Innovators Catalogue

SKUAST-K on the Go

Sher-e-Kashmir University of Agricultural Sciences
& Technology of Kashmir, Shalimar, Srinagar - 190025

Innovators Catalogue

SKUAST-K on the Go

Patron:
Prof. (Dr.) Nazir Ahmad Ganai
Vice-Chancellor, SKUAST-K

Co-Patron:
Prof. (Dr.) D. M. Makhdoomi
Director Extension, SKUAST-K

Compiled & Edited by
Dr. Farahnaz Rasool
Dr. Ambreen Hamadani

Sher-e-Kashmir University of Agricultural Sciences
& Technology of Kashmir, Shalimar, Srinagar - 190025

SKUAST-K on the Go

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Prof. N. A. Ganai
Vice-Chancellor

Message

Innovations and discovery are propellers of job creation and national development. The innovations create products and services that are upscaled into commercial products through entrepreneurship. The research institutions can stay relevant only if they create matching technology support that can be translated into products which offer solutions to problems facing society at large. As a socially responsible institution, SKUAST-K has taken major initiatives to create an enabling ecosystem for innovation led discovery as well as policy and support systems for promoting entrepreneurship.

As a result of proactive institutional support system, SKUAST-K has been able to mainstream the culture of innovations and more than 50 innovations with potential commercial value have come up in last three years out of which five Start-up companies have been established with products and services that offer innovative solutions to problems facing agriculture. The catalogue is a compilation of innovations and startups of the SKUAST-K. I appreciate the editors for the compilation of this important document as it will inspire future generations of students and researchers to follow the footprints to a new dawn.

Prof. Nazir A. Ganai

Shalimar Srinagar-190025, J&K, India
Phone: (O) 0194-2462159, 2464028 Fax: 0194-2462160 (R) 0194-2463655, 2436700 Fax: 0194-2461543; E-mail: vc@skuastkashmir.ac.in, skuastvc@gmail.com

Prof. D.M. Makhdoomi
Director Extension

Sher-e-Kashmir
University of Agricultural Sciences & Technology of Kashmir
DIRECTORATE OF EXTENSION
Shalimar Campus, Srinagar – 190025 (J&K) India. Phone: 0194-2463460; Fax: 0194-2461317; E-mail: deeskuastk@gmail.com

Message

To tap the potential of demographic dividend, it is essential to skill our youth so that their energy can be channelized constructively and productively in the larger interests of national economy improvement It can only fructify when the huge segment of youth in the country are being provided with appropriate skills to generate a pool of job creators. Our greater emphasis on skill development and entrepreneurship must be targeted and focused so as to become the world skill capital which what is required in the present era. Knowledge and skill are the driving forces of socio-economic development of a country. This initiative is promoted by SKUAST-K to provide a holistic entrepreneurial ecosystem through various startups and skill trainings. The pro-entrepreneurial environment in the institute is being nurtured to make youth self-reliant, with the ultimate aim of making the future generations of academia and students as job providers and creators rather than job seekers.

This catalogue comes with a series of success stories of our young igniting minds in the form of new innovations and startups highlighting their potential in creation of various products, technologies, services and most important creating employment opportunities for others. I congratulate the authors for putting in their hard work and coming out with this publication

Prof. D.M. Makhdoomi

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PRELUDE

Entrepreneurs have a mindset that sees possibilities rather than the problems created by change.

- *J Gregory Dees*

Ideas are cheap. Ideas are easy. Ideas are common. Everybody has ideas. Ideas are highly, highly overvalued. Execution is all that matters.

~ Casey Neistat

Often, we are left in awe of the sheer brilliance of the simple solutions to complex problems that entrepreneurs come up with. However, not every idea gets its due recognition in the public domain. This is especially true for the early-stage startups that are the ones who require it the most. We have been thinking of a way to resolve this issue for a while, and self-publishing seemed to be the most apt solution.

Like for everyone around, 2020 was a landmark year for us as well. More so, as we believe that some of the brightest business ideas have emerged at times of distress. It is a matter of great pride for us that we were privy to the early development of several such enterprises in the middle of some really unprecedented times in our lifetime. Their ideas are widely apart from one another and offer a rich diversity.

We had some ventures becoming the first-of-their-kind service in their country, whether it was by constructing drones, taking the art of local artists to the world, introducing others to their traditional medicines, or building a B2B marketplace social issues like women's safety, lack of awareness of the legal system, restructuring education system and sex education are also covered by these *Inno-preneurs*.

Many of them had a special affinity towards healthcare to which they are contributing in the form of a wearable sanitizer dispenser, high-tech disinfectants, novel pain relief and immunity-boosting technologies, revival of traditional agricultural practices like lining fields with agave, upgrading the practice of using vegetable peels as fertilizers, as well as providing all technical assistance to farmers are a few revolutionary ideas we came across in the agricultural sector.

Environmental responsibility also ranks high among the entrepreneurs we are working with who have some brilliant ideas in this sphere including turning municipal waste, human hair, and chicken feather into fertilizers, different ways to deal with plastic pollution, sustainable alternatives for plastic, turning single-use plastics into furniture, high-efficiency fuels and laying roads with recycled plastic. This publication offers an insight into a few of the most brilliant innovations of SKUAST K.

Happy Reading!

Editors

KEY DEFINITIONS

- **Startups**
- **Prototypes**
- **Ideas**
- **Wall of Fame**

Startups are companies or ventures that are focused on a single product or service that the founders want to bring to market. These companies typically don't have a fully developed business model and, more crucially, lack adequate capital to move on to the next phase of business.

A prototype is an initial model of an object built to test a design. It works as a reality check for a given concept. When done right, prototyping reveals all strengths and weaknesses of an idea and allows to perfect a solution before implementing it on a large scale.

A business Idea is a concept that can be used for financial gain that is usually centered on a product or service. An idea is the first spark and a first milestone in the process of building a successful business.

The Wall of Fame refers to the display of an individual's list of achievements to mark their recognition in their field that is chosen by a group of experts.

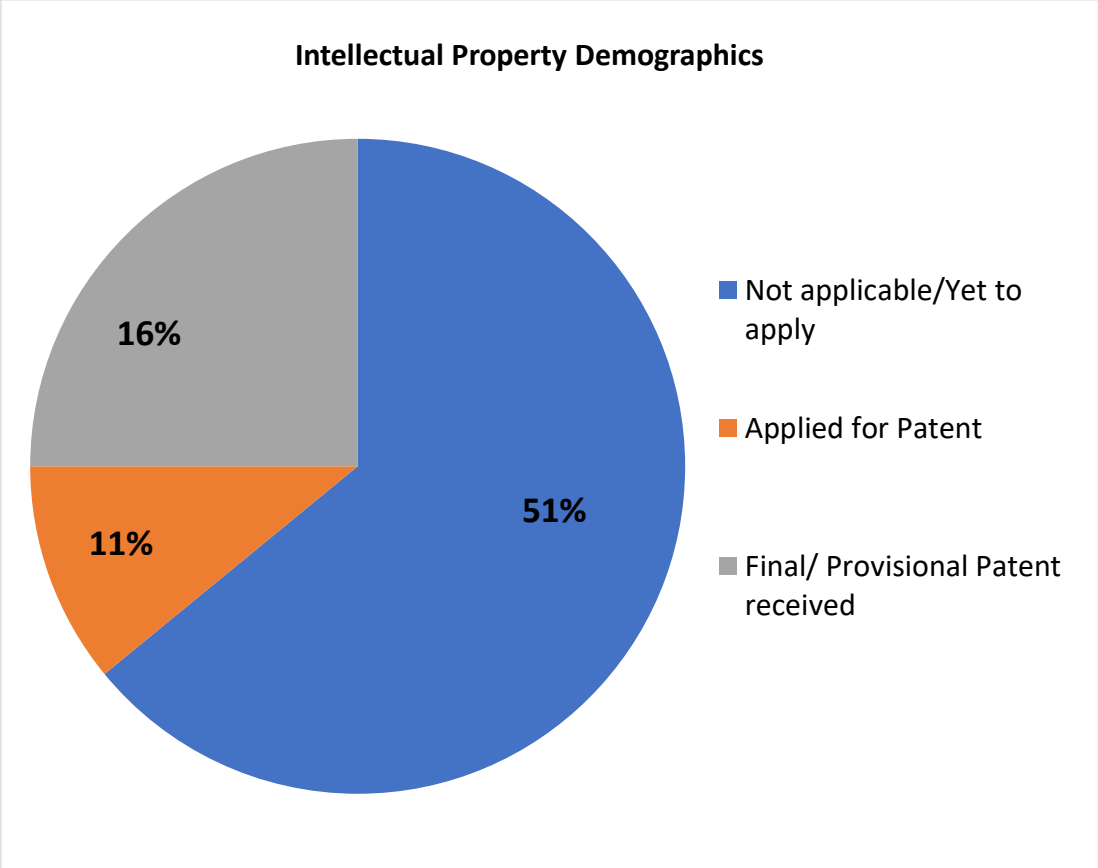
PUBLICATION HIGHLIGHTS

Entrepreneur Ages

The age of the youngest entrepreneur whose story is covered in the publication is 18 years, while the age of the oldest entrepreneur is 59 years. The average age of entrepreneurs is 30.2 years.

Intellectual Property (IP) demographics

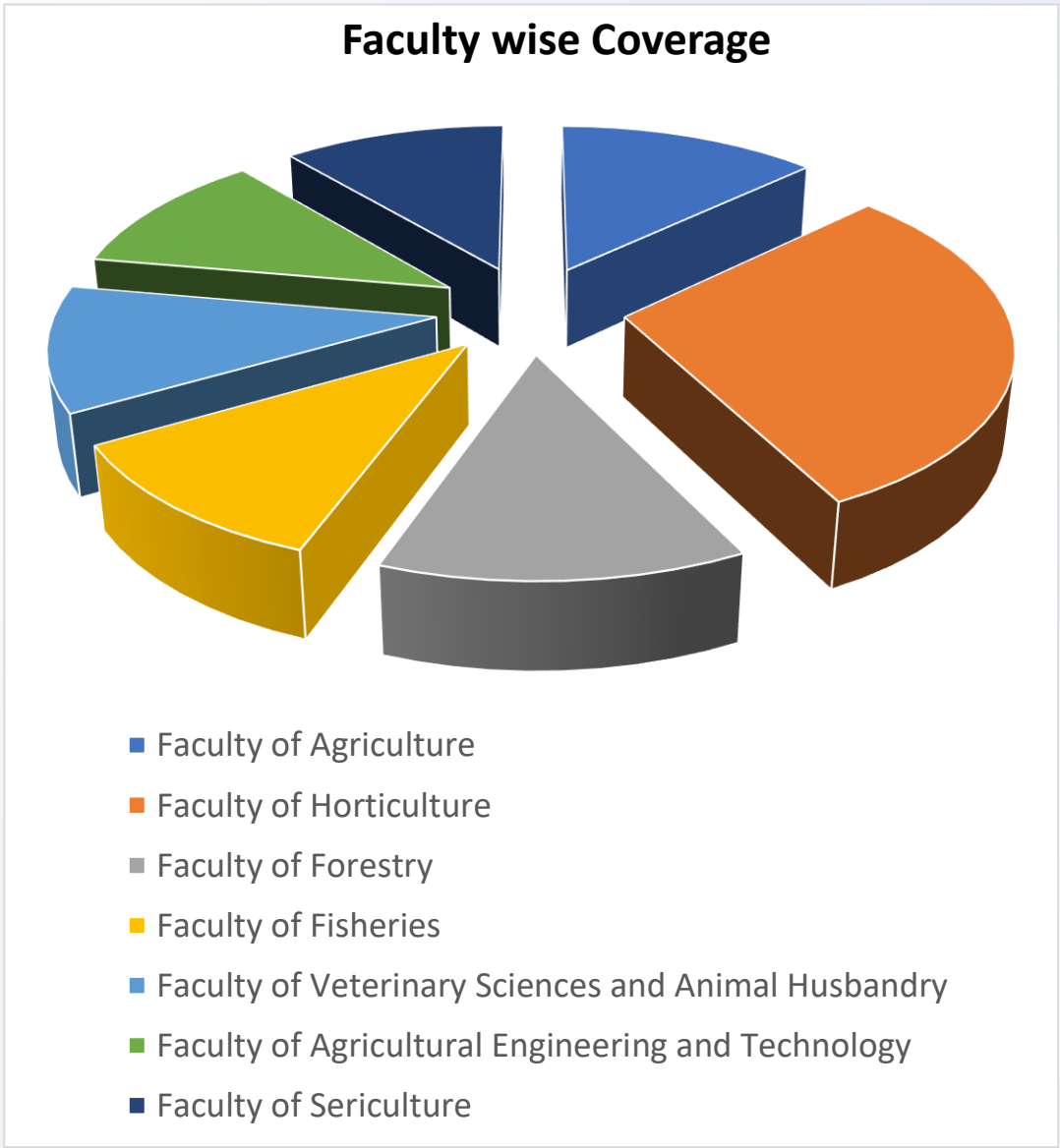
Following are the Intellectual Property (IP) demographics of the entrepreneurs whose stories are covered in the publication



PUBLICATION HIGHLIGHTS

Faculty wise coverage

Following is the faculty wise coverage of the entrepreneurs whose stories are covered in the publication



LIST OF PATENTS/COPYRIGHTS GRANTED

	Innovation Name	Patent / Copyright No
1.	Tabletop paddle operated charkha (Prof Sarfaraz A. Wani)	Indian Patent: 358378
2.	Identification of Cashmere (Pashmina) fibre from processed textile products by PCR-based technique (Prof Sarfaraz A Wani)	Indian Patent: 340284
3.	A device for controlling mistletoe in walnut and other trees. (Dr. Khursheed Ahmad)	Indian Patent: 340843
4.	Novel method for hydrolysing keratinous waste and their use thereof. (Prof. Imtiaz Murtaza)	Indian Patent: 384891
5.	Estimation of mineral oil residues in soil and apple fruit by gas chromatograph with flame ionization detection (GC-FID) (Dr. Malik Mukhtar)	Indian Patent: 380705
6.	Process for commercial production of biopesticides (Dr. F A Mohiddin)	US Patent: 7815903B2
7.	"A novel composition for producing biopesticides based on Trichoderma harzianim, pochonia chlamydoosporia and pseudomonas fluorescens." (Dr. FA Mohiddin)	Indian Patent: 23609
8.	AI driven farm management information system and breeding tool (Smart Sheep Breeder) (Dr. Ambreen Hamadani & Prof. Nazir A Ganai)	Indian Copyright: 10207/2020-CO/SW

Innovators & their Bright Ideas

Established: 2021

Pherobank Technologies

Waterless technology for detection, delimiting, monitoring, mass trapping & mating disruption of insect-pests

Innovator: **Dr. Barkat Hussain**

Grant: **BIRAC BIG grant- 2021**

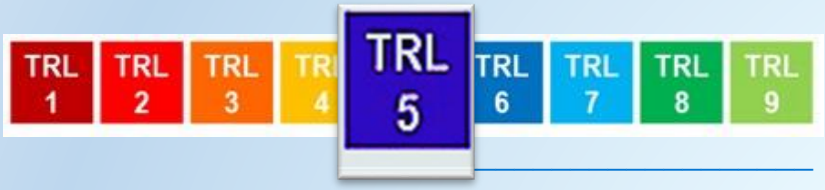
Revenue model

- Business to Business (B2B)
- Business to Consumers (B2C)

Achievements

- 2 Lakh under revolving fund
- IDREAM Award (NIT, Srinagar)

Technology Readiness Level



Technology Specification

Waterless technology is used for detection, delimiting, monitoring, mass trapping, and mating disruption for insect pests. Cool and green technology, no health hazards and pollution to the environment. Safe to natural enemies and honeybees.

Pherobank Technologies

Problem Statement

Insect pest management is a major issue in the horticulture industry, The use of chemical insecticides is expensive, as well as hazardous for humans, animals as well as the environment.

The Solution

Upscaling infrastructure for pheromone technologies as a green solution to increase the economy. Cool and green technology, no health hazards and pollution to the environment. Safe to natural enemies and honeybees. Best suited for area-wide management of insect-pests.

Future Plans

Insect pest management problems and reduce insecticide usage as a green solution & technologies for saving all (fruits, Vegetables, plantation, and fruit) crops, product expansion, and redressal of farmers' problems

Potential Impact

Revenue generated for the University. Pheromone Technology Laboratory established in SKUAST-K. Proven & tested technologies in farmer’s fields.

Established: 2020

BB&GG

Organic fertilizers from human hair and chicken feathers

Innovator: **Mr. Ahmer Bashir**
Mr. Mohsin Bashir

Grant: **BIRAC BIG grant- 2021**

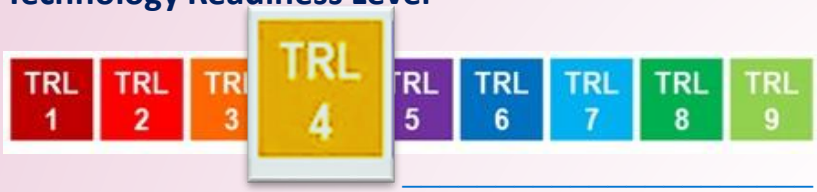
Revenue model

Sales, advertising, affiliate

Achievements

- Incubation and grant support under RKVY RAFTAR Scheme
- Winner of 4 National awards.

Technology Readiness Level



Technology Specification

The innovation uses a novel method to convert the hair and feathers found in poultry waste into agricultural fertilizers in just 50 minutes. A liquid developed thus is rich in several minerals and micronutrients, while being cost-effective and completely natural and can therefore be used in the Indian Agricultural Systems safely.

Be Blessed & Go Green

Problem Statement

Despite making up a huge proportion of municipal waste, there is no waste management plan for keratinous waste that takes more than 50 years to decompose.

The Solution

The development of an innovation that makes use of waste products available abundantly and readily provided by the civic bodies as the ingredients of organic fertilizer.

Future Plans

Find more uses for the keratinous waste including utilizing it as a feed. Making the product available to farmers all over the country.

Potential Impact

Significant reduction in municipal wastes and the menaces associated with them. Reduction in the use of chemical fertilizers as well. This innovation shall be very beneficial for the environment as well.

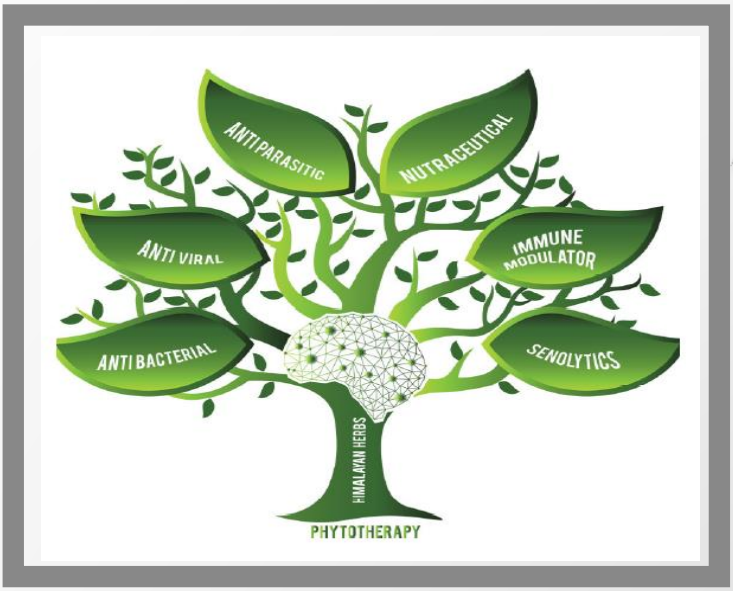
Established: 2019

Dáskdan Innovations Pvt Ltd

Pioneering the use of phyto-biome of Himalayas for animal health

Innovator: **Mr. Naveed Chikan and Group**

Grant: **NIDHI-EIR & BIRAC-BIG**



Revenue model

- B2C where C is Farmer B2B where B is the feed manufacturing Unit

Achievements

- Funding from 2 grants

Technology Readiness Level

Technology Specification

Pioneering the use of the phyto-biome of the Himalayas for animal health. In poultry, the first disease that is being targeted is Coccidiosis, an intra-cellular parasitic disease caused by Eimeria species.

Dáskdan Innovations Pvt Ltd

Problem Statement

Almost 70% of the antibiotics produced globally are used in the animal industry alone. Their use is mostly for disease prevention and growth promotion. Such use of antibiotics is a major contributor to antimicrobial resistance.

The Solution

Daskdán is working towards a herbal renaissance by enabling farmers to replace medically important drugs in animal feed with plant-based alternatives.

Future Plans

Launch *SiccaCide* in June 2022. Minimum of three products by 2023.

Potential Impact

Use of natural products for disease prevention shall cause a drastic reduction in the use of antibiotics which shall help in reducing their impact on the entire food chain. This shall contribute to human and animal health globally.

Established: 2022

AppleDoc

An AI Driven Decision Support System for Precision Apple farming

Innovator: **Dr. Basharat A. Bhat**

Mentor: **Prof. (Dr.) Nazir A Ganai**

Grant: **BIRAC BIG grant- 2021**

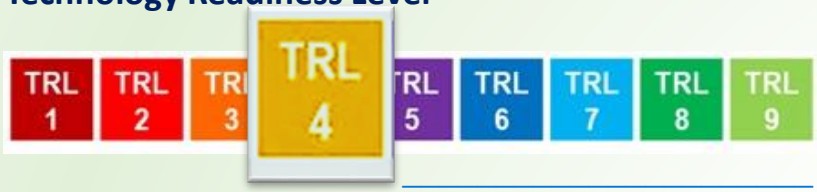
Revenue model

B2C revenue model.

Achievements

- Recognized startup with StartUpIndia

Technology Readiness Level



Technology Specification

This Decision Support System provides location-specific and custom advisory for farmers from bloom to basket, an e-commerce web portal for farmers and input suppliers, and mandis, AI, and ML-driven R&D platform. It is based on data analytics and has experts on-call with IBM Watson, MS Azura, and RIMPRO integrated at the back end

AppleDoc

Problem Statement

Apple industry is the backbone of the economy in J&K, which values Rs 8000 crore. This growth is beset with the challenges of poor information dissemination, technology adoption, weak market linkages, and exploitation by middlemen.

The Solution

Our Intelligent Apple Production System “AppleDoc” is a one-in-all solution. This tool is compliant with the agriculture 4.0 revolution as it generates and analysis real time data for drawing useful inferences.

Future Plans

Launching AppleDoc at the national level.

Potential Impact

Transformation of the apple industry by ensuring better produce and higher profits for all stake holders associated with the apple industry.

Established: 2018

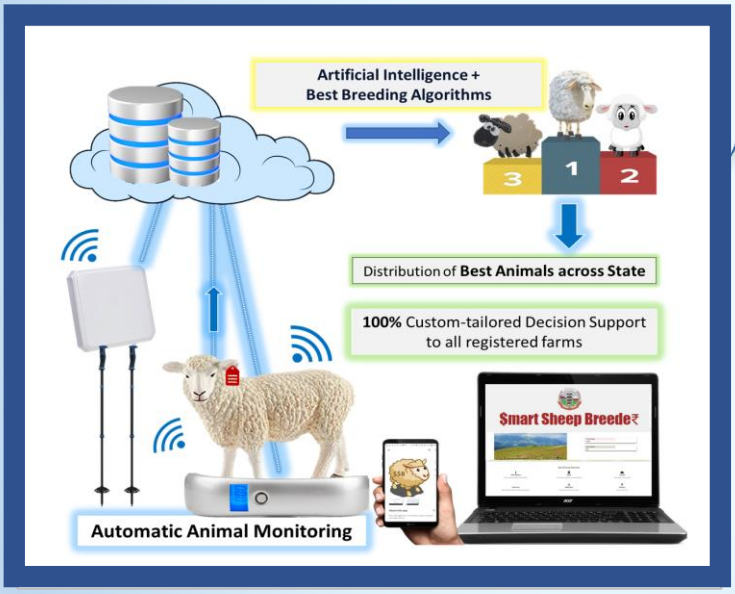
$mart Sheep Breede₹

AI driven IoT System for Farm Automation & Decision Support

Innovator: **Dr. Ambreen Hamadani**

Mentor: **Prof. (Dr.) Nazir A. Ganai**

Grant: **11 lakh (IIGP 2019)**



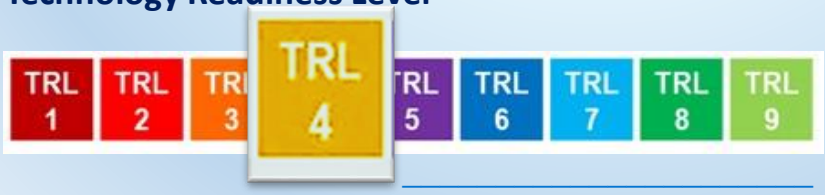
Revenue model

Sales, advertising, affiliate, & subscription.

Achievements

- Patent published
- Copyright granted (No: 10207/2020-CO/SW)
- Innovation is the winner of 7 National Awards

Technology Readiness Level



Technology Specification

Smart Sheep Breeder manages all aspects of sheep rearing. It uses the best breeding algorithms for the selection of animals on pure genetic merit and is capable of state-wide ranking of sheep. It is an e-farm manager, e-data manager, e-commerce portal, a centralized database, e-governance tool, e-veterinarian, e-expert & and e-entrepreneur for facilitating new startups.

$mart Sheep Breede₹

Problem Statement

Sheep Husbandry in J&K is underperforming despite the incessant demand for mutton. This is due to the lack of scientific selection of animals, unconsolidated market, lack of health cover, absence of farmer-expert linkage, and no transparent system of accountability.

The Solution

The development and adoption of an AI and IoT-based decision support system for managing all aspects of sheep rearing. This tool is capable revamping the sector altogether and benefiting all stakeholders associated with sheep farming as it is an e-farm manager, e-data manager, e-commerce portal, a centralized database, e-governance tool, e-veterinarian, e-expert & and e-entrepreneur for facilitating new startups.

Future Plans

Building a state-wide decision support system and centralized database sheep to improve production and profitability.

Potential Impact

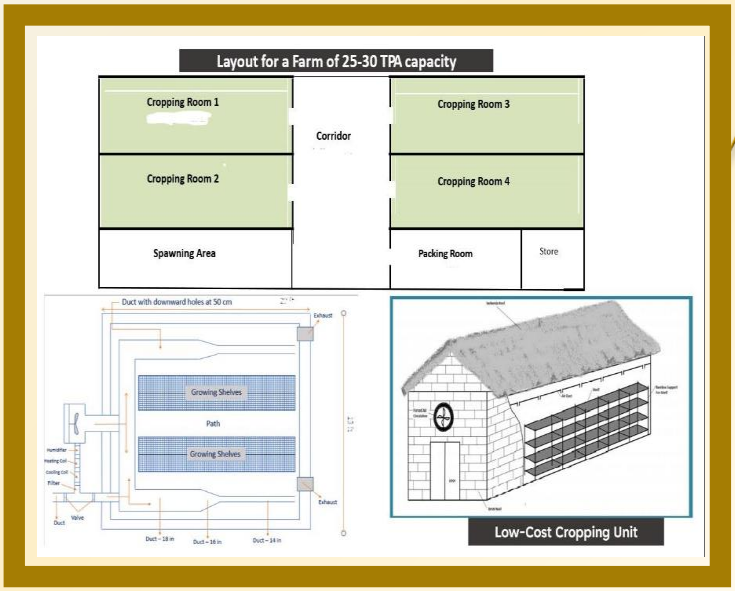
J&K wide germplasm improvement & self sufficiency for the sheep husbandry sector.

Established: 2021

Mushroom Growing Systems

IoT Based Automated Systems for growing button mushrooms

Innovator: **Mahrukh Mir**



Revenue model

Sales revenue model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

This innovation is based on an IoT-driven automatic cropping unit that can regulate optimum levels of physical parameters and obtain a crop of good quality without suffering any losses in production.

Mushroom Growing Systems

Problem Statement

Button mushroom is highly sensitive to environmental parameters like light, temperature, humidity, and carbon dioxide, any fluctuation in any of these parameters would lead to a loss in production and even crop failure.

The Solution

Create a cropping unit designed to regulate levels of humidity, temperature, and carbon dioxide through sensor control.

Future Plans

Include local/small growers to use the automated systems. Include growers outside the state to use our cropping units

Potential Impact

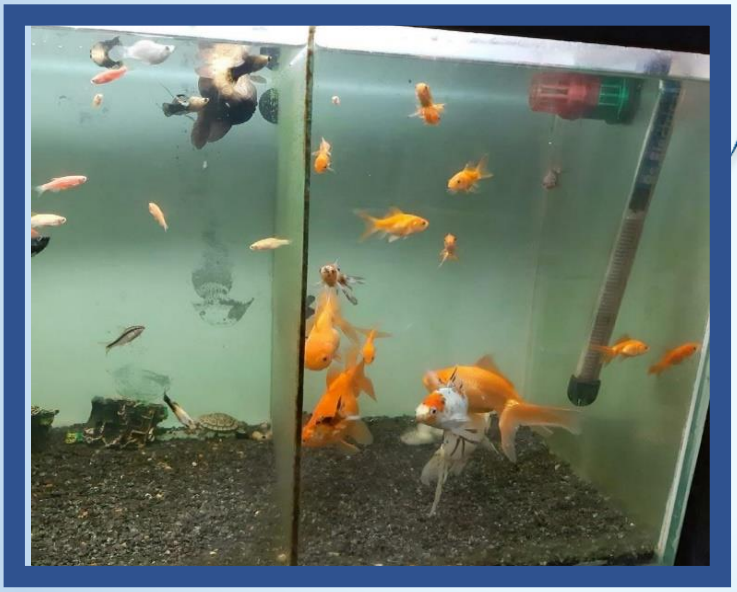
Improved cultivation practices of button mushrooms which would result in wider availability of button mushrooms and better returns for the farmers.

Established: 2021

Jewel Culturists

First ornamental fish breeding unit in the valley of Kashmir

Innovator: **Mr. Raja Mehran**
Ms. Fallah Fida Wani



Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Setting up an ornamental breeding unit ensuring the production of stock in the Valley. The unit will be ready with stock after successful breeding of fish and rearing the young ones in an estimated time of about 6 months.

Jewel Culturists

Problem Statement

There is a dependency on buying stock from outside the Valley adding to the cost of fish in Jammu and Kashmir.

The Solution

It would be useful for the valley to get its own breeding ornamental fish unit. This would contribute to the economic growth of the Valley and promote the aesthetic value of ornamental fisheries. This would also be useful in providing good stock to researchers and scholars.

Future Plans

With their expertise in the same field, the innovators plan to provide consultancy services to local aquarists and people who rear fish.

Potential Impact

This innovation could provide employment to fisheries graduates and also make Kashmir an exporter of ornamental fish thus contributing hugely to its economy.

Established: 2020

Lotext

Converting low valued product into eco-friendly fibre

Innovator: **Ms. Irtiza Hamid**

Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Conversion of low-valued lotus stem into a highly profitable textiles. The product has the quality of luxury products without harm to animals and the environment.

Lotext

Problem Statement

Due to the ready availability of lotus stem it is either wasted or has low value.

The Solution

Conversion of this low-valued product into a highly profitable product without causing harm to the environment.

Future Plans

Expansion in the product type and increase the product Exporting to other countries

Potential Impact

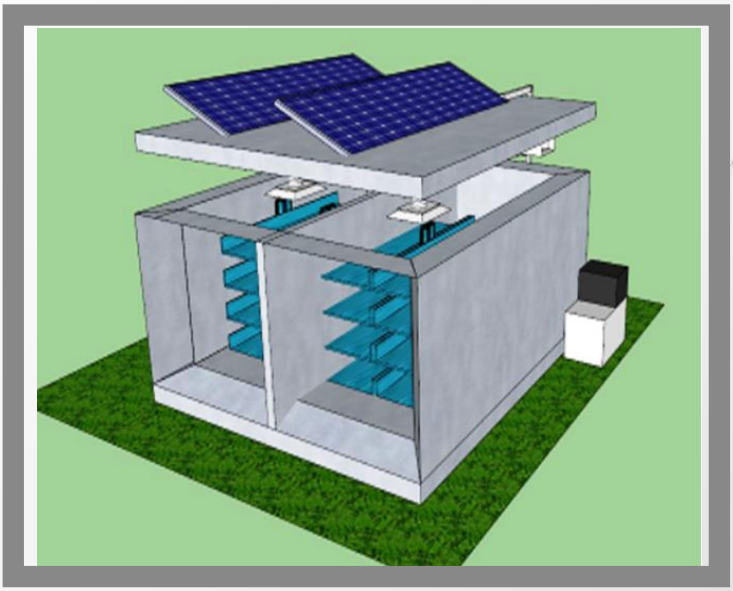
Employment generation for the youth. High economic returns from a seemingly useless and readily available lotus by-product. Reduction in the use of other textiles which are produced using materials hazardous to the environment.

Established: 2021

Coldflora Solutions

Smart micro cold storages for flowers

Innovator: **Ms. Wardah Shah**



Revenue model

Sales model

Achievements

- Incubated under RKVY
- innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

a renewable energy wheel mountable, IoT-Enabled, on-field/on-market, grid-independent micro cold storage 'ColdFlora' for storage as well as for transportation of floriculture produce that will extend the shelf-life and also preserve the freshness and comes with a smartphone app.

Coldflora Solutions

Problem Statement

Highly perishable nature of floriculture commodities is responsible for high marketing costs, price fluctuations and one of the major problems is wastage which is directly linked to inadequate logistical support, lack of cold storage, supply chain bottleneck, poor transport, and underdeveloped marketing channels resulting indirect economic loss to the farmers.

The Solution

ColdFlora Solutions aims at enabling and democratizing cold storage logistics by a portable, renewable energy wheel mountable, modified atmosphere, on-field/on-market, smart micro cold storage for flowers that can meet the needs of a farmer at the procurement section, and also support the value supply chain.

Future Plans

Testing and popularization of the Coldflora Solutions across India.

Potential Impact

Address the problem of extending the shelf life of flowers especially during transport. Eliminate intermediaries to some extent by empowering micro-entrepreneurs and other small businesses

Established: 2020

Smart Irrigation System

An IoT enabled smart irrigation system for high density apple orchards

Innovator: **Er. Riyaz Ashraf**

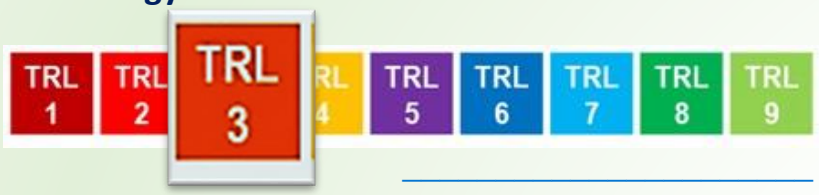
Revenue model

B2C revenue model.

Achievements

- Successfully demonstrated and tested the product at SKUAST-K

Technology Readiness Level



Technology Specification

The developed prototype is a low-cost, solar-driven indigenous product that uses indigenously developed soil moisture designed as per crop root length. The system uses microcontrolles and the internet of things for precision agriculture.

Smart Irrigation System

Problem Statement

Out of total water available on earth only 3% is fresh. A huge percentage of this is used up by agriculture and a lot of it gets wasted due to improper application.

The Solution

The development of a low-cost, solar-driven irrigation system that uses soil moisture sensors and Internet of Things for optimizing water usage on farms.

Future Plans

To make it applicable to every crop and make it a user-friendly and a completely cloud-based platform.

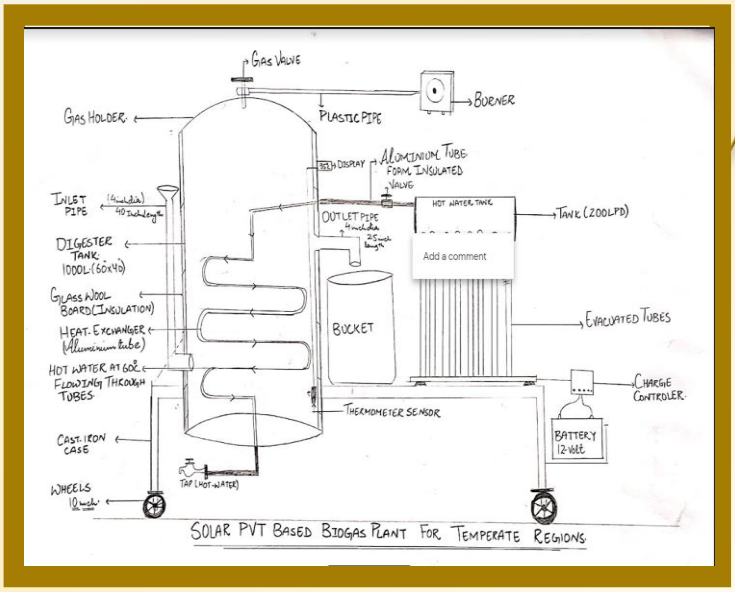
Potential Impact

Efficient utilization of water resources while ensuring each plant is watered to its maximum requirements. Elimination of drudgery on the farms

Solar Biogas Plant

Solar Photovoltaic-Thermal (PVT) Based Biogas Plant for Temperate Regions

Innovator: **Dr. Peer Musadiq A. Makhdumi**



Revenue model

Sales model

Technology Readiness Level

Technology Specification

Development of a technology for maintaining the optimum temperature inside the digester of the biogas plant in winter seasons. The temperature in the digester can be increased to optimum temperature with the proper utilization of solar energy. The water heated from the solar geyser is used as a heat exchanger between slurry and hot water.

Solar Biogas Plant

Problem Statement

In Kashmir, the temperature in winters may go down to -15°C in hilly areas and this temperature is not suitable for biogas production. There is no arrangement to maintain the optimum temperature in the digester

The Solution

Development of a working biogas plant and the availability of hot water in temperate conditions of Kashmir.

Future Plans

Proper utilization of university hostel kitchen waste and animal dung for biogas production. Proper utilization of aquatic weeds of Dal Lake for the production of biogas.

Potential Impact

It will provide a prominent source of energy for cooking, lighting, and building heating, and hot water can be drawn for different domestic purposes.

Established: 2020

Willow Wicker Peeler

An automatic willow wicker peeling machine

Innovator: **Mr. Masroor Ahmad**

Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Development of an automatic willow wicker peeling machine which peels the willow wicker effortlessly and leaves it with a much smoother finish.

Willow Wicker Peeling Machine

Problem Statement

Traditional Method of wicker peeling is time-consuming, labor-intensive, high cost, full of drudgery, has health hazards, and causes a high level of damage to the wicker rods.

The Solution

An automatic willow wicker machine has been developed which will serve the farmers by saving their time, working with ease, increasing production rate, and causing much less damage to the wicker

Future Plans

Development of a feeder to reduce labor charges, breaking tool for wicker, development of collection and packing unit, utilization of wicker peel as a waste to wealth. Automation in an operating unit, feeding unit, and peeling unit of the machine

Potential Impact

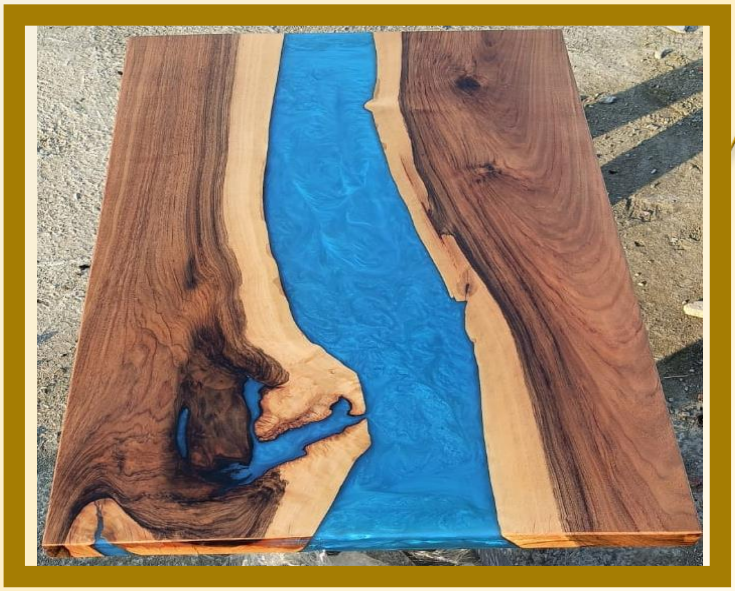
Drudgery elimination and considerable speeding up of the process of peeling willow wickers.

Established: 2020

Waste Wood Management

Superior quality and premium wood-related products with the use of Epoxy Resin.

Innovator: **Er. Tanzeel Khan**
Er. Kashif Khan



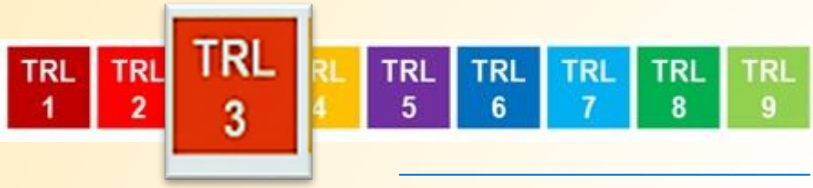
Revenue model

Sales model

Achievements

- Ranked 3rd in SKUAST-K Ideathon
- Certificate of appreciation from VC, SKUAST-K

Technology Readiness Level



Technology Specification

Technology which enables the combination of waste wood pieces with epoxy resins to produce furniture and other products that are more durable than wood, fire resistant and aesthetically pleasing.

Waste Wood Management

Problem Statement

Wood waste is a heavily undervalued resource and is often improperly utilized.

The Solution

Sustainable conservation of forest resources by converting scrap wood into a work of art by combining it with epoxy.

Future Plans

Production of epoxy furniture on large scale. Combining the resin epoxy with the handicrafts of Kashmir to revive the Kashmir walnut wood carving industry.

Potential Impact

Creation of a new industry in Kashmir which utilizes waste wood. It will also be useful for employment generation

Established: 2021

PlantEra

Commercial level production of plants using tissue culture and integration of the production chain with Software as a Service

Innovator: **Mr. Hamayun Shabir**

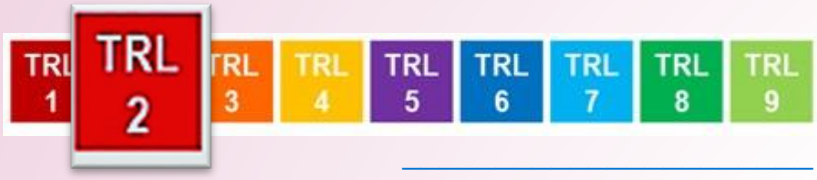
Revenue model

Sales model

Achievements

- Incubated under RKVY-RAFTAAR at SKUAST-Jammu

Technology Readiness Level



Technology Specification

Using tissue culture technique for the production of quality and disease-free planting material and use of software & technical team for the provision of farmer services.

PlantEra

Problem Statement

Non-availability of quality disease-free, vigorous planting material and non-availability of services to grower community.

The Solution

Provision of high-quality planting material by bringing tissue culture into work for commercial level production of plants and integrating this production chain with software-based services to make it a one-stop for the farmer where he will get everything, he wants to start from planting material to services.

Future Plans

Creation of a startup. Advertising and popularization.

Potential Impact

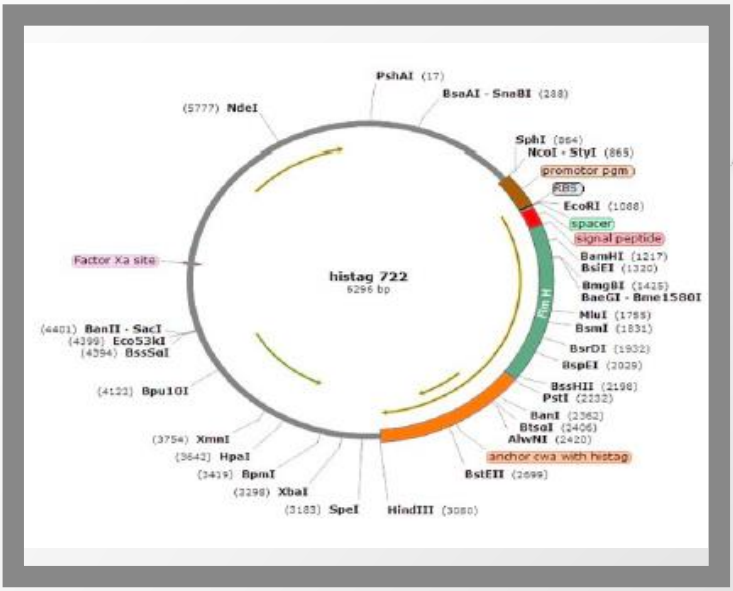
Development of a hub of disease-free, high-quality plants which are easily available. This shall upscale the horticulture industry in Kashmir

Salmonellosis Vaccine

Development of novel vaccine against Salmonellosis

Innovator: **Dr. Syed M Andrabi**

Grant: **SERB, Govt of India (47 Lakh)**



Revenue model

- Sales model

Achievements

- Appreciation Certificate from VC, SKUAST-K

Technology Readiness Level

Technology Specification

A strategy of using non-pathogenic lactic acid bacteria for displaying FimH antigen of Salmonella typhimurium as promising candidates for the development of a novel vaccine against Salmonellosis.

Salmonellosis Vaccine

Problem Statement

The available vaccines against Salmonella have several disadvantages like the inability to provide prolonged immunity and reversion of virulence.

The Solution

The designed recombinant vaccine shall be safe, immune-potent, and provide an efficient platform for the delivery of heterologous proteins. The recombinant lactic acid bacteria shall remain adhered to the mucosal lining and express antigen continuously for prolonged immunity.

Future Plans

Field trials on experimental birds by challenging the experimental birds with Salmonella infection and assessing the tissue-specific bacterial clearance.

Potential Impact

Safe an effective vaccine to prevent Salmonellosis which otherwise causes huge economic losses.

Established: 2020

Compost Separating Machine

Earthworm-cum-compost separator

Innovator: **Mr. Shoaib Amin**
Mr. S Kawoosa
Mr. S Mushtaq
Mr. S Hamid

Mentor: **Dr. J. Dixit**

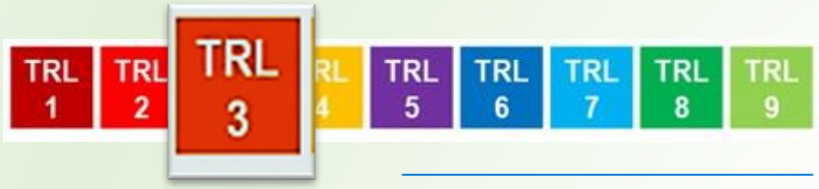
Revenue model

Sales model

Achievements

- Certificate of appreciation from VC, SKUAST-K
- 3 machines sold

Technology Readiness Level



Technology Specification

The separator works on the principle as followed in air screen cleaner and specific gravity separator used for seed processing. Due to the rotational motion, the raw feed moves forward into the sieving unit where fine manure gets separated and collected in the collecting tray.

Compost Separating Machine

Problem Statement

harvesting of earthworms from the vermicasts is done using a manually operated sieve which is time-consuming and labor-intensive.

The Solution

The developed earthworm-cum-compost separator works on the similar principle as followed in Air Screen Cleaner and Specific Gravity Separator used for seed processing.

Future Plans

To further increase the capacity of the machine and ease of operation, a motorized earthworm cum compost separating machine is to be developed. The development of motorized machines

Potential Impact

Elimination of drudgery and increased efficiency of the process.

Established: 2021

Seri-Waste to Wealth

Development of useful products from sericin

Innovator: **Dr. Aabid K Tantray**

Revenue model

Sales model

Achievements

- Certificate of Appreciation from HVC, SKUAST-K

Technology Readiness Level

Technology Specification

Development of products by blending the goodness of sericin and herbal/plant extracts makes the technology more novel and attractive for customers.

Seri-Waste to Wealth

Problem Statement

The raw current silk production of India could generate around 50,000MT of sericin, which goes absolutely waste.

The Solution

This innovation recycles this otherwise waste silk protein through a non-toxic and cheap extraction process to develop cosmetic products with herbal/aromatic/plant additives. Development of products by blending the goodness of sericin and herbal/plant extracts makes the technology more novel and attractive to customers.

Future Plans

Collaboration with RM herbals, Chennai, a renowned herbal company, for further scale-up and commercialization of the sericin-based products

Potential Impact

The recovery and reuse of sericin would not only minimize the environmental issues but also have a high scientific and commercial value.

Established: 2021

Seri-Waste to Feed

Poultry feed supplement from sericin

Innovator: **Dr. Aabid K Tantray**

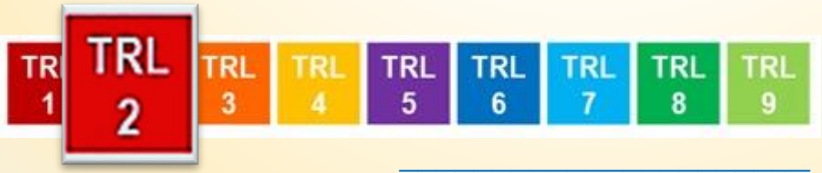
Revenue model

Sales

Achievements

- Certificate of Appreciation from HVC, SKUAST-K

Technology Readiness Level



Technology Specification

Developed a poultry feed supplement containing bioactive compounds derived from sericin for increased weight gain and FCR in broiler chicks. Developed the leftover de-oiled cake after SCFE of silkworm droppings as manure for better yield in mulberry and cucumber plantations.

Seri-Waste to Feed

Problem Statement

Silkworm droppings are referred to as “Black gold” owing to their multifaceted attributes and umpteen applications in pharmaceutical, nutraceutical, and agricultural sectors.

The Solution

The present innovation makes the complete utilization of the waste silkworm droppings by way of producing value-added products through novel processes. Successfully developed high-value extract from silkworm droppings and mulberry leaves containing concentrated bioactive contents.

Future Plans

Supercritical Fluid Extraction is proposed to be established at COTS, SKUAST-K. Development of designer chicks and designer eggs. Technology transfer to industry partners. 1DNJ-based anti-diabetic products for the global market.

Potential Impact

This innovation would provide good quality, cheap, readily available feed for the poultry industry while ensuring that the sericulture sector benefits economically.

Established: 2021

Biochar Products

Converting waste and crop residues into biochar and biochar-based products.

Innovator: **Dr. A Hussain**
Dr. A.H. Lone
Dr. F.A. Mohidin
Dr. N.R. Sofi

Revenue model

Sales model

Technology Readiness Level

Technology Specification

Wood waste and crop residues can be converted into valuable biochar through pyrolysis and biochar-based fertilizer products for carbon sequestration, improving soil health, water use efficiency, and increasing crop productivity.

Biochar Products

Problem Statement

Apple prunings, wood shavings from saw industries, sawdust, tree leaf biomass, rice chaff, and farmyard manure are either mis-utilized or wasted across Kashmir valley.

The Solution

Effective utilization of the products through valuable biochar through pyrolysis and biochar-based fertilizer products

Future Plans

Making biochar production commercial and popularizing it among farmers

Potential Impact

Environmental and economic benefits for the country

Established: 2011

Shalimar Bioformulation

Bio-formulations to improve the soil health status

Innovator: **Dr. F.A. Mohiddin**
Dr. Z.A. Baba
Dr. A. Hussain
Dr. A. Ahanger

Revenue model

Sales model

Achievements

- Two patents accorded in the USA and India
- Certificate of Appreciation from Vice-Chancellor SKUAST Kashmir

Technology Readiness Level

Technology Specification

A novel technology to develop Trichoderma-based bio-formulations was developed not only to improve the soil health status but also to act as an alternative to chemical pesticides for disease management of both field and horticultural crops.

Shalimar Bioformulation

Problem Statement

Plant diseases continue to threaten crop production and are still being controlled by the use of chemical pesticides.

The Solution

A novel technology to develop Trichoderma-based bio-formulations was developed not only to improve the soil health status but also to act as an alternative to chemical pesticides for disease management of both field and horticultural crops.

Future Plans

Large-scale production of Trichoderma bioformulations. Branding and Marketing of Trichoderma bioformulations for plant growth promotions. Awareness among the rural youth to take Trichoderma bioformulations for entrepreneurship.

Potential Impact

The formulation will also act as an important organic input Under Natural Farming, reduce health hazards and create job opportunities.

Established: 2021

Safarms

Smart soil-less saffron farming

Innovator: **Er. Maliqa Majid**

Revenue model

Sales model, services model

Achievements

- Recipient of National and International Fellowships
- Innovative Idea featured in a BBC Documentary

Technology Readiness Level

Technology Specification

Smart soil-less farming systems that would serve as a smart and sustainable alternative to traditional saffron cultivation techniques.

Safarms

Problem Statement

Despite its high demand for consumption and massive production potential, the future of saffron production is still uncertain in the Kashmir valley.

The Solution

This technology is the first of its kind smart vertical soil-less farming system for growing saffron that offers an affordable but technical solution to the hitches faced in traditional saffron production.

Future Plans

Delivering farming systems that would change the face of saffron farming in the Valley

Potential Impact

The technology aims at helping urban growers, tech-savvy growers, and marginal farmers and ultimately bring saffron farming to the balconies.

Established: 2020

Kashmir Pyrolytic Technologies

Multipurpose Pyrolysers for improving soil health

Innovator: **Mr. Owais Ali Wani**

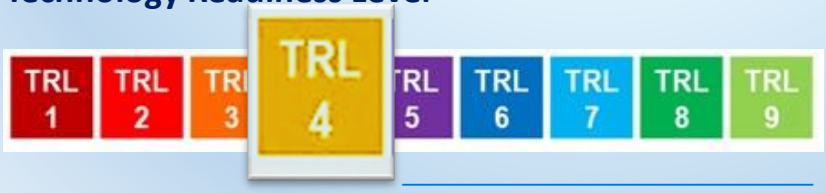
Revenue model

Sales model

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

Development of innovative waste management options which are carbon neutral through the design of various prototypes which are multipurpose for the sustainable conversion of residues to soil amendments.

Kashmir Pyrolytic Technologies

Problem Statement

The bulk of residues at end of every crop cycle are difficult to compost due to high lignin content. The ill management of crop residues and non-climate smart residue management options is a massive problem.

The Solution

Development and upscaling of multipurpose Pyrolysers and sustainable conversion of Agri-hoti-fort residues to valuable soil amendments and other additives.

Future Plans

Fine-tuning of already designed porotypes and upscaling of prototypes and linkage

Potential Impact

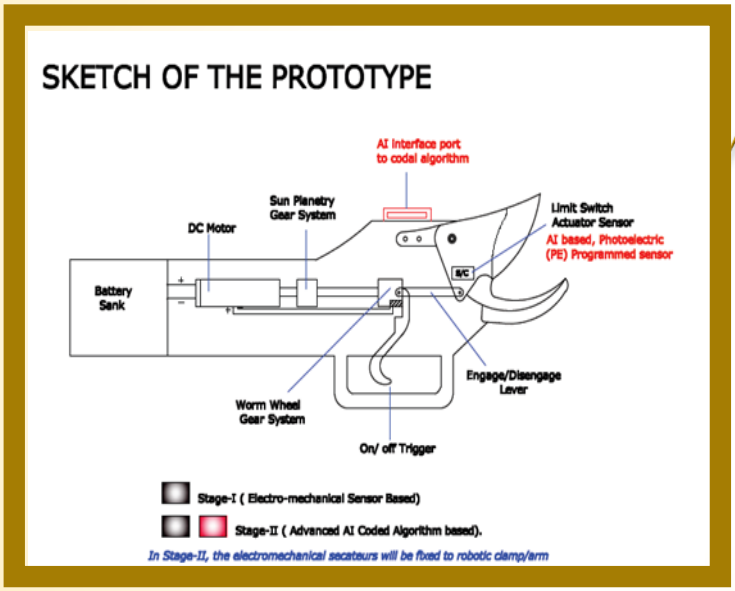
This innovation is a step towards climate change mitigation and resource conservation options.

Established: 2020

Robo Prune

Robotic pruner and pruning model for high-density apple orchards

Innovator: **Dr. Rafiya Mushtaq**
Dr. A.R. Malik
Dr. S.D. Fayaz



Revenue model

Sales model

Achievements

- Winner of Prime Minister's Research Fellowship

Technology Readiness Level

Technology Specification

Automated robotic pruner and pruning model for high-density apple orchards using sensor-based artificial intelligence to replace laborious and defective manual pruning.

Robo Prune

Problem Statement

Pruning is the second-largest labor expense for tree fruit production after harvesting, accounting for 20% or more of the total production cost.

The Solution

Development of an automated cost-effective pruning tool/robot with programmed sensors for selective pruning using the best possible productive strategy developed based on optimum yield and quality production.

Future Plans

Selective pruning protocol model for apples can pave way for the development of such models for other fruit crops under high-density plantations. Drone Based pruning survey through use of programs developed

Potential Impact

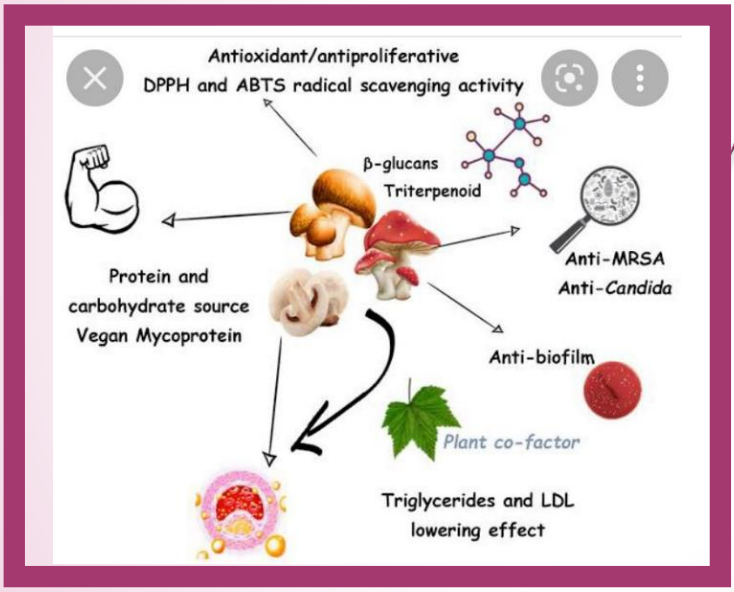
Cost-effective solution for small and marginal farmers through a mechanized sustainable approach to increase productivity potential of apple crop and save economic returns for farmers

Established: 2021

Kashmir Mushroom Solutions

Divert woody waste into production of medicinal mushrooms

Innovator: **Mr. Roaf A Rather**



Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

The startup 'Kashmir Mushroom Solutions aims at generating employment; producing mushroom-based functional foods with nutritive and medicinal properties; capturing carbon thereby protecting the environment and producing functional fertilizers.

Kashmir Mushroom Solutions

Problem Statement

The fruit industry in Kashmir generates a huge amount of woody waste every year which is burnt to release tons of carbon into the atmosphere.

The Solution

Reducing the carbon footprint of the Kashmiri fruit industry by diverting waste to mushroom production.

Future Plans

Expand the production and opening of mushroom-serving restaurants and food chains.

Potential Impact

Generating additional income and functional foods from farm waste.

Established: 2021

Plastiles

Recycling plastics into tiles and roads

Innovator: **Ms. Azra Mir**

Revenue model

- Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Recycling plastics into tiles and roads This model aims to re-use plastic for further products putting an end to single-use plastics and taking steps for more jobs and less pollution.

Plastiles

Problem Statement

Never ending the use of plastics is leading to plastic pollution. Poor quality roads in extreme weather-prone areas like Kashmir, therefore, require frequent maintenance.

The Solution

Converting waste (plastics) into environmentally friendly and useful products. Designing of Plastic tiles (PLASTILES) from plastic waste. Designing weather-friendly roads

Future Plans

To establish it on large scale and promote the scope of PLASTILES at the National and international levels.

Potential Impact

The problem of pollution from two sources i.e., single-use plastics and ceramic tiles and concrete road mechanization can be solved at the same time.

Established: 2021

Apricot Bloom

Oil and cosmetic products from Apricot Kernels

Innovator: **Ms. Daima Salim**

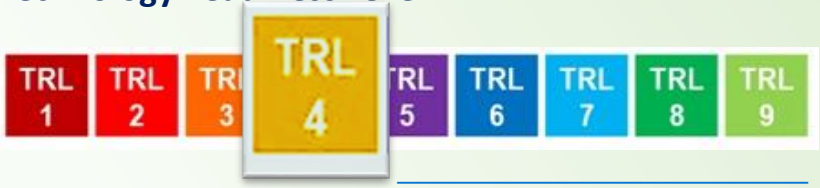
Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

This innovation utilizes waste apricot kernels and convert them into beneficial products for skin, hair, joint pains, cancer treatment, wrinkle treatment, and other cosmetic and pharmaceutical industries.

Apricot Bloom

Problem Statement

Management and recycling of tons of wasted apricot kernels (bitter ones) especially from the mountains of Ladakh is not done.

The Solution

Turning millions of waste apricot kernels into beneficial products like apricot kernel oil and cosmetic products and protecting the community from harmful chemical cosmetic products and replacing them with organic products.

Future Plans

Replacing chemical-based products with organic products in the market. Expand in the waste management sector by trying to utilize waste apricot kernels.

Potential Impact

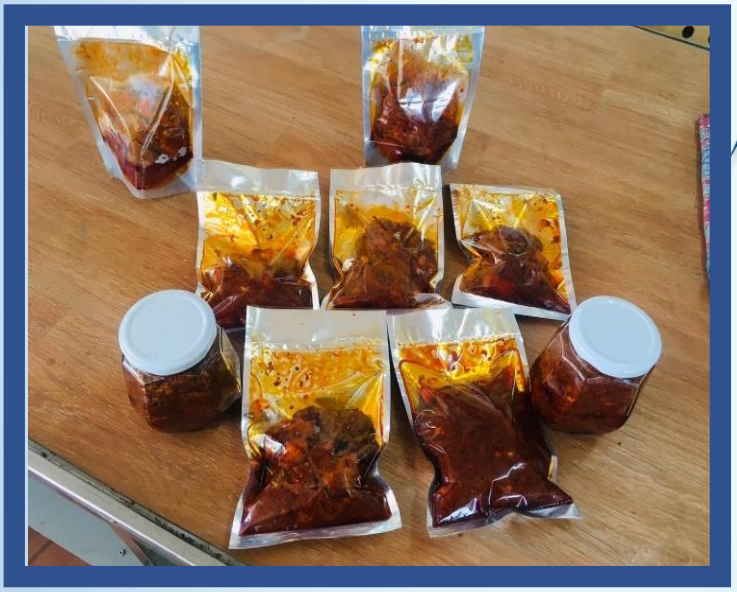
Starting a plant such as this can also help in employment generation for hundreds of youths in Jammu and Kashmir. This shall, therefore, contribute to the circular economy by making use of what otherwise would go in the dump i.e. waste conversion into beneficial use.

Established: 2021

Fishpro

Nutrient-rich, ready-to-eat and cheap fish products

Innovator: **Mr. Burhan Ellahi**



Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Use scientifically approved methods for the preparation of fish products and provide them readily on market.

Fishpro

Problem Statement

Non-availability of scientifically approved value-added fish products in the market.

The Solution

Use scientifically approved methods for the preparation of fish products and provide them readily on market.

Future Plans

Starting with a fish pickle unit, the innovators plan to progress to the preparation of other fish products. Tie up with e-commerce sites to sell the products all over India is also envisioned.

Potential Impact

A viable alternative to fast unhealthy food would have social benefits in addition to revenue generation.

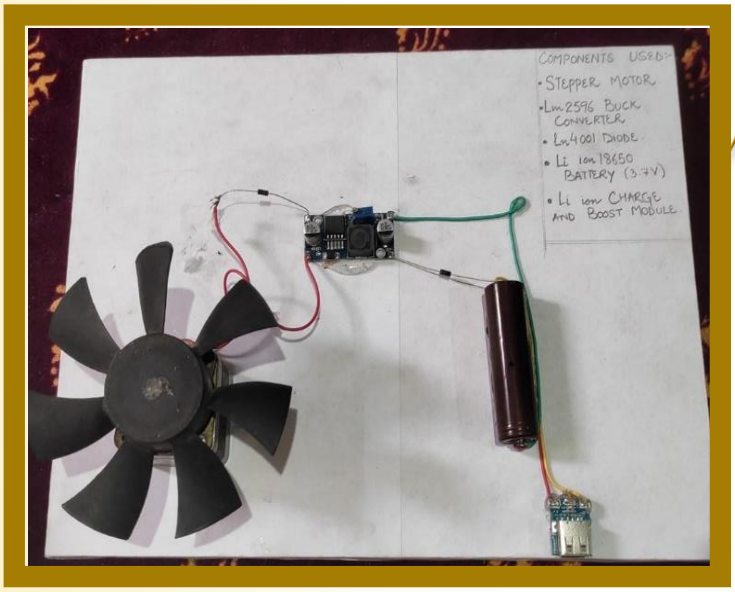
Established: 2021

WEEPCs

Utilization of blades mounted on vehicles, roads to charge the batteries

Innovator: **Mr. Samreen Khan**
Mr. Najeeb Shafi

Mentor: **Dr. M.Muzamil**



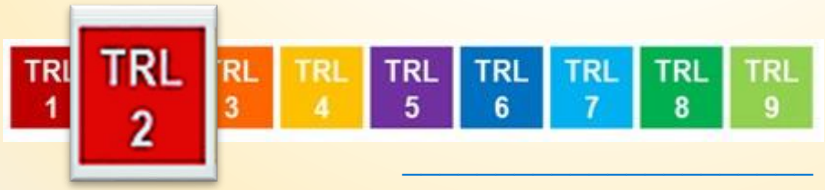
Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

in trapping the energy utilized to power our vehicles. Using the electronic and mechanical system to trap the wind energy and use that energy in charging our batteries.

WEEPCs

Problem Statement

The dependency on conventional-based fuels and the rising costs have increased the prices of local commodities.

The Solution

Tapping the potential of wind through the utilization of special blades mounted on vehicles, and roads to charge the batteries. The energy can then be used for lighting, agricultural operations, hospitals, and various battery-operated devices.

Future Plans

To develop special blades to trap maximum energy from the wind without inducing drag to the vehicle or blocking the pathway. Optimizing the number of blades requires upscaling the idea for the operation of motors in the agricultural sector.

Potential Impact

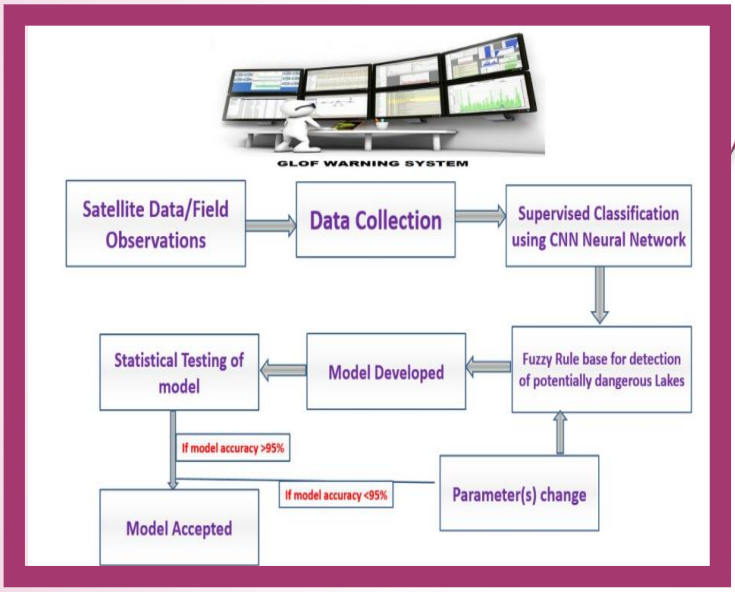
The energy can then be used for lighting, agricultural operations, hospitals, and various battery-operated devices.

Established: 2021

Glof Track

Meta-model for the early detection of potentially dangerous glacial lakes

Innovator: **Ms. Ifra Ashraf**



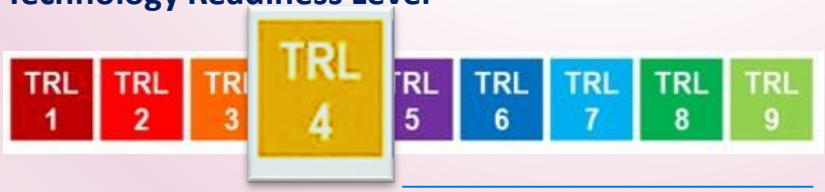
Revenue model

Subscription model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Warning system based on remotely sensed data (satellite imagery) and Machine Learning.

Glof Track

Problem Statement

No GLOF warning system for the Himalayas/ Alpine glaciers.

The Solution

A meta-model was developed that can help detect potentially dangerous lakes remotely and timely.

Future Plans

Developing real-time forecasting systems, targeting regions (Hindu Kush Himalayas), scaling software to the UK in collaboration with our partner - 2023

Potential Impact

The meta-model will help in avoiding the extensive work incurred in spatial analysis and the ambiguity involved in developed empirical relations.

Established: 2021

SMART Gel

Multipurpose portable, plant-based, eco-friendly, technology to detect pH of diverse samples

Innovator: **Dr. Khalid Masoodi**

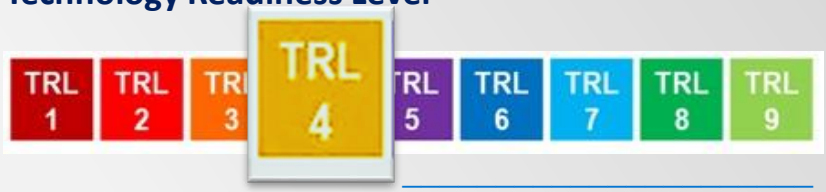
Revenue model

- B2B/B2C

Achievements

- Patent filed
- 11 national and international awards received by the innovator

Technology Readiness Level



Technology Specification

SMART Gel is a multipurpose portable technology for agriculture, food, medical, and biological industries that is a plant-based, eco-friendly, non-toxic, safe, and cheap method to detect the pH of diverse samples

SMART Gel

Problem Statement

pH measurement is an important part of any analysis/Quality assurance of products. The currently used methods are either artificial, toxic, chemical-based, or cumbersome.

The Solution

SKUAST-K Matrix-Assisted Reporter Gel: Multipurpose portable, plant-based, eco-friendly, technology to detect pH of diverse samples

Future Plans

Commercialization, Funding acquisition

Potential Impact

Potential to replace artificial, toxic, chemical-based gels. Promotion of safe alternatives to harmful laboratory gels.

Established: 2022

Magic Food

Anti-prostate cancer functional foods

Innovators: **Dr. Khalid Z. Masoodi**
Dr. I Ashraf
Dr. A Mir
Dr. N Rashid
Dr. D Murtaza
Dr. A Hurrah
Prof (Dr.) N A Ganai

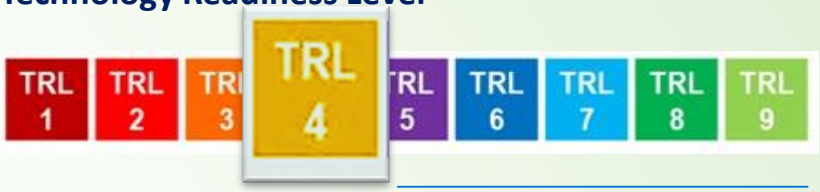
Revenue model

B2C-India, B2B-H&S Biotech Malaysia

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

smart diet may help reduce the risk of developing PCa, slow the progression of the disease, and prevent invasiveness and metastasis.

Magic Food

Problem Statement

Prostate cancer (PCa) is the 2nd leading cause of cancer-related deaths. No defined therapy exists for PCa

The Solution

FSSAI certified anti-prostate cancer futuristic functional foods designed from underutilized plant TaxO

Future Plans

Launching the product as a SKUAST-K product. We have also entered into an MoU with H&S Biotech Malaysia for international commercialization.

Potential Impact

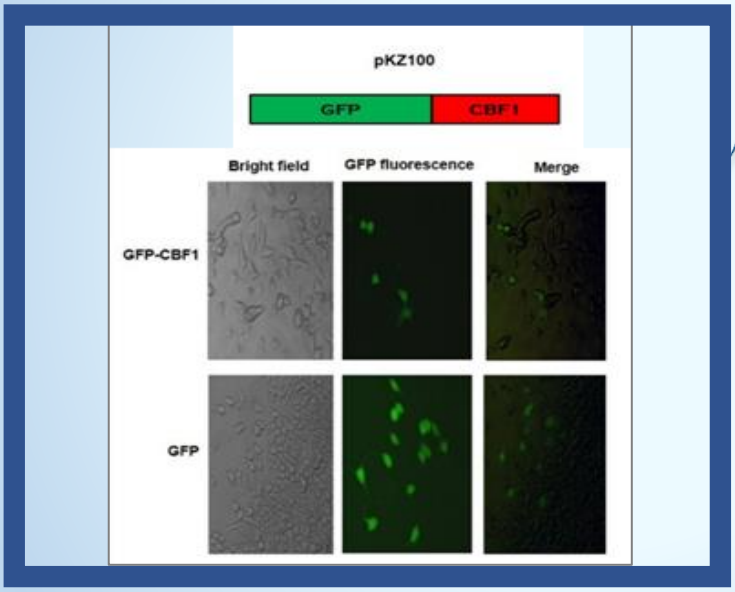
Prevention and control of prostrate cancer in the world.

Established: 2019

Cold Tolerant Tomato

DNA construct for enhancing plant resistance to cold

Innovator: **Dr. Khalid Z. Masoodi**
Dr. K. Hussain
Prof (Dr.) Nazir A. Ganai



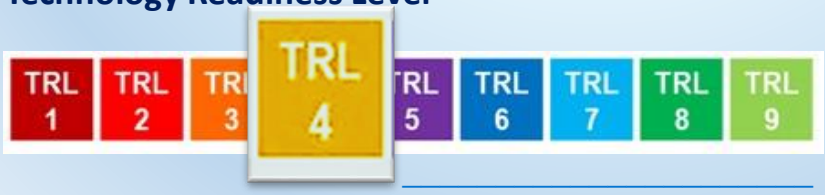
Revenue model

B2C

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

The Invention provides DNA construct for enhancing plant resistance to cold and freezing temperatures. The invention helps in tracking the GFP-CBF1 fusion construct inside a plant cell. We have successfully cloned CBF-1 cold-induced transcription factor from the cold-tolerant tomato variety.

Cold Tolerant Tomato

Problem Statement

Cold is a major environmental limitation to plant distribution and crop productivity, causing large-scale crop damage with concomitant loss of millions of dollars.

The Solution

The invention is in the field of improving tolerance for the cold and freezing temperature of plants. It provides a DNA construct for enhancing plant resistance to cold and freezing temperatures.

Future Plans

Incorporation of the CBF-1 in cold susceptible tomato variety

Potential Impact

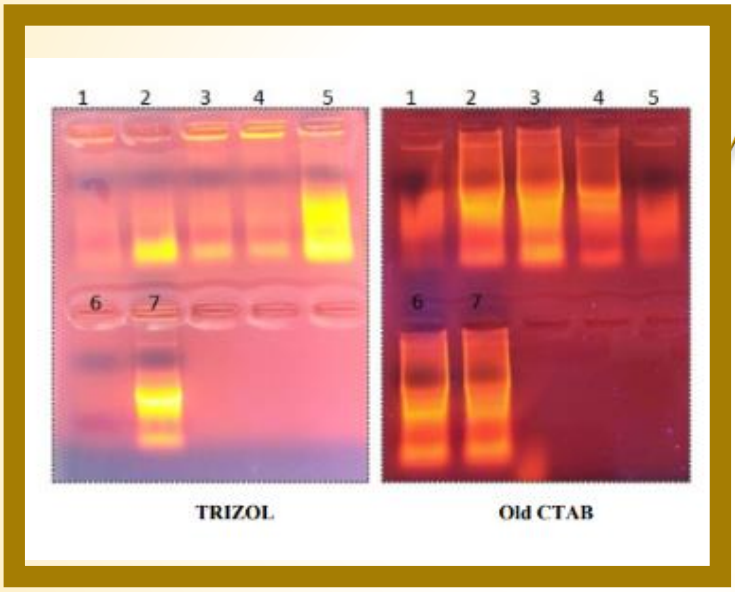
Protecting tomatoes from extreme cold temperatures would enhance plant distribution and crop productivity. This would also benefit farmers and consumers economically.

Established: 2020

Quick RNA Extraction Kit

Method for purifying RNA from plant tissue.

Innovators: **Dr. Khalid Z. Masoodi**
Dr Mudasir A. Mir



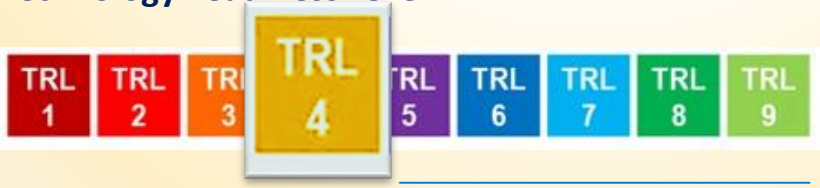
Revenue model

B2C/B2B

Achievements

- Patent published

Technology Readiness Level



Technology Specification

the invention provides a method for purifying quickly and efficiently the Ribonucleic Acid (RNA) from polyphenolic, polysaccharide-rich plant tissue. The invention also provides extraction solutions and kits for extracting RNA.

Quick RNA Extraction Kit

Problem Statement

The tissues of many plant species are rich in phenolics and polysaccharides which poses a hindrance to extracting good quality RNA, because they bind with biomolecules of a cell due to hydrogen bonding, resulting in the isolation of low quality or degraded form of RNA.

The Solution

Development of a quick RNA Extraction kit. The invention provides a method for purifying quickly and efficiently the Ribonucleic Acid (RNA) from polyphenolic, polysaccharide rich plant tissue.

Future Plans

Commercialization of the kit designed by the innovators.

Potential Impact

Quick and efficient RNA Extraction for a number of biological experiments.

Established: 2021

All About Silk

Converting high-end quality mulberry silk into bulletproof silk vests

Innovator: **Ms. Nadiya Mushtaq,**
Ms. Aina Bhat
Mr. Danish Mushtaq
Ms. Lubna Altaf

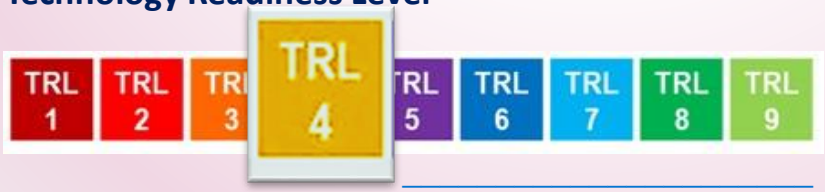
Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Silk is the strongest natural textile in the world, it is stronger than steel. Sixteen layers of mulberry silk provide bulletproof properties, it can stop 9mm bullet.

All About Silk

Problem Statement

The mulberry silk of Kashmir is considered superior in quality with naturally hypoallergenic, anti-microbial, healing, and temperature regulating properties. Despite this sericulture in Kashmir is declining with each passing day and there is a lack of access to proper market channels for farmers selling silk cocoons.

The Solution

Supporting the sericulture farmers and getting income opportunities, Reviving sericulture in the Valley, developing bulletproof vests from Kashmiri silk, a resource to support security personnel. Contributing to sericulture community, defense, military and paramilitary

Future Plans

Set up a profitable startup

Potential Impact

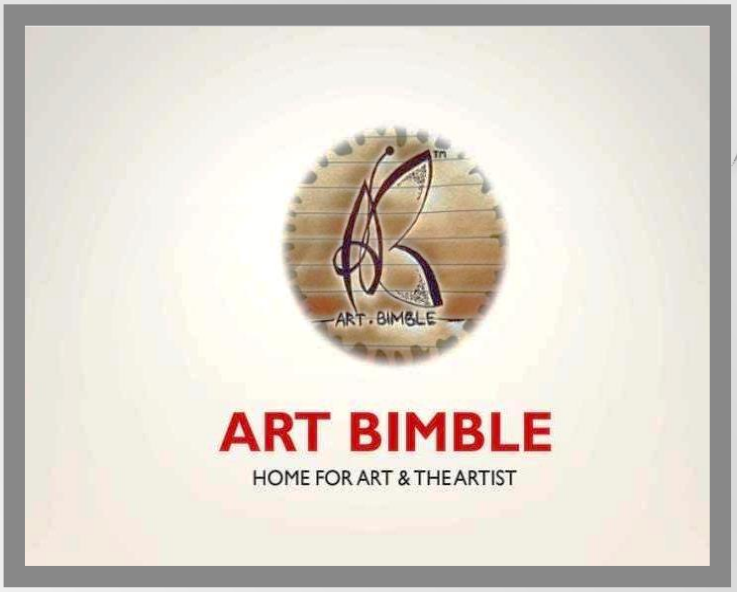
This innovation has the potential to revive the sericulture industry in Kashmir.

Established: 2021

art.bimble

A platform for artists of Kashmir

Innovator: **Ms. Noureen**



Revenue model

- Service model

Achievements

- innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level

Technology Specification

Startup of an art club with a gallery that will provide a workspace, employment, etc. to the artists, giving them an art home, so they get a sense of belonging.

art.bimble

Problem Statement

The unavailability of the art club and art gallery in Kashmir; unemployment of Kashmiri artisans

The Solution

Providing a home for art and the artist in Kashmir - the valley full of talented artists, both professional and learning.

Future Plans

To accentuate Kashmiri's talent in the field of art.. To extend branches of art.bimble around the world.

Potential Impact

Make Kashmir a hub of budding artists and professionals.

Established: 2021

Apple Guide

Online platform for farmers

Innovator: **Mr. Rayees Mushtaq**

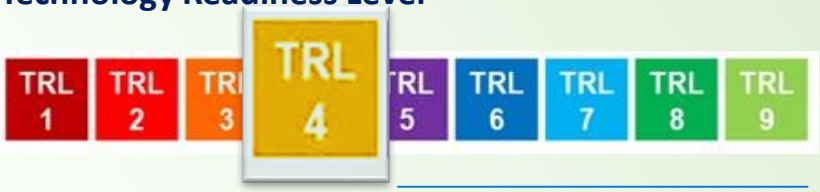
Revenue model

Subscription model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Provision of knowledge, technical assistance, and practical video-based demonstrations on scientific methods of farming via our app to farmers. Providing a facility for buying recommended pesticides & fertilizers online via the app and delivering the products at their doorsteps. Provision of marketing links, and facilities for domestic and international markets so growers would fetch more profits.

Apple Guide

Problem Statement

Lack of education and unawareness of the latest horticultural techniques and implementations among farmers. Indiscriminate use of pesticides by farmers. Improper disease and pest management Misguidance from inexperienced pesticide dealers. Lack of initiative for direct marketing.

The Solution

Digitalizing farming by providing online platform for farmers especially for apple growers of Kashmir valley.

Future Plans

Expansion of services on a larger scale. Provide a huge platform for purchasing agrochemicals at the doorsteps of farmers. Developing SAAS-based platform.

Potential Impact

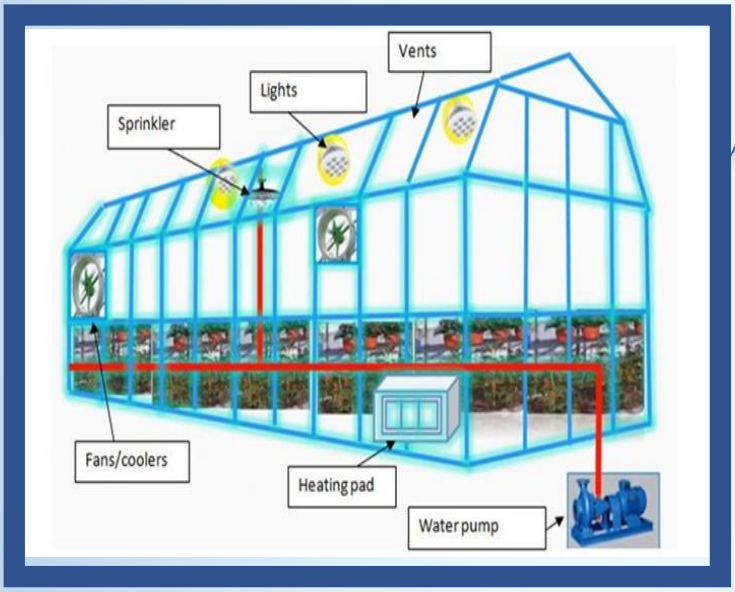
Revolutionizing the horticulture sector of J&K.

Established: 2021

Wild to Worldwide

Commercialization of Kashmiri medicinal plants

Innovator: **Ms. Aqsa Nawaz**



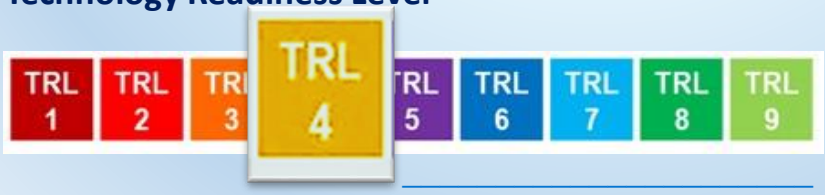
Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Exploring the local medicinal plants of Kashmir and their commercial production to use as a substitute for synthetic medicines with little or no side effects.

Wild to Worldwide

Problem Statement

Excessive dependence on synthetic medicines has immense side effects on human health and the environment.

The Solution

Commercialization and use of local Kashmiri medicinal plants which have immense value in the global market.

Future Plans

Increasing production of local plants. Processing them into a palatable form and exporting to various markets.

Potential Impact

Discontinuation of medicines with side effects on human health as well as the environment.

Established: 2020

PermaVegKart

Digital market for both organic farmers and consumers

Innovator: **Mr. Fazil Fayaz Wani**

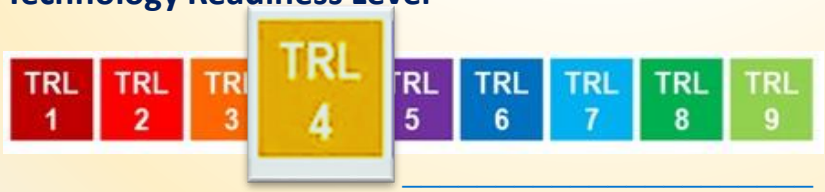
Revenue model

Subscription model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

online smartphone application “PermaVegKart” through which organic vegetable farmers will be able to sell their certified organic vegetables easily through online mode and the customers will be able to buy fresh certified organic vegetables at their doorstep

PermaVegKart

Problem Statement

Lack of online market for organic growers as well as for Organic food consumers

The Solution

Providing doorstep market for both organic farmers as well as for organic food consumers.

Future Plans

Development and popularization of the application

Potential Impact

Consolidation of market for organic productions. Elimination of the need for middlemen who often exploit producers.

Established: 2021

Functional Chicken Bite

Ready to eat functional chicken nugget

Innovator: **Dr. Tahir Nazir**

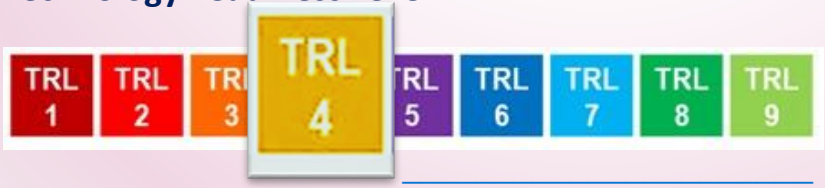
Revenue model

Sales model

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Functional Chicken Bite is ready to eat functional chicken nugget incorporated with dietary fiber in the form of Pectin and designed in the shape of an ice-cream bar.

Functional Chicken Bite

Problem Statement

Meat products are deficient in fiber; whose consumption causes several health issues. Also, apple biproducts have high fibre but are unutilized.

The Solution

A chicken meat nugget having fiber incorporated in the form of pectin was developed. It is a meat product, which is rich in dietary fiber, has a lot of health benefits like antioxidant, anti-cancer, anti-diabetic, acts as pre and probiotics, and is cheaper compared to the conventional chicken nugget.

Future Plans

Extension of product range to different meats like mutton, chevon, fish, etc., Exploring different sources of dietary fiber, Development of organic fiber-rich meat products.

Potential Impact

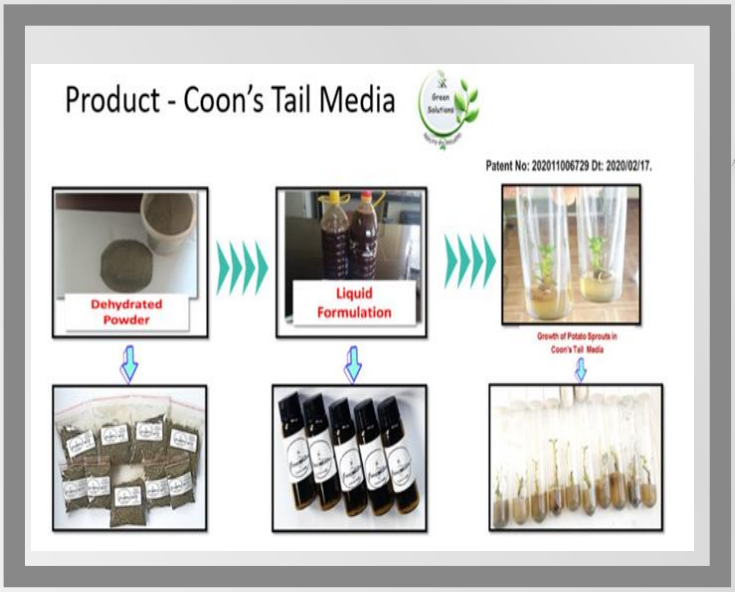
High fibre, nutritious mutton product which could to a large extent also reduce the consumption of unhealthy fast food in India.

Established: 2021

Waste to Wealth

Organic tissue culture media and micropropagation derived potato planting material

Innovator: **Dr. Khursheed Hussain**
Dr Sameera Lone



Revenue model

- Sales model

Achievements

- Patent filed

Technology Readiness Level

TRL 1 | TRL 2 | TRL 3 | **TRL 4** | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9

Technology Specification

Commercial production of organic and low-cost quality planting material of potato using micropropagation/ tissue culture technique under a controlled and aseptic environment. Replacement of this costly MS media with a media that will be cost-effective and completely organic, and that is our, Coon's Tail Media

Waste to Wealth

Problem Statement

Most potato growers do not use quality seed, because of its high cost and lack of access to quality planting material.

The Solution

Development of cost-effective organic tissue culture media and commercial production of organic and low-cost quality planting material of potato using the micropropagation/ tissue culture technique.

Future Plans

Refinement of media. Commercial Production of Organic and Low-Cost quality planting material of Potato. Export the product to the hi-tech tissue culture laboratories outside the state and if possible, outside the country.

Potential Impact

Beneficial to farmers, consumers as well as researchers.

Established: 2017

Fertilizer from Weeds

Converting biomass of extracted weeds into high quality organic fertilizer

Innovator: **Dr. Khurshid Ahmad Bhat**

Grant: **2.3 lakh under NAHEP (SKUAST-K)**

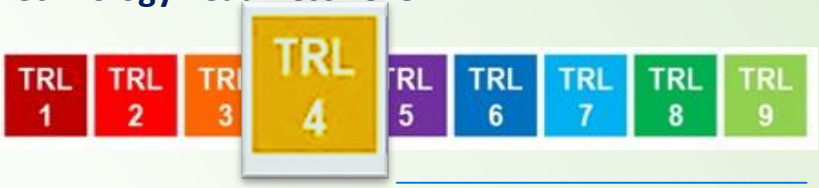
Revenue model

Sales

Achievements

- Approx profit: Rs. 900000
- Patent filed

Technology Readiness Level



Technology Specification

Whole biomass of extracted weeds can be converted to high-quality organic fertilizer using controlled fermentation technology. Product can be bottled and supplied for field application

Fertilizer from Weeds

Problem Statement

100,000 Cubic Meter Dal weed is removed annually from dal lake and left to rot. Dal weeds are mega accumulators of nutrients. During decomposition along or near the banks of dal lake nutrients leach out and are released to groundwater thus not only the nutrients are wasted but also cause environmental pollution.

The Solution

Converting whole biomass of extracted weeds into high quality organic fertilizer using controlled fermentation technology.

Future Plans

The technology can be taken up as a startup and incubated. The technology has all the ingredients to lead to a successful enterprise

Potential Impact

Conservation of Dal and replacement of chemical fertilizers.

Established: 2017

Trichoderma Bio-fungicide

Dal Weed Based Medium for Industrial Mass Multiplication of Trichoderma Bio-fungicide

Innovator: **Dr. Khurshid Ahmad Bhat**

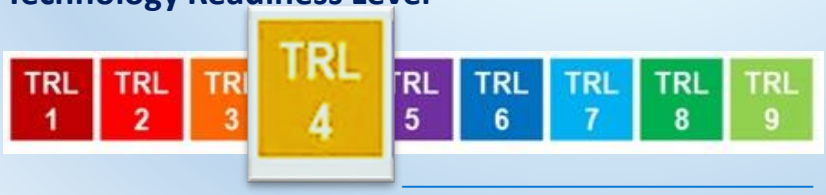
Revenue model

Sales model

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

A nutritive dal weed specie Ceratophyllum demersum-based medium was developed which could support excellent growth of Trichoderma bio-pesticide.

Trichoderma Bio-fungicide

Problem Statement

Industrial mass multiplication of biopesticides uses ingredients that need to be imported from outside the valley, and conventional mass multiplication medium is comparatively costly.

The Solution

A cheap, readily available and nutritive dal weed specie *Ceratophyllum demersum* based medium was developed which supports excellent growth of Trichoderma bio-pesticide. Dehydrated form of this medium can be stored for any length of time and supplied/transported to any corner of the world.

Future Plans

The product can be popularized among research institutes and industries involved in the research and commercial production of fungal biopesticides.

Potential Impact

Effective utilization of Dal weed to develop an economically important biopesticide. Reduction in the use of chemical pesticides in the country.

Established: 2018

Triple Action Bioagent

Microbes as bio-fertilizers

Innovator: **Dr. Khurshid Ahmad Bhat**
Dr. Rahiba-Tun-Nisa

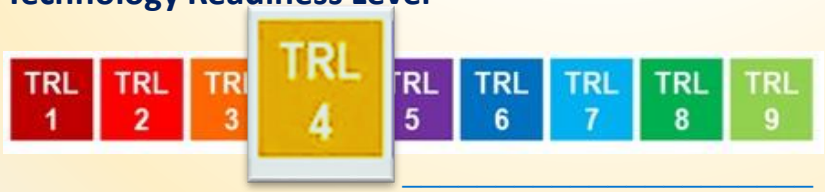
Revenue model

Sales model

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

Use of fungal bio agents as biocontrol agents which resistant/compatible to Cu-oxychloride hence can be applied in combination with other pesticides to enhance disease management.

Triple Action Bio-Agent

Problem Statement

Pollution to the environment and harm to human health and resistance to pests by chemical pesticides are matters of concern. In addition, Biocontrol agents have low efficiency and are incompatible with chemical pesticides .

The Solution

Use of microbes as bio-fertilizers. These fungal bio agents acts as a biofertilizer as well as bio fungicides and are resistant/compatible to Cu-oxychloride hence can be applied in combination with other pestices to enhance disease management.

Future Plans

A production protocol involving low-cost mass multiplication medium, low-cost fermenter equipment, and using locally available carriers in a combination of novel triple action bioagent strains will give rise to a production facility at a cheaper cost.

Potential Impact

Reduction in the use of chemicals by the use of an eco-friendly product.

Established: 2017

SKUAST Fermenter

Self-incubating, cost-effective fermenter

Innovator: **Dr. Khurshid Ahmad Bhat**

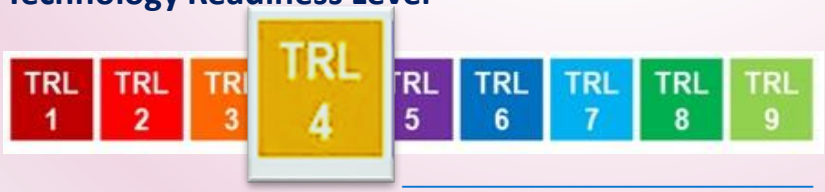
Revenue model

Sales model

Achievements

- Patent filed

Technology Readiness Level



Technology Specification

a cost-effective alternative to costly fermenters in research labs which is self-incubating and has temperature control, optical density-based biomass growth monitoring and uses laminar airflow assisted inoculation method.

SKUAST Fermenter

Problem Statement

The very high cost of fermenter equipment, complex design, and operation. This limits the growth of small and medium biotech enterprises.

The Solution

A cheap alternative to costly fermenters to research labs which is self-incubating with temperature control.

Future Plans

Commercialization of the developed fermenter and its popularization among biotech units.

Potential Impact

Low-cost fermenters will be very beneficial to small and medium biotech units.

Established: 2019

Agro-waste into Japanese Mushroom

Producing lignin loving mushrooms in Kashmir

Innovator: **Dr. Khurshid A Bhat**
Dr. Shaheen K. Jan
Dr. Pilla Avinash

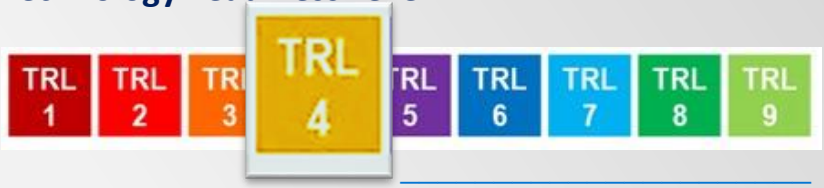
Revenue model

- Sales model

Achievements

- 3 patents filed

Technology Readiness Level



Technology Specification

Producing lignin loving mushrooms like Japanese mushroom in Kashmir thereby transforming waste into high quality Japanese mushroom

Agro-waste into Japanese Mushroom

Problem Statement

Japanese Mushroom is in high demand as an edible mushroom. The Lentinus production industry currently depends mostly on willow sawdust and obtaining pure willow sat dust is a bottleneck.

The Solution

The lignocellulolytic agro-wastes produced in Kashmir has the potential to be used in a better way than burning down them to ashes. Producing lignin-loving mushrooms like Japanese mushrooms have been explored in this technology.

Future Plans

At present Japanese mushroom is not grown in the Kashmir valley. This mushroom can be introduced in the valley with this new technology

Potential Impact

Such technology can provide a subsidiary income to Kashmir farmers to the tune of thousands of crore rupees as Japanese mushrooms can be an additional cash crop to Kashmir farmers.

Established: 2016

Mistletoe Eradicator

A tool to cuts mistletoe from the host and apply high concentration weedicide to the stump

Innovator: **Dr. Khurshid A Bhat**

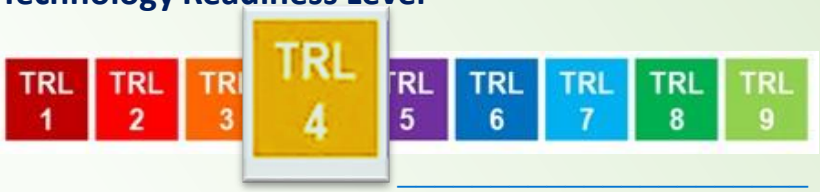
Revenue model

Sales model

Achievements

- Patent granted (grant no. 340843)

Technology Readiness Level



Technology Specification

This tool cuts the mistletoe from host also apply high concentration weedicide to the cut end (stump) of mistletoe.

Mistletoe Eradicator

Problem Statement

Various types of mistletoes are plant pathogenic parasites that are difficult to control.

The Solution

Development of a tool that cuts the mistletoe from the host and applies high concentration weedicide to the cut end (stump) of mistletoe, thus obtaining instant removal, as well as application of a chemical to the scar of mistletoe spike which prevents its re-growth.

Future Plans

It needs popularization among walnut growers of Kashmir.

Potential Impact

It can be used throughout the world to control mistletoe on walnut, fruit, and landscape trees.

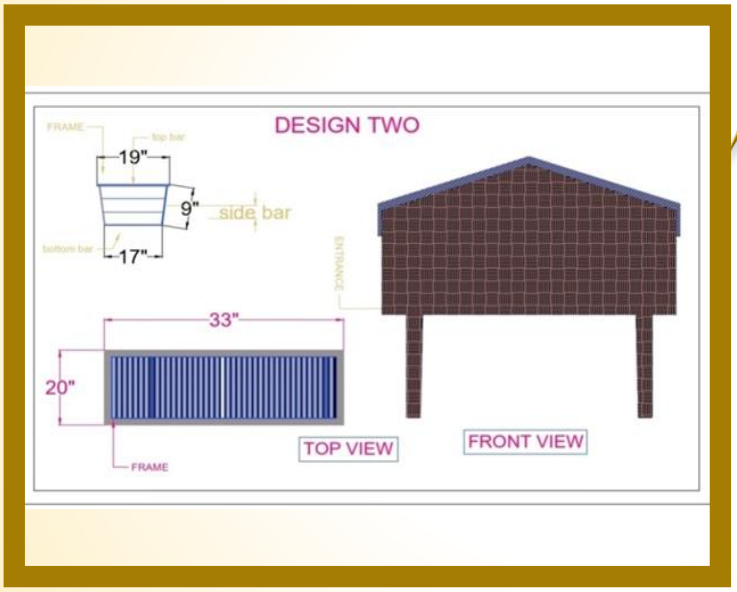
Established: 2019

Two in One Beehive

Rearing two different strains in a single hive.

Innovator: **Dr. Muneer Ahmad**

Grants: **SSTP-DST project**



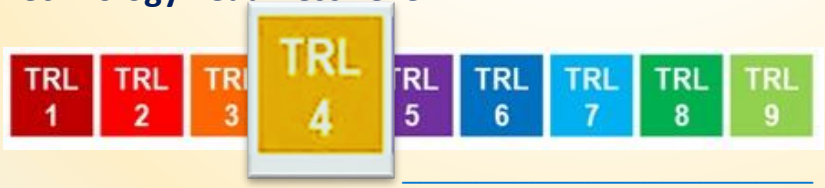
Revenue model

Sales model

Achievements

- One grant received

Technology Readiness Level



Technology Specification

Two colonies of different strains can be managed in a single hive. It has drawer-type feeders and feeding can be given without disturbing the bees during the dearth period. It has a fixed center with ten (10) frames in each chamber and the entrances of the hive are on opposite sides to stop drifting and robbing.

Alfalfa Biomass for Crops

Problem Statement

When feeding bees the modern hives need to be opened and the bees get agitated a professional of needed to give feeding to the colonies and the chances of robbing was high

The Solution

Development and design of a beehive that has drawers that can be used for feeding and two colonies of different strains can be reared in the single hive.

Future Plans

Awareness and training on the inclusion of alfalfa fodder crops in crop rotation to reduce organic input costs and improve soil fertility.

Potential Impact

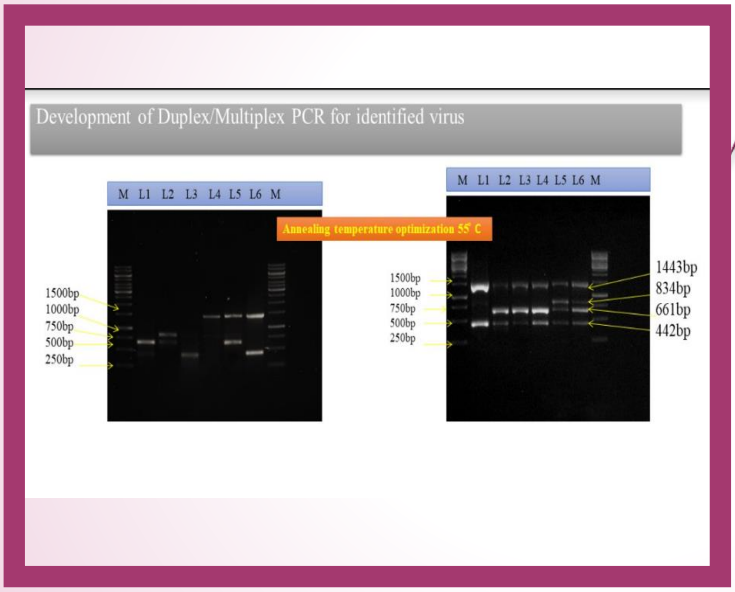
Make Ladakh rich in organic input and organic food production through efficient utilization of unexplored resources.

Established: 2020

Potato Virus Detection Kit

Multiplex detection kit for all known viruses from Potato

Innovator: **Dr. Aflaq Hamid and Group**



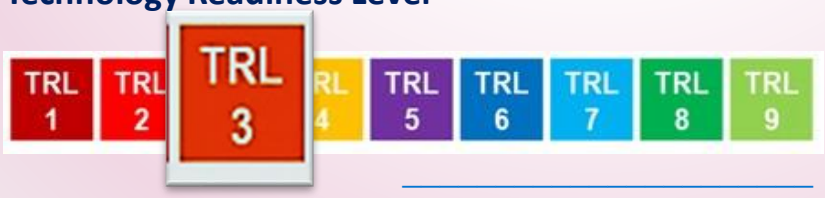
Revenue model

Sales model

Achievements

- Certificate of Appreciation from HVC, SKUAST-K

Technology Readiness Level



Technology Specification

Using multiplex detection kit all known viruses from Potato tuber and tissue can be detected in a single reaction.

Potato Virus Detection Kit

Problem Statement

Potato is affected by different viruses and strains of viruses with most of them seed-borne which ultimately affects its yield and quality.

The Solution

Using a multiplex detection kit all known viruses from Potato tuber and tissue can be detected in a single reaction. Indexing of virus-free seed material for quality seed distribution among end-users.

Future Plans

Virus-free potato seeds will lead to higher yield which will increase farmers' income

Potential Impact

Removal of viral menace for the production of food good quality, safe food.

Liquid Biofertilizer Technology

Cold tolerant liquid biofertilizer technology

Innovator: **Dr. Zahoor Baba**

Revenue model

Sales model

Technology Readiness Level

TRL 1 | TRL 2 | TRL 3 | **TRL 4** | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9

Technology Specification

Cold tolerant liquid biofertilizer technology which is sustainable and ecofriendly.

Liquid Biofertilizer Technology

Problem Statement

Chemical fertilizers besides being very costly have a negative impact on the ecosystem. The use efficiency of different native and applied nutrient elements like nitrogen, phosphorus, potassium, sulfur, and micronutrients is very low.

The Solution

Since the soils are containing a large reserve of phosphorus, potassium, and zinc-bearing minerals, so the available status of these nutrients can be improved on a sustainable and eco-friendly basis by using natural potential mineral solubilizing bacteria. The current idea of cold-tolerant liquid biofertilizer technology is the outcome of observations about deteriorating soil health and low nutrient use efficiency.

Future Plans

To conduct skill development programs for educated youth to promote startup culture.

Potential Impact

Reduce the burden on chemical fertilizers.

Established: 2017

Alfalfa Biomass for Crops

Utilization of Alfalfa Biomass as Organic input for Vegetable Cultivation

Innovator: **Dr. Mohammad Mehdi**
Dr. Rinchan Dolkar

Grants: **10.49 lakh (ICAR- NBAIM)**

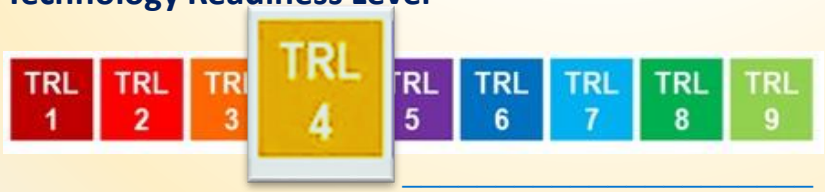
Revenue model

Services model

Achievements

- One grant received

Technology Readiness Level



Technology Specification

Utilization of degraded alfalfa and its biomass for vegetable cultivation using plastic mulching for few years followed by field crop

Alfalfa Biomass for Crops

Problem Statement

The non-availability of organic inputs together with the short and less-diverse agriculture season poses a reckoning limitation to organic agriculture in the region of Ladakh.

The Solution

Utilization of degraded alfalfa and its biomass for vegetable cultivation using plastic mulching for a few years followed by field crop

Future Plans

Awareness and training on the inclusion of alfalfa fodder crops in crop rotation to reduce organic input costs and improve soil fertility.

Potential Impact

Make Ladakh rich in organic input and organic food production through efficient utilization of unexplored resources.

Established: 2020

Tech Chilis, Kashmir

Machine for seed extraction

Innovator: **Er. Masrat Mohi ud din**

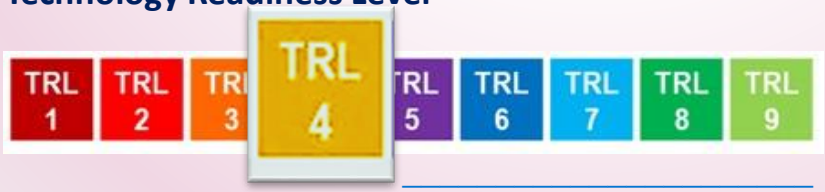
Revenue model

Sales

Achievements

- Innovator awards from Western Sydney University And Lemon School of Entrepreneurship

Technology Readiness Level



Technology Specification

Development of a machine that can serve as an alternative to conventional seed extraction.

Tech Chilis, Kashmir

Problem Statement

The extraction of the seed from the Chilli pod is usually carried out manually through handpicking, sun drying, beating, and winnowing. These methods are infested with high time consumption, labor requirement, and low reliability as it causes sneezing and body irritation, thereby, endangering the health of the laborers.

The Solution

Development of an efficient seed extracting machine which shall eliminate the need for manual extraction.

Future Plans

Attachment of grinding unit to make the paste of pulp after extraction method, conversion of chili pods and seeds into different products, automation in feeding, attachment of automatic weighing balance to check the number of seeds per kg chili fruit extracted, ergonomic modification

Potential Impact

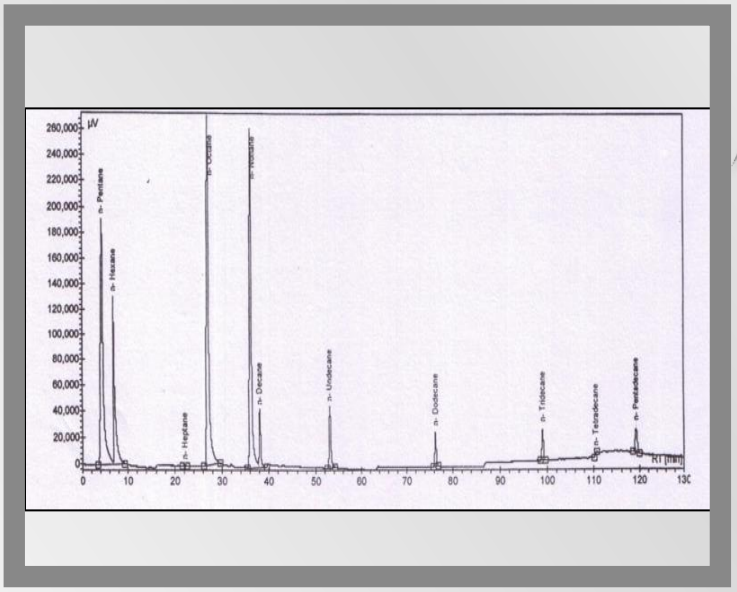
Reduce drudgery on farms and increase farm output.

Established: 2017

Mineral Oil Residue Estimation

A method for the estimation of mineral oil residues in fruits and soil

Innovator: **Dr. Malik Mukhtar**



Revenue model

- Sales and services model

Achievements

- Patent granted
- Appreciation certificate by VC, SKUAST-K

Technology Readiness Level

TRL 1 | TRL 2 | TRL 3 | **TRL 4** | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9

Technology Specification

Estimation of Mineral Oil Residues by Gas Chromatograph with Flame Ionization Detection in fruits and soil.

Mineral Oil Residue Estimation

Problem Statement

For decades, petroleum-derived mineral oils (HMOs) had been one of the primary eco-friendly management of insect pests of deciduous fruit crops. There was no method that could quantify the residues of mineral oil in apple fruit or soil.

The Solution

A method was developed that could satisfactorily quantify mineral oil residues in apple fruit and soil using gas chromatography combined with ionization detection.

Future Plans

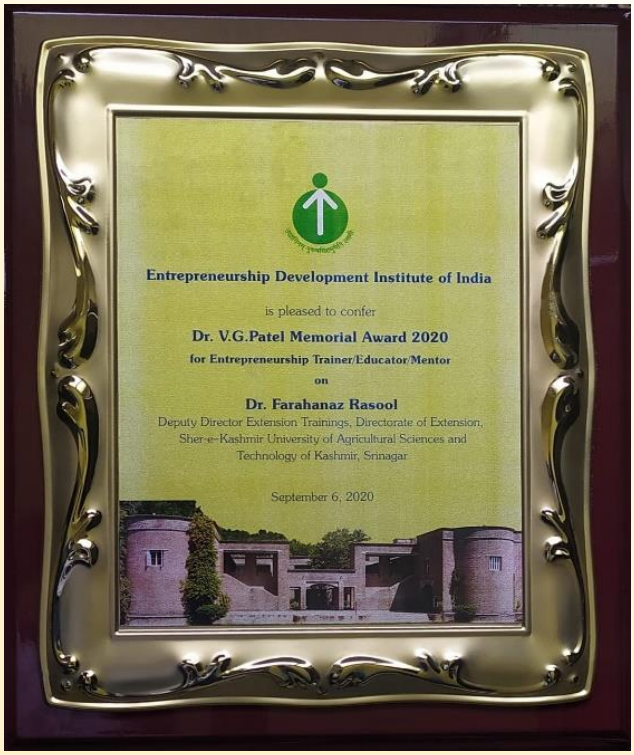
This technique has already been employed by RCRQA for the estimation of HMO residues in apple fruit and soil.

Potential Impact

Elimination of hazards associated with the presence of such residues by their early detection in soil and fruits.

SKUAST-K Achievers' Gallery

Ahmar Bashir at IIT Jammu, Receiving 1-lakh cash prize for his idea



Dr Farahnaz Rasool conferred with Dr VG Patel Memorial Award

Tahir Nazir: 3rd Position in Pitching Contest

Tahir Nazir, third rank at Idea Pitching Competition 2020

Ambreen Hamadani at IIGP-2019 award ceremony Delhi

Ambreen Hamadani receiving **5 awards** for developing Smart Sheep Breeder at Jaipur

Khalid Masoodi with his Innovation Awards

Sadiah Shafi conferred with ISPB Student Award 2020 (second rank) at Tamil Naidu Agricultural University, Coimbatore

SKUAST K in the News

SKUAST-K bags 2 startup awards at IIT Jammu competition

Ahmer Bashir gets 1st position, Dr Khalid Masoodi special prize

SRINAGAR: SKUAST-K student, Ahmer Bashir Shah, has won first prize and Rs 1 lakh cash award for his startup idea of converting human hair into organic fertiliser in a contest organised by IIT Jammu.

IIT Jammu's Institute Innovation & Entrepreneurship Development Centre (I2EDC) has organised the 'Startup Competition for Enterprising Teams with Million Dollar Ideas'. Ahmer Bashir of SKUAST-K's College of Agricultural Engineering and Technology (CoAET) has secured the first position among 130 contestants from various higher

organic liquid that can be readily used as an NPK, mineral and micronutrient-rich fertilizer in Indian agricultural systems resulting in restricted use of toxic chemical inputs into soil.

Dr Masoodi has screened 22,000 medicinal plant extracts endogenous to Kashmir valley, resulting in the discovery of 15 new anticancer molecules against Prostate cancer and Lung cancer. SKUDDL-1 was one of the

every possible step to

SKUAST-K student wins first prize in SciTech-2022 innovative contest

SRINAGAR: Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir PhD scholar, Sameena Lone, has won first prize in the 36th National Science Day competition (SciTech-2022) organised by Maharaja Ranjit Singh College of Professional Sciences, Indore (MP).

Sameena, a PhD scholar of vegetable sciences from the varsity presented her innovative idea on (Coon's Tail Media) "Commercial production of low-cost quality planting material of

ported by Leadership of SKUAST Kashmir and Dr Sumati Narayan, Prof. & Head, Division of Vegetable Sciences.

Sameena has also been selected for CIC-I Cohort-6 for incubational and grant support: Innovation and Agri Entrepreneurship Program of RKVY-RAFTAAR, by National Institute of Agricultural Extension Management Centre for Innovation and

Student innovator brings laurels to SKUAST-K

Srinagar: Mahrukh Mir, Scholar SKUAST Kashmir under Mentorship of IDP SKUAST-K won Incubational Fund Prize for her innovative idea on "IoT based automatic control and monitoring of button mushroom cultivation" in a recent concluding Innovative Women Ideation Event "WINGS" initiative by STEP to cre-

ruk takes it throw to finals and won a place for incubational fund prize. She was adjudged third among hundreds of innovators who have pitched Infront of the jury members during the final pitching round.

Honourable Vice Chancellor, SKUAST Kashmir Congratulated Miss Mehruk and her team/mentors for bringing laurels to the varsity and urged to continue her journey in the arena of

exchange with peers and

SKUAST-K Student Bags Prestigious IIGP-2019 Award

July 20, 2019

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Mir Muskan-un-Nisa Research Scholar of SKUAST-K got shortlisted for 'Her Rising' awards

https://kashmir.today/mir-muskan-un-nisa-research-scholar-of-... See More

KASHMIR.TODAY

Mir Muskan-un-nisa Research Scholar of SKUAST-K got shortlisted for 'Her Rising' a

SKUAST-K bags second position in all-India innovation competition

DR FALAK JAN — NAVEED HAMID — ER TABBASUM AKHTAR — DR MUDASIR ALI

VO NEWS SERVICE

SRINAGAR: Er Falak Jan, Naveed Hamid (Mentor) and Er Tabbasum Akhter & Dr Mudasir Ali (Mentor) Instructors of SKUAST Kashmir Work Und

Greater Kashmir

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Governor congratulates SKUAST-K team for winning 'IIGP 2.0 University Challenge'

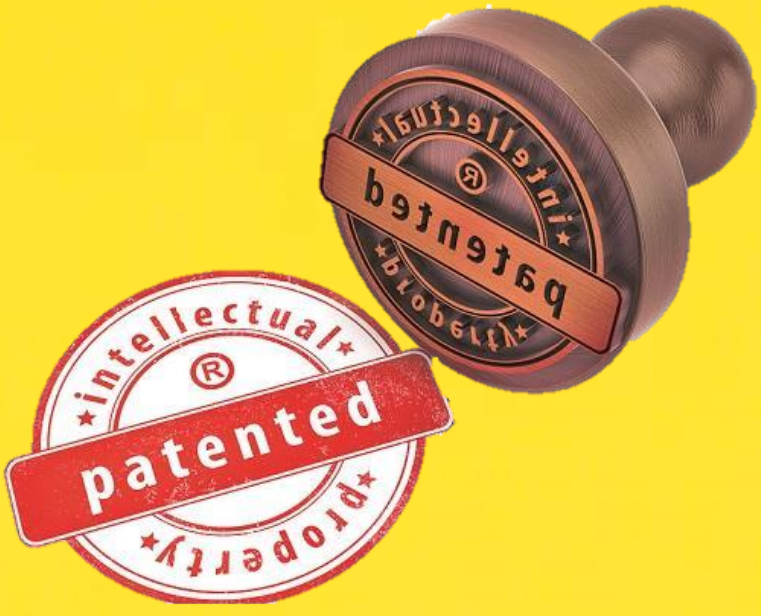
Governor NN Vohra has congratulated the SKUAST-K team comprising Fallah Nazir of Delhi Public School and Mehvish Hameed, Msc Agri Engineering, SKUAST-K for being selected among top 15 winners of the India Innovation Growth Programme, 2.

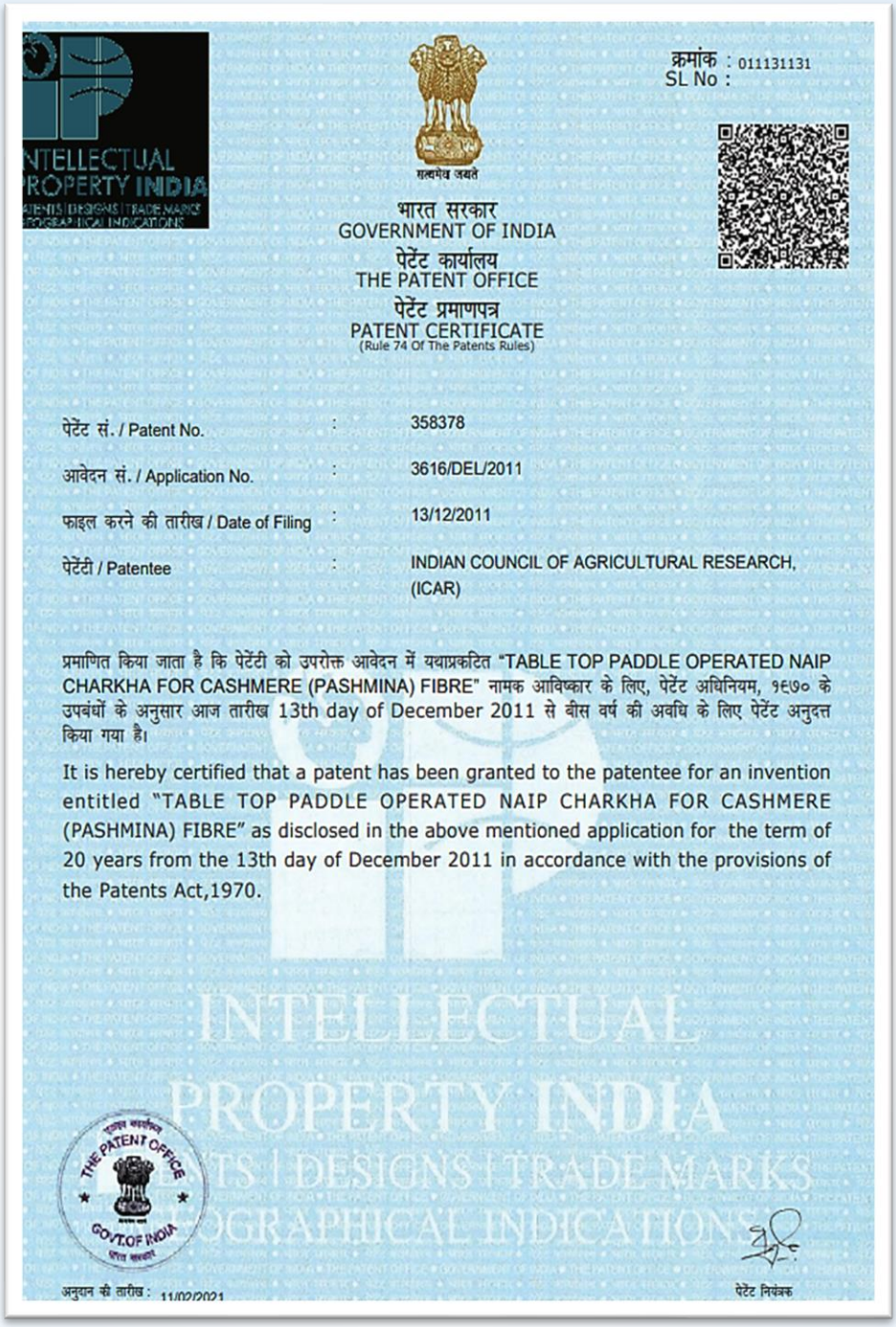
SKUAST-KASHMI

categorised as

BAND-EXCELLEN

Patents and Copyrights





क्रमांक : 011131131
SL No :

सत्यमेव जयते

भारत सरकार
GOVERNMENT OF INDIA

पेटेंट कार्यालय
THE PATENT OFFICE

पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	:	358378
आवेदन सं. / Application No.	:	3616/DEL/2011
फाइल करने की तारीख / Date of Filing	:	13/12/2011
पेटेंटी / Patentee	:	INDIAN COUNCIL OF AGRICULTURAL RESEARCH, (ICAR)

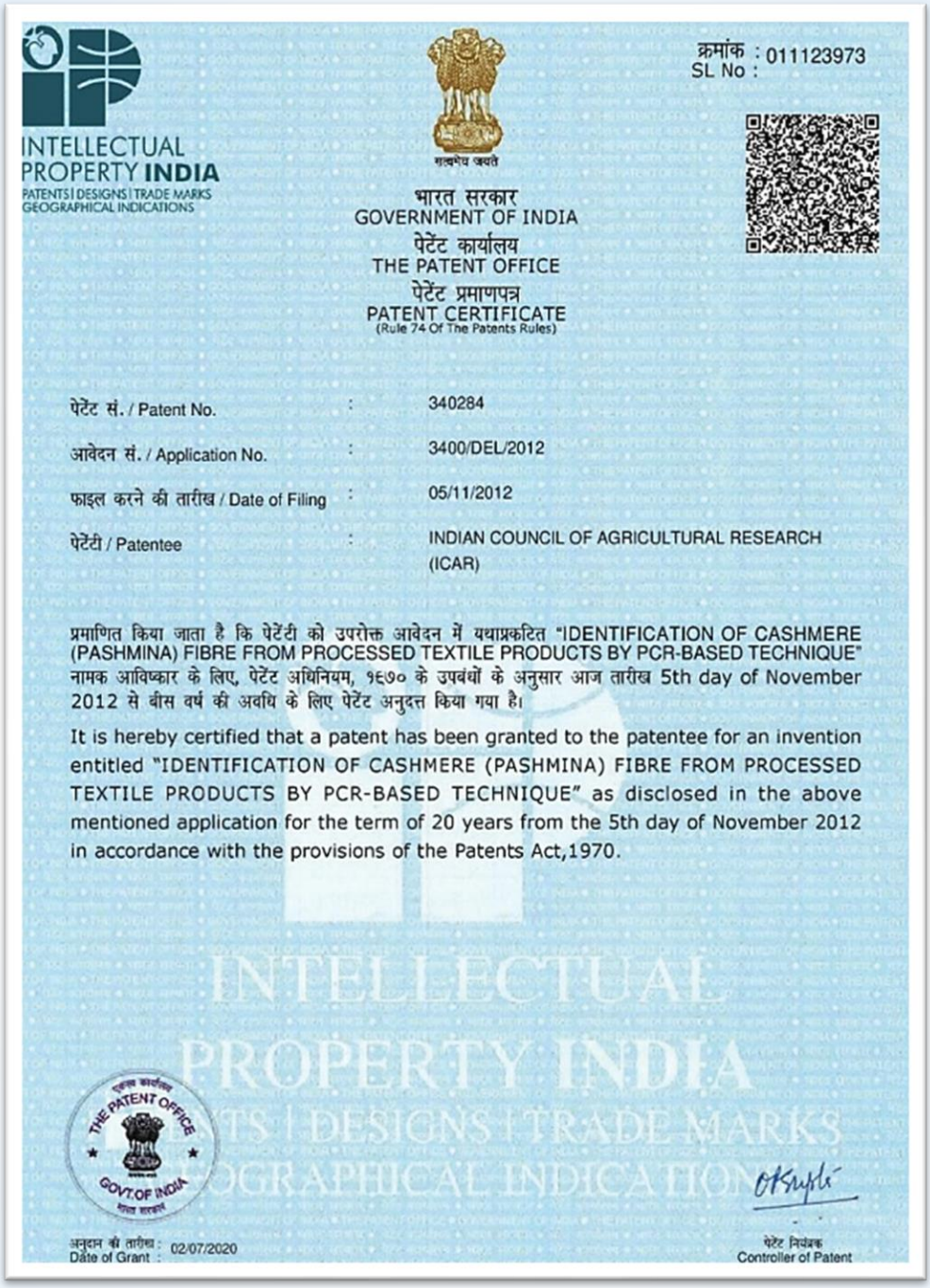
प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित "TABLE TOP PADDLE OPERATED NAIP CHARKHA FOR CASHMERE (PASHMINA) FIBRE" नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 13th day of December 2011 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled "TABLE TOP PADDLE OPERATED NAIP CHARKHA FOR CASHMERE (PASHMINA) FIBRE" as disclosed in the above mentioned application for the term of 20 years from the 13th day of December 2011 in accordance with the provisions of the Patents Act,1970.

अनुदान की तारीख : 11/02/2021

पेटेंट नियंत्रक

Patent for "Table top paddle operated charkha"
(Prof Sarfaraz A. Wani)



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GEOGRAPHICAL INDICATIONS

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क्रमांक : 011123973
SL No :

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THE PATENT OFFICE
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	:	340284
आवेदन सं. / Application No.	:	3400/DEL/2012
फाइल करने की तारीख / Date of Filing	:	05/11/2012
पेटेंटी / Patentee	:	INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित "IDENTIFICATION OF CASHMERE (PASHMINA) FIBRE FROM PROCESSED TEXTILE PRODUCTS BY PCR-BASED TECHNIQUE" नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 5th day of November 2012 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

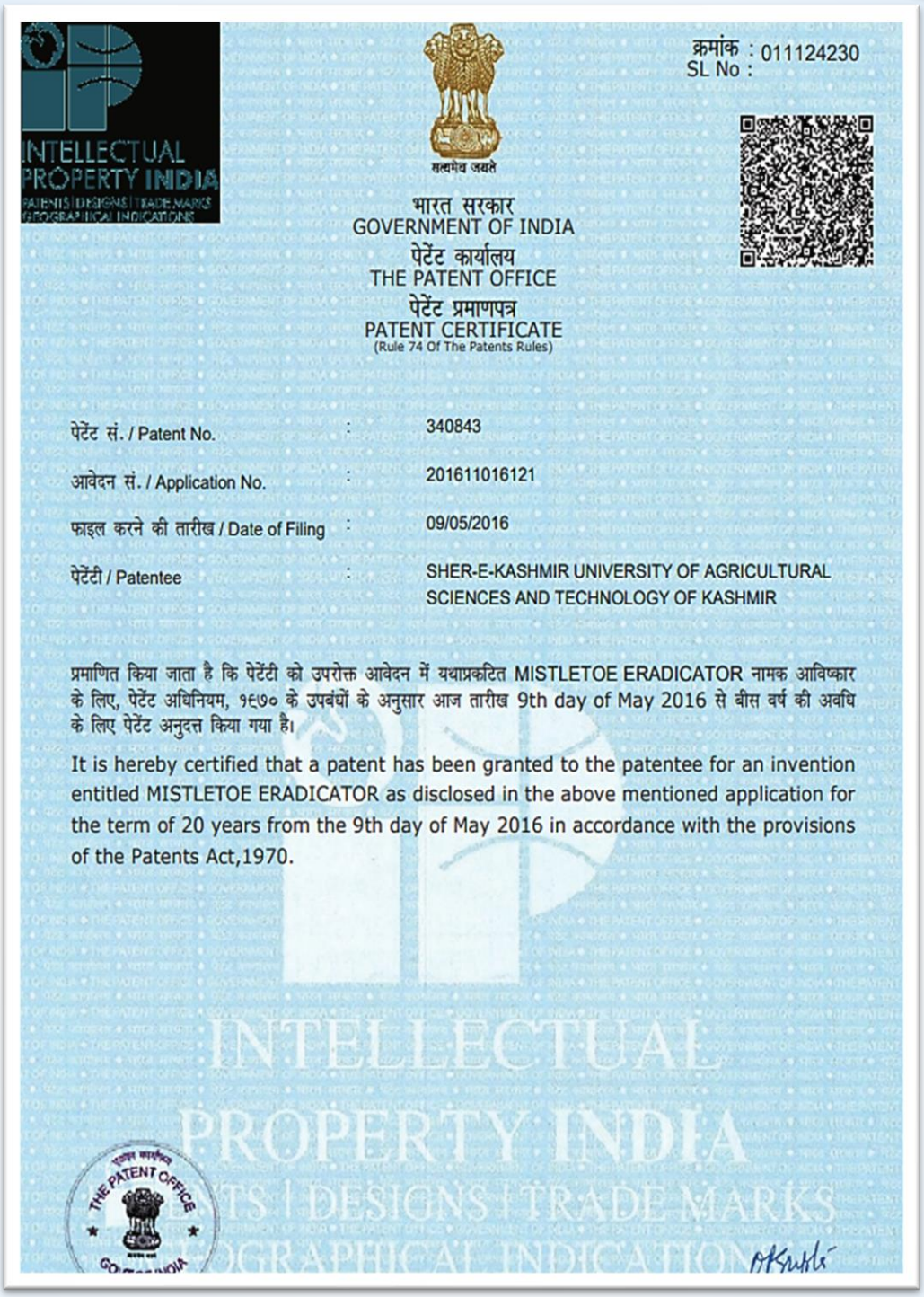
It is hereby certified that a patent has been granted to the patentee for an invention entitled "IDENTIFICATION OF CASHMERE (PASHMINA) FIBRE FROM PROCESSED TEXTILE PRODUCTS BY PCR-BASED TECHNIQUE" as disclosed in the above mentioned application for the term of 20 years from the 5th day of November 2012 in accordance with the provisions of the Patents Act,1970.

पेटेंट कार्यालय THE PATENT OFFICE GOVT.OF INDIA भारत सरकार

अनुदान की तारीख : 02/07/2020
Date of Grant :

पेटेंट नियंत्रक
Controller of Patent

Patent for "Identification of Cashmere (Pashmina) fibre from processed textile products by PCR-based technique"
(Prof Sarfaraz Wani)



क्रमांक : 011124230
SL No :

सत्यमेव जयते

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THE PATENT OFFICE

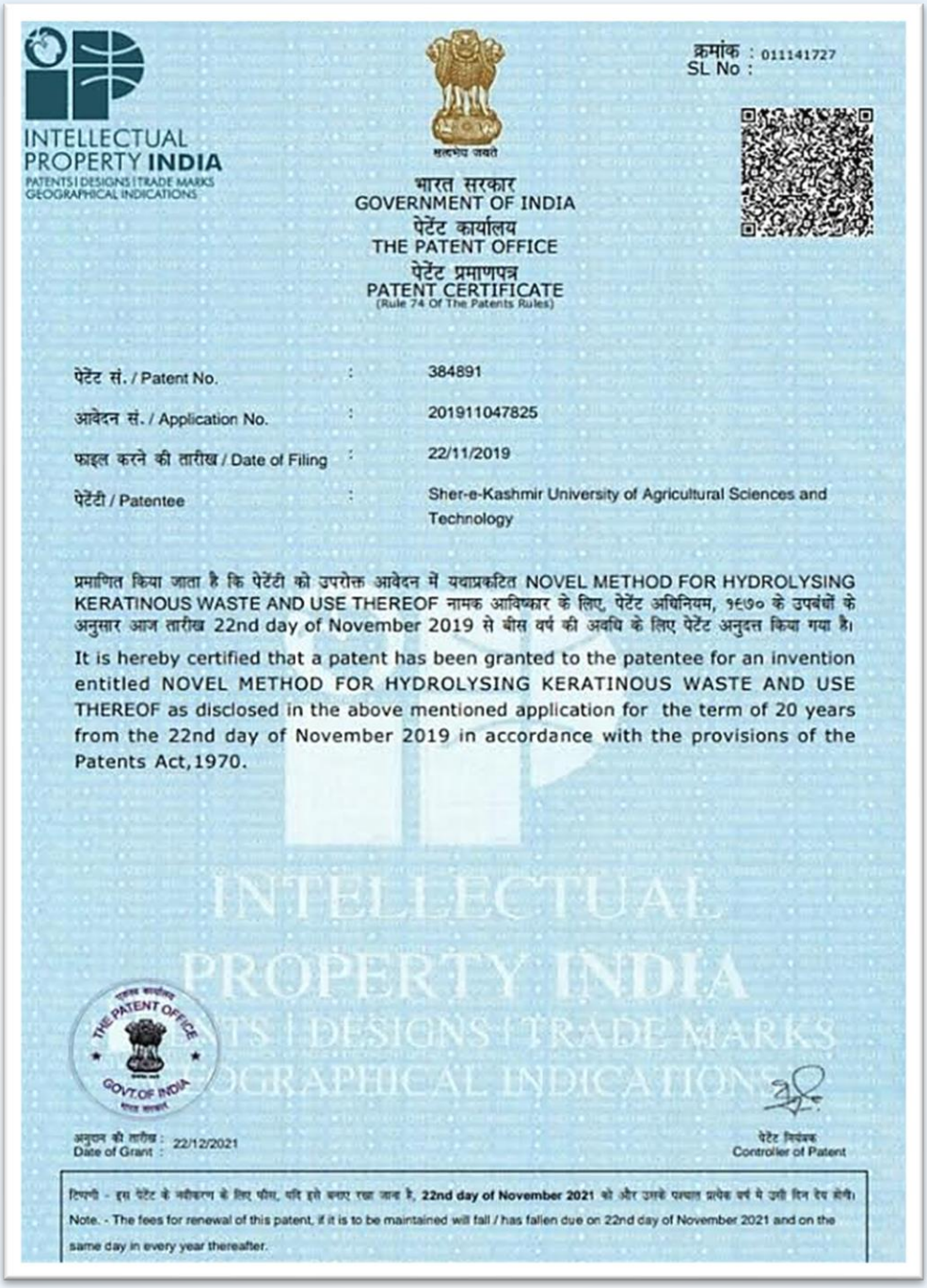
पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	:	340843
आवेदन सं. / Application No.	:	201611016121
फाइल करने की तारीख / Date of Filing	:	09/05/2016
पेटेंटी / Patentee	:	SHER-E-KASHMIR UNIVERSITY OF AGRICULTURAL SCIENCES AND TECHNOLOGY OF KASHMIR

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित MISTLETOE ERADICATOR नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 9th day of May 2016 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled MISTLETOE ERADICATOR as disclosed in the above mentioned application for the term of 20 years from the 9th day of May 2016 in accordance with the provisions of the Patents Act,1970.

Patent for “A device for controlling mistletoe in walnut and other trees”
(Dr. Khursheed Ahmad)



INTELLECTUAL PROPERTY INDIA
PATENTS | DESIGNS | TRADE MARKS
GEOGRAPHICAL INDICATIONS

सत्यमेव जयते

क्रमांक : 011141727
SL No :

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पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	:	384891
आवेदन सं. / Application No.	:	201911047825
फाइल करने की तारीख / Date of Filing	:	22/11/2019
पेटेंटी / Patentee	:	Sher-e-Kashmir University of Agricultural Sciences and Technology

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित NOVEL METHOD FOR HYDROLYSING KERATINOUS WASTE AND USE THEREOF नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 22nd day of November 2019 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled NOVEL METHOD FOR HYDROLYSING KERATINOUS WASTE AND USE THEREOF as disclosed in the above mentioned application for the term of 20 years from the 22nd day of November 2019 in accordance with the provisions of the Patents Act,1970.

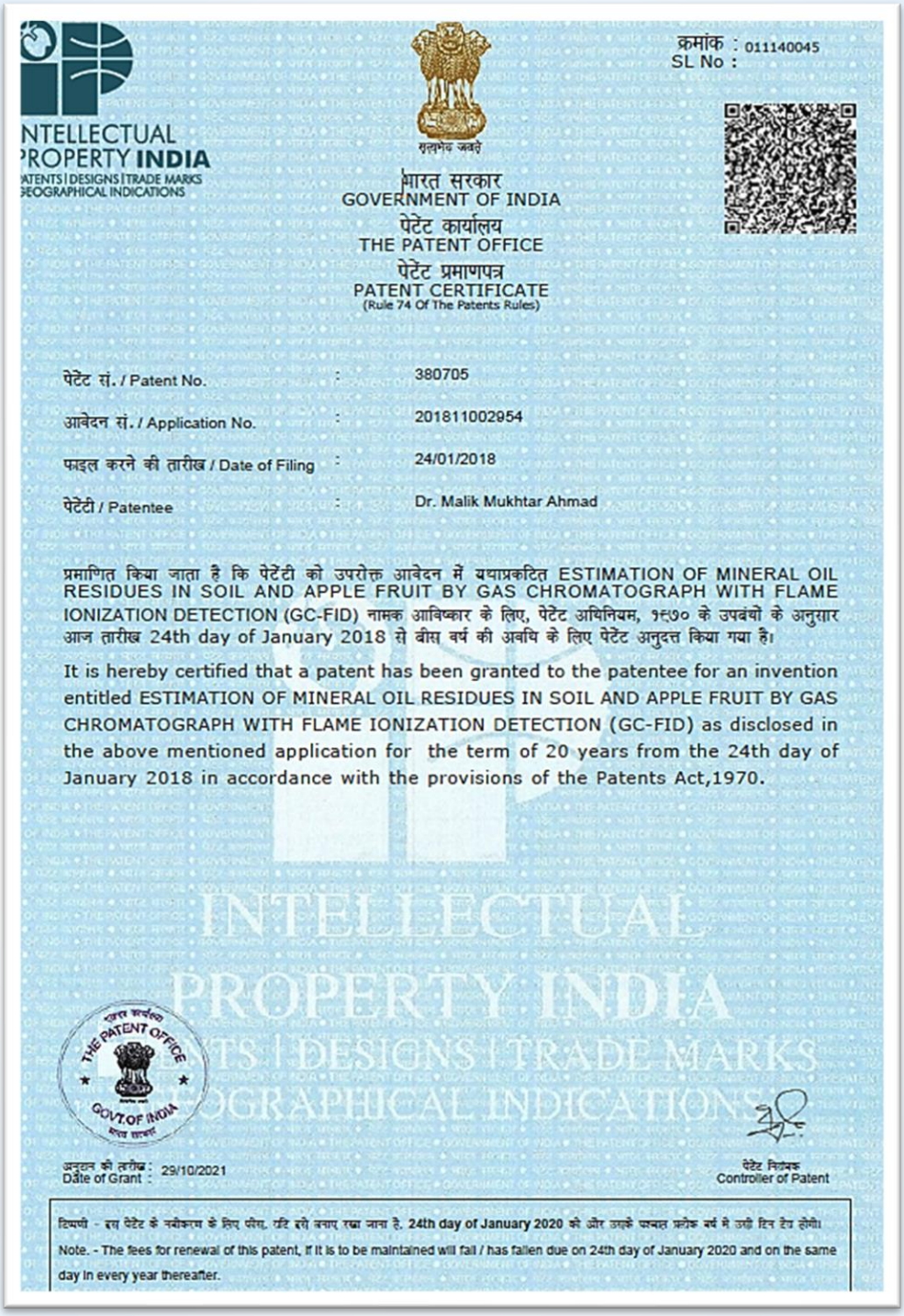
THE PATENT OFFICE GOVT.OF INDIA

अनुदान की तारीख : 22/12/2021
Date of Grant :

पेटेंट नियंत्रक
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, **22nd day of November 2021** को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 22nd day of November 2021 and on the same day in every year thereafter.

Patent for Novel method for hydrolysing keratinous waste and their use thereof.
(Prof. Imtiaz Murtaza)



क्रमांक : 011140045
SL No :

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THE PATENT OFFICE

पेटेंट प्रमाणपत्र
PATENT CERTIFICATE
(Rule 74 Of The Patents Rules)

पेटेंट सं. / Patent No.	:	380705
आवेदन सं. / Application No.	:	201811002954
फाइल करने की तारीख / Date of Filing	:	24/01/2018
पेटेंटी / Patentee	:	Dr. Malik Mukhtar Ahmad

प्रमाणित किया जाता है कि पेटेंटी को उपरोक्त आवेदन में यथाप्रकटित ESTIMATION OF MINERAL OIL RESIDUES IN SOIL AND APPLE FRUIT BY GAS CHROMATOGRAPH WITH FLAME IONIZATION DETECTION (GC-FID) नामक आविष्कार के लिए, पेटेंट अधिनियम, १९७० के उपबंधों के अनुसार आज तारीख 24th day of January 2018 से बीस वर्ष की अवधि के लिए पेटेंट अनुदत्त किया गया है।

It is hereby certified that a patent has been granted to the patentee for an invention entitled ESTIMATION OF MINERAL OIL RESIDUES IN SOIL AND APPLE FRUIT BY GAS CHROMATOGRAPH WITH FLAME IONIZATION DETECTION (GC-FID) as disclosed in the above mentioned application for the term of 20 years from the 24th day of January 2018 in accordance with the provisions of the Patents Act,1970.

THE PATENT OFFICE GOVT OF INDIA

अनुदान की तारीख : 29/10/2021
Date of Grant :

पेटेंट नियंत्रक
Controller of Patent

टिप्पणी - इस पेटेंट के नवीकरण के लिए फीस, यदि इसे बनाए रखा जाना है, 24th day of January 2020 को और उसके पश्चात प्रत्येक वर्ष में उसी दिन देय होगी।
Note. - The fees for renewal of this patent, if it is to be maintained will fall / has fallen due on 24th day of January 2020 and on the same day in every year thereafter.

Patent for "Estimation of mineral oil residues in soil and apple fruit by gas chromatograph with flame ionization detection" (Dr Malik Mukhtar)

US007815903B2

(12) **United States Patent**
Khan et al.

(10) **Patent No.: US 7,815,903 B2**
(45) **Date of Patent: Oct. 19, 2010**

(54) **PROCESS FOR COMMERCIAL PRODUCTION OF BIOPESTICIDES**

(75) Inventors: **Mujeebur Rahman Khan**, Aligarh (IN); **Shahana Majid**, Aligarh (IN); **Fayaz Ahmad Mohiddin**, Aligarh (IN); **Nabilah Khan**, Aligarh (IN)

(73) Assignees: **Aligarh Muslim University**, Aligarh (IN); **Department of Biotechnology**, New Delhi (IN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1174 days.

(21) Appl. No.: **11/393,246**

(22) Filed: **Mar. 30, 2006**

(65) **Prior Publication Data**

US 2006/0292124 A1 Dec. 28, 2006

(51) **Int. Cl.**
A01N 3/04 (2006.01)
A01N 63/00 (2006.01)
G01N 33/569 (2006.01)

(52) **U.S. Cl.** **424/93.4**; 424/93.5; 435/7.32; 435/7.31; 504/117

(58) **Field of Classification Search** ..... None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,117,136	A *	9/1978	Hisada et al.	514/291
4,837,155	A *	6/1989	Tabachnik	435/256.8
5,332,673	A *	7/1994	Harris et al.	435/253.3
5,962,305	A *	10/1999	Mihara et al.	435/262.5
6,511,821	B2 *	1/2003	Singh et al.	435/42
2005/0182129	A1 *	8/2005	Ikeda et al.	514/450

FOREIGN PATENT DOCUMENTS

WO	WO 2005/121314	*	12/2005

OTHER PUBLICATIONS

Siddiqui et al. (Journal of Plant Diseases and Protection; Mar. 2005; 112 (12): 146-155).*

* cited by examiner

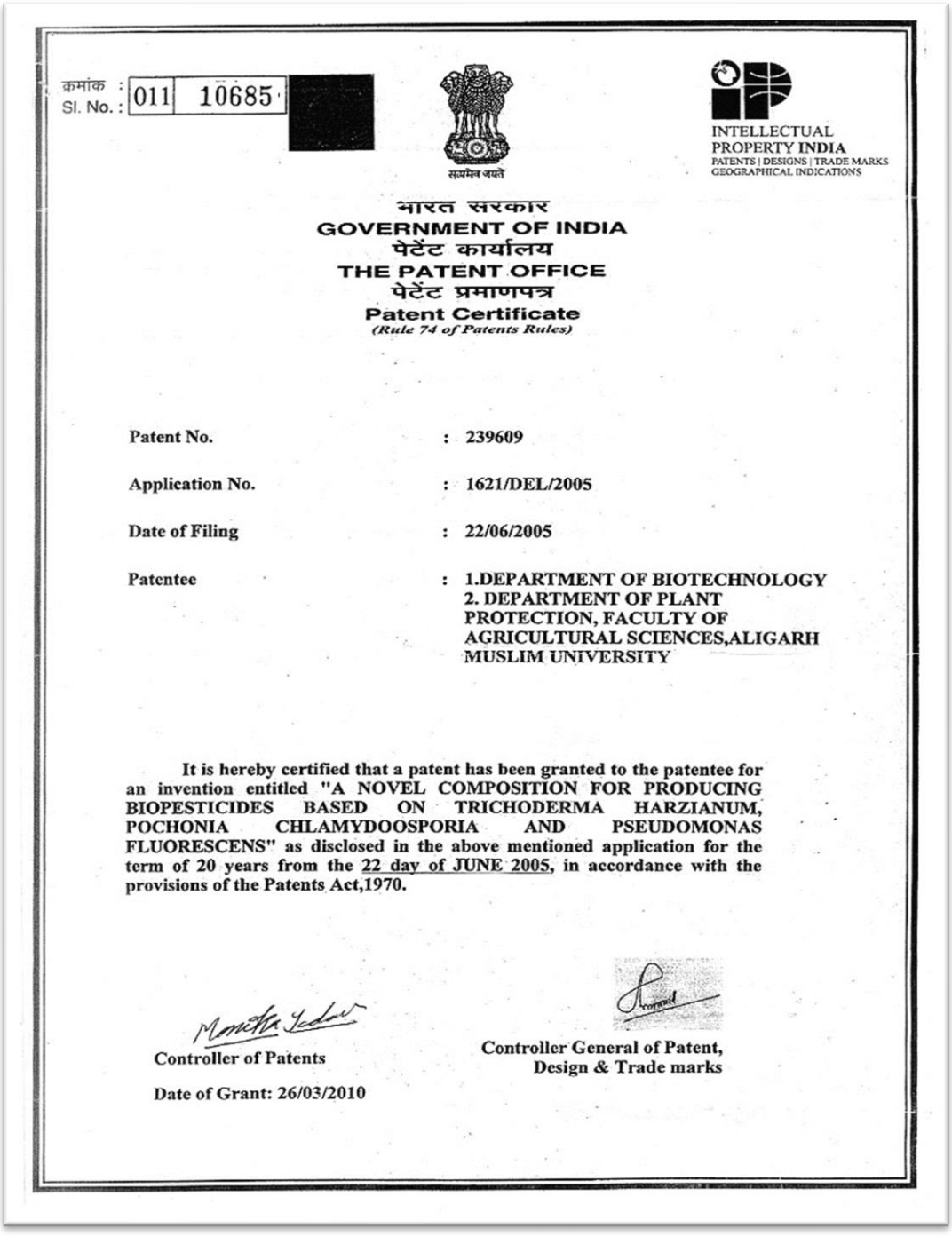
Primary Examiner—Shanon A Foley
(74) *Attorney, Agent, or Firm*—The Webb Law Firm

(57) **ABSTRACT**

The invention relates to a process for producing biopesticides based on *Trichoderma harzianum, Pochonia chlamydosporia* and *Pseudomonas fluorescens* comprising preparing mass or stock culture of biocontrol fungi and bacteria on sawdust, soil and molasses mixture, and then immobilizing the bioagents in a flyable based carrier.

10 Claims, No Drawings

US Patent for: “Process for commercial production of biopesticides” (Dr.FA Mohidin)



क्रमांक : 011 10685
Sl. No. :

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THE PATENT OFFICE
पेटेंट प्रमाणपत्र
Patent Certificate
(Rule 74 of Patents Rules)

Patent No. : 239609

Application No. : 1621/DEL/2005

Date of Filing : 22/06/2005

Patentee : 1.DEPARTMENT OF BIOTECHNOLOGY
2. DEPARTMENT OF PLANT PROTECTION, FACULTY OF AGRICULTURAL SCIENCES,ALIGARH MUSLIM UNIVERSITY

It is hereby certified that a patent has been granted to the patentee for an invention entitled "A NOVEL COMPOSITION FOR PRODUCING BIOPESTICIDES BASED ON TRICHODERMA HARZIANUM, POCHONIA CHLAMYDOOSPORIA AND PSEUDOMONAS FLUORESCENS" as disclosed in the above mentioned application for the term of 20 years from the 22 day of JUNE 2005, in accordance with the provisions of the Patents Act,1970.

Controller of Patents

Date of Grant: 26/03/2010

Controller General of Patent, Design & Trade marks

Patent for: "A novel composition for producing biopesticides based on trichoderma harzianim, pochonia chlamydoosporia and pseudomonas fluorescens."
(Dr FA Mohiudin)

Copyright Office
Government of India

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Extracts
from the Register
of Copyrights

Dated : 01/09/2020

1.	Registration Number	:	**SW-13652/2020**
2.	Name, address and nationality of the applicant	:	DR. AMBREEN HAMADANI , KURSOO RAJBAGH EXTENSION, NEAR HURRIYAT, SRINAGAR, J&K-190008 INDIAN PROF NAZIR AHMAD GANAI , SKUAST-K SHALIMAR 190025, J&K, INDIA-190025 INDIAN
3.	Nature of the applicant's interest in the copyright of the work	:	AUTHOR
4.	Class and description of the work	:	COMPUTER SOFTWARE WORK
5.	Title of the work	:	AI DRIVEN FARM MANAGEMENT INFORMATION SYSTEM AND BREEDING TOOL (SMART SHEEP BREEDER)
6.	Language of the work	:	PHP, JAVASCRIPT (WITH HTML, CSS, JQUERY), PYTHON, R , JAVA, MYSQL
7.	Name, address and nationality of the author and if the author is deceased, date of his decease	:	DR. AMBREEN HAMADANI , KURSOO RAJBAGH EXTENSION, NEAR HURRIYAT, SRINAGAR, J&K-190008 INDIAN PROF NAZIR AHMAD GANAI , SKUAST-K SHALIMAR 190025, J&K, INDIA-190025 INDIAN
8.	Whether the work is published or unpublished	:	PUBLISHED
9.	Year and country of first publication and name, address and nationality of the publisher	:	2018 INDIA DR. AMBREEN HAMADANI , KURSOO RAJBAGH EXTENSION, NEAR HURRIYAT, SRINAGAR, J&K-190008 INDIAN 2018 INDIA PROF NAZIR AHMAD GANAI , SKUAST-K SHALIMAR 190025, J&K, INDIA-190025 INDIAN
10.	Years and countries of subsequent publications, if any, and names, addresses and nationalities of the publishers	:	N.A.
11.	Names, addresses and nationalities of the owners of various rights comprising the copyright in the work and the extent of rights held by each, together with particulars of assignments and licences, if any	:	DR. AMBREEN HAMADANI , KURSOO RAJBAGH EXTENSION, NEAR HURRIYAT, SRINAGAR, J&K-190008 INDIAN PROF NAZIR AHMAD GANAI , SKUAST-K SHALIMAR 190025, J&K, INDIA-190025 INDIAN
12.	Names, addresses and nationalities of other persons, if any, authorised to assign or licence of rights comprising the copyright	:	N.A.
13.	If the work is an 'Artistic work', the location of the original work, including name, address and nationality of the person in possession of the work. (In the case of an architectural work, the year of completion of the work should also be shown).	:	N.A.
14.	If the work is an 'Artistic work' which is used or capable of being used in relation to any goods or services, the application should include a certification from the Registrar of Trade Marks in terms of the provision to Sub-Section (i) of Section 45 of the Copyright Act, 1957.	:	N.A.
15.	If the work is an 'Artistic work', whether it is registered under the Designs Act 2000 if yes give details.	:	N.A.
16.	If the work is an 'Artistic work', capable of being registered as a design under the Designs Act 2000,whether it has been applied to an industrial process and ,if yes ,the number of times	:	N.A.
17.		:	

10207/2020-CO/SW

Date of Application : 24/07/2020

Date of Receipt : 24/07/2020

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DEPUTY REGISTRAR OF COPYRIGHTS

Copyright for "AI driven farm management information system and breeding tool (Smart Sheep Breeder)"
(Dr. Ambreen Hamadani & Prof Nazir A Ganai)

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BAND-EXCELLENT
UNDER ATAL INNOVATION RANKING
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