBNCRIIA: On 29th November, 2024 the Honey Bee Network Creativity and Inclusive Innovation Awards (HBNCRIIA) honoured innovators transforming lives and redefining possibilities. The first, second and third prize was awarded to Shri Suneel Singh (J&K), Shri Samirbhai Ghani (Gujarat) and Md. Ishfaq Ahmed Wani (J&K), respectively, for their solution oriented innovations.

IIM Shodhyatra: The students of IIM along with Prof. Gupta, and Prof. Navdeep Mathur went for a Shodhyatra to Lahaul, Spiti last winter where they interacted with innovators,

and villagers. They learned about local resources, food, innovations and shared reflections with their peers. A delegation from Lahaul was invited to participate in Sattvik.

Zydus Lifesciences Innovation Programme: The 2nd Zydus Lifesciences Innovation Programme Awards powered by Zydus Lifesciences Ltd and GIAN celebrated scalable innovations linked to SDGs in healthcare, environment/ waste management, technology/ engineering. The awards received over 130 entries from young innovators across the country.

GETCO: In collaboration with GETCO, GIAN will mobilise futuristic energy innovations from youth and other users by organising ideathons among colleges and MSME clusters. The objective is to bring out a book based on selected ideas to inspire other students.

GPCL: To identify 50 innovations out of which at least 10 will be recognized through reward at the state level, GIAN has partnered with GPCL. This includes organizing exhibitions to provide incubation support to select innovations. The project will contribute to the Gujarat Energy Innovation Awards 2024.

On Ayurveda and Chemistry

Sahil Odhavia
sahilodhavia@gmail.com

My name is Sahil Odhavia, 5th year Chemistry Major from IISER Kolkata.

You visited IISER Kolkata and gave a talk about Honey bee network and opportunity for grass roots innovators in August 2024.

The reason I mailed you for is that my research interest is in the field of crystal engineering and crystallography of Molecular crystals and my master's thesis is also related to a drug and upon hearing this, you told me that you have some contacts with people working on Ayurveda and if you want I can share those contacts with you, as I can also get opportunity to explore the field of Ayurveda and also get in touch with someone who may need my expertise in that realm.

Thank you for taking time to read my email. I look forward to hearing from you.

(Will you like to find structure of new compounds extracted from herbal products then one could send you some products, but u will need to know extraction protocol, these structures could also be used for quality control and genuinity of products eventually. : Ed.)

Windmill Energy in Himalayan Region

Parth Patel
Parsons School of Design' 25, MFA Design and Technology. patep440@newschool.edu

My name is Parth, and I am currently a graduate student pursuing an MFA in Design and Technology at Parsons, New York. For my thesis, I am developing a low-cost, community-assembled wind turbine KIT for the remote region of Turtuk, India. I recently learned about SRISTI's work through Mansee Bal, my undergraduate thesis guide, and Harpreet Sareen, my current professor, and I believe that insights from your experience in grassroots collaboration would be immensely valuable to my design efforts. I am eager to learn from your approach to engaging with communities in similar contexts, and I would be grateful if we can arrange for a short conversation.

Thank you very much for your time and consideration.

(We did invest a lot of energy in adapting a bamboo windmill from Assam by Mehtar Hussain and Mushtaq Ahmed for salt workers (with metallic stands) in Gujarat. Alstom foundation had supported this experiment and there were several challenges.

Stopping the windmill was difficult when velocity was high, for women workers. Some Delft design students had also done some action research on stopping mechanisms but in vain. The torque was very high and sometimes the shaft was damaged. Some windmills did work well for some time but corrosion in saline environment required different kind of coating on the materials--these mills were *used to pump water (brine) for salt making. Best wishes and keep me informed of your efforts. All the best: Ed.)*

On a Sustainable Geo Communities Program

Tarun Jain
tarun.jain@dariohealth.com

I wanted to introduce you to Prof. Shashank Priya, VP of Research at University of Minnesota who is working to build a Sustainable GeoCommunities program in India in collaboration with several research institutions. University of Minnesota under leadership of Prof. Priya is organizing a workshop on Sustainable GeoCommunities at IIT Kanpur's NOIDA campus in the 3rd week of June and he is seeking your inputs for that. As an alum of U of Minnesota, I hope that you find this opportunity mutually beneficial.

(It is a very interesting idea but I will be occupied with the 51st shodhyatra in Nagaur, Rajasthan June 17-23. I look forward to hearing more and hope to keep in touch wishing you all the best for your meeting and cross-pollination among spatial/geo communities, intermingling of cultures, acquiring and diffusing varying features, forms and functions.: Eds.)

HBN Re-connection with France

Sylvie Borzakian
(Director General, European Institute of Creative Strategies and Innovation, Paris)

It was a great pleasure to (finally) meet up with Professor Anil Gupta, whom we invited about ten years ago to Paris at the Sorbonne University for the Hermès Trophy for Humanist Innovation, awarded to Honey bee Network.

This remarkable Indian organization that collects and promotes people's innovations, which has been working for decades to share and cross-pollinate authentic, responsible and fairly ideas, has become iconic for the international innovation community

Honey Bee Network has brought together a large community of innovators, entrepreneurs, farmers, academics, politicians and NGOs who share the same ideas of progress in India and around the world. But in a world where the profits of technological advances are often reserved for a privileged minority, its actions and initiatives deserve to be more supported by institutions.

The visit of our delegation* in November 2024 and numerous meetings with many Indian organizations was an opportunity to better understand the dynamics of India's development and in particular the key role of frugal innovation plays there.

We wish great success to your Fifth International Conference on Creativity and Innovation at/for / from/with Grassroots 5 with so many high-quality contributions. For the future, we will come back to you to define cooperative initiatives for the year 2026.

** 17 representatives of the Paris Club of Chief Innovation Officers (comprising 150 large companies, research institutes, administrators, NGOs and universities)*

Glimpses of 2024

Shodhyatra with IIMA students at Dharamshala, Himachal Pradesh

Village meeting during Shodhyatra

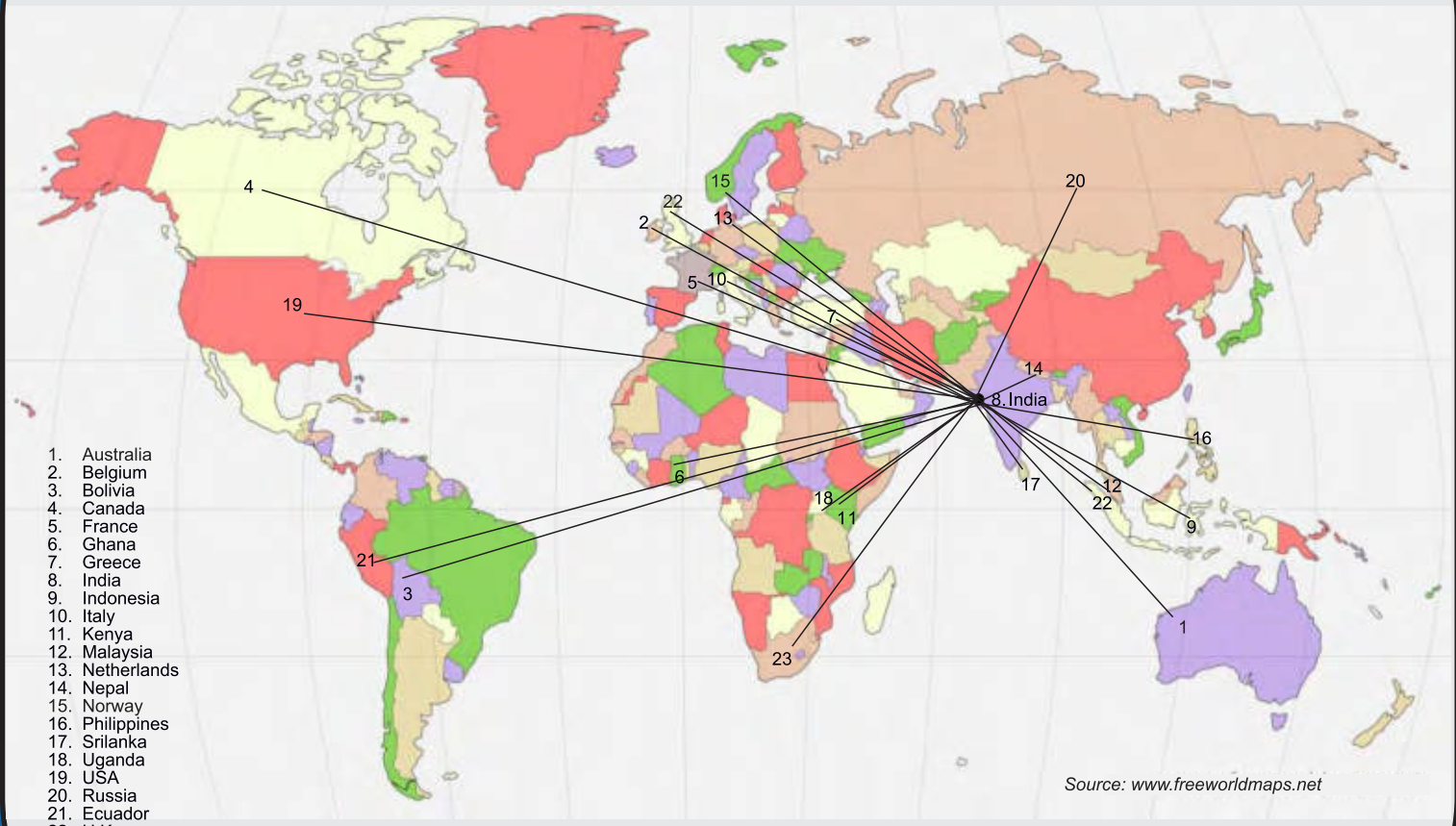
Sindhoora Raja, has been honored with the Pradhan Mantri Rashtriya Bal Puraskar 2024 for her exceptional achievements in AI and technology at the hands of Hon'ble President of India.

Sattvik Recipe competition

GYTI Award Ceremony

Creating social innovations & entrepreneurial opportunities for Himalayan bio-resources

ICCIG-5 2025 Participants



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11. Kenya
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14. Nepal
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21. Ecuador
22. U.K.
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Honey Bee Network

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Prof. Anil K Gupta, Editor, Honey Bee,
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