

COMPENDIUM OF AGRI-TECH START-UPS

2024



Office of the Principal Scientific Adviser
to the Government of India

Science & Technology Cluster



BCKIC
Bhubaneswar City
Knowledge Innovation
Cluster Foundation



RICH
Research and Innovation
Circle of Hyderabad



BeST
CLUSTER

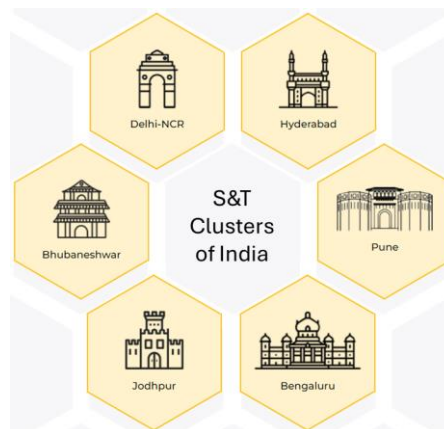
Curated from the S&T Clusters of Bhubaneshwar, Hyderabad and Bengaluru



PREFACE

Science and Technology Clusters | Fostering collaboration for Innovation and Growth

The Science & Technology (S&T) Clusters are being established as formal umbrella structures for S&T organizations in various cities to have better synergy while retaining their autonomy. These are supported by the Office of the Principal Scientific Adviser to the Government of India on the recommendation of the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC) to create an Atmanirbhar Bharat through S&T. There are six S&T Clusters across the country – Delhi, Hyderabad, Bhubaneswar, Jodhpur, Bengaluru, Pune and Hyderabad. (<https://www.psa.gov.in/st-clusters>).



Efforts of S&T Clusters in Agritech Theme

In the Agritech theme, three S&T Clusters – RICH (Hyderabad), BCKIC (Bhubaneswar) and BeST (Bengaluru) are doing major activities with respect to technology development, technology deployment and inter-institutional partnerships.

RICH | Research and Innovation Circle of Hyderabad



Theme Objectives: Be a strategic convenor, fostering collaboration among agriculture academic & research institutions, industry, innovators & start-ups to facilitate translation of research into impactful solutions that benefit agriculture and allied sectors.

BCKIC | Bhubaneswar City Knowledge Innovation Cluster Foundation



Theme Objectives: Conservation of Regional Agri-biodiversity and convergence of various national and state initiatives and programs for grassroot level implementations. | Utilization of Agri wastes and conversion into various value-added products. | Facilitation of

Grassroot level Cluster development programs based on regional crop production expertise. | Nurturing various regional startups having direct implications in Agri-value chain optimization and production losses and nutritional enhancements. | Nutritional enhancement via production and processing technological advancements in the region.

BeST | Bengaluru Science and Technology Cluster



Theme Objectives: Enabling Development and Creating frameworks for Deployment of Technologies relevant to Precision Agriculture and Protected Agriculture such as Monitoring and regulation of microclimatic condition for protected farming, Pest management in protected cultivation system, Sensing, Imaging and Delivery Systems in Precision Agriculture.



Synergizing the efforts of All S&T Clusters

To synergize the efforts of all S&T Clusters, an All S&T Cluster Meet was held by the Office of the Principal Scientific Adviser to the Government of India on 26th and 27th of October 2023. The two key areas of inter-cluster collaboration among RICH, BCKIC and BeST identified are:

- Dissemination of Agri-tech innovations & technologies through creation of repositories and capacity building
- Enable consortium-based approach to last mile delivery of products and services using S&T.

Compendium of Agritech Start-ups

The compendium of Agritech Start-ups has been prepared by BeST with the support of BCKIC and RISH to curate the information of start-ups in the three S&T Clusters. A survey form (<https://forms.gle/FfcuNF2w8SFVZQqaA>) circulated among the start-up network of the three S&T clusters collected information such as the name, DPIIT number, contact information, description about technology with validation, TRL details and approximate cost, potential beneficiaries, category and the respective S&T cluster. The link is active and the curation exercise will be continuous.

This book “Compendium of Agritech Start-ups | 2024” has a collection of 37 start-ups with 77.5% start-ups in TRL 7-9, 12.5% in TRL 4-6 and 10% in TRL 1-3, belonging to various agritech categories.

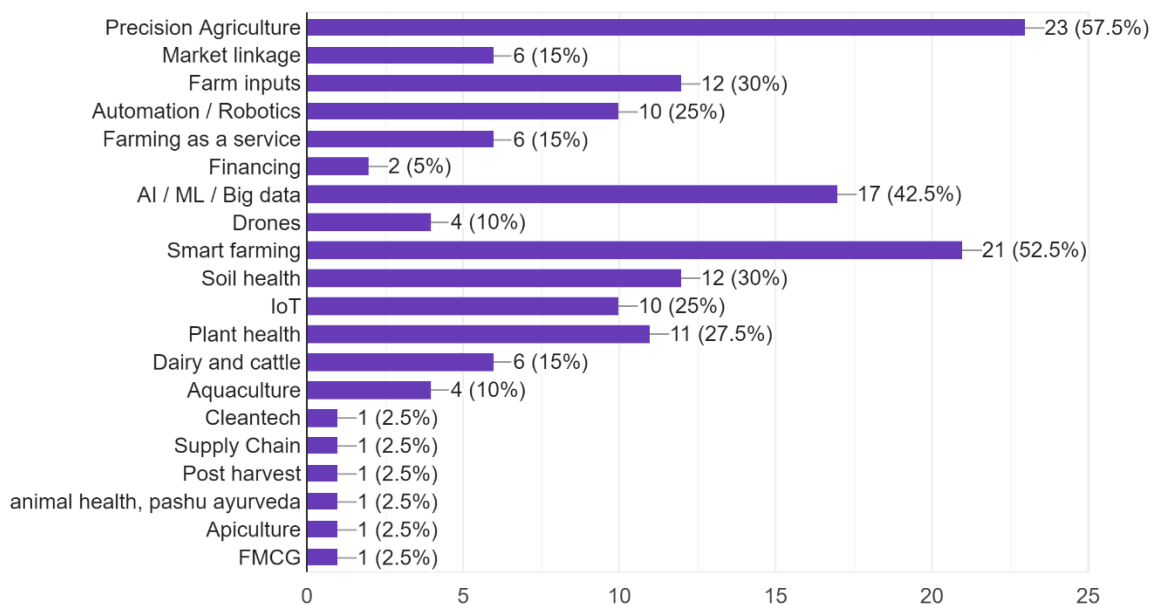




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BeST
CLUSTER



RICH
Research and Innovation
Circle of Hyderabad



BCKIC
Bhubaneswar City
Knowledge Innovation
Cluster Foundation

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Absolute

Startup DPIIT No

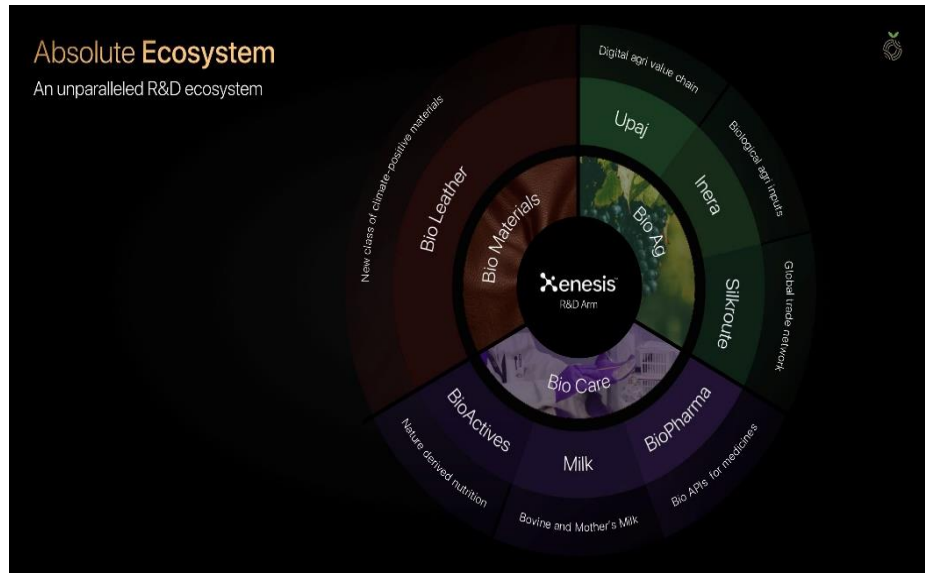
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Website

www.absolute.ag

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Technologies

Inera and Upaj:

Inera Cropscience is a pioneering force in agricultural innovation, dedicated for harnessing the potent powers of nature to drive sustainable farming practices while ensuring plentiful yields. Enriched by a profound understanding of ecological dynamics, Inera's R&D core, Xenesis, develops breakthrough biologicals that surpass synthetic input alternatives in performance, efficiency, and agricultural output.

Inera's portfolio consists of products that have been tested extensively at the company's own R&D hub - Xenesis Institute.

The R&D facilities at Xenesis span over 5 million square feet of farms for product development and testing, with state-of-the-art research laboratories headquartered in New Delhi and further expanding to Pune. Xenesis has also launched an advanced research facility in Pune for phenotyping, development of agricultural biocontrol inputs from Inera Cropscience and other innovative biocare and biomaterials solutions.

Upaj is Absolute's Tech Driven Ag Value Chain business on a mission to improve the life of farmers by enabling them to grow better and stay protected against weather abnormalities through their comprehensive suite of solutions covering inputs, soil testing, precision advisory, farm monitoring, insurance, and credit. UPAJ aims to redefine the agricultural value chain by harnessing the collective strength of nature, technology, agronomists, scientists, and industry pioneers. Upaj has over 20 lakh paid farmers in its ecosystem and is on track to increase its reach to 50 Lakh farmers.

UPAJ has been working on joint projects with prestigious global institutions like World Bank, UNDP India, Reserve Bank Innovation Hub, Pradhan Mantri Fasal Bima Yojna (PMFBY), and Assam Rural Infrastructure and Agricultural Services (ARIAS) Society amongst others.

TRL	7 - 9
Beneficiary	Farmers
Cost	-
Category	Precision Agriculture, Farm inputs, Farming as a service, Financing, AI / ML / Big data, Smart farming, Soil health, IoT
Lead S&T Cluster	Bengaluru



AgriRain Agro Industries

Startup DPIIT No.
DIPP40639

Website
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Contact
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Technology

Irrigation as a Service: Their innovative technology combines data-driven precision irrigation with a pay-per use farm mechanization model, enhancing agricultural efficiency and sustainability. Their mobile sprinkler system, featuring a self-propelled hosereel and movable sprinkler cart, enables precision irrigation at critical crop stages, enhancing yields and farm income. Operating on an Irrigation as a Service (IaaS) basis, they charge per irrigation, ensuring cost-effectiveness and accessibility for farmers. Moreover, they foster community-based irrigation systems through farmer clusters and FPCs/FPOs, promoting collaboration and optimizing resource utilization. This integrated approach revolutionizes irrigation practices, empowering farmers and fostering agricultural resilience.

This technology has been validated. It has undergone testing at National Seeds Corporation, India, and Wageningen University, Netherlands, which have been their research and knowledge partners since 2017. Additionally, the product has been utilized at NSC for irrigation during the Rabi season every year since 2018, further affirming its reliability and effectiveness.

TRL	7-9
Beneficiary	Small and Marginal farmers
Cost	Rs. 1200 per acre for 10mm of irrigation
Category	Precision Agriculture
Lead S&T Cluster	Hyderabad



AgroNxt

Startup DPIIT No
DIPP2978

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Technology

AgroNxt BhuParikshak: AgroNxt in partnership with IIT Kanpur has launched Bhu-Parikshak, a Smart Soil testing device. Bhu-Parikshak is an affordable, chemical less, rapid, artificial intelligence and machine learning powered soil testing device with reports & dashboards.

Bhu-Parikshak is based on NIR Spectroscopy, IoT sensors and AI/ML. It can measure Soil nutrients in 90 seconds without using chemicals. A single device can test 100-250 Soil tests per day at effective per test cost of under Rs. 50.

Bhu-Parikshak is a perfect device to be used by Village level entrepreneurs to augment their incomes by offering affordable Soil testing as a Service to farmers.

Technology has been duly validated by an ICAR supported institution Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar.

TRL 7-9

Beneficiary	Farmers as end users, FPOs, Input Shops, Agri universities, KVKs, Input companies, Value chain companies like processors, sugar mills, tea and coffee plantations, state departments etc.,
Cost	Rs. 96,000 for hardware with one year warranty, For full five years Rs. 50,000 test warranty at Rs.1,65,000, Rs. 25 for each test report.
Category	Precision Agriculture, AI / ML / Big data, Smart farming, Soil health, IoT
Lead S&T Cluster	Hyderabad

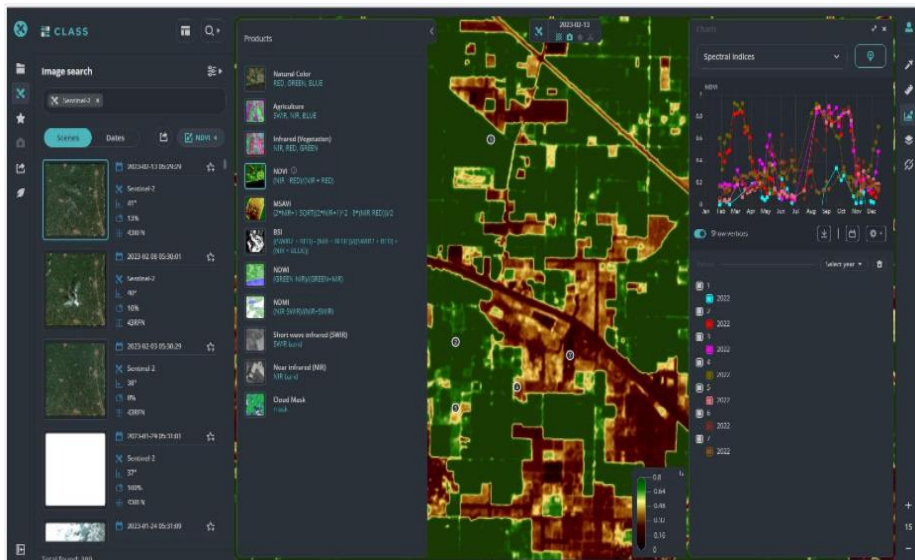


Agrotech Risk

Startup DPIIT No
DIPP65898

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Technology

CLASS: It is a highly sophisticated software providing end-to-end crop statistics and analytics with the aid of trained AI and ML models. This technology has been validated by the Union ministry of Agriculture's Centre of Excellence (MNCFC).

TRL

7-9

Beneficiary

Agriculture Sector

Cost

-

Category

Precision Agriculture, AI / ML / Big data, Drones, Smart farming, Soil health

Lead S&T Cluster

Delhi

Startup DPIIT No
DIPP65898

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www.anitra.co

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Technology

Livestock Market place: Anitra has developed a digital app which is user friendly, crisp and captures all the required information for enabling to undertake its objective of helping livestock farmer. Farmers of Livestock can enroll free of cost. Livestock is identified by unique muzzle biometrics and the data about livestock is captured and updated periodically through FPOs & Village level Entrepreneurs. The integrity and accurateness pertaining to Animal traceability is ensured through Blockchain technology.

This technology has been validated by the Institute of Rural Management (IRMA).

TRL 7-9

Beneficiary Marginalized farmers and organized players

Cost Margin of 8% will be recovered from total sale value for the service they have provided.

Category Market linkage, AI / ML / Big data, Dairy and cattle

Lead S&T Cluster Hyderabad

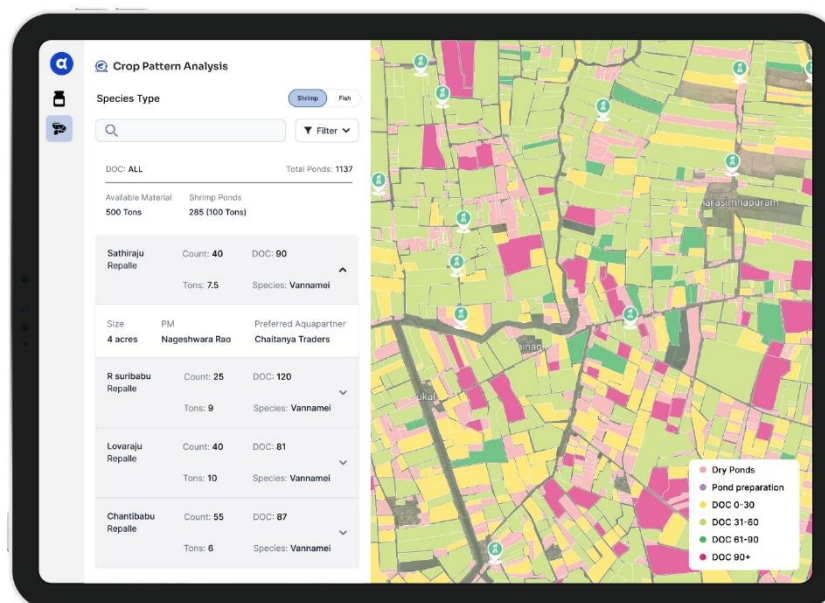


Aquaconnect

Startup DPIIT No
DIPP16013

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Technology

AquaSAT: Aquaconnect's "AquaSAT" project integrates Artificial Intelligence and Geospatial technologies to bring transparency and efficiency to the aquaculture value chain. Fetching data from satellite remote sensing and powered by deep learning algorithms, Aquaconnect has been able to democratize aquaculture ponds, distinguish between fish and shrimp ponds, and predict Days of Culture (DOC). Aquaconnect leverage DOC sensing capabilities to enable near-real-time monitoring and predicting farm input demand and harvest supply at various scales. These data intelligence helps Aquaconnect's business partners, especially retailers and seafood buyers, make informed decisions, optimize their operations in terms of inventory and sales planning, and upscale their businesses.

This platform has undergone thorough in-house validation, complemented by a comparative study to verify its effectiveness and reliability. This comprehensive validation process enabled them to meticulously monitor and evaluate the technology's performance, ensuring its suitability for practical application in the field.

TRL 4-6

Beneficiary	The solution is designed to serve stakeholders in the aquaculture sector, especially farm input retailers and seafood buyers, potentially leveraging intelligence to make informed decisions, optimize their operations in terms of inventory and sales planning, and upscale their businesses.
Cost	AquaSAT's capabilities support Aquaconnect's core business of enabling efficient market linkages in both the pre- and post-harvest value chains. Aquaconnect generates revenue through its comprehensive business model, which includes an aggregation service for its retail partners and sourcing fees from seafood companies for facilitating post-harvest market linkages.
Category	Market linkage, Farm inputs, AI / ML / Big data, Aquaculture
Lead S&T Cluster	Bengaluru

Startup DPIIT No
DIPP134624

Website
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Animal Feed Ingredients

1. Black soldier fly dried larvae



2. Black soldier fly defatted meal (Protein)



3. Black soldier fly oil (Fats)

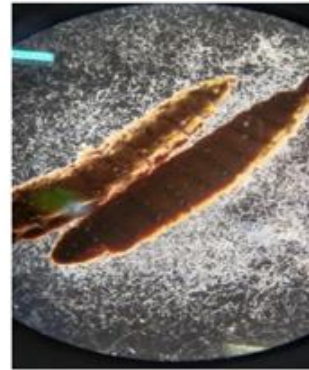


Agri Inputs

1. Black soldier fly Frass (Natural fertilizer)



2. Biopesticide (Entomopathogenic Nematodes based)



Technology

Black soldier fly larvae-based ingredients for animal feed industry & entomopathogenic nematode based biopesticides for plant agriculture: They harness the capabilities of Black Soldier Fly larvae (BSF) to optimize resource utilization. BSF larvae thrive on agri-industrial residues, efficiently converting these nutrients into valuable resources by feeding. These larvae are then processed into protein meal and oil, serving as crucial protein and energy sources within the animal feed industry.

Additionally, they employ BSF larvae as hosts for the large-scale production of Entomopathogenic Nematodes (EPNs). These nematodes are pathogenic to soil-borne pests, offering an effective solution to pest management. Previously, the challenge with EPN production lay was with availability of suitable insect hosts. However, our innovative proprietary process facilitates the mass production of EPNs by utilizing BSF larvae as hosts.

The Black Soldier Fly larvae ingredients are marketed commercially to the pet, shrimp, and fish feed industries. The protein content in the

meal ranges from 58% to 60%, a figure verified by NABL accredited labs such as EUROfins and Animal health quarantine services during export.

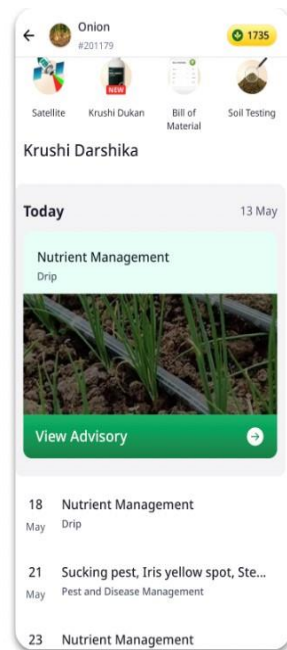
Their Entomopathogenic nematode technology is undergoing validation by the National Bureau of Agriculture Insect Resources. Through extensive lab-scale testing on numerous soil-borne pests, they've achieved mortality rates of 98% to 100% across various pest species. To further validate their technology in real-world conditions, they've partnered with a sugar factory based in Andhra Pradesh for field trials, which are currently underway.

TRL	7-9
Beneficiary	Black soldier fly larvae are the ingredients for Petfood, Shrimp and fish feed industry; Entomopathogenic nematodes based biopesticides is used for plant agriculture
Cost	Black soldier fly protein - Rs. 170/kg Black soldier fly Oil- Rs. 140/Kg Black soldier fly dried larvae - Rs. 180/kg Entomopathogenic nematodes biopesticide - Rs. 180/Kg
Category	Farm inputs, Plant health, Aquaculture
Lead S&T Cluster	Hyderabad

Startup DPIIT No
DIPP15584

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Technology

BharatAgri: BharatAgri is an advisory solution for farmers where they get personalised recommendations for their crop which include integrated nutrient management, pest & disease management and irrigation management.

This is in the form of calendar on the BharatAgri app. They collect data from the farm i.e. soil data, weather data and satellite imaging data, to generate this personalized and dynamic calendar.

BIRAC has validated this technology.

TRL 7-9

Beneficiary Farmers

Cost Rs. 399 per year

Category Precision Agriculture, Farm inputs, Smart farming, Soil health, Plant health

Lead S&T Cluster Hyderabad



Boomitra

Startup DPIIT No

-

Website

www.boomitra.com

Contact

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Technology

Boomitra Soil Carbon Marketplace: Boomitra uses proprietary AI & remote sensing capabilities for monitoring, reporting, and verifying (MRV) carbon content ("CarbonFocus") in the soil. Boomitra uses datasets from a 100+ satellites across the electromagnetic spectrum. This data is cross-referenced with their regional machine learning (ML) models to measure the absolute soil organic carbon (30cm deep), soil moisture (1m deep), nitrogen, phosphorus, and more on a given plot of land – all insights are delivered with a 10m resolution. The use of this scalable & robust technology enables them to provide finance to even the most remote farmer for adopting regenerative practices.

Boomitra's CarbonFocus AI has been third-party, internationally certified by a UNFCCC certified carbon auditor and Boomitra has FIVE Verra Validated Projects (by 3 different UNFCC certified carbon auditors) in diverse landscapes ranging from Grasslands in Mexico to smallholder farmers in India. In India, they work with 1,00,000 farmers across 14 states and 53 partners such as DCM Shriram, Welspun, WeltHungerHilfe and Department of Farmer Welfare & Agriculture - Government of Madhya Pradesh and e-Sahamati, Government of Karnataka

TRL	7-9
Beneficiary	The beneficiaries of their technology are the farmers, local entrepreneurs and implementation partners with whom they work with.
Cost	Not Applicable, as Boomitra does not charge its farmers and partners for leveraging its ecosystem.
Category	Precision Agriculture, Market linkage, Financing, AI / ML / Big data, Smart farming, Soil health
Lead S&T Cluster	Bengaluru



Crop Domain

Startup DPIIT No
DIPP11862

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Technology

MicroSANJEEVINI Climate-savvy farming supplies for managing pests, improving soil health, preserving varied species, and lowering gas emissions harmful to the environment: Crop Domain Private Limited is a pioneering biotechnology agricultural startup committed to tackle critical challenges in the agricultural sector viz., climate smart precision and sustainable agriculture, erratic weather, crop losses, biodiversity losses, the spread of invasive pests, soil health replenishment and agricultural waste. They specialize in pest control, soil and plant health promotion, and biodiversity conservation through sustainable products derived from root microbiome microorganisms. Their mission is to uplift smallholder incomes, minimize greenhouse gas emissions, and reduce chemical dependency, leading to improved production, nutrition, environment, and overall quality of life. Their expertise lies in the development of cost-competitive and efficient biopesticides, bioprotectors, bionutrition, seed germinators, bio herbicides, biostimulant and decomposers (urban solid waste management and agriculture waste) products.

TRL 7-9

Beneficiary	The primary beneficiaries of Crop Domain Private Limited's agricultural solutions, including biopesticides, bioprotectors, and other related products, are smallholder farmers. These farmers, often work on limited land and resources, face challenges related to pest management, crop protection, and sustainable agriculture practices. By providing cost-effective and efficient bio-based solutions, Crop Domain aims to empower smallholder farmers with tools to enhance crop yield, improve crop quality, and minimize economic losses caused by pests and diseases. Additionally, the emphasis on eco-friendly and sustainable practices aligns with the broader goal of promoting environmentally conscious agriculture. The beneficiaries extend to; • Farmers: Smallholder farmers across different geographical locations, especially those grappling with issues related to white root grub infestation, can benefit from Crop Domain's nature-derived solutions. • Agricultural Ecosystem: The adoption of sustainable and bio-based products contributes in preserving the biodiversity of the agricultural ecosystem, including beneficial insects and soil microflora. • Local Communities: The success of smallholder farmers positively impacts local communities by fostering economic growth, food security, and environmental sustainability. • Government Initiatives: Crop Domain's solutions align with government programs and schemes focused on promoting sustainable agriculture, making it a potential collaborator with relevant authorities. • Global Agriculture: The scalable nature of the solutions positions Crop Domain to contribute to global agricultural practices by addressing common challenges faced by farmers worldwide. In summary, the primary beneficiary is the smallholder farmer, but the positive impact extends to various stakeholders within the agricultural ecosystem, local communities, and broader global agriculture initiatives.
Cost	600 per kg
Category	Precision Agriculture, Farm inputs, Smart farming, Soil health, Plant health
Lead S&T Cluster	Bengaluru



Dairymate

Startup DPIIT No
DIPP33856

Website
www.dairymate.in

Contact
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9448059909



Technology

Last mile delivery of Agri-tech innovations: They educate farmers on veterinary healthcare and yield enhancement via tech-enabled KIOSKS. and they sell the solutions farmers need to achieve the results they have been educated about. KIOSK is supported by a backend app, e-commerce website, front-end app for farmers and KIOSK operators.

They already have two test KIOSKS actively interacting with 4,000+ farmers and over 6,000 cattle and generating data. This gives other players in the ecosystem access to last-mile delivery.

TRL 4-6

Beneficiary Small and medium dairy farmers

Cost ₹50 per user per month which can be redeemed in coupons to buy machines.

Category Precision Agriculture, Farm inputs, AI / ML / Big data, Smart farming, Dairy and cattle, animal health, pashu ayurveda

Lead S&T Cluster Bengaluru

Startup DPIIT No
DIPP13257

Website
www.deltathings.com

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9989390200



Technology

ITrapper: This solution features a variable wavelength-emitting light source, strategically designed to lure and attract targeted pests. As pests reach the trapping device, a high-resolution camera captures images, utilizing advanced AI and ML algorithms these images undergo precise data analytics. The result is a comprehensive pest advisory, providing valuable insights for effective pest management. This cutting-edge technology combines lure-based trapping with intelligent analytics, offering a proactive and efficient approach for pest control, minimizing environmental impact and optimizing agricultural practices.

Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, India has validated this technology.

TRL 7-9

Beneficiary Farmers

Cost Rs. 4500 for basic version (pest control) and Rs. 23000 for Advanced version with Pest advisory

Category	Precision Agriculture, Farm inputs, Automation / Robotics, AI / ML / Big data, Smart farming, IoT, Dairy and cattle, Aquaculture
Lead S&T Cluster	Hyderabad

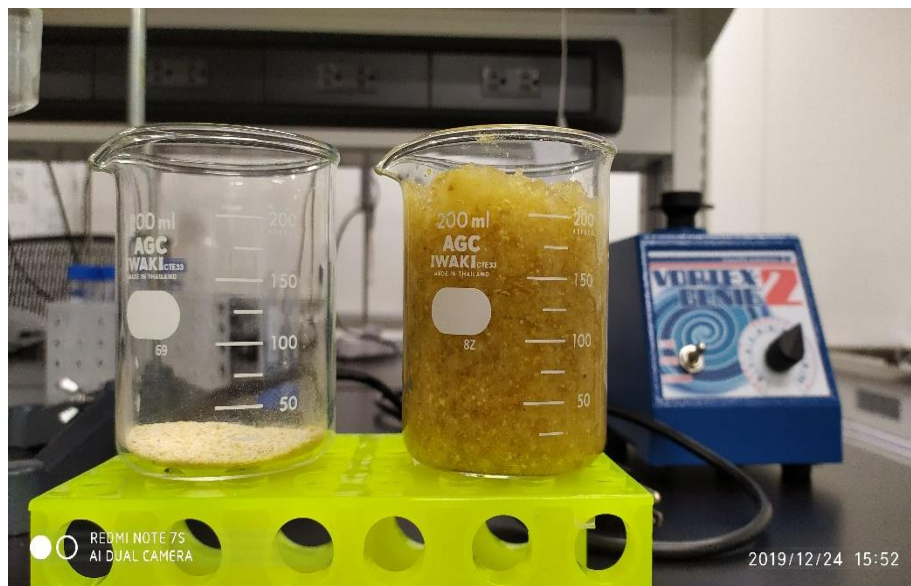


EF Polymer

Startup DPIIT No
DIPP29416

Website
www.efpolymer.com

Contact
Puran Singh Rajput,
Co-founder & COO
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Technology

Organic Super Absorbent Polymer (Fasal Amrit): Fasal Amrit is organic super absorbent polymer made from fruit peels. It absorbs 100 times water than its weight and release it back to the soil. It can minimize the irrigation water requirement by up to 40%.

This technology has been validated by Maharana Pratap University of Agriculture and Technology, Udaipur

TRL 7-9

Beneficiary Farmers

Cost Rs. 2999 per acre (5 kg bag)

Category Farm inputs

Lead S&T Cluster Hyderabad

Startup DPIIT No

DIPP48215

Website

www.greenpodlabs.com

Contact

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deepak@greenpodlabs.com
 9840069712



Technology

Active Packaging Sachets: A biotech product that extends the shelf life of fruits and vegetables at ambient temperature during transport and storage.

They have commercialized three products in the market, working with 200+ customers.

TRL

7-9

Beneficiary

Traders/ exporters

Cost

-

Category

Plant health

Lead S&T Cluster

Hyderabad



Humble Bee (Buzzworthy Ventures)

Startup DPIIT No

DIPP139108

Website

www.thehumblebee.co

Contact

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CEO and Co-founder
monika@thehumblebee.co
7204024529

**Technology**

BEEKIND app for empowering beekeepers: BEEKIND app and intervention builds scientific capacity of beekeepers and farmers with smart decision tools, vernacular AI-speech helpdesk, comprehensive learning repository, peer/expert support community, credit connects and a fair-trade marketplace for quality hive products (sale/purchase) for small-scale beekeepers across India. Their mission is to maximize hive productivity, narrow information asymmetry, reduce the gender divide (by unlocking beekeeping as a low-barrier economic activity), enhance crop yields, mitigate climate change, and benefit the overall health of bees and local ecosystems. Their platform and solution revolves around transforming small-scale beekeeping by leveraging AI, speech and image recognition, vernacularization and other technologies.

They are one of the winners of BIRAC-BIG 2023, achieved on the basis of their technology prowess and potential. In addition, they are actively doing field validations and feedback collection from a beta set of beekeepers.

TRL	7-9
Beneficiary	Smallholder Farmers, Women Farmers, Tribal/Forest dwelling communities
Cost	-
Category	Precision Agriculture, Market linkage, farm inputs, AI/ML/Big Data, Apiculture
Lead S&T Cluster	Bengaluru

Startup DPIIT No

-

Website

www.kheyti.com

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Fund raising
aditi.a@kheyti.com

-



Photo Credit: Rishabh Malik

Technology

Kheyti Rakshak: Kheyti provides low-cost greenhouses to small farmers to help increase incomes and build resilience against climate change.

Over 3,500 farmers are using our greenhouses and over the last 10 months our farmers have seen an average income increase of \$430 annually from greenhouse farming. An impact study conducted by the agency '60 Decibels' also found that over 74% of respondents saw yield increases, 69% of farmers using the Kheyti Greenhouse reported being better prepared for climate shocks and 64% reported shorter recovery times post an unprecedented climate event, as a result of using Kheyti greenhouse.

TRL

7-9

Beneficiary

Smallholder farmers who own less than 5 acres of land

Cost

Rs. 75,000

Category

Smart farming

Lead S&T Cluster

Hyderabad



Klonec Automation Systems

Startup DPIIT No
DIPP11041

Website
www.krishitantra.com

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Technology

KRISHI-RASTAA: Krishi-RASTAA is a game-changer in the agricultural landscape. Its rapid automated soil testing capabilities enable farmers to make data-driven decisions, enhancing crop yield and productivity. Additionally, its agronomy advisory services provide personalized guidance, empowering farmers to adopt best practices and optimize their resources. With the help of this innovative technology, agriculture can become more sustainable, efficient, and profitable. By embracing Krishi-RASTAA, we pave the way for a brighter future for both farmers and the world's food production.

This technology is validated by ICAR - Krishi Vigyan Kendra, Raichur

TRL

7-9

Beneficiary

Farmer Community

Cost

-

Category

Soil health, IoT

Lead S&T Cluster

Bengaluru



Marut Dronetech

Startup DPIIT No
DIPP41694

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Technology

AG365- India's First Multiutility Agriculture Drone: AG365 – Marut Dronetech Private Limited's flagship Agriculture Drone focuses on agriculture mechanization. This is the country's only multi-utility drone which is DGCA-type certified and has 7 different use cases like Direct Seeding, Spraying, Thermal Fogging, Pollination, Crop Intelligence & Monitoring, Agri Product Delivery, and Fertilizer Granular Spreading..

TRL 7-9

Beneficiary

Rural Youth, Agri Entrepreneurs, Farmers, FPO, Agriculture Universities

Direct beneficiaries are Farmers (remunerative farming and reduced health risks), and agri-entrepreneurs (Over 2 lakh rural youth can turn into entrepreneurs with this model) mostly in the rural areas. Indirect beneficiaries are consumers due to less residue of agrochemical on farm produce because of precision agriculture. The ecology including various species is also an indirect beneficiary.

Cost	Rs. 6,80,000/-
Category	Precision Agriculture, Automation / Robotics, Farming as a service, Drones, Smart farming, Soil health, Plant health
Lead S&T Cluster	Hyderabad



Millet Bowl Food Products

Startup DPIIT No
DIPP2260-

Website
www.milletbowl.com

Contact
K R Sanjay Kumar
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8008142786



Technology

Millet Based Snacks and Beverages: First Ready to Drink Multi Millet Protein Shake.

Patent has been granted to this technology.

TRL

7-9

Beneficiary

Entire Population

Cost

Rs.50/200 ml

Category

FMCG

Lead S&T Cluster

Hyderabad

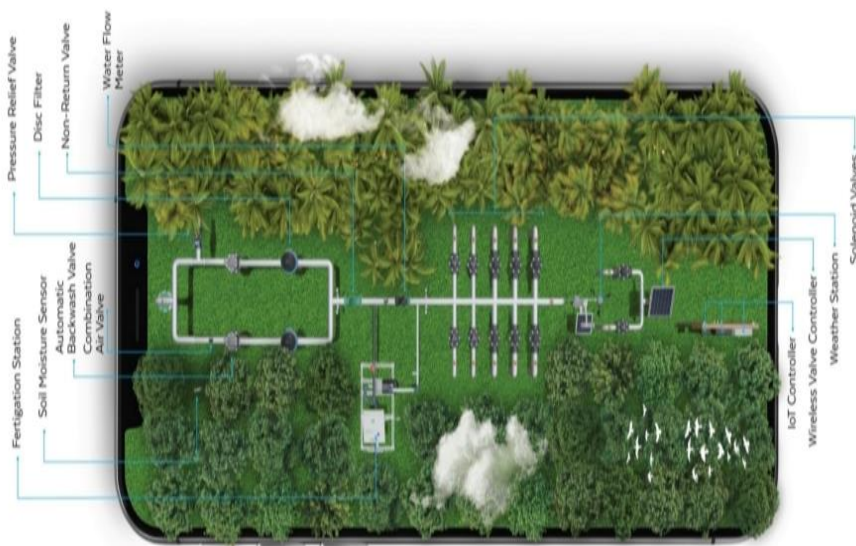
Mobitech Wireless Solution

Startup DPIIT No
DIPP144033

Website
www.mobitechwireless.in

Contact
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kaliraj@mobitechwireless.in
9150018281

Visual View of Irrigation & Fertigation Automation



Technology **Irrigation and Fertigation automation system:** Mobitech Wireless Solution Private Limited leads the way in irrigation and fertigation automation systems, providing comprehensive solutions.

TRL 7-9

Beneficiary Farmers

Cost Cost may Depends upon the field requirements.

Category Precision Agriculture, Automation / Robotics, Smart farming, IoT

Lead S&T Cluster None

Mylar Treee

Startup DPIIT No

Website

Contact

Dr. H K T Kumara, Director
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9844234205



Technology

GREEN THINK BOX, Kitchen food waste to farmland: In urban areas daily mixed kitchen food waste is being collected and its major portion is used for landfilling. This has created environmental hazards. This crisis has to be addressed scientifically by treating the food waste at household level. Innovative product Green Think Box is a portable hybrid system with carbon based activated smell absorber. It has taken care of customer pain-smell, flies and germs during fermentation. The fermented food and juice are ready to mix with soil for composting at farmland or at terrace gardening with enhanced nutrient values.

Food waste is added to the Green Think Box by opening the airtight lid and it is closed. It takes about 8 to 10 days to fill up to the mark and this is the fermentation step. The airtight box is placed in sun light for heat cycle and cold cycle for 20 days to kill pathogenic bacteria and weed seeds and to produce fermented food and juice. After 30

days, fermented food and juice is mixed with soil for composting in farmland.

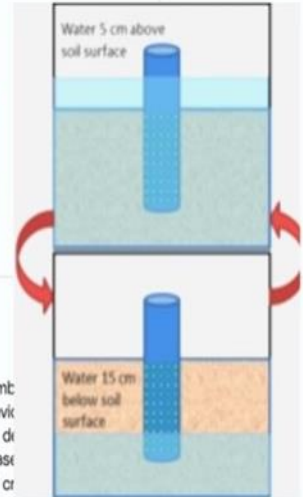
The compost is analyzed in ICAR Krushi Vignana Kendra, Research Laboratory, Hirehalli, Tumakuru, which showed enhanced nutrient NPK % and macro nutrients %.

TRL	7-9
Beneficiary	Household level, Municipalities, City corporations and Farmers
Cost	Rs. 1200 to Rs. 2700
Category	Farming as a service, Soil health, Dairy and Cattle
Lead S&T Cluster	Bengaluru

Startup DPIIT No
DIPP108799

Website
www.nivac.in

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7259570007



LISTEN as programmable Controller & Platform to record data, works on Master - Slave combination using available free radio frequency & communicate to cloud using one GSM device present in Master Controller. After the irrigation in the crop field, the water depth gradually decreases because of evapotranspiration, seepage, and percolation. From installed sensor base tubes in the field, it is possible to monitor the water depth below the soil surface up to 15-20 cm. When the water level drops 15 cm below the soil surface, LISTEN controller will automate the irrigation in the field to re-flood to a depth of 5 cm. With various installed sensor tubes in field level, all will communicate to one Master Controller for proper irrigation process & maintain same level in all blocks.

Technology

Alternate wet & dry method cultivation water level monitoring in paddy & sugarcane fields: For reduced use of energy & water, to reduce soil salinity, for alternate wet & dry method cultivation which is being adopting in many parts of India, they have proposed a technology to monitor the water level and to use a micro controller to irrigate the fields with automated irrigation valves by using a master & slave combination controller valve system, thereby measuring the water flow and time of flow.

TRL 1-3

Beneficiary Paddy & sugarcane farmers

Cost Rs. 7500

Category Precision Agriculture, IoT

Lead S&T Cluster Bengaluru

Startup DPIIT No
DIPP66003

Website
www.piatrika.com

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8897458982



Technology

Agritech: Their innovative platform helps researchers and plant breeders bring Sustainable Seeds and Agri Chemicals to market faster and cheaper.

They have deployed the platform for 2 customers related to Gubba & CT Seeds

TRL

7-9

Beneficiary

Seed companies

Cost

Depends on the number of modules required

Category

Precision Agriculture, Farm inputs

Lead S&T Cluster

Hyderabad



Rashvee - International Phytosanitary Research and Services

Startup DPIIT No
DIPP91330

Website
No

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9036608527



Technology

Non-insecticidal climate-resilient olfactory lure and arolium-fixing trapping system for multi-species fruit flies (Tephritidae): This novel non-insecticidal lure formulation has anti-evaporation properties giving resilience to temperatures. When dissolved in water @5%, it has surfactants that bind to the arolium and pulvilli of fruit flies, immobilizing them and eventually causing the flies to drown. The lure formulation is ecologically friendly and climate resilient. The cap of the trap (any waste disposable water bottle) with parachute technology softens wind drag and a rain-hood protects it from rain. This trap technology is useful to manage fruit flies in fruits and thus help farmers to grow residue-free fruits and vegetables that are healthy and fit for exports. This trap is compatible in organic farming. The trap is also useful in studying the biodiversity of Tephritid fruit flies and does not attract non-target useful insects.

This technology has been validated by

- State Agricultural University, University of Agricultural Sciences, GKVK, Bengaluru
- ICAR Institute, ICAR National Bureau of Agricultural Insect Resources
- Farmer Producer Organizations (FPO) and several progressive farmers of mango, cucurbits and gherkin

TRL	7-9
Beneficiary	Farmers, post-harvest Industries, Exporters
Cost	Rs. 20 / trap
Category	Farm inputs, Smart farming, Plant health
Lead S&T Cluster	Bengaluru



Reude Technologies

Startup DPIIT No
DIPP113120

Website
www.reude.tech

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6384667822



Technology

STINGRAEY: As the usage of drones increases in the domain of agriculture sector, the type of usage has diversified. In order to keep up with the requirements, people have to buy different drones for different operations. Reude Technologies have developed "STINGRAEY", a multi-payload drone. This single drone and its payloads can be bought based on the operation requirement of the person.

For example: If a person needs spray and seed operations in his farm, he/she need not buy two drones and can buy one drone with different payloads. The good part is their payload is the 'grabber system' developed inhouse and patented, which can attach itself to the payload on its own without human interference. They have been doing trials for the past 6 months with this technology in the fields.

TRL 4-6

Beneficiary Farmers, DAAS providers, agricultural equipment manufacturers, existing drone manufacturers

Cost Rs. 10.5 L

Category	Precision Agriculture, Automation / Robotics, AI / ML / Big data, Drones, Smart farming, Soil health, IoT, Plant health, Dairy and cattle, Aquaculture
Lead S&T Cluster	Bengaluru

Revy Environmental Solutions

Startup DPIIT No
DIPP8715

Website
www.revy.co.in

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8156009652

OUR METHOD (SOLUTION)



REVY Stub

Field Trials - 1



Bed Preparation



Formulation Ready For Spraying



Formulation Spraying



Periodic Spraying



Regular pH & Temp Monitoring



Stubble status after 34 Days

Field Trials - 2



Bed Preparation



Formulation Ready For Spraying



Formulation Spraying



Periodic Spraying



Regular pH & Temp Monitoring



Stubble status after 34 Days

Technology

REVY STUB – Product developed by REVY for Bio-decomposition of Stubble – An alternative to burning: REVY has proposed REVY – Stub kit. REVY- Stub kit has formulations in unique combination of several useful microbes with consortia and relevant nutrients. When this product is sprayed on stubble, the microbial cultures carry out a process of decomposition by colonizing over it, and will secrete amino acids, enzymes and hormones along with micronutrients and beneficial bio-chemicals which enriches the soil fertility and enhances the soil microflora thereby enabling reduction in chemical fertilizer inputs and other expensive agro-inputs. The product shall contain non-pathogenic bacterial strains that occur naturally in soil and is biodegradable.

They have conducted field trials with their product – “REVY –Stub” at Ropar and Panipat – 1.25 hectares of combined land. They were able to successfully restore and make it nutrient rich for sowing the next crop in a very economical manner. REVY – Stub is a new product by REVY for which validations and certifications need to be done. Patents for the same need to be filed for its supply and distribution ship.

TRL	1-3
Beneficiary	Farmer communities or to government agencies who can supply this product to farmers under a specified or certain government initiatives or under some sort of subsidy.
Cost	Services offered: Product - REVY STUB and O&M via REVY's customized APP called R-EMAPP.
Category	Smart farming, Cleantech
Lead S&T Cluster	Bengaluru



Rootsgoods

ROOTSGOODS PVT LTD

Startup DPIIT No
DIPP21343

Website
www.rootsgoods.com

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Technology

AI-Deep tech and Bio-informatics driven quality assessment and management of agriculture crops post-harvest: RootsGoods has a bioinformatics and AI-Deep tech based SAAS platform for quality assessment and management of agricultural crops post-harvest. They have reduced post-harvest loss of maize from 22% to 5% and reduced carbon emission from 30% to 6%.

Prof Jayasankar, Telangana State Agriculture University has validated this technology.

TRL 4-6

Beneficiary Maize farmers, Maize processing units

Cost 2-8% of each transaction

Category Market linkage, AI / ML / Big data, Plant health

Lead S&T Cluster Bengaluru, Hyderabad

Startup DPIIT No

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Website

www.rukart.org

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8956341913



Technology

Subjee Cooler: World Economic Forum
(www.weforum.org/agenda/2022/04/9-youth-led-innovations-are-protecting-the-planet)

Subjee Cooler is a nature-based Storage-cum-Natural Ripening chamber that does not require any external energy source even SOLAR & needs only 20 liters Water/Day & is suitable for Farmer/Vendor<\$150 (Rs.12K)/Month. The Subjee Cooler - at Farmgate/Retail point - & Mobile Subjee Cooler - Farmgate to customer - provides end-to-end solution to mitigate Fruit & Vegetable losses.

Saving of 4.7K Kg CO₂/Year/Subjee Cooler (9X higher than SOLAR) and 6 Million Kg of CO₂ with 1,300+ of present use of Subjee Cooler.

The Subjee Cooler is validated by ICAR.

TRL

7-9

Beneficiary

- Farmers growing Vegetable/Fruit/Flower/Mushroom in less than 0.5 acres of plot.

- Farmer-cum-Traders/ Retailers selling Fruit/ Vegetable/ Flower/ Mushroom in hundreds of Kg.
- Farmers/Retailers/Entrepreneurs/FPOs/Social Organizations running Direct to customer Fruit/Flower/Vegetable/Mushroom business.

Cost Depends on the capacity of product

Category Smart farming

Lead S&T Cluster Hyderabad



Satyukt Analytics

Startup DPIIT No
DIPP27702

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www.satyukt.com

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9986568525

Sat2Farm mobile app: Precision farming for every farmer



Providing real time information based on the satellite remote technology for which patent is pending.



- Geotagging and **instant** information
- **No hardware** required
- **No capex** required
- No needs to carry samples anywhere
- Recommendations on optimal:
 - Pesticide/insecticide
 - Fertilisers
 - Irrigation

Technology

Sat2Farm and Sat4Agri: Agriculture faces structural challenges such as low productivity, sub-optimal input use efficiency, high biotic losses, and a lack of mechanization which all results in the disruption of supply chains. They have developed scalable algorithms that use data from optical and microwave satellites, weather forecasting, and water resource modeling to provide SaaS solutions for agriculture worldwide. Their technology focuses on precision farming which helps farmers increase their income by increasing crop productivity by up to 25-30% and reducing the cost of cultivation. Keeping this in mind they have developed a mobile application "Sat2Farm" to help farmers through precision farming.

They have validated their technology across India. Additionally, their technology has been validated by Indian Institute of Science (IISc), Bengaluru and DCM Sriram sugarcane mill.

TRL 7-9

Beneficiary	Their customers include farmers, franchise partners, agri output companies, agri input companies, agri retailers, agro advisory/consultancy companies, post-harvest, agri equipment, food companies, government departments, insurance analytics, water resources, FinTech companies, and disaster relief organizations.
Cost	The services are offered at Rs. 100 per month per acre, and for a six-month period, the cost is Rs. 600 plus GST per acre. Yearly services are also available based on customer requirements. These services cater to business-to-business, business-to-government, and business-to-customer needs, offering customization, as per their requirements.
Category	Precision Agriculture, Farm inputs, Automation / Robotics, AI / ML / Big data, Smart farming, Soil health, IoT
Lead S&T Cluster	Bengaluru

Shree Veerabhadreshwara Solutions

Startup DPIIT No
DIPP139033

Website
-

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MVP of **SuggiVeer** – Corn, Sorghum



Technology

SuggiVeer - Complete Crop Harvester: In India, there's always been a cattle fodder shortage. SuggiVeer is a complete crop harvesting solution that offers mechanized operations, allowing farmers to harvest and collect both fruits and stover seamlessly, thus unlocking opportunity to generate 1 to 1.5 tonnes of stover per acre as fodder. Currently, they are concentrating more on fodder producing crops such as corn and sorghum.

This technology is being developed and validated by the startup 'Shree Veerabhadreshwara Solutions LLP' in both laboratory and real environments.

TRL 1-3

Beneficiary Small and marginal land holding farmers growing corn and sorghum with an objective to perform complete harvesting of their crops.

Cost Rental cost of Rs. 5000 per acre for harvesting

Category Farming as a service, Dairy and cattle

Lead S&T Cluster Bengaluru



Sickle Innovations

Startup DPIIT No
DIPP1091

Website
www.sickle.in

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Technology

Horticulture Mechanisation Solutions: Sickle Innovations Private Limited has developed and commercialized various fruit harvesting solutions for fruits like Mango, Apple, Sapota, Lemon, Papaya, Aonla etc. They have also commercialized Crop protection devices like hand weeder, automatic solar powered light trap for insects which charges in the daytime and uses UVA light to attract and then kill harmful insects in the farm saving instead of bearing huge cost of pesticides and making food safer. They have delivered almost 2,00,000 products to distinct parts of the country through their dealer network and online sales partners. Their products are already in use by farmers across the country. More than 200000 farmers have been using their products to increase the farm income.

Many of their products are also validated for the effectiveness and engineering built by various FMTTI (Farm Machinery Training and Testing Institute)

TRL 7-9

Beneficiary	For their Hand tool products, they look for early adopters of the new technologies. Since most of the products they launch are new to their categories, the first movers are progressive farmers, hobby farmers, CSR teams and Government centers. From these channels, the information is then spread to others. Horticulture based progressive farmers are the primary customers.
Cost	-
Category	Precision Agriculture, Automation / Robotics
Lead S&T Cluster	Hyderabad

Startup DPIIT No
DIPP36228

Website
www.temperatetech.com

Contact
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7659079944

New cold room for an FPO in Telangana



Technology

ColdEasy - Low-power and cost-effective cold storage solution that converts any room into a cold room: Temperate Technologies provides farmers with access to cost-effective and low-power cold storage solutions to increase the shelf-life of fruits and vegetables, and in the process, increase their incomes.

Their solutions consume 85% less energy than traditional refrigeration-based solutions and are based on a new low-power cooling technology called dew point cooling. Due to low-power usage, their solutions are especially suitable for off-grid solar-powered installations. We provide solutions for short-term storage of daily-use fruits and vegetables and long-term storage of onions. Their solutions help reduce food waste, increase farmer incomes, increase food security and reduce greenhouse gas emissions.

They are in process of getting validation from ICAR-CIAE Regional Centre in Coimbatore.

TRL

7-9

Beneficiary

FPOs, farmers, aggregators, wholesalers and retailers

Cost	Rs. 60000/-
Category	Post harvest
Lead S&T Cluster	Hyderabad



TerraCroft Agritech

Startup DPIIT No
DIPP41507

Website
www.terracroft.com

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7259524308



Technology

krishiBOT - A smart agriculture robot: krishiBOT is a smart battery-operated system that helps optimize input usage with 95% accuracy, ensuring singularity and uniformity in resource utilization for required plant density. This approach empowers growers, maximizes crop yield and ensures sustainability in farming practices.

This technology has been validated in-house and on-farm in Bengaluru for groundnut crops (KL, K6 varieties) and with use of DAP, MOP, SSP, Urea and complex fertilizers.

TRL 7-9

Beneficiary Farmers (Marginal to large), FPOs.

Cost Farming as a service for Rs. 1200/acre.

Category Precision Agriculture, Automation / Robotics, Farming as a service, AI / ML / Big data, Smart farming

Lead S&T Cluster Bengaluru

Startup DPIIT No
DIPP15204

Website
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Technology

Agricultural Spraying Drone: Agricultural Spraying Drone operates autonomously, thus addressing the multiple problems of Labour Shortage, Inefficient Spraying, Health hazards in one go and this technology is validated.

TRL 7-9

Beneficiary Farmers, Farm Service Providers

Cost Rs.5.5 Lakhs

Category Precision Agriculture, Automation / Robotics, Drones

Lead S&T Cluster Hyderabad

Startup DPIIT No
DIPP65541

Website
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Technology

TRST01Chain, Footprint & dMRVSolution: TRST01 is a leading technology platform that revolutionizes sustainable supply chains, ESG reporting, and the digitization of climate action. It offers innovative solutions like TRST01Chain for traceable supply chains, Footprint by TRST01 for automated ESG reporting, and the advanced dMRV system for digitized climate action, empowering organizations worldwide to enhance their sustainability efforts, optimize operations, and contribute positively to a greener global economy. Focused on transparency, accountability, and efficiency, TRST01 works with businesses of all sizes, providing tools for compliance, achieving sustainability goals, and verifying environmental impacts, driven by a deep commitment to sustainable development and technological excellence.

TRST01, a leader in sustainable technology solutions, offers three key products in the market- TRST01Chain, Footprint, and the dMRV system. TRST01Chain is deployed across Agri commodity supply chains like Rubber, Coffee, and Cocoa to ensure sustainable procurement practices. Footprint is tailored for corporates aiming to

measure and manage their carbon footprint effectively. Meanwhile, the dMRV solution facilitates precise climate action measurement. All solutions are actively used by a diverse clientele, showcasing TRST01's impact on promoting sustainability, transparency, and efficiency in various sectors. This underscores TRST01's commitment to leveraging technology for sustainable development and a greener global economy.

TRL	7-9
Beneficiary	Farmers (Rubber and Coffee), Corporates
Cost	-
Category	AI / ML / Big data, Plant health, Supply Chain
Lead S&T Cluster	Hyderabad

Startup DPIIT No
DIPP11179

Website
www.villamart.in

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7978544744



Technology

PhyGital Platform As A Service (PPAAS), a marketplace for farm products: VillaMart introduces a groundbreaking PPAAS (PhyGital Platform As A Service) model, reshaping the agricultural landscape through a tech-enabled Direct-to-Consumer (D2C) Omni-channel marketplace for farm produce. Their seamlessly integrated mobile and static outlets, coupled with a sophisticated Procurement cum Fulfillment Center (PFC), utilize advanced technology to ensure freshness, chemical-free produce, efficient sales tracking, and pattern analysis, with a primary focus on reducing wastage.

Crucially, the PPAAS model operates on a franchise basis, extending its benefits to roadside vegetable vendors, kirana stores, farmers, Farmer Producer Organizations (FPOs), and Self-Help Groups (SHGs). This inclusive ecosystem aims to create a win-win situation for all stakeholders.

With this technology being in market since 7 years, has reached the revenue 8 Crore.

TRL	4 - 6
Beneficiary	Farmers by creating a sustainable marketplace, roadside vegetable vendors by creating an organized business model, kirana store vendors and also the consumers.
Cost	Franchise cost 4-5 lakh
Category	Market linkage, AI / ML / Big data, IoT
Lead S&T Cluster	Bhubaneswar

Startup DPIIT No
DIPP10107

Website
www.xmachines.ai

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Technology

AI Based Multi-purpose Robots for Precision Agriculture: XMachines manufactures compact Robots to perform agricultural operations to aid small & marginal farmers to deal with declining labor availability, minimize chemical usage and grow quality farm produce. The flagship product of XMachines is X100, a compact & rugged product designed to perform seeding, weeding, spraying & planting with precision & intelligence. It caters to farmers growing commercial crops such as cotton, chilli, vegetables, horticulture crops & orchards who are troubled by labor availability problems.

X100 is a fully electric Robot, operates autonomously in the fields, uses AI to understand crop status and guides farmers bring the highest quality yield leading to convenience & profits.

The technology has been validated by Telangana state agricultural university in maize crop under supervision of Scientists, Experts & Agronomists.

TRL	7-9
Beneficiary	Farmers across the world
Cost	Starts from INR 3,50,000
Category	Precision Agriculture, Automation / Robotics, Smart farming, IoT
Lead S&T Cluster	Hyderabad

Acknowledgements

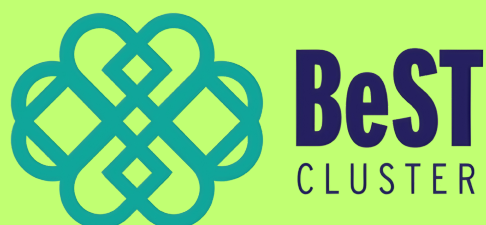
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Bengaluru Science and Technology (BeST) Cluster

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