

LAND ACCELERATOR SOUTH ASIA 2021

BUSINESS LEADERS RESTORING FARMS AND FORESTS





Photo Credits:

WRI India and Restoration Entrepreneurs from
Land Accelerator South Asia Cohort 2021 and 2022

Disclaimer: All contents of the eleven case studies presented in this document are completely based on self-reported data provided by these entrepreneurs.

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ABOUT THE PROGRAM

Land Accelerator South Asia

In 2018, the World Resources Institute (WRI) launched the Land Accelerator Africa - the world's first training and mentorship program targeted specifically towards businesses that restore degraded forests, farmlands, and pastures. Globally, this program has enabled plantation of around 22 million trees restoring 207,000 hectares of land, while it created 13,000 jobs and supported 1.2 million farmers in 46 countries.

The Land Accelerator South Asia is a unique initiative designed to strengthen entrepreneurial opportunities, enhance local livelihoods and incomes, and protect and restore forests and farmlands across South Asia. This first-of-its-kind program, launched in 2020, aims to foster entrepreneurship through a unique accelerator curriculum and supports leaders who develop sustainable and profitable business models for restoring lands across South Asia.

The program builds a global network of restoration experts, mentors and entrepreneurs that can act as an enabling ecosystem and provide a mentorship support for restoration entrepreneurs in developing sustainable business models, effective pitching, and marketing and sales strategies. Applicants under this program are screened with a predefined criteria focusing on the innovation, replicability, scalability, and profitability of their restoration business models. Their environmental and socio-economic impact is a key indicator for determining the holistic impact of these businesses. While the program provides a customized mentorship to support each Land Accelerator entrepreneur, it particularly encourages women entrepreneurs.

Strengthening a restoration-based economy, Land Accelerator South Asia focuses on connecting high-potential restoration businesses to debt and equity funders in the impact investment space. Fundraising opportunities are provided to help participants unlock investment opportunities. They are connected with potential investors through Demo Days, where the top performing entrepreneurs pitch their businesses to the investor community. The program also helps these entrepreneurs build their capacities in tracking, measuring, and documenting the environmental and social impact of their work, while aligning their business goals with the global climate commitments.





With funding support from IKEA Foundation and ecosystem support from Startup India, the first entrepreneurial cohort was launched by Land Accelerator South Asia in 2020 supporting 15 South Asian restoration businesses (14 from India and one from Sri Lanka). These businesses have successfully scaled up today and are progressing ahead with funding commitments from investors' community. Tata Trusts, Samunnati Foundation, Upaya Social Ventures and Vriksh Impact have joined hands with these startups to provide financial support to them.

The program expanded in 2021 to support 58 restoration entrepreneurs with additional support on program launch and outreach from AGNli and Invest India. This diverse group also reflected an increased participation by women entrepreneurs (from around 13 percent in 2020 to 31 percent in 2021). These startups work towards developing climate resilient business solutions in the domains of sustainable agriculture, agroforestry, satellite-based crop monitoring, value chains for non-timber forest produce, precision and AI based farming or agritech solutions, drones in forestry and agriculture, aquaculture, clean energy based post-harvest solutions, sustainable bee value chains, eco-friendly planting and packaging materials etc. to name a few.

Exemplifying the immense potential for restoring our forests and farmlands, these incredible startups across South Asia are leading innovative transformations. The Land Accelerator South Asia program follows a 'PPP approach' that integrates people, planet and profit to restore our ecosystems. Aligning with this, it is committed towards strengthening entrepreneurial opportunities for such businesses and generating sustainable livelihood opportunities for smallholder farmers, indigenous communities, tribals, forest dwellers and other marginalized groups who are directly impacted by the changing climate. This can enable socio-economic benefits for local communities building their resilience while enabling a shift towards sustainable land management practices.

ACKNOWLEDGEMENT

Success of any initiative depends upon successful collaboration of ideas, people and resources. We are extremely grateful to all our collaborators for supporting the land restoration entrepreneurs and making Land Accelerator South Asia 2021 program successful. With deepest regards, we thank our program partner Sangam Ventures for their consistent contribution and instrumental role in co-organizing this program with WRI India, and effectively maximizing the program outreach across South Asia.

We are thankful to our ecosystem partners Startup India, Invest India and AGNli for their invaluable support in launching this program on their platform, providing critical insights on public avenues of support available for restoration entrepreneurs in India, and widening the program's outreach within India's startup ecosystem. This program would not have been possible without IKEA Foundation's generous financial support, which continues to inspire and motivate these restoration businesses by incentivizing them with a supporting fund.

Acknowledging and thanking all the mentors for their valuable insights and encouragement offered to the cohort during one-to-one mentorship sessions, we recognize that their involvement instilled a strong confidence in them for pitching their business solutions successfully. We thank our incredible investor panel who listened to these entrepreneurs on Demo Days 2021 and provided their valuable feedback and commitments.

Most significantly, we thank our amazing entrepreneurs who put in all hard efforts to grow, learn and evolve continuously in their startup journey with this program. They deserve all the praise and support as they transform their dreams to reality in the times ahead. Lastly, our heartfelt thanks to everyone who has contributed towards compiling and publishing this compendium.

Team Land Accelerator South Asia
WRI India

FOREWORD



After a successful first year with 15 restoration entrepreneurs in 2020, the summer of 2021 brought in a thrilling experience for us when we saw the number of entrepreneurs enrolled for the Land Accelerator South Asia program shot up to 58. This huge 'cohort' had representatives not only from 20 different Indian states but also Sri Lanka and presented a whole range of diverse and unique business solutions that can restore farms and forestlands.

As we know, more than 100 million hectares of India's total land offers an opportunity for forest protection and landscape restoration. This land, if restored, can sequester 3 to 4.3 gigatons of above-ground carbon by 2040 and with the Land Accelerator South Asia program, we aim to tap into this opportunity. Our approach is to foster a unique entrepreneurial eco-system that can nurture restoration-based businesses, channelizing support and investments from industry mentors and investors for these entrepreneurs. As a six-month acceleration program, the Land Accelerator South Asia supports them by enhancing their business development skills, creating a scope for scaling-up through expert mentorship, networking for business expansion, providing financial support in form of a grant and fundraising opportunities with impact investors.

This booklet recognizes 11 of these remarkable innovators from cohort 2021 and shares their inspiring beginnings which have gradually evolved into an impressive growth trajectory. I hope that these 11 stories will inspire more such young minds from first generation entrepreneurs across South Asia and motivate them to dream for a better, restored future and join this restoration drive. I am also hopeful that the investment ecosystem will find this publication a handy and pithy resource for learning about the growth and 'ask' of these amazing companies. I congratulate and extend my heartfelt wishes to these restoration trailblazers for pursuing their dreams and enabling restoration action for India.

Kavita Sharma

Senior Program Manager - Land Accelerator South Asia
Sustainable Landscapes and Restoration
WRI India



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RAGHU BURLI N
Founder



FOCUS OF THE BUSINESS

Biotechnology and agri-tech based farming solutions

THE SOLUTION

Precision agriculture for boosting organic farming through mechanized automated spraying with intelligent drones and smart pest traps.

THIS STARTUP'S JOURNEY

1 Felt a burning need to prevent crop damage due to pest infestation and reduce chemical intensive farming practices.

3 Collaboration with research institutes such as Indian Association for the Cultivation of Science, Kolkata and ICAR-National Bureau of Agricultural Insect Resources Bangalore where eminent experts joined hands to develop an integrated technology solution.

5 Realized the need to innovate for small and marginalized farmers and innovated Smart Pest Traps which boosted organic cultivation of horticulture and food crops.

2 Identified potential of intelligent drones for detecting pest infestation in crops and preventing it with limited chemical use.

4 Kickstarted the project with grant support from Biotechnology Industry Research Assistance Council (BIRAC).

6 Wide range of products and solutions available for all types of farmers ranging from small and marginalized groups to large farmers and corporates.



ASK FROM INVESTORS

INR 20 million
(USD 270,000) for capital equipment, manpower/ consultancy, research and development, and sales and marketing

RESULTS

The Socio-economic Impact

- Improved farmers' health by reducing direct contact with harmful chemicals through use of mechanized automated spraying process using drones.
- Enabled organic farming with yields increased up to 30 percent by using smart pest traps.
- Employment opportunities for rural youth in implementing intelligent drones as drone pilots locally.

The Environmental Impact

- With intelligent drones identifying precise quantities of pesticide for containing infestation locally, use of chemical pesticides is reduced by 25 percent.
- This has reduced infusion of chemicals in the food grown.
- Soil contamination is also prevented.
- Smart pest traps enables use of environment friendly organic inputs resulting in chemical free produce for consumers with invaluable health benefits.

NEXT STEPS

- Expansion of the range of intelligent drones for multiple crops of economic importance such as food crops (paddy, wheat, corn), cash crops (cotton, sunflower, sugarcane) and plantation crops (coffee, tea, banana).
- Further research on different pheromones and kairomones for developing pest specific solutions for major pests.
- Plan to build the drones indigenously with features such as flight controllers, remote controllers, Global Positioning System (GPS) antennas and brushless DC motors.





AIMTHY THOUMOUNG
Founder



REKHA BARUA
Co-Founder



Assam and Rajasthan

FOCUS OF THE BUSINESS

Aggregation of farmer producer companies to enable sustainable livelihoods and a sustainable environment

THE SOLUTION

Agricultural value chain services to sellers, including farmers and FPCs, as well as buyers and corporate market linkage providers. InDev provides a combination of four factors that Farmer Producer Companies (FPCs) require for sustainability and scalability: technology, business and management support, capital and market linkages.

THIS STARTUP'S JOURNEY

Started in July 2016 as a consulting firm focused on catalyzing inclusive development.

1

Identified four key factors for the sustainability and scaling up of farmer-producer companies: technology, business management support, capital, and market linkages.

3

In 2020, InDev joined hands with Assam Bio Refinery, which provides secure market linkages for bamboo producer companies in the Northeast India.

5

Gained experience of working with both FPCs and buyer organizations / corporate market linkage providers.

2

Brainstormed on optimizing results from a unique combination of these four factors for FPCs while providing value-added services to them and buyer organizations / corporate market linkage providers.

4

Established an aggregation solution for FPCs.

6



ASK FROM INVESTORS

INR 4.8 million
(USD 65,000) to build a
team for regional business
development and outreach
across Northeast India.

RESULTS

The Socio-economic Impact

- InDev's solution enables each smallholder farmer to increase their income by an average of INR 40,000 per year through effective and immediate market linkages. The company estimates that each farmer will also get an additional annual income of INR 40,000 within five years, through value-added activities and value chain capture, making it a total increase in income of INR 80,000 per farmer per year.
- Better incomes leading to improved access to education and healthcare services overall enhancing lives of those farming households, who are members of FPCs.

The Environmental Impact

- InDev will bring around 17,600 hectares of land under bamboo cultivation in the next 10 years. This is expected to result in carbon sequestration of approximately 194,000 million tons per year per hectare. These new bamboo farms will play a significant role in reversing land degradation and improving soil health across the Northeast.
- One hectare of bamboo produces 5 to 7 tons per year of leaf litter, an effective mulching material for improving soil properties.
- Soils under bamboo neutralize acidity with high levels of organic matter and nutrients.



NEXT STEPS

- InDev aims to establish bamboo producer companies, for which it has entered a tripartite memorandum of understanding with Assam Bio Refinery and Assam State Rural Livelihood Mission. It has also received approval from National Bank for Agriculture and Rural Development (NABARD) to start its first bamboo producer company in May 2022 in Assam.



CHARANPREET SINGH
Founder



DAMANJIT SINGH
Co-Founder



MOHIT SHARMA
Co-Founder



FOCUS OF THE BUSINESS

Agri-tech based robotic solutions for efficient farm operations

THE SOLUTION

Autonomous weeding services for small- to large-scale farmers, which are efficient and cost-effective.

THIS STARTUP'S JOURNEY

Coming from a farming family, Charanpreet closely experienced the process of growing food for many years. He was deeply concerned with inefficiency and harmful impacts of present farming models.

1

While learning about organic farming as a solution, Charanpreet identified a key issue – heavy reliance on manual labor for weeding. This incurs a huge cost for both organic and non-organic farmers, who keep increasing the chemical dosage as crops grow resistant to weedicides with time.

3

Soilhackers' team was built with Damanjit and Mohit in 2017, aiming to address issues related with manual and chemical methods for controlling weeds in the farms.

5

Developed business model for Soilhackers Robotics, providing weeding as a service, charged at a rate of INR 1,000-1,200 per acre. The current robot model weeds up to 3 acres a day.

7

With bachelor's degree in Computer Science, he initially worked as a freelance software developer, and tried understanding issues with unsustainable farming practices.

2

Developed machine learning algorithms that can recognize crop plants and clear weeds with the same precision as the manual process.


4

In 2020, the first working prototype of a robotic solution was ready.

6

By the end of 2020, the team started their on-ground service in Amritsar, Punjab.

8



ASK FROM INVESTORS

INR 5 million
(USD 63,000) in
pre-seed funding

RESULTS

The Socio-economic Impact

- Weeding costs are reduced at least by half, helping boost farmers' incomes.
- Crop health and yield are improved due to reduced herbicide use.

The Environmental Impact

- Robot is 100 percent electric and can be charged using solar energy also.
- Automated weeding machine improves soil health by eliminating need for chemical herbicides or weedicides.


NEXT STEPS

- Developing commercial operations for weeding services.
- Identification of other crop varieties for which this solution can be applied and customize the solution for each of the identified crop.
- Improvement in mechanical design of the robot, coupled with extensive software testing, and begin collecting crop data to train artificial intelligence models.
- Strengthening of the leadership team.





DR. RAJESH P. JOSE
Founder

 Kerala and Karnataka

FOCUS OF THE BUSINESS

Agri-biotech startup working on sustainable and organic farming solutions

THE SOLUTION

Sustainable, scientific, and safe substitutes for chemicals used in farming, with the current focus on a one-stop safe solution for fungicides to enable plants to defend themselves from fungal infection.

THIS STARTUP'S JOURNEY

1 Rajesh started looking for sustainable solutions for plant protection based on hurdles faced during his own farming experiences.

3 Developed the idea of creating a vaccine that would protect plants from infections.

5 In 2018, a solution for arecanut was ready, to protect plants capable from Phytophthora palmivora by activating systemic acquired resistance and increasing activities of antioxidant and defense hormones.

7 Drew up a business development plan based on identified market gaps.

2 Identified the issue after finding that existing chemical solutions were not effective as their impact is only temporary and does not last through wind and rain.

4 Formally registered St. Jude Herbals on June 14, 2016, and began product development.

6 After obtaining no-objection certificates from relevant authorities, the solution was offered to local farmers.

8 By 2021, the product was crop agnostic, after successful testing on coconut, pepper, ginger, and cardamom. This work was supported by Punjab Agricultural University, Kerala Startup Mission, and Manush Labs.



ASK FROM INVESTORS

INR 10 million
(USD 125,000)

RESULTS

The Socio-economic Impact

- Crop protection costs is reduced by 50 percent on an average.
- Crop yield is increased by up to 30 percent.

The Environmental Impact

- The product is manufactured by extraction of phytopharmaceuticals from herbs, and thus eliminates the need for chemicals, and facilitates organic and sustainable farming. This results in impacts across the ecosystem, including soil, biodiversity, water and human wellbeing.


NEXT STEPS

- The product is under active trials for fruit crops including apple. It will be scaled up for various crops across different regions, including Tamil Nadu, Telangana, Maharastra, Madhya Pradesh and Jammu as immediate target geographies.



**HARIPYARI NAOREM**

Founder

 Kakching, Manipur

FOCUS OF THE BUSINESS

Developing a value chain for soibum, or fermented bamboo shoot, an indigenous northeastern delicacy

THE SOLUTION

Creating market linkages for bamboo-based Soibum, manufactured by a traditional method without using any chemicals.

THIS STARTUP'S JOURNEY

1 A key motivating factor for Haripyari to start SP Foods was that forest dwelling local communities in Manipur are not able to earn good incomes from bamboo shoots present in abundance locally while Soibum- an indigenous fermented food, has high demand outside Manipur for its unique taste and medicinal value.

3 Started with a few local women in 2018 in Kakching, Manipur, and registered as an Micro, Small and Medium Enterprise (MSME) in 2019.

5 Became a participant under Cohort 1.0 of the Her&Now incubation program in 2019 and built connections with other women entrepreneurs in the Northeast.

7 Expanded procurement operations to Kwatha village in Chandel district, to source partially fermented bamboo, the raw material for soibum with help of village residents there.

2 Haripyari is a firm believer of women's extraordinary capabilities, she wanted to use this venture as an opportunity to empower women around her, particularly those from marginalized groups.

4 After receiving a positive sales response in Manipur, the B2C sale of the product was expanded to Guwahati where the response was excellent.

6 Received grants of INR 70,000 from Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

6 Further, started B2B operations also by collaborating with bulk buyers in Guwahati, for retail sales and to supply to other businesses who use SP Foods' product to make bamboo shoot pickles and other products. The partnership with Nilachal Foods is being finalized.



ASK FROM INVESTORS

Equity-free loan of INR 2.5 million (USD 31,000), with 50% grant

RESULTS

The Socio-economic Impact

- SP Foods bridges the market gap by buying their produce and supporting livelihoods, which has helped increase incomes of at least 100 forest dwellers by 50 percent.
- 80 percent of the work force consists of women.

The Environmental Impact

- Forest dwellers are encouraged to only collect bamboo shoots and not cut the bamboo plants, to prevent deforestation and soil erosion.
- Bamboo provides twice as much oxygen as other trees, and absorbs more carbon dioxide. Hence, protecting and promoting bamboo helps reduce carbon emissions.


NEXT STEPS

- Currently working to incorporate SP Foods as a private limited company.
- Exploring opportunities to export soibum.
- Building a partnership with an organization such as NABARD, North Eastern Regional Agricultural Marketing Corporation (NERAMAC) or other investors, for funding and mentoring.
- Two new products (dried yongchak and dried soybean) to be launched this year.
- Planning to build a focused digital marketing strategy to increase customer outreach.
- Infrastructure development for higher production levels.





NAMRATA DIWAKER
Founder

 Raipur, Chhattisgarh

FOCUS OF THE BUSINESS

Weaving fragrant and cooling insect repellent curtains from vetiver plant waste

THE SOLUTION

Rayush Natural's innovative curtains are naturally scented with insect repellent, antidepressant and cooling properties. They are produced from agrowaste generated by aromatic oil production.

THIS STARTUP'S JOURNEY

1 Perceived an urgent need for a natural, affordable cooling system that could work without electricity.

3 Conducted a market survey to gauge the potential for Kusha Cool Curtains, and confirmed the demand for the product.

5 The technology was commercialized over next 1.5 years, encouraged by consumer response, as well as awards, media coverage and exhibition opportunities.

2 Developed the process of creating aromatic fibers from aromatic crop waste in 2019, after more than 25 trials.

4 Registered the company in 2020, and exhibited prototype curtains at a business fair in Raipur, where we received on the spot pre-bookings for 10 curtains.

6 Three patents have been filed to secure the product, process and machine.



ASK FROM INVESTORS

INR 10 million
(USD 125,000) of
Safe Notes

RESULTS

The Socio-economic Impact

- Kusha curtains are a sustainable, aesthetically pleasing, natural cooling aid with mosquito repellent properties that can improve living conditions even for those without electricity.
- Provides employment to many weavers, laborers, and women workers from tribal and marginalized groups or self-help groups such as Bihan Bunkar Samiti, which is involved in commercial production of these curtains.
- A well-established market driven product encourages farmers to cultivate vetiver and other aromatic crops, providing them an opportunity for reaping double income from the farms by harvesting plant waste as well as plant oils.

The Environmental Impact

- By building a market linkage for agrowaste of aromatic plants, Kusha curtains directly boost cultivation of aromatic crops, which can reduce soil erosion, enhance its moisture, and improve soil fertility as well as productivity.
- These crops can also remove heavy metals from soil and maintain its fertility, thus sequestering 60 times more atmospheric carbon.
- These curtains do not require electricity, generate no further heat, involve no toxic chemicals, uses local resources, and has anti-venom, insect repellent, and antidepressant properties.
- Around 50 acres of degraded land area has been restored in association with Krishi Vigyan Kendra (KVK) Korea, which helped small farmers to minimize impact of harmful chemical fertilizers and replenish soil fertility.

NEXT STEPS

- The project is easily scalable by increasing crop cultivation through contract farming, as only four months are needed before harvesting the full crop.
- At present, Rayush Naturals is pilot testing the uptake of these curtains with potential institutional buyers such as hotels, hospitals, builders, architects and interior designers.





RAKESH MAHANTY
Founder



FOCUS OF THE BUSINESS

Ecosystem-based restoration through agroecological solutions

THE SOLUTION

Agroecological models that can transform rural landscapes, offer sustainable livelihood opportunities, and provide responsible consumption options for local people.

THIS STARTUP'S JOURNEY

1 Rakesh's journey started in 2016 with a news article learning about agrarian crisis, which deepened after interacting with farmers on the ground.

3 He quit his corporate job in 2018 to learn about climate change and agrarian crisis, and potential of technology as a solution. He adopted sustainable development as a core principle, integrating economics, environment, and social responsibility. Thus, Brook N Bees was born in East Singhbhum, Jharkhand.

5 Launched the 'Farmer's Haat' and 'Be A Tree' initiatives in 2020.

2 He traveled for one year across regions to understand grassroots issues and possible solutions for agriculture.

4 Brook N Bees adopted agroecological models and regional ecosystem-based development and launched 'Farm Paathsala Project' in 2019 for educating local tribals / village dwellers on sustainable farming techniques.

6 Partnered with academic institutions and the government to scale the impact through public policies and schemes in 2021.



FARM PAATHSALA PROJECT SCHOOL OF NATURE

ASK FROM INVESTORS

Equity investment of INR
1.4 million (USD 17,000)
and debt fund of
INR 4.6 million
(USD 58,000)

RESULTS

The Socio-economic Impact

- Working to create natural assets through agroforestry and community forests, both timber and non-timber forest products (NTFPs) such as silk, lac, medicinal herbs, fodder, in addition to fruit trees with 50 farmers. These assets are estimated to be worth USD 13,000 in next 10 years.
- Enabled efficient land use through orchards, silvopasture, and agroforestry in at least 8 percent of the land.
- Increased farm incomes for 100 farmers through crop diversification, integrated farming systems, and market linkages, and built capacities of another 200 on sustainable farming practices.
- Increased land productivity by 80 percent by increasing crop cover days from 120 to 290 days.
- Reduced farmers' input costs by 70 percent by adopting sustainable farming methods.
- Increased dietary diversity, access to nutritious food, and product traceability for urban communities, directly connecting with 150 consumers purchasing these farm produce from farmers.
- Improved land access for 10 pastoralists in East Singhbhum district for rotational grazing by 100 cattle
- Reduced 20 percent of post-harvest losses due to transit.

- Reduction in cost of procuring fodder for cattle by 50 percent as well as nutrient input for crops by 70 percent by using crop and animal waste in farming practices, thus building a circular economy.
- Better agricultural practices have enabled better incomes for local people, who now earn 25 percent more than Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) payments.

The Environmental Impact

- Enabled efficient land use in 15 hectares through silviculture and agroforestry which has increased the carbon sink area by 25 percent.
- Improved regional biodiversity by introducing 24 indigenous plant species with 80 percent survival rate, including 10 varieties of rice and 4 of millets grown over 20 acres of land under sustainable farming. An indigenous seed bank has also been developed with 40 local crop varieties.
- Reduction in surface water runoff by 70 percent in a year, protecting the topsoil and maintaining good soil health.
- Better cropping patterns, water budgeting, and micro irrigation being practiced in 10 hectares of land
- Watershed management deployed in 2 hectares, has reduced water consumption for farming by 40 percent.
- Switched from diesel to renewable energy for mechanical farm operations, reducing carbon emissions.

NEXT STEPS

- To expand the current business model in more villages across the country, increase the number of farmers from 150 to 900, and customers engaged from 150 to 1000.
- To generate a revenue of INR 24 million (USD 300,000) by the end of 2024.

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**DR. SIDHARTH ARORA**

Founder



Uttarakhand

FOCUS OF THE BUSINESS

Creating bio-economic solutions from agricultural waste

THE SOLUTION

With a circular bio-economy approach, Fermentech Labs produces enzymes, prebiotics, specialty chemicals and biofuel by fermenting pretreated agricultural and forest waste, with a wide range of industrial uses such as fruit juice and wine clarification, textile processing, biofuel production, pharmaceuticals, animal feed supplement, pulp and paper processing etc.

THIS STARTUP'S JOURNEY

Idea and proof of concept developed for a bio-economic solution.

1

Optimized process for enzyme production, and expanded the team to 10 working members.

3

Catered these enzymes to the bakery and fruit juice industry.

5

2 Raised investment from the BIRAC and Engineers India Ltd (EIL).

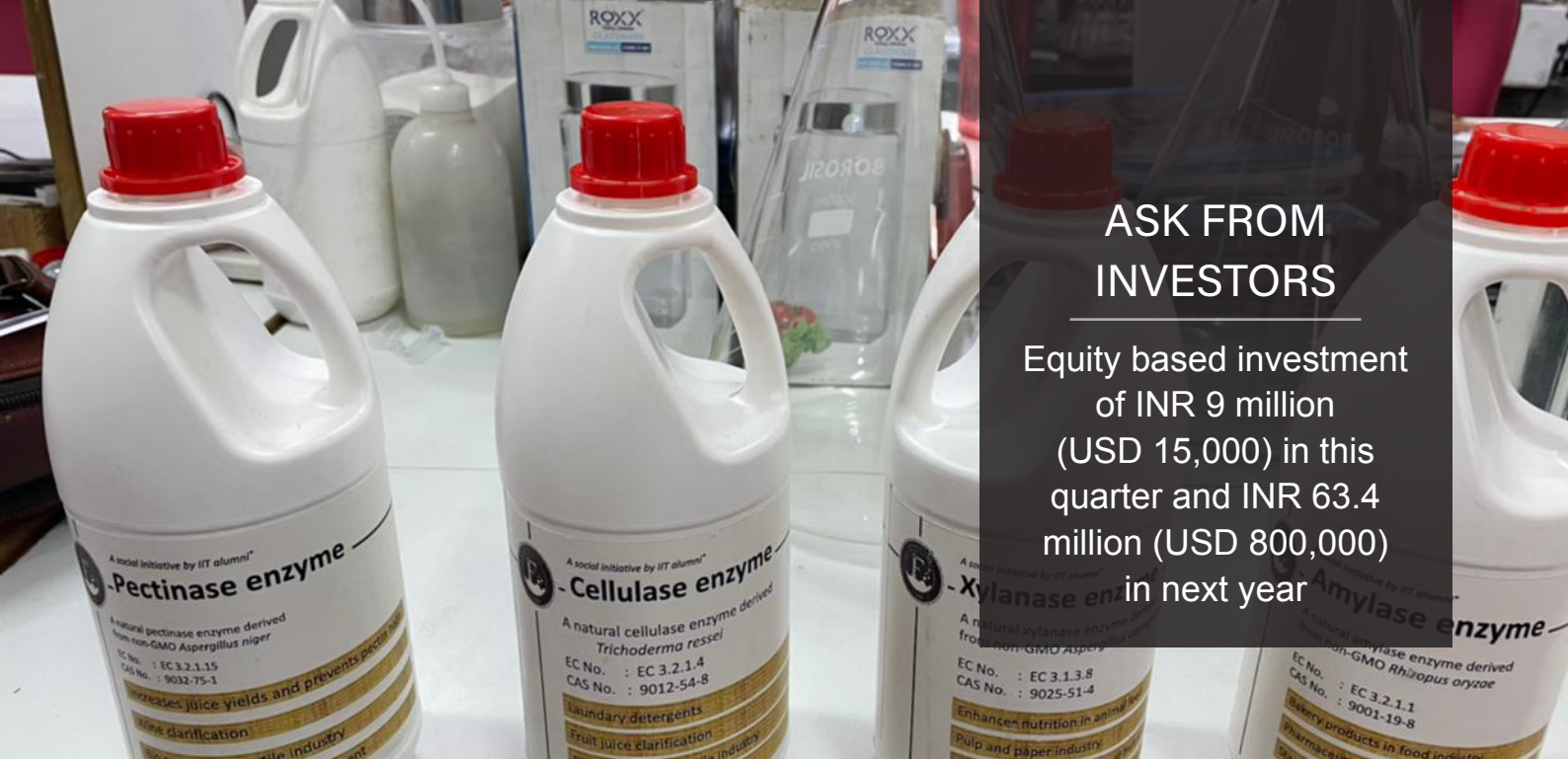
2

4 Increased production and scaled up the pilot.

4

6 Received Food Safety and Standards Authority of India (FSSAI) certification for our products.

6



ASK FROM INVESTORS

Equity based investment of INR 9 million (USD 15,000) in this quarter and INR 63.4 million (USD 800,000) in next year

RESULTS

The Socio-economic Impact

- Fermentech Labs has been associated with 28 farmers in Uttarakhand and has added USD 70 or approximately INR 5500 to their annual income.
- Provided work and learning opportunities to 12 people to date.

The Environmental Impact

- Successfully demonstrated the transformation of pine needles (a major cause for forest fires) and *Parthenium hysterophorus* (an invasive weed) into cellulase and pectinase respectively. Use of cellulase enzyme in bio-polishing of every 5 kg denim fabric, saves 10.8L of water during the washing step.
- All enzymes are produced using non-GMO strains which are safe for both humans and environment.



NEXT STEPS

- With the 150-kg pilot plant, our production level will be 600 L enzymes per month in July-October 2022, generating a possible revenue of up to INR 300,000 from January next year.



ANUJA DUKLAN
Founder



SURENDRA PRASAD
Co-Founder



Pauri Garhwal, Uttarakhand

FOCUS OF THE BUSINESS

Manufacturing of herbal products, mainly shilajit and essential oil products

THE SOLUTION

Manufacturing low-cost health supplements through secondary agriculture of *Euphorbia royleana* plants, using biotechnology processes.

THIS STARTUP'S JOURNEY

Anuja's journey begins from her school days when she was curious to learn about *Euphorbia royleana* plants, a native plant found abundantly in Uttarakhand but unused by humans or animals.

1

In August 2019, after a rigorous market survey, Suraitech Innovations was incorporated with two co-founders, and grew into a multi-stakeholder network of farmers, workers, and customers.

3

Raised funds through, BioAsia Young Mind Award (INR 50,000), BIRAC-The Indus Entrepreneurs: Women in Entrepreneurial Research Award from Government of India (INR 500,000), Ministry of Agriculture and Farmers' Welfare grant (INR 2 million), Startup Council of Uttarakhand (INR 180,000).

5

Established first manufacturing unit in 2021, procured machinery and equipment, completed third-party lab testing, signed an agreement with National Biodiversity Authority, and applied for a patent. Presently, there are 300+ customers.

7

Anuja also learnt of a few men climbing dangerous Himalayan rocks for extracting shilajit and expanded her knowledge about shilajit's source and properties. She then developed the high-priced ayurvedic food supplement from the latex of *Euphorbia royleana* plants.

2

Suraitech set up plantations and manufacturing units in rural Himalayan villages, and expanded marketing operations across India.

4

Worked on its business and revenue models, and expanded operations through a strategic partnership with Indian Institutes of Management-Kashipur in Uttarakhand and BIRAC.

6



ASK FROM INVESTORS

INR 25 million
(USD 313,000)

RESULTS

The Socio-economic Impact

- Reduces migration of the rural population from Himalayan states in search of employment opportunities, as this solution has created employment opportunities locally. At present, Suraitech provides employment to nine people, including six women.
- Suraitech's microscale manufacturing unit employs five workers including women, engaged in the plantation and processing of *Euphorbia royleana* plants in wasteland.

The Environmental Impact

- *Euphorbia royleana* plantations are helpful in reversing land degradation on hilly slopes and semi-arid patches of land, as they do not need irrigation.
- Elongated roots of these plants increase water absorption deep into the ground, and being a legume, it also enables nitrogen fixation in the soil, replenishing soil fertility.
- With a crassulacean acid metabolism (found in succulents), these plants can sequester 590 million tons of CO₂ if deployed on approximately 2.2 million hectares.



NEXT STEPS

- Suraitech Innovations plans to scale up our startup from seed stage to growth stage.



SURYANIRBHAR AGRITECH



ASHWINI VIKAS

Founder



Bangalore, Karnataka

FOCUS OF THE BUSINESS

Agricultural mechanization

THE SOLUTION

One single solution for multiple farm activities, which is affordable, efficient, eco-friendly, and easy to use for all, including women.

THIS STARTUP'S JOURNEY

Ashwini became a full-time agriculturalist after serving 15 years in the IT sector.

1

A strong need for mechanizing post-sowing activities was felt, which led to Suryanirbhar – with a vision of empowering women farmers by building simple agri-implements.

3

Studying the effectiveness of traditional farm tools and practices, the team worked to electrify traditional agriculture to reduce harm to environment, cut costs for farmers, and improve their standard of living.

5

Suryanirbhar's agri-implements are sold through FPCs, KVKs, enterprising farmers, and digital platforms. The company also plans to partner with NGOs / CSR in rural development, microfinance institutions, and village-level entrepreneurs.

7

Their present products include quiet machines with de-weeders, ridgers, tillers, sprayers, etc., available as attachments for a single machine.

9

Observing women farmers in her fields, she saw that manual activities like weeding are extremely painful, but unavoidable. Other solutions like herbicides are detrimental for health while engine-driven machines used in farms emit high vibrations, even causing paralysis among a few farmers.

2

The company first made a solar sprayer, understanding the limitations of using a battery.

4

A prototype was built in April 2021, which was developed into a final product after field testing.

6

Operations are presently focused on maize, pulses, groundnuts in North Karnataka.

8



ASK FROM INVESTORS

INR 15 million
(USD 188,000)

RESULTS

The Socio-economic Impact

- Operational costs are reduced by 10 times, saving farmers INR 30,000 per year.
- One machine offers multiple applications, using different attachments, so farmers need not invest in multiple machines for different activities.
- Minimal charging cost, as the battery is chargeable through grid energy or solar energy.
- Many parts of the Suryanirbhar machine, such as frames, attachments, etc., can be contract manufactured, except for key components, generating local employment opportunities.
- The products are easy to use for women also, which reduces drudgery and improves efficiency by 10 times.
- Working with village-level entrepreneurs to provide field demonstrations to farmers and address their complaints and minor service requests has improved efficiency of 80% of local agricultural workforce formed by women laborers.

The Environmental Impact

- Reduces use of weedicides by providing a safe, easy-to-use, and affordable alternative solution for removing weeds.
- Our product is driven by a DC motor and powered by a battery, rather than using petrol or diesel, hence there are no toxic emissions.

NEXT STEPS

- Working to develop moulds for tyres, rim, gearbox, and reducing production cost.
- Developing a battery-operated brush cutter, chainsaw, and other plantation machinery, aiming to sell 100 units in the first year, 500 units in second year and 1,000 in the third year.
- There are also ideas to collaborate and establish battery-swapping stations in villages, so that farmers do not need to purchase batteries.
- The company plans to scale up to other parts of Karnataka and beyond to Tamil Nadu, Maharashtra, Telangana, and the Northeast.



**DR. SUCHITA BHANDARI**

Founder



Maharashtra, Madhya Pradesh,
Orissa and Chhattisgarh

FOCUS OF THE BUSINESS

Commercial agroforestry and contract cultivation of commercial agricultural crops such as spices and medicinal plants

THE SOLUTION

Research-based agribusiness model integrated with technology, skill efficiency and sustainability solutions for farmers. Also, providing customized end-to-end project management and quality compliance solutions for corporates or industrial buyers looking to increase backward linkages and farmer network, strengthen field research, and experiment with crops in new geographies.

THIS STARTUP'S JOURNEY

Urvara Krsi's work began in 2019 with assessing potential for most suitable crops based on regional climatic and soil conditions. They generated local awareness on these identified crops among farmers, highlighting cultivation costs and possible profits.

1

During these two years, their team worked on an operational model which ensured procurement of produce at the farm gate and built market linkages for selling farm produce at pre-agreed market prices.

3

Urvara Krsi's team handholds the farmers in executing field-level operations such as weighing, packaging, dispatch and payments as well as conducts awareness workshops on overall process and procedures of contract farming with farmers.

5

In 2020, they worked with farmer groups to provide technical knowledge and technological assistance and also support by sourcing planting material for some crops from industry partners and ensuring availability of high-quality seeds.

2

A technology-based interface was developed in 2020 providing end to end services including technical farming assistance, profiling of farm products, market linkages etc. which really boosted initial sales.

4



ASK FROM INVESTORS

A credit line
(working capital)
of INR 4 million to 5
million

RESULTS

The Socio-economic Impact

- Increasing farmers' agricultural income through models such as agroforestry and improved market linkages, presently for around 3000 farmers.
- Working with farmers for cultivation of commercial crops, supporting agribusiness such as spices and medicinal plants. Currently engaged with 1,138 farmers for spice cultivation in 975 acres of land that has already produced 240 metrics tons of dried red chili. Similarly, commercial cultivation of ashwagandha is being done with 73 farmers on 100 acres, which has yielded 70 million tons of dried roots and aerial plant parts.
- Employment opportunities for rural youth with strengthening of rural markets.
- Skill enhancement and capacity-building of farmers in sustainable agriculture practices.
- Improved living standards and better incomes for people in rural areas.

The Environmental Impact

- Around 11 million saplings distributed and planted in approximately 4,000 hectares of land.
- Direct ecological benefits in the form of increased soil productivity and carbon sequestration, which helps reduce land degradation and mitigate climate concerns.

NEXT STEPS

- The Urvara Krsi team plans to raise more funds for better forward planning and scaling up. As they are engaged in contract farming of niche crops with farmers, the procurement window for specific crops is seasonal in nature and requires a considerable volume of funds during the season for the procurement of harvested crops. Limited financial capacity limits the business volume and turnover, presenting a major hindrance to scaling up.



MANIPURI BLACK RICE







For more information about the Global Land Accelerator Program, visit www.wri.org/initiatives/land-accelerator

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