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ICAR

VIKSIT KRISHI SANKALP ABHIYAN

IMPACTFUL FARMER-LED INNOVATIONS

Indian Council of Agricultural Research
New Delhi

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Division of Agricultural Extension
Indian Council of Agricultural Research
New Delhi

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MESSAGE

Shivraj Singh Chouhan
Union Minister of Agriculture & Farmers' Welfare,
Government of India

THE spirit of *Aatma-nirbhar Krishi* and the vision of a *Viksit Bharat* by 2047 underpin our government's commitment to the transformation of Indian agriculture. The *Viksit Krishi Sankalp Abhiyan* (VKSA) 2025, was not just a campaign, it was a movement. Spanning across 728 districts, engaging over 1.35 crore farmers, and facilitated by thousands of scientists and extension personnel, it became a unique platform to understand grassroots realities, disseminate information, and co-create solutions.

Farmer-led innovation involves farmers creating, adapting, and sharing new farming practices, techniques, or products to solve specific agricultural challenges and improve yields. The utilities of such innovations are significant, fostering increased income, improved food security, enhanced resilience to environmental changes, more sustainable agricultural practices, and the creation of robust farmer networks through peer learning. This publication is a tribute to the *innovative spirit* of Indian farmers, especially with reference to their resilience, ingenuity, and adaptability in the face of ever-evolving challenges. From sustainable practices and climate-resilient crops to disruptive digital solutions and tradition-based ingenuity, the compendium reflects real-world innovations at the grassroots that hold the potential to re-shape Indian agriculture.

As Indian agriculture moves towards robust productivity, sustainability, and global competitiveness, it is imperative to integrate modern science, digital technologies, experiential knowledge, and policy support. The empowerment of farmers through grassroots innovation, extension networks, and supportive government programs will continue to be the pillar of the nation's progress. The VKSA, and farmer-led innovations showcased in this publication, exemplify the power of partnership between science and tradition, ensuring the sector remains a key driver in shaping a prosperous, resilient, and developed India by 2047.

I sincerely hope this publication inspires policymakers, scientists, extension workers, entrepreneurs, and most importantly, farmers themselves to pursue and scale farmer-led innovations for the benefit of all.

(Shivraj Singh Chouhan)

MESSAGE

Bhagirath Choudhary
Union Minister of State for Agriculture & Farmers' Welfare,
Government of India

THE *Viksit Krishi Sankalp Abhiyan,* carried out from May 29 to June 12, 2025, has been a landmark movement that brought together the scientific community, extension agencies, and farmers onto a common platform. During VKSA, our teams witnessed inspiring examples of grassroots creativity, an evidence that innovation thrives not only in laboratories, but also in the fields and villages of India.

This compendium is a celebration of *farmers' innovations,* in terms of practical solutions that address immediate on-ground problems, improve livelihoods, and foster sustainability. Farmer-led innovation refers to a process where farmers actively engage in identifying agricultural problems, designing solutions, implementing experiments, and sharing successful practices, often in collaboration with researchers and other stakeholders. This approach recognizes and leverages farmers' experiential knowledge and creativity in addressing local challenges and improving farming systems. Many of these innovations, ranging from low-cost resource-conserving tools to ingenious pest management practices, have the potential to be replicated across States and UTs, thereby furthering the goal of inclusive and sustainable agricultural growth.

I congratulate each and every farmer whose work is showcased here and express gratitude to the scientists and officials of ICAR and partner organizations for documenting these innovations. Let us commit to strengthening the science-farmer-policy linkages and to nurturing the bold ideas of our farming community. May this inspiring documentation spark a movement towards collective progress in Indian agriculture.

(Bhagirath Choudhary)

MESSAGE

Ram Nath Thakur
Union Minister of State for Agriculture & Farmers' Welfare,
Government of India

THE *Viksit Krishi Sankalp Abhiyan* (VKSA), conducted from May 29 to June 12, 2025, marked a significant milestone in Indian agriculture. It successfully brought together farmers, scientists, extension agencies, and stakeholders onto a shared platform, highlighting the power of collaboration in driving agricultural transformation. During this initiative, our teams captured remarkable examples of grassroots innovation—clear evidence that creativity and problem-solving thrive not only in research institutions but also in the fields and villages of India. These farmer-led innovations demonstrate the immense value of experiential knowledge and practical ingenuity in addressing local agricultural challenges.

This compendium is a celebration of such innovations—practical, low-cost, and sustainable solutions developed by farmers to improve productivity, livelihoods, and resilience. These include a wide range of interventions, from resource-efficient tools and climate-smart practices to novel pest management techniques and crop diversification strategies. What unites them is their origin in real-world experience and their potential for replication across States and Union Territories.

I extend my heartfelt congratulations to every farmer, whose work is featured in this compendium. Their creativity and commitment to sustainable agriculture are truly commendable. I also express deep appreciation to the scientists and officials from ICAR, KVKs and partner organizations, who have meticulously documented these innovations.

Let us collectively commit to strengthening the linkages between science, policy, and farming communities. May this compilation serve as both recognition and inspiration—fuelling a nationwide movement for inclusive, innovative, and resilient agricultural growth in India.

(Ram Nath Thakur)

MESSAGE

Devesh Chaturvedi
Secretary, Department of Agriculture & Farmers' Welfare,
Ministry of Agriculture & Farmers' Welfare,
Government of India

VIKSIT Krishi Sankalp Abhiyan (VKSA), a massive nationwide campaign conducted before the onset of *Kharif* 2025 to create awareness about improved agricultural practices, inform farmers about government schemes and policies, foster reciprocal learning between farmers and scientists, and gather local insights and feedback on technologies and capture farmer-led innovations.

VKSA was grounded in behavioural change theories, adult learning principles, and systems thinking, and it adopted a multi-level strategy extending from national planning to village-level implementation. The campaign was executed through a convergence-based approach called 'One Nation-One Agriculture-One Team', ensuring coordinated action across institutions.

Farmer-led innovation refers to a process where farmers actively engage in identifying agricultural problems, designing solutions, implementing experiments, and sharing successful practices, often in collaboration with researchers and other stakeholders. Many farmer-led innovations focus on using local resources efficiently, promoting sustainable practices like low-cost machines and integrated pest management, and developing climate-resilient farming systems. Farmer-led innovations can improve productivity, reduce input costs, enhance market access, and ultimately lead to increased household income and food security.

I place on record my sincere appreciation bringing out the compilation of impactful farm-led innovations, which will provide a medium that facilitate interaction and exchange between farmers and other stakeholders (e.g., researchers, extension agents) allow for the validation and dissemination of knowledge, enriching the understanding of problems and potential solutions.

I sincerely hope this compendium inspires policymakers, researchers, extension workers, entrepreneurs, and most importantly, farmers to recognize, support, and scale farmer-led innovations for the collective progress of Indian agriculture.

(Devesh Chaturvedi)

FOREWORD

Dr. M.L. Jat
Secretary, Department of Agricultural Research and Education,
Ministry of Agriculture & Farmers' Welfare, Government of India
& Director General, Indian Council of Agricultural Research

THE Indian Council of Agricultural Research (ICAR) has always believed that the pathway to agricultural excellence is paved with both scientific breakthroughs and farmer-led ingenuity. In fact, this campaign, aptly named as Viksit Krishi Sankalp Abhiyan 2025 provided an unprecedented opportunity to interact closely with 1.35 crores farmers, unearthing a wealth of innovative practices rooted in local knowledge, experimentation, and adaptation.

Farmer-led innovation strengthens individual farmers' confidence, knowledge, and skills to experiment and innovate, fostering a culture of continuous learning and adaptation within communities. Farmers, being intimately familiar with their local context, can develop and adapt innovations that are precisely suited to their specific ecological, economic, and social conditions. This compilation of farmer-led innovations, a result of rigorous documentation and cross-country collaboration, serves as a window into the vast creative potential that exists at the grassroots level. By cataloguing these innovations, ICAR seeks to not only honour the creative efforts of Indian farmers, but also to share scalable models that can benefit the wider agricultural community, in the long run.

The insights herein ought to encourage researchers to co-create more context-specific solutions with farmers and inspire extension agencies to promote farmer-to-farmer learning across the nation. The ICAR reaffirms its dedication to supporting such collaborative innovation ecosystems, accelerating the journey towards a resilient, prosperous, and sustainable agricultural sector for India. In fact, Directors of ICAR institutes may collaborate with such innovators; and facilitate in refining & validating those farmer-led innovations as well as coming out with practical solutions, thereby encouraging demand-driven research.

(M.L. Jat)

PREFACE

Innovation in Indian agriculture has long been perceived through the lens of formal research systems and institutional advancements. However, a parallel and equally potent current of transformation has been flowing silently across the country — powered by the ingenuity, lived experiences, and adaptive spirit of our farming communities. These *Farmers' Innovations* and *Grassroots Innovations,* often emerging from marginal conditions and driven by local needs, exemplify the tremendous capacity of rural India to design context-specific and sustainable solutions.

The *Viksit Krishi Sankalp Abhiyaan (VKSA),* held from *May 29 to June 12, 2025,* was a landmark & historic initiative undertaken across all States and Union Territories of India with the vision of shaping a resilient and self-reliant agricultural future for the nation. Conceived as part of the broader vision for *Viksit Bharat @2047,* the ***Abhiyaan*** mobilized millions of farmers, extension personnel, scientists, and development practitioners to engage in grassroots-level interactions, share local knowledge, and identify innovative practices that are transforming agriculture on the ground. A key focus of *VKSA-2025* was the *identification, documentation, and dissemination of grassroots-level innovations* developed by farmers. These innovations span a wide spectrum — from low-cost farm machinery, eco-friendly plant protection techniques, and improved livestock practices to indigenous crop varieties, organic formulations, and integrated farming models. What unites them all is their relevance, practicality, potential for replication and scaling-up across similar agro-ecological regions.

These frugal innovations reflect the wisdom, creativity, and resilience of rural communities who, driven by necessity and nurtured by deep ecological understanding, are crafting unique and sustainable solutions to the emerging challenges.

This publication seeks to showcase a curated compilation of such innovations, identified through the concerted efforts of *National Agricultural Research Education & Extension (NAREE) System, viz. ICAR institutions, State Agricultural Universities (SAUs), Central Agriculture Universities (CAUs),* and *Krishi Vigyan Kendras (KVKs),* while partnering grassroots organizations during the course of *VKSA-2025.* Categorized thematically, the innovations presented here offer deep insights into *farmer-led experimentation, resilience-building,* and *agro-ecological intelligence.*

This compilation presents a bunch of such innovations identified during *VKSA-2025.* Categorized thematically, these examples offer powerful insights into *farmer-led ingenuity* in areas such as innovations related to Natural Resource Management & Field Crops, Horticulture, Livestock & Animal Science, Farm Mechanization & Post-Harvest Engineering, Plant Protection, and miscellaneous in nature.

We hope this publication not only serves as a repository of knowledge and inspiration but also contributes meaningfully to *mainstreaming grassroots innovations* into research, extension, and policy frameworks. By bridging the gap between formal and informal systems of innovation, we can ensure that the vision of a *self-reliant, inclusive, and technologically empowered agricultural sector* becomes a reality.

By documenting these innovations, this publication aims to:

- Recognize and honour the creative contributions of Innovative farmers,
- Facilitate wider awareness, adoption, and adaptation of locally-developed solutions, and
- Strengthen the linkages between formal agricultural research-extension systems and grassroots innovation networks.

We acknowledge the support and cooperation of all the scientists and extension agencies of NAREE System, who facilitated in capturing these *"Innovations",* at the grassroots level. Their collective energy and commitment continue to reaffirm the potential of India's farming community as the true engine of agricultural transformation. Further, we also extend our sincere appreciation to all participating farmers and field functionaries whose enthusiastic participation and valuable contributions form the backbone of this effort. Their stories serve as a reminder that innovation is not confined to laboratories, but often flourishes in the fields, powered by necessity, observation, and perseverance.

We hope that this compendium will be quite useful for policy-makers, researchers, extension agencies, and development practitioners to *mainstream farmer innovations* as a vital component of agricultural development. In doing so, this publication also contributes towards building a more inclusive innovation ecosystem in agriculture — one that is rooted in field realities and shaped by the participation of those who live and work closest to the land; and refined further by researchers to upscale these frugal innovations among farming community.

Editors

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Introduction

The application of ideas, knowledge, or practices that are new to a particular context aimed at creating positive change to address pressing needs, overcome persistent challenges, or seize emerging opportunities constitutes innovation. In the context of agriculture, where production systems are inherently diverse, highly dynamic, and increasingly vulnerable to both biotic and abiotic stresses, innovation is not just an advantage but a necessity too. True agricultural innovation involves the application of all forms of knowledge such as scientific insights, experiential skills, indigenous practices, and intuitive understanding to achieve socially relevant and economically viable outcomes. This becomes especially important within the complex and evolving realities of rural landscapes, where farmers constantly navigate uncertainty, risks, and changing socio-economic conditions.

The transformation of Indian agriculture is rooted in the ability of farmers to innovate at the grassroots. *Farmers' Innovations* refer to the creative solutions, new techniques, adaptations, and technologies devised or customized by farmers to meet local agronomic, environmental, and socio-economic realities. These innovations are crucial for sustainable income growth, climate resilience, and national food security. The *VIKSIT KRISHI SANKALP ABHIYAAN (VKSA-2025),* conducted nationwide from May 29 to June 12, 2025, embodies this spirit by connecting scientists and extension agents with farmers to promote, document, and disseminate such innovations directly at the field level.

Understanding Farmers' Field-level Innovations

Definition and Scope

Farmers' Innovations include new practices, reconfiguration of traditional systems, use of modern tools, adoption of novel crop varieties, soil conservation methods, low-cost mechanization, and smart water/nutrient management. These can be incremental (improving existing techniques) or disruptive (introducing entirely new methods). As a process, the innovation produces inventions that may involve new ideas, new technologies, or novel applications of existing technologies, new processes or institutions, or more generally, new ways of doing things in a place or by people where they have not been used before. Eventually the application of all types of knowledge, insights and intuitions to achieve the desired social or economic outcome constitutes an innovation in real sense.

Innovation, thus, has to be viewed in a broader context e.g. multidisciplinary and multi-stakeholder system geared to enhance productivity, income of the farmers, inclusiveness, livelihood security, input-use efficiency, climate resilience and ecological/environmental sustainability. In fact, innovations that are socially appropriate, economically beneficial and competitive will work better in any society.

Drivers of Innovation

- *Necessity:* Pressing local challenges (drought, pests, low productivity) encourage experimentation.
- *Resource limitations:* Scarcity of inputs prompts creative problem-solving.
- *Support:* Programmes like VKSA facilitate innovation through exposure, technical support, and peer exchange.

Processes and Key Features

- Local adaptation and trials in real-world field conditions.
- Integration of indigenous knowledge with modern science (e.g., blending bio-fertilizers with precision irrigation).
- Open sharing, peer-to-peer learning, and extension via demonstration plots, Farmer Field Schools, and innovation networks.

Conceptual Framework: How Farmers' Innovations Emerge and Scale ?

Core Components

» *Innovation Process:* Farmer identifies problem → experiments with a solution → trials and adapts → shares outcome → extension services support diffusion.
» *Learning by Doing:* Repeated trials and participatory research build skill and confidence.
» *Feedback Loops:* Networking with peers, scientists, and market actors refines innovations.
» *Enabling Environment:* Policy, credit, institutions, and digital tools catalyze adoption and scaling.

Key Theoretical Insights

» *Adoption is Dynamic:* Farmers' decisions evolve through risk-reward assessments, trial outcomes, and peer influences.
» *Role of Social Networks:* Farmer-to-farmer extension and community validation essential for widespread diffusion.
» *Multi-actor Collaboration:* Synergy between farmers, KVKs, FPOs, agri-tech startups, and scientists drives impact

Implications

One of the important objectives of VKSA was to capture the innovations developed by farmers. Further, the focus will be on the process of refinement & validation of such innovations as well as exploring its scope & potential for upscaling and/or out scaling. The success of VKSA-2025 is poised to shape future strategies for the diffusion of farmer innovations in India in significant ways:

1. Evidence-Based Policy Formulation

VKSA-2025, through its extensive field-level engagements and innovation documentation, provides large-scale, real-world data on what works in diverse agro-climatic settings. Policymakers can now design targeted interventions, focusing on scaling innovations with demonstrated local impact and adaptability, rather than relying solely on top-down recommendations.

2. Strengthening the Farmer–Scientist–Extension Ecosystem

The campaign's model of direct village outreach by scientists and agricultural officers sets a new standard for collaborative knowledge exchange, ensuring that farmer innovations are validated, scientifically refined, and rapidly disseminated through extension networks. This approach encourages continuous feedback, mutual learning, and real-time troubleshooting.

3. Promotion of Peer Learning and Farmer-Led Diffusion

VKSA-2025 highlights the power of farmer-to-farmer dissemination. Farmer innovators become ambassadors, demonstrating techniques in their communities, and creating innovation hubs that accelerate grassroots diffusion. Future strategies will invest more in strengthening such informal networks and platforms for peer learning.

4. Leveraging Digital and Social Platforms

VKSA-2025's use of digital tools for documentation, recognition, and communication has underscored the importance of digital infrastructure in spreading innovations. Future diffusion strategies will likely integrate mobile advisory, e-extension, and social media campaigns to amplify reach, particularly to women and marginalized farmers.

5. Incentivizing Localized Innovation

By publicly recognizing and rewarding innovative farmers, VKSA-2025 fosters a culture of experimentation and risk-taking. Future strategies will include robust incentive mechanisms—awards, grants, and scale-up funding—to stimulate continuous local problem-solving and adaptation.

6. Ensuring Equity and Inclusion

The campaign's deliberate outreach to remote, climate-vulnerable, and marginalized communities demonstrates that inclusive innovation diffusion is possible and effective. Future strategies will prioritize equity, ensuring benefits reach all socio-economic segments, regions, and genders.

7. Facilitating Multi-Stakeholders Collaboration

The collaborative framework employed during VKSA-2025, while engaging all the concerned stakeholders, including farmers, scientists, extension agents, start-ups, FPOs, and policymakers, will form the template for multi-actor partnerships in future campaigns, enhancing synergy and resource leveraging.

8. Enabling Ecosystems for Farmer Innovation

For farmers' innovations to thrive, it is essential to create enabling ecosystems. Innovation must be supported as a process, not merely an output, through responsive policies, inclusive platforms, and farmer-friendly institutions. This includes investing in agricultural extension systems, rural skill hubs, innovation incubation centres, and local knowledge networks. Local governments, State Departments of Agriculture, ***Krishi Vigyan Kendras*** (KVKs), and other institutions must serve as enablers, helping farmers overcome institutional bottlenecks and market access barriers while facilitating access to credit, insurance, digital services, and knowledge resources. Despite commendable progress in food grain production and technological dissemination, India continues to grapple with challenges like undernutrition, rural unemployment, low profitability, natural resource degradation, and climate vulnerability. These issues cannot be addressed by top-down approaches alone. A farmer-centric, bottom-up, and demand-driven innovation ecosystem is essential, one that recognizes the creativity and knowledge of rural innovators and builds on their experiences to co-create solutions.

9. Empowering Farmer Collectives and Peer Learning

One promising approach is to strengthen farmer collectives such as cooperatives and FPOs, which can help farmers achieve economies of scale, improve bargaining power, and gain better access to quality inputs, technology, and market linkages. These collectives can serve as platforms for peer-to-peer learning, co-creation of innovations, and shared problem-solving.

10. Recognizing and Scaling Farmers' Innovations

Successful farmer innovations are often spearheaded by individuals who possess extraordinary creativity, determination, and a deep understanding of local challenges. These farmer-innovators identify critical constraints, and subsequently experiment with tools, ideas, or practices, and devise workable and replicable solutions. Many of these farmers engage with researchers, extension agents, NGOs, or public institutions to refine, validate, and scale their innovations.

Refinement and validation of Farmers' Innovations

Farmers' innovations, though often highly practical and locally effective, benefit significantly from scientific validation to ensure broader applicability, safety, and performance under diverse conditions. Research institutions play a critical role in assessing, refining, and enhancing these innovations through systematic trials and expert analysis. Validation not only lends credibility to farmer-developed solutions but also facilitates their integration into mainstream extension and policy frameworks. Strengthening farmer-researcher partnerships is thus essential for scaling impactful innovations and bridging grassroots ingenuity with scientific rigour. VKSA-2025 demonstrated the power of grassroots innovation and structured outreach in shaping a sustainable, productive, and inclusive agricultural future for India. The field-driven methods, as adopted during VKSA-2025 focus on grassroots validation, digital integration, and inclusive recognition will inform and inspire future innovation diffusion strategies. These strategies will become more participatory, data-driven, digital, equitable, and collaboration-oriented, thereby transforming not just how innovations are scaled, but who benefits from them and how quickly they are adopted across India's vast and diverse agricultural landscape.

In this light, agricultural innovation must be understood through a broad, multi-disciplinary, and multi-stakeholder lens. Its value lies not only in boosting productivity or income but also in enhancing inclusion, resource efficiency, gender equity, livelihood security, climate resilience, and environmental stewardship. Farmer innovation is therefore deeply intertwined with the achievement of multiple Sustainable Development Goals (SDGs), especially those related to hunger eradication, poverty reduction, clean water, climate action, responsible consumption, and strong institutions. In developing economies like India, these grassroots innovations are vital. Structural challenges such as credit constraints, weak infrastructure, fragile institutions, and limited access to markets make it difficult for many farmers to adopt top-down, externally imposed solutions. In such scenarios, farmer-led, low-cost, and resource-efficient innovations developed through lived experience and local insight offer the most realistic and sustainable options.

Capturing the Farmers' Innovations during VKSA

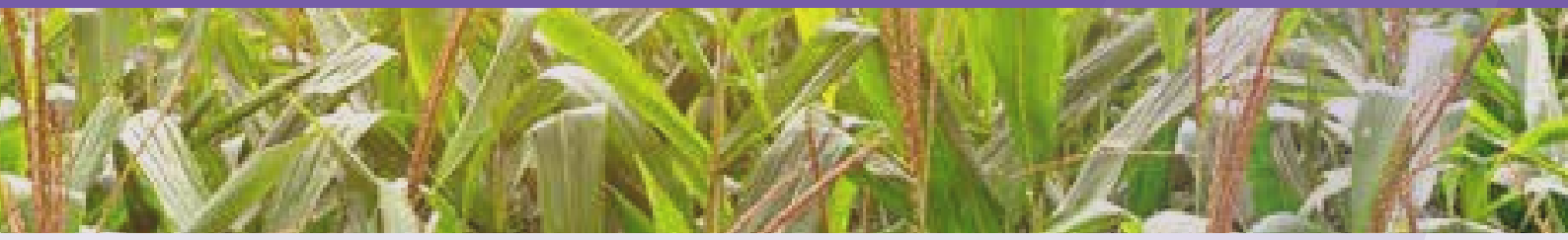
The ***Viksit Krishi Sankalp Abhiyan*** (VKSA) brought to light the immense creativity and problem-solving capacity that lies at the grassroots level. These innovations, spanning crops, livestock, water, inputs, and social systems, highlight the extraordinary contribution of farmers to national development and rural resilience. Going forward, these farmer-led innovations must serve as inspiration and building blocks for shaping a more inclusive, efficient, and climate-resilient agricultural system. By investing in the creativity and capacities of farmers and empowering them as innovators, India can unlock the full potential of its agricultural sector, ensuring a more secure, equitable, and sustainable future for all.

PART-I

PART - I

Innovations related to Natural Resource Management and Field Crops

This category includes practices, tools, machines, and equipment developed or modified by farmers to reduce labour, improve efficiency, and make farming operations more cost-effective. Focus Areas: Tillage, planting, weeding, irrigation, and conservation of traditional crops and varieties.



1. From Puddles to Precision: Passion for developing Multi-Functional Agricultural Machines for Resource-Efficient Farming

Profile of Innovator

Name	:	Rajender Singh Punia
Age	:	48 Years
Education	:	12th
Experience	:	30 Years
Contact Details	:	Satrod, District-Hisar, Haryana
Mobile No	:	9992230963

Brief Description of the Innovation

Facing severe shortages of machinery, labour, and funds for traditional puddled transplanting of paddy—an exhausting, costly, and time-consuming method—the farmer drew upon his lifelong passion for tractors and mechanical maintenance. In 2015, Sh. Rajender Punia adopted Direct Seeded Rice (DSR) using a seed-cum-fertilizer drill, bypassing the need for puddling and nursery transplanting. Then in May 2020, amid an acute labour scarcity for transplanting, he designed his own DSR implement and achieved excellent germination and efficiency. Building on that success, he further refined the machine by integrating a rotavator, enhancing soil preparation and seeding effectiveness. Since then, his self-designed DSR machine has performed consistently with full efficacy. He didn't stop there—he also innovated a multipurpose, self-propelled weeder and sprayer, tackling both weed control and spraying in one adaptable tool.

Technical Specifications of Innovations

i) The custom-built DSR machine enables direct paddy sowing in both wattar (moist) and dry conditions and is compatible with a rotavator attachment. The lightweight, self-propelled locally crafted ***desi jugaad*** "Tarzan" integrates functions such as soil puddling, crust breaking, algae removal, weed control, fertilizer drilling (DAP/NPK near root zone), straw bundling, boom spraying, and top-leaf cutting—all without a tractor.

ii) Modified DSR Machine priced competitively at 80,000– 90,000 (excluding rotavator) has adjustable seed-depth control and ensures uniform placement with exceptional 95–100% germination. This

Boom spraying by using multipurpose self made tractor

Innovator's multi-purpose jugad in action under field-conditions

machine efficiently breaks soil crusts and hard pans, significantly reduces water and diesel usage, and enhances yields by 5–6 quintals per hectare over traditional transplanting. Notably, fertilizer efficiency is boosted, with the farmer applying lesser urea dosage.

iii) The "Tarzan" is a locally crafted, self-propelled, tractor-free machine priced around ₹3.25 lakh, and built with a lightweight modular configuration. It performs a host of functions—soil puddling, crust breaking, algae removal, weed control, fertilizer drilling (DAP/NPK near the root zone), boom spraying etc.—all with low diesel consumption. It achieves 70–80% weed reduction, making it particularly beneficial in chemical-free or organic farming systems.

iv) He also designed and developed super power fan for grain cleaning, he got patent on this machine. He also developed his own workshop where he works with 'out of box' approach. This cleaner is having efficiency of 120-150 Q/Hr. capacity and cleans seeds of wheat, paddy, guar, bajra, barley, etc.

Potential of Innovation for Wider Reach/Out Scaling

This innovation promises great value for rice-growing regions in Haryana, Punjab, and Rajasthan.

Custom built DSR machine fitted on jugad

Design and development of super power fan for grain cleaning in bulk

With modest adaptations, it can be extended to other crops for year-round, scalable use. Its standout advantages—saving time, reducing costs, and addressing labour shortages, rising fuel prices, and fertilizer inefficiencies—make it exceptionally well-suited for the realities of today's farming landscape.

Scientific Validation Required

Yes, while the field performance of these technologies has been promising, rigorous scientific validation is essential to establish a reliable database detailing yield and economic advantages, as well as any improvements in fertilizer use efficiency relative to conventional methods. Conducting long-term trials that assess soil health and productivity impacts is also critical to enable wider adoption of the integrated mechanization approach.

Multi - Functional machines for various opreations

Integrated Machanization approach for promotion of DSR

Domain

Integrated farm mechanization optimizes sustainable rice production by enhancing nutrient placement, improving water-use efficiency, and streamlining weed management. There innovation have vast scope in paddy-growing areas of Northern India.

2. Single Bud Sugarcane Propagation: Accelerated Seed Multiplication at Reduced Cost

Profile of Innovator

Name : Jagbir Singh
Age : 53 Years
Education : Postgraduate
Experience : 08 Years
Contact Details : Village-Gagsina, Post-Gagsina,
Block- Munak, Dist.- Karnal, Haryana
Mobile No. : 9416600112

Brief Description of Innovation

The innovative method devised by Sh. Jagbir Singh for rapid multiplication of sugarcane planting material require planting in Feb-March using Single bud method, this develops into mother shoot of 3-4 internodes in 90 days which is again cut and planted. Tillers come after 25 days which again give 5-6 internode which are cut and planted, through this method by almost 200 to 250 times more seed material is produced in a year.

Bumber sugarcane crop raised from single bud propagation

Seed Multiplication method: Farmer- Led innovation for providing low cost solutions of seed availability in sugarcane

Glimpses of Bud sugarcane propagation

Sugarcane cultivation and bumper harvesting

View of sugarcane plant

As per the farmer, traditional method of sugarcane sowing requires around 90-100 q sugarcane planting material costing around Rs. 36000-40000 per ha while 25000 buds produced by his method weighing around 15 q, are sufficient for one ha area costing around Rs. 25000 per ha.

He is earning net profit of around Rs. 10-12 lakhs per ha by producing seed material of improved high yielding varieties with B:C ratio of as high as of 4.90. Thus, this rapid multiplication method is low cost comparing to tissue culture seed production and also good model of agri-entrepreneurship.

Potential of Innovation for Wider Reach/Out Scaling

Huge potential for replication after validation by the research institute especially for 'clean plant' concept.

Scientific Validation required

Yes, the innovator is doing this since last eight Years, but for upscaling in more area scientific assessment of the whole process will help.

Domain

Summer Planted Sugarcane in North Western Plains and Eastern Region

3. Grassroots Innovator: Developing frugal solutions for small holders

Profile of Innovator

Name	:	Dharam Pal Singh Duhan
Age	:	56 Years
Education	:	Postgraduate in Agricultural Economics
Experience	:	20 Years
Contact Details	:	Kureri, Baraut, Baghpat (U.P.) dpsinghdyduhoon@gmail.com
Mobile No	:	9917862313

Brief description of Innovation

Shri Dharam Pal Singh Duhan, a Post Graduate in Agriculture Economics, is a grassroots innovator par excellence, besides being a progressive farmer. He has great interest in developing machines particularly in Sugarcane to solve labour problems. He has been putting lots of hard-work and using his acumen. He has designed several machines and tools which reduces drudgery, in various operations in inter cropping in sugarcane. Following are some of his innovations out of his sheer hard work, zeal and out of the box thinking:

- Multi Seeding Manual Planter
- Turmeric& Ginger Processing Machine
- Safed Musli Peeling & Washing Machine
- Shatavari Peeling & Washing Machine (for both Indian White & Yellow Nepali)
- Improvised D.C. Powered Multi Crop Weeder Cum Cultivator

Shri Dharam Pal has also developed many types of digging machines available in the market, they are usually designed for a particular crop's root digging, such as ridge or raised bed digging.

Demonstration of crop weeder operation

Agronomic operations using Innovated tools

However, this digging machine, innovated by our company, is designed to work for all types of root crops, whether grown on ridges or raised beds. It can dig without damaging the roots, making it highly useful for farmers growing multiple root crops. It operates effectively with a minimum 25 HP tractor.

Innovation's Highlights

- Suitable for multiple crops like Safed Musli, Turmeric, Ginger, Garlic, Akarkara Roots, Ashwagandha, Potato, Carrot, and Onion.
- Works on both ridge and raised bed farming systems.
- Adjustable digging depth according to the digging area.
- Heavy-duty construction with cast iron and heavy metal.
- Tractor-mounted design.

Benefits/Advantages

- Can dig almost all types of root crops without damage.
- Saves significant time compared to manual digging.

Various innovative tools developed by the innovator

Some other innovative tools developed by the innovator

» Cost-effective: Manual digging costs ₹15,000–₹18,000 per acre, whereas this machine reduces the cost to around ₹1,000 per acre.
» Reduces labour requirements drastically.

Dharampal with one of his innovative tools

Scope & Potential of Innovation for Wider Reach/Out Scaling

This machine has wide application potential for farmers engaged in diversified cropping involving root and tuber crops. It can be adopted across various agro-climatic zones in India and abroad, especially where labour costs are high or skilled labour for root digging is scarce.

Scientific Validation required

Yes — Testing by an agricultural research institute or farm mechanization center would help validate performance, digging efficiency, and crop damage rates across different soil types and crop varieties.

Domain

Agricultural Machinery / Farm Mechanization / Root & Tuber Crop Harvesting.

4. Agri-Fusion: A Dual-Purpose Tractor-Mounted Weeder-Cum-Fertilizer Applicator

Profile of Innovator

Name	:	Rajender Khileri
Age	:	42 Years
Education	:	Matriculation
Experience	:	26 Years
Contact Details	:	Sadalpur, District-Hisar, Haryana
Mobile No	:	9034823229

Brief Description of Innovation

To address the challenge of timely DAP fertilizer application—especially in cotton—Sh. Rajender developed a solution to two common problems: unavailability of DAP at sowing and the risk of re-sowing due to rain or poor germination. Since broadcasting DAP in standing crops is inefficient and separate fertilizer drills increase costs, he innovated a combined approach. In Kharif 2023, he collabourated with a manufacturer to attach a fertilizer drill to a tractor-operated power weeder. This allowed three operations in one pass: mechanical weeding, furrow making for better water management, and precise fertilizer placement (DAP, MOP, NPK) near the root zone. The machine is now effectively used in cotton, wheat, mustard, and barley.

Cotton weeder cum DAP Applicator

View of weeder cum fertilizer applicator

Innovation's Highlights

The key innovation lies in its dual functionality—combining weed control and fertilizer application in a single pass. This saves time, cuts costs, and ensures timely, efficient nutrient delivery. Compatible with standard tractor-operated power weeders, the machine requires no major modifications. It applies DAP, MOP, or NPK directly into the soil near the root zone, boosting nutrient use efficiency, while simultaneously creating furrows to enhance water infiltration. With a capacity of 1.5–2 acres per hour, it adapts to various crops and row spacing, making it a versatile tool for integrated crop management. This improved power weeder integrates a PTO-driven system with a mounted fertilizer box and metering mechanism. Built with heavy-duty mild steel and reinforced joints, it offers long-term durability. Adjustable furrow openers with replaceable tips provide precise depth control, while a gravity-fed fertilizer system allows adjustable application rates. With a working width of 1.2–1.5

meters, it suits varying crop row spacing. The 40–50 kg fertilizer box supports extended operation. At an optimal speed of 2.5–3 km/h, it can cover 8–10 acres per day. Maintenance is minimal, involving occasional greasing and cleaning.

Benefits and Advantages

This innovation cuts cultivation costs by ₹1,200–₹1,500 per acre by combining fertilizer placement, weed control, and furrow making in a single pass. It saves time, reduces labour, and improves efficiency. Fertilizer is placed directly near the root zone, enhancing nutrient uptake, while mechanical weeding lowers herbicide use. Furrow formation boosts water efficiency, helping crops withstand dry spells. Overall, the system supports sustainable farming through targeted input use and reduced chemical reliance.

Scope and Potential for Wider Reach

The innovation has significant potential for cotton

Experts interacting with Innovator

Farmer with his innovative machine

and mustard cultivation in Haryana, Punjab, and Rajasthan. With minor adjustments, it can also be used for pulses, maize, and select vegetables. Its strong appeal lies in saving time and costs, making it ideal for farmers dealing with labour shortages, high fuel prices, and fertilizer inefficiencies.

Scientific Validation Required

Yes, while field performance has been encouraging, scientific validation is necessary to establish yield advantages, cost-benefit ratios, and nutrient use efficiency compared to conventional practices. Trials focusing on long-term effects on soil health and productivity will also help in promoting the technology at scale.

Domain

Integrated farm mechanization for sustainable crop production, with a specific focus on nutrient placement, weed management, and improving water productivity.

5. Using a Tractor-Drawn Planker as a Platform for Efficient Paddy Transplanting in Punjab

Profile of Innovator

Name : Gursewak Singh
Age : 42 Years
Education : 10th
Experience : 24 Years
Contact Details : Village: Pedni, District: Sangrur,
State : Punjab
Mobile No : 9463028643

Brief description of Innovation

It consists of using a 14 ft tractor operated planker fitted with a corrugated sheet as a platform for labourers to transplant paddy. The planker can accommodate six persons who can transplant paddy seedlings in rows (3 rows per person) in puddled field while tractor is moving at a slow speed allowing sufficient time for planting.

Innovation's Highlights

This innovation is first of its kind that can be used by farmers for transplanting paddy nursery without use of large amount of labour. The family members or farmer along with the help of fellow farmers can complete transplanting in the field.

Benefits/Advantages

It helps to save about 35% time and money. It also helps in saving of labour for transplanting.

Farmers doing transplanting in the field

View of transplanting on tractor-drawn planker

View of Paddy field transplanted through innovation

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation can help in combating labour shortage in future. It has a potential of saving of labour cost by Rs 3500-4000 per hectare.

Scientific Validation Required

Yes; trails should be conducted to find out the labour drudgery associated with this method as compared to conventional manual transplanting method.

Domain

Cost-effective viable options for support farmers during the periods of labour scarcity in paddy growing areas.

6. Fuel-Efficient Modified Diesel Plough for Small, Uneven Farms in Hilly Terrain

Profile of Innovator

Name	:	Parveen Kumar
Age	:	34 Years
Education	:	Matriculation
Experience	:	18 Years
Contact Details	:	Village-Langer, District-Rajouri, Jammu & Kashmir
Mobile Number	:	9906229452

Brief description of Innovation

To enhance tillage operations on small and uneven farms, Sh. Parveen Kumar modified a diesel plough for better fuel efficiency and superior field coverage. It is specifically adapted for fragmented landholdings prevalent in hilly areas.

Innovation's Highlights

The tool optimizes fuel consumption while improving tillage depth and soil pulverization across various soil types and topographies. Engine modifications reduce fuel consumption by 10–15%. The chassis and blade configuration are optimized for maneuverability in narrow fields.

Diesel plough in operation in the field

Innovator with his diesel plough

Benefits/Advantages

Farmers save on diesel costs and achieve better soil preparation in shorter timeframes. Labor needs are also reduced.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Suited to hilly, tribal, and smallholding-based agriculture systems across India.

Scientific Validation required

Yes, trials for fuel efficiency, tillage uniformity, and mechanical reliability.

Domain

Farm machinery adaptation for terrain-specific needs.

7. Seed-Mate: Tractor-Attached Drum Seeder for Efficient Paddy Sowing

Profile of Innovator

Name : T. Ganesh
Age : 48 Years
Education : Intermediate
Experience : 20 Years
Contact Details : At- Thimmarajpeta, PO- Thimmarajpeta, Dist- Visakhapatnam,
State : Andhra Pradesh, Pin-531033
Mobile No. : 9642264487

Brief description of Innovation

Sri V. Ganesh, motivated by the direct-sown paddy initiative, successfully developed an innovative dry sowing paddy drum seeder by modifying an existing tractor-operated cultivator. This low-cost innovation is aimed at addressing labour shortages, high costs of nursery and transplanting operations, and ensuring timeliness in paddy cultivation.

Innovation's Highlights

This innovation is a modified tractor-operated cultivator designed for efficient sowing. Bearings are added to both ends of the cultivator frame to support a rotating iron shaft fitted with six perforated plastic seed drums. These drums dispense seeds accurately as the shaft is rotated by a ground-driven spiked wheel, synchronized with the tractor's movement. Six cultivator tynes, spaced 25 cm apart, act as furrow openers, while a levelling blade at the rear covers the furrows with soil—completing the sowing process in a single pass. This implement offers a field capacity of 0.4 ha/hr and is ideal for dry direct sowing of paddy.

Benefits/Advantages

» Eliminates nursery preparation, puddling, and transplanting, saving up to ₹17,500 in initial investment.
» Cost-effective design using locally available materials.
» Removes dependency on manual labour for transplanting.
» Saves 12 labour-days and reduces time significantly.

View of cultivator cum drum seeder in the field

Innovator sharing his innovation with other Farmers

Close view of drum seeder cum cultivator cum planker

» Ensures uniform seed distribution and depth.
» Suitable for Dry Direct Sowing (DDS) of paddy.
» Crop maturity is achieved 7-10 days earlier than traditional practices.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

This innovation is well-suited for adoption in about 1 lakh hectares of paddy cultivation, especially in areas facing water scarcity, high cultivation costs, and labour shortages. It benefits tractor-owning farmers by reducing transplanting costs and labour needs, requiring only minor additions—seed drums, a shaft, and a spoked wheel—to an existing tractor cultivator.

Scientific Validation required

Agronomic Performance needs validation

Domain

Development of low cost tool for DSR in plain land situation

8. Agri-Rider: The Low-Cost Man-Riding Power Weeder

Profile of Innovator

Name : Repalle Shanmukha Rao
Age : 46 Years
Education : Matriculate
Experience : 21 Years
Contact Details : At- Kambalapalli , PO: Kambalapalli, Dist- Mahabubabad , State- Telengana, Pin-506103
Mobile No. : 9492113609

Brief description of Innovation

Cotton and chilli are major Kharif crops in Mahabubabad district, where weed infestation—both broad- and narrow-leaved species—is a common problem. Farmers mostly rely on manual weeding, often combined with intercultural operations using farm machinery. To reduce labour and costs, a low-cost Main Riding Power Weeder was developed using locally available and repurposed materials.

Innovation's Highlights

Farmers in Mahabubabad have used automated weeders for cotton and chilli, but existing 2-wheel models with differential gears often damage crops and cause strain during turning. To solve this, Mr. Shanmukha Rao developed a low-cost (₹35,000) man-riding power weeder using a petrol engine, gearbox, chain, and two iron ploughs. His one-wheel design allows easy turning without shoulder strain, making it comfortable and crop-safe. It's effective for weeding, interculture, and even wetland ploughing, and can be locally customized with adjustable tynes or discs to suit various row spacings.

Benefits/Advantages

To overcome these challenges, innovator Shanmukha Rao developed a one-wheel, ride-on power weeder. This design allows the operator to sit while working, reducing fatigue and making turning smooth and effortless. Ideal for cotton and chilli crops, it features laterally adjustable tynes or discs to work between crop rows, stir the soil, break clods, and cultivate the field effectively.

Agri-rider in field

Farmer riding power weeder for weed control

Innovator's workshop where he designed Agri-Rider

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Conventional power weeders require the operator to walk behind the machine, often leading to fatigue and back pain. In contrast, this riding model significantly reduces physical strain, particularly benefiting elderly and female operators. Additionally, it can save up to ₹5,000 per acre in weed control costs.

Scientific Validation required

Needs validation of ergonomic and operator safety, durability & maintainability

Domain

Improvised design of tool for weed-control in plain land condition.

9. Weed-Rider: Affordable Power Tiller Weeder for Cotton

Profile of Innovator

Name : Mahaveer Kumawat
Age : 27 Years
Education : Graduation (B.Sc., B.Ed)
Experience : 4 Years
Contact Details : Village- Chotiyas, Post-Parasoli, Block-Aasind, District-Bhilwara, Rajasthan
Mobile No. : 7891930930,

Brief Description of Innovation

Cotton, being a kharif season crop, is infested heavily by weeds of both the categories, broad leaved weeds and narrow leaved weeds. The weeding is often done manually along with inter-culture operations. Shri Mahaveer Kumawat developed a very low-cost power tiller cum weeder from locally available materials, mostly unused materials of machines, as alternative to manual weeding.

Designed by Mahaveer and is very low-cost machine, the device is powered by a 5HP diesel engine of single cylinder and air cooled. It measures 6 ft in length, 2.5 ft in width and 4 ft in height and weight approximately 150 kg. It has both forward and reverse gears, with manual rod-based steering at about 30-degree rotation. This devise is having 4 wheels. The front wheel base is of 16 inches and rear wheel base is of 18 inches. It has foot press lever brake system and single seat. The speed is controlled through lever. The engine of device starts through rotation by handle manually. The attachment is a

Interaction with the visitors in the Field

Mr. Mahaveer with his innovations in field

tiller with five tines fitted in two rows (2 in front or first row and 3 in back or second row). This tiller is lifted by foot press lever. The power tiller is the most economical with fuel efficiency of completing tilling or weeding of 1.25 bigha (about 1700 sq meters) per litre of diesel. The cost of device is only Rs 30,000/- whereas the similar machine set in the market is available in more than Rs 80,000/-. The cost of weeding of one hectare of cotton using this is only Rs. 1000.0 per ha against Rs. 12000 per ha under traditional method of manual weeding in cotton. This device saves about Rs. 11000.00 per ha.

Potential of Innovation for wider reach/out Scaling

The machine has a huge potential for about 20 million ha of widely planted crops of cotton, soybean, maize in Rajasthan and elsewhere especially in relatively heavy soils where heavy machines cannot move due to large aggregation of wet soils in the wide wheels of tractor mounted weeders, etc. However, before upscaling some modernization in the innovations for its automatic or push button start and quality seating arrangements for operator may make it more attractive. It has also opportunity to replicate for all *kharif* and winter seasons vegetables as well.

Scientific Validation required

The validation for costs and operational efficiency would be great help for identifying a new vendor to take to this innovation to a new height. Data generation based on multi-location testing of the innovation is also required to get this innovation registered in NIF. It is necessary to validate the device scientifically for horizontal expansion in the district.

Domain

Suitable for all crops planted at 60 cm row spacing in cotton growing areas of Bhilwara.

10. Riding Type Prime Mover with Multi Tool Attachments

Profile of Innovator

Name : Suresh Malleshappa Kondikoppa
Age : 47 Years
Education : SSLC
Experience : 28 Years
Contact Details : Narasapur village, Taluk & District: Gadag, Karnataka
Mobile No : 8722210081

Brief description of Innovation

Three-wheeler diesel-operated machine with attachments for tillage, weeding, and spraying. Supports 50-litre tank, 5m spray boom, saves 70–85% labour. Payback in 1.5 years.

Innovation's Highlights

Multi-functional agri-vehicle; Low cost; Custom-made locally.

Benefits/Advantages

Reduces labour; Affordable mechanisation for smallholders

Scope & Potential of Innovation for wider reach/ out scaling

Adopted in multiple states; Patentable design; Govt subsidy potential.

Three wheeler diesel operated machine for spraying and weeding

Glimpses of prime mover under field conditions

Scientific Validation Required

Yes – Validation of efficiency and refinement in terms using reinforced fibre materials instead of still can be studied

Domain

Farm Machinery-based Innovations
Suitable for small holders and areas where labour scarcity and high labour cost.

11. Chickpea (Bengal gram) Nipping and Leaves Collecting Machine

Profile of Innovator

Name : Girish Badragond
Age : 45 Years
Education : SSLC
Experience : 15 Years
Contact Details : KrishiTharanga Farmtech LLP, No 02, Halasangi Complex, Near Radio Station, Vijayapur-586101 (Karnataka)
Mobile No : 9902133996

Brief description of Innovation

It is essential to cut unwanted and excessive growths of in Chickpea. Currently trimming/cutting is done manually which is labourious and time consuming. To get rid of the problem, Mr.Girish developed solar powered plant trimmer. It is a solar power operated trimming machine that simplifies the trimming process by saving time and improving yield.

Key features

» Low weight
» Use locally available cutting tools
» Solar panel (12v,5w) built on top of the helmet
» Low maintenance cost

Farmer-Led solar powered plant trimmer in chickpea




Solar powered plant nipping machine

Innovation's Highlights

It is equipped with easily replaceable, locally available and very affordable cutters. It works even when it is cloudy. The pruned leaves are used as vegetable and sold in local market, gives additional income to farmers.

Benefits/Advantages

- » Increases yield up to 10%
- » 4 acres per day can be trimmed using the trimmer whereas with manual trimming only 1-1.5 acres can be trimmed.
- » Can be operated with minimal sunlight also as no grid power is required

Solar-powered trimmer

Scope & Potential of Innovation for wider reach/out scaling

The innovation has huge potential as nipping of chickpea is labour intensive and involves high cost. Machine use can bring down the cost and also drudgery.

Scientific Validation

Required
Validation is required

Domain

It can be promoted and used in all chickpea growing areas.

12. Locally engineered Power tiller mounted farm implements

Name : Mr. Kallappa K. Mutnal
Age : 41 Years
Education : HSC
Experience : 18 Years
Contact Details : At: Itagi, Post: Itagi; Tq: Khanapur, Dist: Belagavi-591112 (Karnataka)
Mobile No : 6360959810

Brief description of Innovation

With the help of local blacksmith and fabricator, innovative farmer designed the implements which can be attached to existing power tiller mainly for paddy and sugarcane crops grown in his land at Khanapur taluk of Belagavi district

Specifications:

i. Farmer designed power tiller mounted with dozer at front and rotavator at rear end.
ii. Farmer designed power tiller mounted combined rotavator, seed drill and seed cover
iii. High-Pressure Triplex (HTP) sprayer attached to Power tiller.

Innovation's Highlights

» Power tiller mounted combined rotavator, seed drill and seed cover.
» Rotavator will churn the pre-ploughed soil.
» Seed cum fertilizer drill will be used for the sowing of seed and fertilizer into the soil.
» Seed cover will be used for covering the seed and fertilizer after placing into the soil at proper depth.

Farmer - friendly machanized weeder-cum-sprayer

Power-tiller based tools

Benefits/Advantages

» Power tiller mounted dozer fitted at front is useful to carryout levelling the field with low gradient slope. This enables no dependency on heavy machineries.
» HTP Sprayer attached to Power tiller makes spraying operation fast and easy for fertilizers and pesticides spray compared to traditional knapsack sprayer.

Scope & Potential of Innovation for wider reach/out scaling

About 15 farmers have adopted his technologies in their fields. Most of the farmers growing paddy and sugarcane have power tiller for rotavator operation, this innovation helps them to adopt the power tiller mounted implements which saves time and money. KVK and Department of Agriculture are spreading the farmer designed technologies to other fellow farmers.

Scientific Validation Required

No

Domain

Farm Implements and Machinery

Mechanized weeder designed for smallholder farmer

13. Mechanical Weeder-cum-Sprayer

Profile of Innovator

Name	:	Krishna A. Madalli
Age	:	31 Years
Education	:	BE (Mechanical)
Experience	:	6 Years
Contact Details	:	Hallikeri village, Annigeri Taluka, Dharwad District (Karnataka)
Mobile No	:	9480645550

Brief description of Innovation

Invented a farmer-friendly mechanized Weeder-cum-Sprayer.

Specifications

» Powered by 4.4 HP single-cylinder diesel engine, 5-litre fuel tank ensures longer operation
» Tyres: Front – 3.00-18; Rear – 100-18 for better traction
» Speed: Operates at 5–10 km/h, Coverage: Weeding – 1 acre/hour, Spraying – 3 acres/hour
» Dimensions: Length – 2540 mm, Width – Adjustable (1435–2032 mm)
» Ground clearance – 762 mm
» Minimum row width: 200 mm (suitable for vegetables, pulses)
» Built-in PTO for spraying, pesticide application and irrigation

Innovation's Highlights

» This machine offers dual functionality - weeding and spraying, in a single unit, reducing labour, time and effort.
» Its compact design, ease of use and adaptability for narrow-row crops
» like vegetables and pulses make it ideal for smallholder use.

Benefits/Advantages

» This innovation helps to reduce drudgery and improve efficiency, especially for small and marginal farmers.
» Low maintenance and high efficiency further enhance its appeal.

Innovator operarting his weeder cum sprayer in the field

Mechanized weeder cum sprayer in action

Scope & Potential of Innovation for wider reach/out scaling

» The mechanized weeder-cum-sprayer holds immense potential for large-scale replication due to its affordability, simplicity in design and relevance to the needs of small and marginal farmers across the country.
» It addresses critical challenges in Indian agriculture such as labour scarcity, high cost of cultivation and time-consuming manual operations, making it suitable for widespread adoption.
» The machine's multi-functionality-performing both weeding and spraying-adds to its value proposition and promotes efficient resource use on the farm.

Scientific Validation Required

Needs validation

Domain

Farm implements and mechanization, can be used by small and marginal farmers across the country.

14. Water-logged Resilient Raised Bed Maker: From Old Cultivator to Crop Saviour

Profile of Innovator

Name	:	Animesh Singha
Age	:	51 Years
Education	:	Graduation
Experience	:	18 Years
Contact Details	:	Village: Kailaba, District: Malda, State: West Bengal
Mobile No	:	8967302049

Brief Description of Innovation

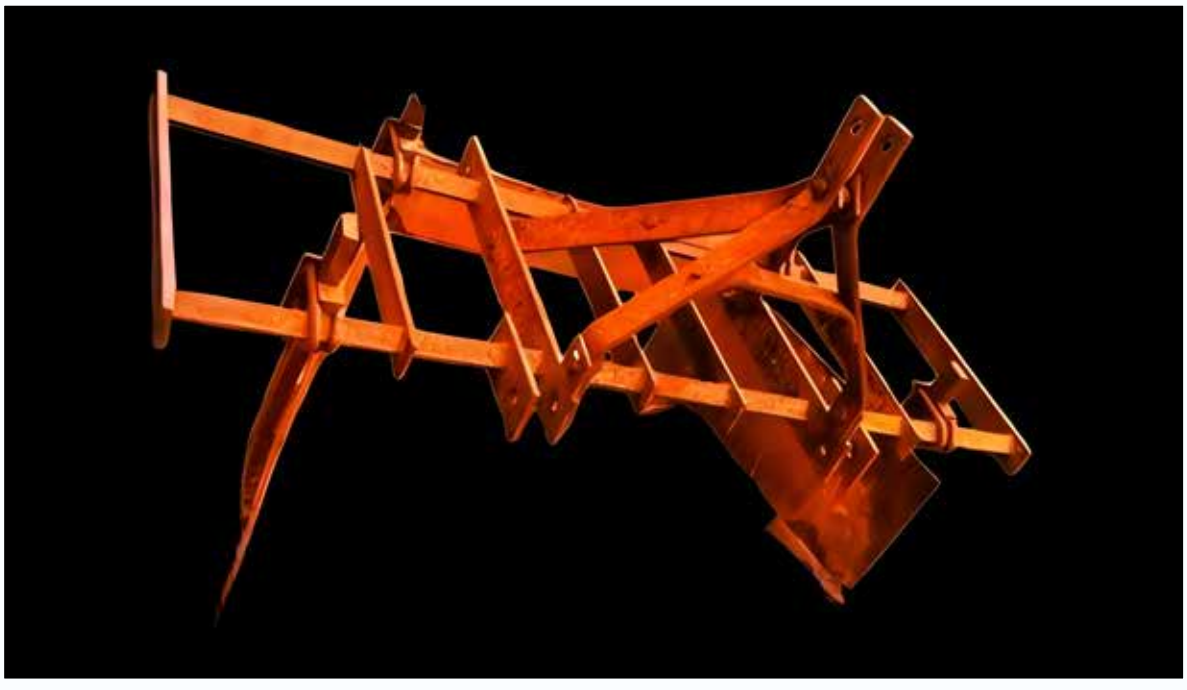
In a region frequently challenged by flash floods and erratic rainfall, farmers in Malda are increasingly seeking resilient solutions to overcome waterlogging and crop failure. Recognizing this need, Shri Animesh Singha has developed a cost-effective and innovative raised bed implement, repurposing old farm machinery to enhance climate-smart cultivation.

Innovation's Highlights

Shri Singha modified an unused cultivator by removing the tiller and integrating two plant plates at a 1-meter distance. This repurposed implement enables precise and efficient formation of raised beds with a consistent depth of 45 cm, ideal for cultivating water-sensitive crops like pulses and maize.

Benefits/Advantages

- Field Capacity: 3 hrs. per acre (1 acre = 3 bigha)
- Operating Cost: ₹7200/- per acre
- Manual Alternative: Requires 36 labourers per acre at a cost of ₹21,000
- Net Savings: ₹13800 per acre
- Seasonal Income Generation: Estimated at ₹50,000 through service provision to neighbouring farmers through CHC (Custom Hiring Centre)



Close view of modified raised-bed maker

Raised bed-maker in field

Scope & Potential of Innovation for Wider Reach/Out Scaling

This frugal innovation addresses the core issue of poor drainage in flood-prone areas. By ensuring timely bed formation and promoting improved root aeration, the implement significantly enhances crop survival and productivity in vulnerable conditions. Its affordability, ease of use, and income-generating potential also position it as a replicable model for other smallholders facing similar challenges.

Scientific Validation required

To some extent.

Domain

Flood Prone Area; Quite suitable for use in flood-prone area to facilitate mechanization It can be scalable in 20000 ha under Rabi Maize & 5000 ha of Cucurbit & Chilly Crops. Also scalable for such agro-ecologies m the country.

15. Modified Sugarcane Trench Opener with Levelling Attachments: Enabling Intercropping and Efficient Irrigation

Profile of Innovator

Name : Jabarpal Singh
Age : 44 Years
Education : 12th
Experience : 11 Years
Contact Details : Village: Karanpur Block: Meerganj
District: Bareilly, Uttar Pradesh
Mobile No : 9837171007

Brief description of Innovation

A modified trench opener with adjustable spacing (120–180 cm) and levelling attachment enables sugarcane intercropping with vegetables like pea, mustard, cauliflower, and tomato. Integrated with drip irrigation and a custom Package of Practices, it boosts yields up to 2280 q/ha and reduces labour by 20–25 days/ha.

Innovation's Highlights

This innovation combines customized equipment for precision trench farming with a highly productive intercropping system. It delivers triple the yield from the same area and generates additional income from intercrops. It also reduces labour needs by 20–25 days per hectare, enhances moisture retention, and increases overall profitability.

Benefits/Advantages

The innovation delivers significantly higher economic returns, with benefit-cost ratios such as 1:5.45 for Sugarcane + Cauliflower intercropping compared to just 1:1.85 for traditional paddy cultivation. This highlights its strong profitability and efficient resource utilization for farmers.

Modified sugarcane trench opener for mechanized irrigation

implement designed for trench opening

Scope & Potential of Innovation for Wider Reach/Out Scaling

The model has already been adopted by over 150 farmers. The innovator has formed two national WhatsApp advisory groups "Target 100 Tons Per Acre" and "Lakshya 100 Ton Prati Acre"—with over 900 members sharing knowledge regularly, supported by KVK Bareilly scientists. Currently, 25% of the sugarcane area in Bareilly uses trench farming, demonstrating strong potential for expansion to other sugarcane-growing regions.

Scientific Validation Required

Yes, scientific validation is essential to assess the agronomic, economic, and environmental benefits of the trench farming and intercropping model. Validation will ensure reliable data on yield gains, resource use efficiency, and profitability, supporting large-scale adoption in sugarcane-growing regions

Trench opener in action

Domain

Precision Intercropping and Mechanization Solutions for Sugarcane-Based Systems

16. Low-cost Power-Tiller-cum-Zero Tillage Machine

Profile of Innovator

Name	:	Md. Qamar Tauhid
Age	:	32 Years
Education	:	B Tech. (Mechanical)
Experience	:	7 Years
Contact Details	:	Village: Ranga; Dist.: Banka, Bihar
Mobile No.	:	9772006336

Brief description of Innovation

Paddy, a major crop of Banka district and delayed monsoon is common phenomenon and farmers have less sowing time. Low-cost Power Tiller cum Zeo tillage machine using locally available and repurposed materials was developed to address the labour-intensive and costly tillage operation in small fragmented land. Adaptations made to a conventional Zero Tillage Machine, allowing it to efficiently sow seeds even in fields that have already been ploughed (not just unploughed fields as is usually intended). This modification addresses a practical gap in the use of zero tillage technology under varied field conditions commonly encountered by farmers in the region.

Innovation's Highlights

Manufacture and assembling using 5 HP, single-cylinder, air-cooled diesel engine and unused zero tillage machine components and other local materials. Dimension of Zero Tillage Machine 5 ft (l)x 2.5 ft (W)x 4.0 ft (H) for ploughing fields, significantly broadening its scope of use. Working efficiency of machine is 8-9 hour required for ploughing one-hectare land. Diesel fuel consumption of 600ml per

Low-cost power-tiller-cum-zero tillage machine

Glimpses of low -cost power tiller-cum-zero tillage machine

hour. This simple, low-cost, and farmer-friendly innovation ensures easy adoption at the local level and represents a practical, need-driven solution to real-world agricultural challenges.

Benefits/Advantages

Highly economical, operation cost Rs. 4,500/ha for sowing, compared to Rs. 11,000/ha with traditional methods. Saves approximately Rs. 6,500/ ha in sowing cost. It is also fuel and time saving in comparison to traditional method. The cost of machine is Rs. 40,000 which is much lower than the commercial models which have price above Rs. 75,000. Increases the versatility and utility of existing Zero Tillage Machines, allowing farmers to use one implement for more field conditions; Saves the cost of purchasing additional sowing machinery. Reduces time and labour requirements for sowing. Enhances efficiency in crop establishment, potentially leading to more timely sowing and improved yields.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The machine has a huge potential and substantial promise for scaling out across regions where zero tillage is practiced but fields frequently require tillage before sowing due to local soil or cropping patterns. Its low-cost, farmer-driven nature supports easy replication. Agricultural extension agencies, manufacturers, and development organizations can disseminate these modifications to benefit a wider farming community.

Scientific Validation required

Needs validation for safety standard, efficiency and for different soil condition.

Domain

Most suited for small and fragmented land in plateau region

17. Tractor-Bund: Precision Bund Maker with Adjustable Settings

Profile of Innovator

Name	:	Mridupaban Handique
Age	:	42 Years
Education	:	Graduate
Experience	:	10 Years
Contact Details	:	Vill/PO- Angera konwar Gaon, Lakwa, Charaideo, Assam Pin-785688
Phone	:	8135846613

Brief description of Innovation

Mr. Mridupaban Handique has designed the tractor-mounted bund maker, which is made of high-strength mild steel or carbon steel body. The width and height of the bunds are adjustable according to need. The tractor-mounted bund former is designed for use with 35 HP and above tractors (Category I/II hitch) and features a three-point linkage attachment system. Constructed from high-strength mild steel or carbon steel, the machine offers an adjustable bund width ranging from 60 cm to 100 cm and a bund height of 25 cm to 45 cm. It has a working width between 1.2 m and 1.8 m, depending on the model, and weighs between 180 kg to 250 kg. The implement operates at a depth of up to 20 cm and has an output capacity of 0.3 to 0.5 hectares per hour. Its heavy-duty box frame comes with a rust-resistant coating, and the soil engagement system includes disc or wedge-type wings for effective soil cutting and pushing.

Innovation's Highlights

The Tractor Mounted Bunds Maker is used to make uniform soil bunds efficiently using a tractor, enabling quick bund construction suited for paddy fields.

Tractor-mounted bund maker

Tractor-mounted bund maker in action

Benefits/Advantages

Manual bund making is time-consuming, labour-intensive, and often inconsistent in shape and dimension. A tractor-operated bund maker provides a cost-effective, time-saving, and uniform solution for bund construction suitable for dryland and irrigated fields for bund construction. It plays a key role in areas where the farmers have very fragmented land holdings

Estimated Cost incurred by the farmer to make the device is ₹18,000 while the cost of the device if purchased commercially would be ₹60,000.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The tractor-mounted bund maker has **high potential for upscaling across various agro-climatic zones in India**, particularly in the rice growing belt of India i.e Assam, West Bengal and Odisha,

Scientific Validation required Yes

Validation required on bunds formation efficiency and time required per unit area in different soils in wetland.

Domain

Suitable for dryland and irrigated fields for bund construction. This innovation finds relevance in geographic areas such as central and eastern India, however expertise required for operation of the tool. The farmers have to be trained.

A close view of Tractor-mounted Bund-Maker

18. Precision Fertilizer Dispenser for Efficient Crop Nutrition

Profile of Innovator

Name : Tummala Ranaprathap
Age : 49 Years
Education : Postgraduate
Experience : 21 Years
Contact Details : At- Vallapuram, PO: Dandapalli, Dist- Khammam, State-Telangana , Pin-507164
Mobile No. : 9948508221

Brief description of Innovation

Chilli is an important commercial crop in Khammam district. To achieve higher yields from improved varieties, farmers often apply 3–4 times more fertilizer than recommended, increasing production costs. Fertilizers are usually broadcast, leading to inefficient use. Although placing fertilizer in the root zone is more effective, labour shortages during peak seasons make it difficult for farmers to adopt this method. So, Fertilizer dispenser is manufactured with locally available iron sheet and in appearance is like a funnel with a capacity of 15 Kg. This implement can be attached to three tine harrows, the inter cultivation implement.

Innovation's Highlights

It is made of a funnel-shaped iron structure with a 15 kg capacity. It also has a controller (holes at basal part) to adjust the amount of fertilizer applied. The traditional implement, Jaddigam, (wooden circular base) is commonly used for fertilizer application, and the funnel and controller are attached to it for improved efficiency. The funnel has an upper diameter of 40 cm, a bottom diameter of 8 cm, and a depth of 36 cm. It takes 15 minutes to dispense 15 kg of fertilizer. Using the dispenser, fertilizer

Farmer using a bullock-drawn fertilizer dispenser in field

Fertilizer applicator designed for simultaneous fertilizer application

can be applied at the root zone of the crop while inter cultivation operation is carried out. It saves the fertilizers but also improves the fertilizer use efficiency.

Benefits/Advantages

Intercultivation and fertilizer application are done simultaneously, reducing labour requirements and overall cost of cultivation. Fertilizer is applied uniformly, resulting in higher efficiency. The implement costs ₹4,500, and it can help reduce fertilizer application costs by ₹6,000 to ₹7,000 per acre.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

It can be used in all types of soils and is flexible enough to be used at different stages of crop growth.

Scientific Validation required

Validation needed for Quality Assessment, Ergonomic Evaluation, Durability & Maintenance

Domain

Development of indigenous tools for fertilizer application suitable for cotton, chilli and maize fields.

19. Tractor-Mounted Rice Huller on Zero-Tillage Frame: A Mobile Grain Processing Unit

Profile of Innovator

Name	:	Kamlesh Pandey
Age	:	59 Years
Education	:	Graduate
Experience	:	15 Years
Contact Details	:	Village: Geruabandh, Dist.: Buxar, Bihar
Mobile No.	:	9162659114

Brief Description of Innovation

Mounted a rice huller on one end of the Zero Tillage frame and attached a 5 HP electric motor on the other end. The two were connected using a conveyor belt and pulley system, effectively transforming the idle ZT frame into a movable rice hulling unit. This multifunctional setup allows the rice huller to be transported easily by tractor, making it highly suitable for rural areas where mobility is key. With a processing capacity of 200 kg/hour, it requires just one person to operate. Additionally, by simply changing the sieve, the same machine can also be used for cleaning wheat grains—separating out weed seeds, under-sized grains, and other impurities without damaging the grains.

Innovation's Highlights

Integration of unused Zero Tillage frame and rice huller, 5 HP electric motor-powered mechanism, mobile and tractor-compatible, multipurpose and Low-labour requirement.

Rice huller fixed on zero-till machine

Machinery for grain cleaning fitted on zero-tillage machine

Benefits/Advantages

This approach reuses idle farm machinery, reducing waste and maximizing return on investment, while providing a cost-effective and labour-saving solution with the added advantage of mobility for operation across different farm locations. It enhances post-harvest efficiency and benefits both rice and wheat growers in the region. Through its use, the farmer earns about ₹42,000 annually, along with an additional ₹12,500 from the sale of rice husk and bran. By replacing the sieve, the same unit used for cleaning wheat grains which enables the removal of impurities (weed seeds, undersized grains, foreign particles), all without damaging the wheat grains

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation is ideal for replication in rural areas where idle farm machinery is common. It can be promoted among farmer groups and cooperatives who often lack access to dedicated post-harvest equipment. Its low-cost adaptability and versatility make it scalable in other grain-producing regions of India. Huge scope for utility since the area comes under Rice-Wheat cropping system.

Scientific Validation required

Needs validation to assess machine durability, safety standards, energy efficiency, and long-term cost-benefit ratio.

Domain

Post-harvest processing, Farm machinery repurposing, Sustainable reuse of farm implements.

20. *Chauka* System: Community-Led Water Harvesting for Sustainable Agriculture

Profile of Innovator

Name	:	Laxman Singh
Age	:	68 Years
Education	:	Matriculation
Experience	:	40 Years
Contact Details	:	Village-Laporiya, PO-Laporiya, Block-Dudu, Dist.- Jaipur, Rajathan
Mobile No.	:	9784355071

Brief Description of Innovation

This community innovation led by Shri Laxman Singh is most suitable for pasture lands. It is a shallow rectangular dug out areas (chouka) for rain water harvesting along the natural slope passing from chouka to adjacent chouka.

Innovation's Highlights

The pits are dug at intervals across the slope so as the runoff water is intercepted and retained in field until absorbed. Each chouka must not be deeper than 9 inches to avoid damage to grasses likely to be caused by deep water. The choukas intercept the run-off water and also control loss of finer, fertile sediment rich in organic matter.

Benefits/Advantages

Choukas have transformed the dry wasteland surrounding Laporiya into grassy village common lands perfect for grazing. Choukas enable the growth of dozens of different types of fodder plants, medicinal herbs and encourage birds.

Scope & Potential of Innovation for Wider Reach/Out Scaling

There is huge potential to be integrated with watershed development programme as around 1,600

Sustainable model of rainwater harvesting for pasture lands

Chauka system for conservation of water

hectares of choukas built in Laporiya villages made it sufficient in water. Farmers can now grow a variety of grains and vegetables with recharged groundwater for irrigation, further, choukas help improve water availability during scarcity periods and in drought years. It can be out scaled in most of Rajasthan with annual rainfall of 440 mm.

Scientific Validation required

Yes, though, it is time tested but for quantification of rainwater harvested and groundwater recharge level affected positively will make it more convincing for out scaling.

Domain

Pasture lands of Arid and semi-arid areas of Rajasthan and other areas.

21. Twin Ring Method of Bore Well Recharge

Profile of Innovator

Name	:	Shankarappa I. Sogali
Age	:	33 Years
Education	:	ITI
Experience	:	10 Years
Contact Details	:	Kunnur, Shiggon, Haveri District-581193 (Karnataka)
Mobile No	:	9738434329

Brief description of Innovation

Developed a new method called the Twin Ring Method by Mr. Shankarappa. The method is simple, works well and is cost effective. In brief the process is as follows:

1. A pond – approx 5 feet x 5 feet and 10 feet deep – is constructed nearby the borewell site – in a position to gather the run off water from the monsoonal rains.
2. A pit is dug around the actual borewell casing – 5 feet x 5 feet size and 10 feet deep. This work is done with JCB.
3. The bottom of this pit is lined with filtration material to a depth of 2 feet – layers of 40 mm boulders size.
4. Next slits are cut into the borewell casing using a cutting machine, and the casing is then wrapped with nylon mesh so solids cannot enter the casing pipe.
5. At this stage, 5 x 5 foot diameter cement rings are placed around the borewell casing and the spaces between them are filled with cement to seal them. This pit is then filled with 20mm small stones.
6. A second pit measure of 5 x 5 foot diameter cement rings are placed next to the first pit and the gaps between them are filled with cement. This pit is left empty. And a cement cover is placed on it to avoid falling of dust particles.

Developement of twin ring method for recharging

A view of bore well recharge

7. A 3 inch feeder pipe is fitted coming from the pond to a hole in the first cement ring of this empty well. This brings the water from the pond.

Innovation's Highlights

During rainy season the water flows from the pond into the first empty pit where it percolates down through the filter materials and subsequently up into the second pit around the borewell casing. It then enters through the slits and filters down into the underlying aquifer where it is stored for the following dry season.

Benefits/Advantages

» Increased water-output
» Better water-quality
» Customizable
» Eco-friendly
» Cost-effective: The total cost required to establish this recharge technique is Rs. 5000/- and the ground water recharged is 90000 litres per day

Scope & Potential of Innovation for wider reach/out scaling

Scaling up also requires addressing challenges like land availability, water quality concerns, and ensuring long-term maintenance of recharge systems.

Scientific Validation

Needs validation

Domain

For ground water recharge especially in low water table areas.

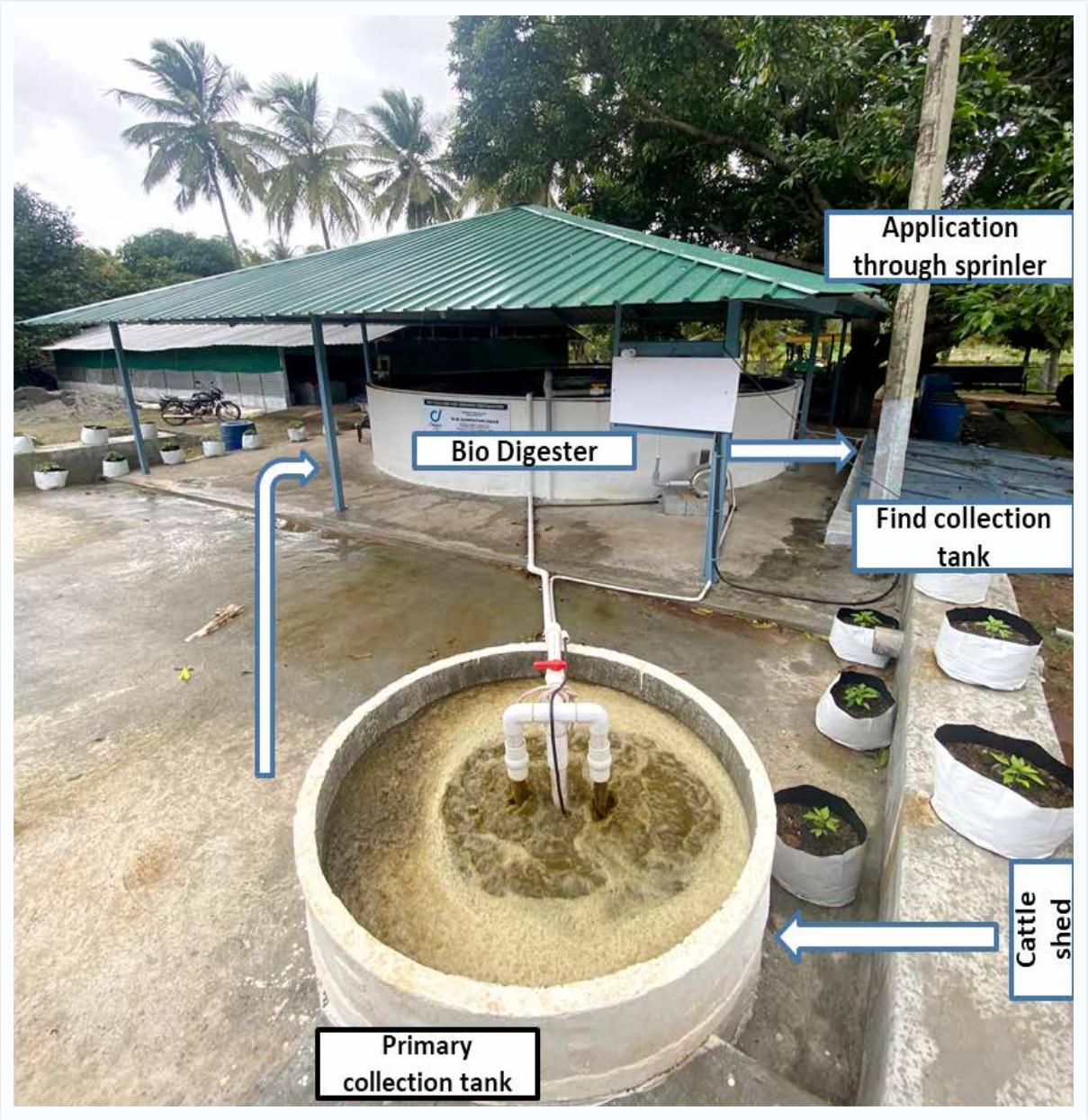
22. Automated Cow-Dung Bio-stimulant Production & Delivery

Profile of Innovator

Name : Gnana Saravanan
Age : 31 Years
Education : Post Graduation
Experience : 15 Years
Contact Details : Deesan Farms, Ramar Pannai Kalam, Moolathara Village, Chittur, Palakkad, Kerala, 678533
Mobile No. : 9962688000

Brief description of Innovation

Automated bio-input production using cow dung with fermentation, filtration, and sprinkler distribution systems.



Bio-digester system designed to process organic waste

Close view fo bio-digester

High quality produce can be produce, cost effective, labour saving, and cost reduction 75 % compared to conventional method. Capable of producing up to 8000 liters of bio-input daily.

Innovation's Highlights

Mechanization of cow dung-based input production and distribution.

Benefits/Advantages

25x more efficient than manual; consistent quality; reduced labour cost; high-volume output. B:C ration is 3.2 over conventional method.

Scale & Potential of Innovation for Wider Reach/Out Scaling

Highly scalable; addresses organic input constraints; suitable for demos and replication in farming clusters.

Scientific Validation required

Yes, difference in the quality of the bio-inputs produce in comparison to the conventional way of production.

Domain

Organic / Natural Farming practicing farmers who are willing to produce their own cow-dung based Bio-inputs using mechanised production.

23. Magnetic Water Conditioner for Treating Saline Water

Profile of Innovator

Name	:	Sh. Dilip Singh Gehlot
Age	:	60 years
Education	:	Intermediate (B.Sc. First year)
Experience	:	35 years
Contact Details	:	Village-13 MGD PO- Mohangarh, PO-Mohangarh, Dist.- Jaisalmer, Rajasthan
Mobile No.	:	9829704603

Brief Description of Innovation

The device is invented to make saline water suitable for irrigation. It was prepared by using 2/2.5/3-inch diameter, 3-4 feet long steel pipe (304 grade) or copper pipe, on which place 4 or 6 neodymium magnets of 5000-14000 gauge face to face. These magnets generate a strong magnetic field inside the pipe, through which saline/alkaline water is flowing. The saline/alkaline water which will be

Magnetic water conditioner for treating saline water

Dignitaries showing magnetic water conditioner

affected by this magnetic field will become magnetic water. The USP of the device is that it is low cost and ions in saline water breaks when pass through the magnetic fields which improved water quality and makes it suitable for irrigation. The treated saline/alkaline water by this magnetic field become magnetic water which benefits agriculture use as it promotes the absorption of water into the soil and plant cells, which leads production capacity of the crop increases by 15 to 30 percent. It increases the disease resistant power of the plant and makes it healthy, it also reduces soreness of soil. This machine cost around Rs. 10,000-15,000 and can work for around 15 years with same effectiveness.

Potential of Innovation for Wider Reach/Out Scaling

Huge potential in view of the vast geography in Rajasthan and Haryana and Western UP under saline groundwater conditions About 10 million ha

Scientific Validation required

Yes, the device is used by many farmers but the effectiveness need to assessed on various water quality parameters for post treated water to establish its suitability for irrigation.

Domain

Saline groundwater areas of western Rajasthan and Sekhawati Region of Rajasthan

24. Modified water lifter using tractor

Profile of Innovator

Name	:	Satyanand Singh
Age	:	42 Years
Education	:	Graduate
Experience	:	8 Years
Contact Details	:	Village: Simri, Post: Simrikhankot:, Block: Itwa
District	:	Siddarthanagar (U.P.)
Mobile No	:	9161414408

Brief description of Innovation

It involves modifying a 6"x6" centrifugal pump to operate using a tractor's PTO (Power Take-Off) shaft. It features a single delivery pipe split into three outlets, effectively reducing pressure while delivering water in three directions. The system is optimized for lift irrigation, particularly suited to the sub-humid Tarai region.

Innovation's Highlights

The pump offers a highly efficient water-lifting solution. It reduces irrigation time one acre in just one hour compared to 9 hours using conventional methods, and achieves notable fuel savings of approximately 7 liters per acre, translating to around ₹450 saved per acre.

Benefits/Advantages

The pump lowers irrigation costs to ₹200 per acre, compared to ₹900 with ordinary pumps, resulting in a net benefit of ₹700 per acre. With a high Benefit-Cost Ratio of 3.5, the system offers an economically viable and energy-efficient alternative for small and marginal farmers.

Modified water lifter

Glimpses of modified water lifter

Scope & Potential of Innovation for Wider Reach/Out Scaling

Though currently adopted by 10 farmers, the innovation shows strong potential for horizontal spread through farmer-to-farmer demonstrations. High appeal for medium and large farmers in the Tarai belt.

Scientific Validation Required

Yes, scientific validation is necessary to confirm the pump's performance efficiency, water discharge rate, fuel consumption, and long-term durability.

Domain

Suitable for Sub-Humid Tarai Agro-Ecological Zones.

25. Napier Grass Cultivation using Dairy Wastewater: A Sustainable Fodder Solution

Profile of Innovator

Name	:	Gauri Shankar
Age	:	53 Years
Education	:	Postgraduate
Experience	:	4 Years
Contact Details	:	Village-Dhuni Mata (Dabok), PO-Dabok, Block- Ghasa, Dist.- Udaipur, Rajasthan
Mobile No.	:	9416600112

Brief Description of Innovation

For realizing the innovative idea of growing Napier on dairy wastewater Sh. Gauri Shankar designed an efficient irrigation system that utilizes wastewater from dairy. He channelled it in a way that ensures Napier plants receive irrigation every 20 days. Innovative water management system ensures adequate nutrients and moisture to Napier, Careful management of the dung and urine from the dairy enriched water helps healthy growth of the Napier.

During both summer and winter seasons, he irrigates the field with fresh water as needed, in addition to using wastewater. The labourers are trained to plant and harvest the Napier according to the gaps in the field, promoting continuous production. Mr. Nagda's carefully manages the organic matter in the waste water, which includes dung and urine from the dairy. This enriched water helps improve the quality of the soil and supports the healthy growth of the Napier fodder, which thrives in waterlogged conditions—an advantage over other types of fodder crops that might be affected by such conditions. To ensure that his cattle receive the best nutrition, he got samples of the Napier grass analyzed at a research station, and the results indicated that the crude protein content was in the range of 13-14%, making it highly nutritious for his cows.

Field of napier grass fed with dairy waste

View of dairy farm with drain

Collection of dairy wastewater

Potential of Innovation for Wider Reach/Out Scaling

Huge potential for round the year green fodder availability. All small and commercial dairy units can adopt, added advantage in Rajasthan where irrigation water is of poor quality and availability is limited

Scientific Validation required

Yes, though he is practicing it and getting good results

Domain

Fodder production in all the dairy farms located in similar conditions anywhere.

26. Bio-Boost: Natural Seed & Soil Growth Enhancing Technique

Profile of Innovator

Name	:	Dolly Kumari
Age	:	27 Years
Education	:	Graduate
Experience	:	2 Years
Contact Details	:	Village: Amawa, Dist.: Nawada, Bihar
Mobile No.	:	9334658560

Brief description of Innovation

Ms. Dolly Kumari has developed an eco-friendly plant growth promoter, which is prepared from mixing Fresh Water: 20 lit, Besan (Chickpea flour) : 100 gm, Jaggery (unrefined sugar): 100 gm, Cow urine : 1.0 Lit., Cow dung : 1.0 Kg . This mixture is fermented for 48 to 72 hours. The bio-solution (@ 100 ml/ 1 kg seed) is mixed properly with the seed and then covered with the gunny bags. This mixture is fermented for 48–72 hours before use. The solution is applied to seeds and crops, especially paddy and vegetables, to enhance seed germination, promote plant growth, and offer natural protection against pests and diseases. The prepared solution applied @ 20 lit mixing in 2 q Vermicompost and broadcast in the field.

Innovation's Highlights

Made from easily available bio-materials; No chemical input; Can be prepared on-farm; Low-cost and safe for handlers; Suitable for organic and natural farming. Improve soil health and less mortality of plants. Nursery almost free from damping off disease and very less seedling mortality in cauliflower, cabbage, tomato and brinjal, etc.

Materials for making eco-friendly plant growth promoter

Application of eco-friendly plant growth promoter by Mrs. Dolly Kumari

Preparation of bio-boost

Benefits/Advantages

Environmentally safe, ecologically sound, economically viable, socially acceptable & restores soil health. Applied in Natural Farming for control of wilt and other disease. Easy in preparation and application. Reduced the cost of cultivation by Rs. 3000/ per acre and increase income by 7-8 thousand in each season. The preparation cost of solution is Rs. 11- 15 per liter.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Can be promoted across organic and natural farming communities; Can be scaled up through training and demonstration by KVKs, NGOs, and agricultural departments; and can be packaged and sold as a ready-to-use bio-product after validation. The prepared solution can be kept 10-12days. It can be applied even in pulse crop like Lentil and Chickpea where fusarium is very common.

Scientific Validation required

Microbial population, nutrient profile of soil, Pest/disease resistance and Soil health impact needs validation.Domain: Organic/Natural Farming, Plant Protection, Soil Health Management, suitable for small holders who practice natural farming.

27. Modified Venturi Injector for Fertigation in Low-Pressure Irrigation System

Profile of Innovator

Name	:	Mukesh Kushwah
Age	:	42 Years
Education	:	Intermediate
Experience	:	8 Years
Contact Details	:	Village- Ward No. 18, Shyam Nagar, District- Raisen (M.P.)
Mobile No.	:	9425456185

Brief Description of Innovation

The farmer built an improvised venturi system out of locally available materials and installed it before the pump set. This system allows uniform delivery of fertilizers, insecticides, and bio-pesticides via drip and sprinkler irrigation, even with low water pressure from a 1 HP motor, hence increasing input efficiency and crop yield. Farmers could install this device before installing the pump for a cheap cost of Rs 500/-. This is significantly cheaper than standard fertigation practices.

Innovation's Highlights

The low-cost, farmer-made ventury system has high potential for widespread adoption, particularly among smallholders who use low-horsepower pumps. It assures efficient nutrition and pesticide application, minimizes input waste, and enhances crop health, making it suitable for encouraging sustainable and precision farming techniques in resource-constrained environments. Ensure regular distribution of fertilizer/pesticide with a simple venture to increase input efficiency and crop yield. This also improves production by 25-30 % with proper fertigation. This system saves water, save money and conserve Soil.

View of venturi injector for fertigation

Modified venturi injector for fertigation under low pressure irrigation system

Benefits / Advantages

Low cost, energy efficient venture system supports sustainable and precision farming.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Crop fetigation is extremely effective for smallholders with limited resources and low-pressure irrigation systems.

Scientific Validation required

Validation is required for efficacy, homogeneity, and material lifespan in field circumstances.

Domain

It is suitable for small filed conditions for micro-irrigation systems in different agro-climatic conditions.

28. Integrated Ridge-Bund Maker with Adjustable Fertilizer Application

Profile of Innovator

Name : Bala Ram Patidar
Age : 65 Years
Education : 8th Standard
Experience : 20 Years
Contact Details : Village- Sarangi, District-Jhabua (M.P.)
Mobile No. : 9977096087

Brief description of Innovation

Developed low-cost tractor-operated equipment used for making ridge/bund and applying basal fertilizer with adjustable spacing/dose. Two iron plates (each 6 feet long and 1.4 feet wide) are combined in a "V" configuration and set on an iron frame. A fertilizer drum with a pulley system is attached, allowing basal fertilizer to be applied straight to the middle of the ridge as the bund forms. The spacing between bunds and the amount of fertilizer dispensed can both be adjusted.

Innovation's Highlights

The tractor-operated bund maker with fertilizer drill can increase labour efficiency, ensure precise fertilizer placement, and boost crop yields. It is ideal for small and medium-sized farmers looking for cost-effective mechanization for vegetable cultivation.

Benefits/Advantages

The innovation is cost effective improves yield, labour saving, facilitates efficient fertilizer application, for suitable small/medium vegetable and fruit growers. This low-cost innovation is both efficient and inexpensive, costing only Rs. 8,000. The use of a Bund Maker with Fertilizer Drill to create bunds and apply fertilizer saves 40% on labour costs, and proper fertilizer placement increases crop production by up to 20%.

Combo bund-fert integration

Ridge - bund maker with adjuistable fertilizer application

Scope & Potential of Innovation for Wider Reach/Out Scaling

It is useful for labour-saving and precision vegetable and fruit production, with potential in all vegetable and fruit growing belts.

Scientific Validation required

Validation needed for adaptability across soil/crop types.

Domain

Mechanization, precision input application in Vegetable cultivation.

29. Lotus Bloom: Harnessing Wetland Resources for Sustainable Income

Profile of Innovator

Name	:	Neelesh Meenpal
Age	:	29 Years
Education	:	Matriculate
Experience	:	3 Years
Contact Details	:	Village- Ratnabandha, District-Dhamtari (C.G.)
Mobile No.	:	9829704603

Brief description of Innovation

Dhamtari district has with about 6.08% (27966 hectare) of vast wetland including small wetlands (<2.25 ha) which are 1134 ha. and these potential could be utilized by aquatic crops. The lotus is very much popular as a part of Indian cultural tradition. It is a rooted hydrophytes and having multiple uses in the state of Chhattisgarh. Cultivating lotus Invented to utilize wetland areas, an aquatic vegetable/ flower crop well-suited for waterlogged conditions.

Innovation's Highlights

Lotus is primarily grown for its flowers, seeds, and rhizomes, which are consumed raw or cooked as salads and vegetables. Rhizome is used as Vegetables, seeds for preparation of Ayurvedic medicines to cure many diseases and also having religious and social values. It is also good for farmers from economic point of view and they earn money from harvesting of Rhizome by selling the roots, leaves, flower, fruit and seeds. The most significant contribution made by the Fishing community of the district (Dheemar) is to use the natural and artificial wetland area of the district by growing Lotus for earning economic profit.

Neelesh Meenpal harvesting the lotus bloom

View of Lotus cultivation

Harvested lotus produce

Benefits/Advantages

Sh. Neelesh Meenpal is a leading innovator who practices lotus cultivation and motivates communities to practice lotus cultivation in Dhamtari District. The lotus cultivation has the potential to provides sustainable income from wetlands, diversifies rural livelihoods. He utilizes wetland areas by cultivating lotus, an aquatic crop well-suited for waterlogged conditions and earns net return ranges of Rs. 88000-120000/ha.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Huge potential in view of the large wetland potential in Dhamtari and similar regions; Lotus is popular as high-value aquatic vegetable crop.

Scientific Validation required

Recommended for yield and cropping system impacts needs validation.

Domain

The innovation focuses on the productive use of wetland areas through cultivation of crops like lotus, enhancing livelihood opportunities and sustainable land use.

30. Liming Soils: A Dual Strategy for Fruit Fly Management and TSS Improvement in Guava

Profile of Innovator

Name	:	S. Kuldeep Singh
Age	:	57 Years
Education	:	Intermediate
Experience	:	41 Years
Contact Details	:	Village-Sarai, District-Rupnagar, Punjab
Mobile Number	:	9463147737

Brief description of Innovation

To combat fruit fly infestation in guava orchards, S. Kuldeep Singh incorporated lime into the soil to create an alkaline environment hostile to fruit fly pupation. The lime also improved soil health and nutrient uptake, contributing to higher Total Soluble Solids (TSS) in the fruit. Agricultural lime (Calcium Carbonate - $CaCO_3$) is used with a dosage of 2–3 quintals per hectare applied once annually, ideally 2–4 weeks before flowering. The lime is lightly incorporated into the top 10–15 cm of soil, keeping a safe distance (15–20 cm) from the trunk.

Innovation's Highlights

This dual-benefit innovation reduces pest infestation while enhancing fruit sweetness and quality. Lime is applied at a rate of 2–3 quintals per hectare before flowering. Soil pH is monitored to avoid over-alkalinity.

Benefits/Advantages

Low-cost intervention reduces crop loss and improves market returns by enhancing guava sweetness and quality.

Guava fruits

Operation of liming the soil in guava plant

Scope & Potential of Innovation for Wider Reach/Out Scaling

Adoptable in guava and similar fruit crops susceptible to soil-borne insect pupation.

Scientific Validation required

Yes, trials correlating lime dosage, soil pH, pest survival, and fruit quality metrics (TSS, Brix).

Domain

Soil-based pest management and fruit quality enhancement for guava orchards.

lime for management of fruit fly control in Guava

31. Boost Crop with Urea + Vermicompost Mix: A Practical Fertilizer Solution

Profile of Innovator

Name : S. Bhupinder Singh Bajwa
Age : 53 Years
Education : High School
Experience : 35 Years
Contact Details : Village-Bazpur, District-Nainital, Uttarakhand
Mobile Number : 9837685428

Brief description of Innovation

To improve nitrogen use efficiency (NUE), S. Bhupinder Singh Bajwa mixed conventional urea with vermicompost slurry and allowed microbial activity to stabilize the nitrogen before application. This reduces leaching and volatilization losses.

Innovation's Highlights

Blending urea with organic matter enhances its efficiency, promotes soil health, and reduces environmental impact. 1 kg of urea is mixed with 4–5 liters of vermicompost slurry and kept for 48–72 hours before application.

Benefits/Advantages

Reduces fertilizer wastage and cost of input. Enhances crop yield and soil microbial activity.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Suitable for cereal, horticultural, and cash crops across India.

Close view of application of fertilizer solution in crop

Mixing of vermicompost and urea: An innovative way

Scientific Validation required

Yes, field trials on NUE, yield comparison, and soil microbial biomass analysis.

Domain

Integrated nutrient management and eco-efficient fertilization strategies.

32. Layer Grow: Integrated Multi-Layer Cropping for Intensive Cultivation

Profile of Innovator

Name	:	Sitaram Nigwal
Age	:	56 Years
Education	:	Primary
Experience	:	30 Years
Contact Details	:	Village- Avalia, District-Dhar (M.P.),
Mobile No.	:	8959128226

Brief description of Innovation

Multi-storey cropping with crop diversification like spice and vegetable cultivation along with seed treatment, IWM, IPM, INM, water conservation, space management, raised Bed with vertical & horizontal space management.

Innovation's Highlights

Multi-storey cropping with crop diversification and use of raised beds with vertical and horizontal space optimization have great potential for sustainable and productive farming.

Benefits/Advantages

Farmer taking 2 or more crops including vegetable and spice crop in per unit area and producing high net return of Rs. 400000-500000 per ha. with B:C ratio higher than 4.0.

Sitaram Nigwal at multi layer cropping field

Planting for multi-layer crops

Scope & Potential of Innovation for Wider Reach/Out Scaling

Multi-storey cropping with crop diversification, including spice and vegetable cultivation, combined with integrated weed management (IWM), integrated pest management (IPM), integrated nutrient management (INM), water conservation, space management, and the use of raised beds with vertical and horizontal space optimization, has great potential for sustainable and productive farming.

Multi-Layer cropping

Scientific Validation required

Multi-storey cropping system need to develop best cropping system model with packages and practices in different AER for sustainable production.

Domain

Multi-storey cropping system is needed to enhance the vegetable production Suitable for sustainable vegetable production in the country.

33. Super Spike Wheat: Indigenous High-Yielding Variety

Profile of Innovator

Name	:	Dilip Singh Gehlot
Age	:	60 Years
Education	:	Intermediate (B.Sc. First year)
Experience	:	35 Years
Contact Details	:	Village-13 MGD PO-Mohangarh, PO-Mohangarh, Dist.- Jaisalmer, Rajasthan
Mobile No.	:	9829704603

Brief Description of Innovation

The innovator has found a local wheat variety which has spike length of 11 inch. Plant height of this wheat variety is 3-4 feet and the length of the wheat spike is about 11 inches, which was no less than a surprise in itself. The production of this wheat is expected to be double then production of other wheat variety. The production of this variety of wheat is double that of other wheat varieties with a BC ratio of 3.39:1. In the pursuit of agricultural innovation, a new wheat variety was developed in 2015, named DG II. The specialty of this variety lies in its exceptionally long ears measuring 9–11 inches. This achievement was inspected and acknowledged by the then Hon'ble Agriculture Minister, Sh. Prabhulal Ji Saini.

Innovation's Highlights

The foundation of this research was laid in 2012, when the innovator took 100 grams of wheat seeds belonging to the following varieties: HD; Kalyan-Sona (4); Lokman (4) and 3765.

Innovator with indigenous high-yielding variety of super spike wheat

Glimpses of super spike wheat

These seeds were soaked in water infused with 10,000 gauss of Neodymium magnetic force for 24 hours. Subsequently, the seeds were kept in a magnetic field. After germination, when the seeds developed into plants, I observed that some plants exhibited a distinct root structure.

Based on this observation, the innovator grouped and thinned the plants, selecting only those with longer ears. This process was repeated continuously for two years, and finally, I obtained plants with remarkable characteristics.

Potential of Innovation for Wider Reach/Out Scaling

The innovative wheat variety DG II has demonstrated significant potential in enhancing productivity, improving grain quality, and providing sturdier stalks. This variety is not only a step towards higher yields but also a remarkable contribution to the field of grassroots agricultural innovation.

Scientific Validation required

Yes, to establish the potential of the variety, it is essential to have scientific trial. After validation, the variety may be registered PPVFRA for IPR.

Domain

Wheat growing areas of Rajasthan and Gujarat 6-7 million ha, especilly for those areas of Rajasthan and Gujarat with poor quality water and limited irrigation.

34. Nutri-Purple Harvest: Organic Cultivation of Purple Rice & Wheat

Profile of Innovator

Name	:	Mohan Lal Chandrakar
Age	:	55 Years
Education	:	MBA
Experience	:	15 Years
Contact Details	:	Village- Keshwa, District-Mahasamund (C.G.)
Mobile No.	:	9977002275

Brief description of Innovation

Shri Mohan Lal Chandrakar promotes organic cultivation of purple rice and purple wheat, rich in antioxidants and known for their health benefits. Through a farmer producer company, he ensures collective production, value addition, and marketing of these premium crops.

Innovation's Highlights

He brought rice varieties from Assam and wheat from Punjab and under the Urza Krishi Farmer Producer Company Ltd, farmers collectively cultivate and market organic purple rice and purple wheat, known for their high antioxidant content and medicinal benefits such as boosting immunity

Mohan Lal Chandrakar with his value added products


View of purple rice & wheat grams


Glimpses of purple rice & wheat crop

and combating cancer, blood pressure, and stress. They aim is to promote low-cost organic farming by integrating cows into farming practices, utilizing all cow products—including milk, urine, dung, horns, and decomposed bodies—as natural, fertile inputs.

Benefits/Advantages

His model integrates cow-based natural farming, promoting low-cost, sustainable agriculture and improved farmer income. Model produced gross income of Rs. 87500/- and Rs. 160000/- per ha and B:C ratio 1.99 and 4.92 from cultivation of Purple Wheat and purple rice, respectively.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Organic farming model improves farmers' income through premium, health-beneficial crops while promoting sustainable, low-cost agriculture. It supports environmental conservation, enhances soil fertility using cow-based inputs, and meets growing consumer demand for nutritious, organic foods.

Scientific Validation required

Nutritional value of purple wheat and purple rice and value addition.

Domain

The innovation focuses on collective organic cultivation of nutrient-rich crops with an emphasis on sustainable, low-cost farming practices integrating livestock resources.

35. Indigenous Drought-Resilient *Bhawrani* Black Chana with Double Yield

Profile of Innovator

Name : Mukesh Kumar
Age : 41 Years
Education : Middle (7th)
Experience : 20 Years
Contact Details : Village-Bhawrani, PO-Bhawrani,
Block- Ahore, Dist.- Jalore, Rajasthan,
Mobile No. 9799113211

Brief Description of Innovation

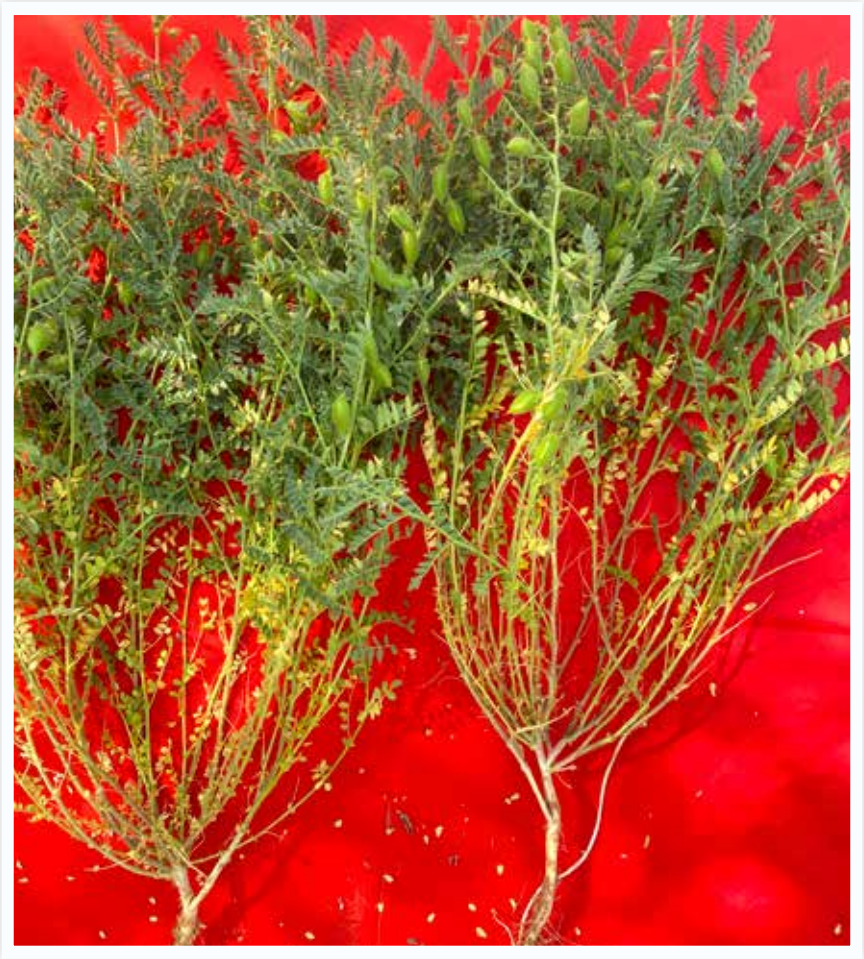
Local (Desi) variety, plant semi spreading type, seed shape owl's head, seed testa texture rough, flower colour pink, stripe on the flower, leaflet size medium, pod size medium.

Innovation's Highlights

Number of grains per pod 2, seed ribbing present and seed type deshi with small seed (<20 g/100 seed weight), dark brown colour variety.

Benefits/Advantages

It flowers and set fruits even under extreme water stress conditions wherein normal chickpea variety fails. It gives average yield of 15-18 quintal per ha with B:C ratio of around 3.05 under rainfed (sevaj) condition.



Drought resilient 'Bhawrani' black chickpea

View of different parts of 'Bhawrani' black chickpea

Potential of Innovation for Wider Reach/Out Scaling

This genotype can be tested for rained chickpea growing areas of western Rajasthan and similar ecology in Gujarat

Scientific Validation required

Yes, however, it is traditionally grown in the rainfed (sevaj) conditions locally, but to have out scaling in similar growing conditions, multi-location trial may need to be conducted.

This variety has been approved PPVFRA.

Domain

Chickpea especially under acute moisture stress conditions

36. *Marcha Dhan:* Preserving the Aromatic Heritage of West Champaran's GI-Tagged Rice

Profile of Innovator

Name	:	Anand Singh
Age	:	53 Years
Education	:	Graduate
Experience	:	20 Years
Contact Details	:	Village: Samhauta, District: West Champaran, Bihar
Mobile No.	:	7739111100

Brief description of Innovation

"Marcha Dhan" of West Champaran is an indigenous paddy variety renowned for its unique aroma and high-quality rice flakes. It has been awarded a Geographical Indication (GI) tag. The variety is named "Marcha" due to its pepper-like grains. It matures in about 140–150 days and provides an average yield of 20–25 quintals per hectare. Currently, it is cultivated over an area of 150-200 hectare.

Innovation's Highlights

Renowned for its distinctive aroma and exceptional quality of rice flakes, this variety has been awarded a Geographical Indication (GI) tag, recognizing its unique regional identity and heritage value. It is named for its pepper-like grains, whose small, rounded shape and characteristic appearance set it apart from other rice varieties. Celebrated both for its culinary appeal and cultural significance, it continues to be a prized choice for traditional dishes and specialty markets.

Benefits/Advantages

"Marcha Dhan" of West Champaran, known for its unique aroma and quality rice flakes. It matures

Farmers with products of Marcha Dhan

Products of Marcha Dhan

in 140–150 days with a yield of 20–25 q/ha. Farmers getting premium price of flex Rs. 200/ kg in local market. The flex has shelf-life of 120-180 days at ambient.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Marcha Dhan yields soft, aromatic, short-grain rice flakes that are especially prized for preparing Poha.

Known for their superior texture and fragrance, these flakes command a premium market price, offering farmers a profitable return on cultivation. With the rising demand for traditional and aromatic rice varieties, Marcha Dhan presents significant potential for expanding production and strengthening farmers' income opportunities.

Scientific Validation required

To secure its long-term viability and productivity. Through scientific assessment and varietal improvement, management practices or breeding solutions can be developed to improve lodging resistance while retaining its desirable grain and flake qualities, thereby boosting both farmer profitability and consumer satisfaction.

Domain

Conservation of Indigenous Variety of Paddy

37. Nutrient-Rich Sweet Potato Varieties for Arid Regions

Profile of Innovator

Name	:	Rawal Chand
Age	:	42 Years
Education	:	Matriculation (10th)
Experience	:	15 Years
Contact Details	:	Village-Nosar, PO-Nosar, Block- Mohangarh, Dist. -Phalodi, Rajasthan
Mobile No.	:	9784497852

Brief Description of Innovation

Sh. Rawal Chand developed three improved varieties of sweet potato, namely -1) Thar Madhu, 2) Safed Shakarkand and 3) Maru Gulabi.

Innovation's Highlights

Thar Madhu variety is spreading type, vine length 186 cm, tuber skin colour pink, tuber flesh colour white, tuber wt 119g, tuber length 27.7 cm, tuber dia 28.6 cm, no. of tubers/vine 4.5 have mid maturity with tuber yield 257 q/ha. It has higher total soluble solids and higher soluble sugar content, higher phenol content and superior anti-oxidant property.

The Safed Sakarkand variety is also spreading type, vine length 215 cm, tuber skin colour white, tuber flesh colour white, tuber wt 181g, tuber length 22.1 cm, tuber dia 29.6 cm, no. of tubers/vine 4.1 have mid maturity with tuber yield 367 q/ha. It has lowest sugar making it an option for diabetic patients' consumption.

Farmer in the sweet potato field

Farmer with visitors in the field

The Maru Gulabi variety is also spreading type, vine length 302 cm, tuber skin colour purple, tuber flesh colour purple, tuber wt 185g, tuber length 28.7 cm, tuber dia 39.7 cm, no. of tubers/vine 5.0 have mid maturity with tuber yield 434 q/ha. It has higher fibre making it suitable for consumers seeking higher fibre dietary fibre intake.

Benefits/Advantages

The trials by AU, Jodhpur revealed that these varieties are promising for cultivation, offering higher yields, improved nutritional quality, and better pest tolerance under arid conditions.

Potential of Innovation for Wider Reach/Out Scaling

Sweet potato growing areas of Rajasthan and elsewhere

Scientific Validation required

No

Domain

Sweet potato growing areas of arid region of Rajasthan.

Glimpses of sweet potato varieties

38. *Bhutku* Rice: Reviving Jharkhand's Indigenous Grain for Nutritional and Ecological Sustainability

Profile of Innovator

Name	:	Situ Oraon
Age	:	52 Years
Education	:	Matriculate
Experience	:	12 Years
Contact Details	:	Village: Lundari, Dist.: Ranchi, Jharkhand
Mobile No.	:	6203222463

Brief description of Innovation

Bhutku Rice, an indigenous aromatic paddy variety selected from 136 landraces for its **nutritional value**, **fluffy texture**, and **aromatic flavour**. Grown under natural farming conditions, Bhutku rice is now cultivated by over 1000 farmers through FPO 4S 4R in Ranchi's Mandar Block.

Innovation's Highlights

Bhutku Selected from 136 traditional rice varieties of Jharkhand state and registered with PPVF&RA (REG/2015/801). This variety is high in protein (8.7 g/100g), iron (10.24 mg/kg) and zinc (24.66 mg/kg) as estimated by ICAR NRRI, Cuttack, Odisha. As per performance of this variety at farmer's field and KVK farm, this was found very much suitable for natural/organic farming system. Scaled from individual to more than 1000 farmers in last five years; and supported by farmer producer organization (FPO).

Benefits/Advantages

Nutrient-rich and aromatic rice with high consumer demand; Suitable for organic/natural farming; Resilient to heavy rain, winds, and pests; Preserves indigenous agro-biodiversity; and provides premium market value and rural income generation. Highly preferred by consumer demand due to its

Situ Oraon in his Bhutku rice field




Packaging of Bhutku rice for selling

characteristic aroma and taste. This climate resilient variety has yield potential of 42 q/ha in 140-145 days' crop duration, suitable for organic/natural farming under rain-fed low land (Don 1). Selling price of paddy (Rs. 40/kg) it is highly remunerative (Rs. 45600/acre including income from grain and straw) with Benefit: Cost ratio of 2.24 (against 1.57 achieved in hybrid varieties).

Scope & Potential of Innovation for Wider Reach/Out Scaling

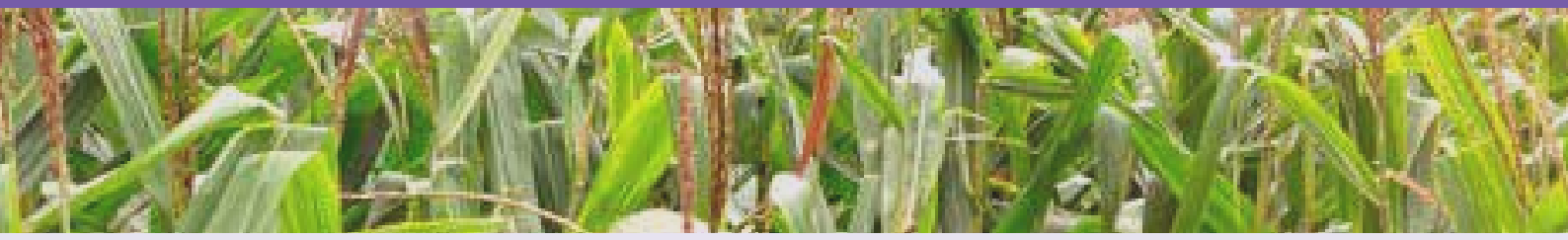
High potential for expansion across organic and heritage rice markets. It can be promoted through FPOs, organic retail chains, and GI-tag initiatives & suitable for promotion under government biodiversity and tribal development programs. Presently covered 14000-acre area by 5000 farmers. Seed demand increasing across the districts.

Scientific Validation required

Different parameters like aroma, nutrients, molecular analysis (DNA finger printing) have been estimated after multi-location field trial. The process of Geographical Indication is in process. Research work for yield improvement needs to be carried out. Validation of pest/disease tolerance, climate resilience and yield is needed.

Domain

Indigenous Crop Conservation / Organic Farming / Nutritional Crops. Huge scope of export. GI rice can be popularized by educating farmers to produce under natural farming in tribal areas.

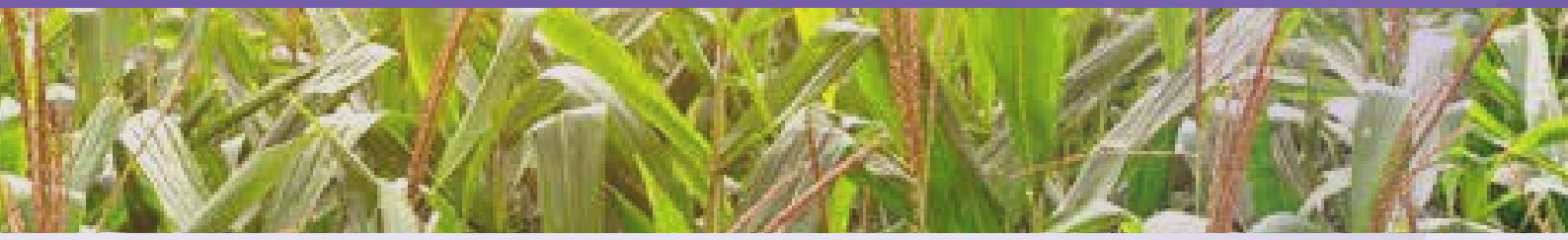


PART-II

PART - II

Innovations Related to Horticulture

These innovations deal with the cultivation and management of fruits, vegetables, spices, and flowers. Focus Areas: high-density planting, propagation techniques, intercropping, and protected cultivation



39. From Soil to Seedling: Farmer-led Innovations in Nursery Production

Profile of Innovator

Name	:	S. Harbir Singh
Age	:	49 Years
Education	:	MA (Pol Sc)
Experience	:	22 Years
Contact Details	:	Village Dadlu, Tehsil Shahabad, District Kurukshetra (Haryana)
Mobile No.	:	9416553212

Brief description of Innovations

Sardar Harbir Singh, an exceptionally innovative and progressive farmer from village Dadlu in Kurukshetra district, has established a state-of-the-art hi-tech vegetable nursery that is unique in India. Through his exemplary dedication and commitment, he has developed environment-friendly technologies that not only promote sustainable farming but also significantly reduce input costs for farmers. His efforts stand as a model of modern, responsible, and impactful agricultural innovation. He has developed several cost-effective and practical innovations that have enhanced large-scale commercial vegetable nursery production.

Innovation's Highlights

» *Eco-friendly silica rich sustainable nursery media:* It is a combination of FYM + burnt rice husk + silica-rich sand, reducing cost and improving seedling quality. This mix enhances seedling health, promotes stronger root systems, and makes use of materials that are locally available at minimal

Harbir singh at his Nursery production unit












Views of nursery with different innovations

cost. It effectively replaces expensive commercial growing media, resulting in significant cost savings for nursery operations.

» *Low-cost nursery tunnels:* It is developed by using 25 GSM UV-stabilized polypropylene non-woven (PPNW) cloth for protection and microclimate management. These tunnels create a favourable microclimate for seedlings, protecting them from harsh weather, temperature fluctuations, and pests. Compared to conventional polyhouse structures, this approach is highly economical while delivering excellent results in seedling growth and survival.

» *Micro-sprinkler irrigation system:* It ensures efficient water use and uniform moisture for better germination. The adoption of a micro-sprinkler irrigation system in his nursery ensures uniform and precise water distribution across seedbeds. This not only improves germination rates and plant health but also conserves water, reduces wastage, and lowers operational costs, making the irrigation process more sustainable and efficient.

» *Line-sowing implements:* To further enhance nursery efficiency, he has designed and developed line-sowing implements that enable precise, uniform seed placement in nursery beds. This innovation improves germination uniformity, reduces seed wastage, and saves labour, thereby streamlining large-scale vegetable seedling production.

Scope & Potential for Wider Reach and Out-Scaling

These innovations hold immense potential for adoption across diverse agro-climatic regions of India and other vegetable-growing countries. Being low-cost, eco-friendly, and based on easily available local resources, these technologies can be readily replicated by small and marginal farmers as well as commercial nursery enterprises.

Scientific Validation Requirements for the Innovations

While Sardar Harbir Singh's innovations show strong practical benefits, scientific validation is vital for reproducibility, performance optimization, and wider adoption.

Views of innovative solutions for bed preparation

Views of nursery: Combination of innovations

1. Eco-friendly silica rich sustainable nursery media: Lab analysis for nutrient profile, pH, EC, and microbes; comparative nursery trials for germination, vigour, and survival; economic analysis for cost–benefit.
2. Low-cost Nursery Tunnels (25 GSM UV PPNW): Monitor microclimate parameters; assess seedling growth and survival; test cloth durability across seasons.
3. Micro-sprinkler Irrigation: Measure water distribution uniformity and droplet size; compare water-use efficiency with traditional methods; assess impact on germination, growth, and disease incidence.
4. Line-sowing Implements: Evaluate seed spacing, depth, and germination uniformity; compare labour/time efficiency with manual sowing; conduct multi-location performance trials.

Overall approach for validation needs multi-location trials across diverse agro-climatic zones; documentation of protocols, performance data, and economics; participatory testing with KVKs, Agricultural Universities, and ICAR institutes; peer-reviewed publication of results to establish credibility and policy integration.

Domain

In addition to producing and marketing vegetable nurseries within Haryana, his high-quality seedlings are supplied to several other destinations, including Himachal Pradesh, Punjab, Rajasthan, Uttar Pradesh, Uttarakhand, and even international markets such as Italy. Furthermore, he actively engages in testing and evaluating private hybrids of various vegetable crops on his farm to assess their performance and suitability.

40. Stoli Orchard System (SOS) in Apple: Redefining Horticulture

Profile of Innovator

Name : Jatinder Singh
Age : 42 Years
Education : B. A, B. ed., PGDCA
Experience : 16 Years
Contact Details : VPO: Bagi Gawas,
Tehsil Chirgaon, Shimla, HP
Mobile No : 8894092492

Brief description of Innovation

Stoli Orchard System (SOS) is a revolutionary ultra-high-density orchard model designed to maximize fruit yield and quality while minimizing land use, labour, and management costs. Unlike traditional or high-density systems, SOS uses narrow, tilted mother plants with multiple upright fruiting shoots.

Innovation's Highlights

This system is engineered for allowing up to 1625 apple plants per acre with 5x5 feet spacing, early fruiting (as early as year 2 and that too with vigorous rootstocks and even with seedlings), uniform light penetration, superior fruit color and size, and high productivity—yielding up to 3250 boxes (20 kg each) per acre, which is 3–4 times more than High-Density Plantation (HDP) methods.

Its slim canopy (6–8 inch width), adaptability to various terrains, and low water and nutrient requirements make SOS ideal for both small farmers and commercial investors aiming for high returns with lower inputs. Suitable for natural farming and as well as organic farming.

Stoli Orchard system (SOS) in Apple

A view of Stoli orchard system (SOS) in apple orchard

Benefits/Advantages

The Stoli Orchard System (SOS) achieves maximum yield on minimal land through an ultra-efficient, high-density canopy design that ensures early returns and superior fruit quality. Its slim, tilted structure maximizes space and sunlight penetration, optimizing energy for fruit production. With low resource requirements and reduced labour and management costs, it also offers exceptional flexibility across climates and terrains. Scalable and investor-friendly, SOS promotes sustainable orchard design—and its field-tested success underscores its revolutionary approach to horticulture.

Scope & Potential of Innovation for Wider Reach/Out Scaling

From smallholder farms to corporate agricultural models, this technology offers nationwide applicability, delivering a low-cost, high-return solution that boosts export-oriented quality across diverse crops. Its modular design allows customization, making it ideal for different crops, scales, and mechanization needs—perfect for emerging agritech and government or NGO projects. Built for climate resilience and sustainability, it adapts seamlessly across terrains and climatic zones. With proven field success, the system is replicable internationally, empowering global agriculture with scalable, sustainable innovation.

Jatinder Singh explaining Stoli Orchard System in apple to the visitors

Bumper production of apple with SOS System

Scientific Validation Required

The Stoli Orchard System (SOS) requires scientific validation through comparative field trials to assess plant growth, yield, and resource efficiency versus traditional and HDP systems. Studies on light penetration, root development, water and nutrient use efficiency, and pest resistance are essential. Lab analysis of fruit quality (Brix, shelf life) and structural stability of the tilted canopy must be conducted. Validation from ICAR, SAUs, or CITH will support large-scale adoption.

Domain

Precision Orchard Design and Ultra-High-Density Farming in horticulture sector.

41. Innovative Coloured Mango Hybrids to overcome Alternate Bearing

Profile of Innovator

Name	:	Avnish Kumar Tyagi
Age	:	57 Years
Education	:	M. Sc. (Maths)
Experience	:	35 Years
Contact Details	:	Nangla Akkhoo, Ghaziabad (UP)
Mobile No	:	9311352693

Brief description of Innovation

"Alternate bearing" is a serious problem in mango which Impact economics of farmers. Shri Avnish K. Tyagi, a Post Graduate in mathematics, has come forward to introduce Latest varieties of mango developed by ICAR-IARI, New Delhi to sort out this serious problem in mango. He has further designed various combinations of different varieties of mango (***Pusa Arunima, Pusa Lalima, Pusa Pratibha, Pusa Shreshtha, Pusa Peetamber, Pusa Surya***), in order to reduce the incidence of alternate bearing in mango. Shri Avnish Tyagi, hailing from Nangla Akkhoo, Ghaziabad (UP) has had been replacing such traditional varieties of mango, which are prone to alternate bearing. This innovation ensures consistent yields, better fruit quality, and longer shelf-life. Further, he has facilitated in designing various permutation & combination of different varieties of mango.

Innovation's Highlights

» Introduction of coloured, high-quality mango hybrids from IARI.
» Solves alternate bearing issue common in traditional mango varieties.
» Attractive fruit appearance and rich flavour boost marketability.
» Increased farmer income and market recognition.

Benefits/Advantages

» Yearly and stable mango production.
» Premium price in the market due to colour, size, and taste (@₹ 150-200 per Kg)
» Better shelf life reduces post-harvest losses.

Coloured mango hybrid fruit

Coloured mango hybrid cultivation

Scope & Potential of Innovation for Wider Reach/ Out Scaling

» Suitable for all major mango-growing belts of India.
» High potential for export markets and value-added processing.
» Can be integrated into orchard rejuvenation programmes.
» Can significantly improve rural economy through adoption in clusters.

Scientific Validation required

» Multi-year performance evaluation in different agro-climatic zones.
» Pest and disease resistance studies.
» Post-harvest quality and storage performance assessment.
» Crop geometry and combination of different varieties.

Domain

Horticulture-based Innovation has huge scope in mango growing regions.

42. Cleft-Grafting of Pollinizer Branches to Enhance Apple Fruit Yield

Profile of Innovator

Name : B.S. Thakur
Age : 75 Years
Education : Matriculation
Experience : 55 Years
Contact Details : Village-Adal, District-Shimla, Himachal Pradesh
Mobile Number : 9816424811

Brief description of Innovation

To address the issue of poor pollination in established apple orchards lacking pollinizer cultivars, Sh. B. S. Thakur, a farmer, introduced a cleft grafting-based top-working technique. Instead of planting new pollinizer trees that take 8–10 years to mature, he grafted pollinizer branches onto existing trees. To prevent canker at the graft union, he innovatively covered large cuts with bark from the same plant, which successfully healed and allowed the graft to establish.

Innovation's Highlights

This approach avoids the long wait for pollinizer trees to mature and ensures enhanced fruit set in apple orchards. The bark-covering method effectively prevents canker development, enhancing the success rate of cleft grafting. Multiple pollinizing cultivars were used for better results. The technique involves cleft grafting of 3–4 pollinizer varieties using bark dressings on mature trees. Grafting is done during the spring season. The method does not require removal of the main tree and allows continuity in production.

Benefits/Advantages

This technique increased yield from 5–6 t/ha to 16–17 t/ha, with no major capital investment. It is easily replicable in other orchards and provides immediate benefits.

Graffted apple fruit orchard

Cleft Grafting-based top-working technique in apple

Grafted apple tree

Scope & Potential of Innovation for Wider Reach/Out Scaling

Applicable in apple orchards across Himachal Pradesh and other temperate zones where pollination is limited.

Scientific Validation required

Yes, there is a need for anatomical and pathological studies on graft union healing and long-term productivity.

Domain

Improved horticultural technique for productivity enhancement in temperate fruit orchards.

43. Intercropping in High Density Apple Orchards : Enhancing Land Productivity and Early Income

Profile of Innovator

Name : Fayaz Ahmad Rather
Age : 38 Years
Education : Middle
Experience : 20 Years
Contact Details : Village-Ahan, District-Ganderbal, Jammu & Kashmir
Mobile Number : 7006264196

Brief description of Innovation

Mr. Fayaz Ahmad Rather introduced intercropping of watermelon, muskmelon, and tomatoes between rows of young, non-bearing apple trees. This utilizes vacant space during the early orchard establishment phase and provides supplementary income.

Innovation's Highlights

Optimizes land use and boosts early income without affecting the long-term health of apple trees. Seasonal vegetables are planted with consideration to sunlight and nutrient requirements. Irrigation is managed through drip or furrow methods.

Benefits/Advantages

Generates income from otherwise idle land, improves soil health, and introduces diversity to the cropping system.

Harvesting of tomato crop in intercropping system




Harvesting of watermelon, muskmelon and tomato crops in intercropping system in high density apple orchard

Scope & Potential of Innovation for Wider Reach/Out Scaling

Suitable for all temperate fruit orchards with young plantations across India.

Scientific Validation required

Yes, comparative studies on intercropped vs. monocropped systems, soil fertility impact, and income differentials.

Domain

Agroforestry and integrated horticulture for small and marginal orchardists.

44. Earning More with Multi-Crop Vegetable Cultivation: Smart Farming for Better Profits

Profile of Innovator

Name : Manjit SIngh
Age : 41 Years
Education : Matric
Experience : 30 Years
Contact Details : Village: Chuhrian, District: Mansa,
State : Punjab (151505)
Mobile No : 98723-83002

Brief description of Innovation

The Innovator has practising intercropping of pea and cabbage in bottle gourd crop grown under low tunnel for several years and fetch high profits as compared to single crop. This also ensures their risk coverage by cropping different crops. All three crops (bottle gourd, pea & cabbage) are sown during the second fortnight of November. Firstly, bottle gourd and pea are sown in the prepared field and irrigation is applied and then bottle gourd seedlings are transplanted after a weekThe harvesting of cabbage starts in end January and it completes until February, after which ridges are levelled to make 1-1.5 ft wide beds for bottle gourd. The harvesting for pea is started from 20 February and completed until 20 March, with 1-2 harvests. The harvesting of bottle gourd starts from March and goes upto June end. The average yield of 70-75 q/ha for pea, 160-180 g of cabbage and 250-300 q/ha of bottle gourd is obtained from this intercropping system.

Innovation's Highlights

From the same piece of land and almost similar input cost results in high returns and also ensures the good earning by minimizing the risks.

Innovative Intercropping of pea and cabbage in bottle gourd crop grown under low tunnel

View of Multi-crop vegetable cultivation

Benefits/Advantages

Intercropping ensures negligible weed problems. Net profit from this system is approximately 2 lakh per acre

Scope & Potential of Innovation for Wider Reach/Out Scaling

It is need of the hour to study such production technology methods to popularize the cultivation of vegetable crops in the state.

Scientific Validation Required

Yes; Scientific validation and efficacy trials are essential to quantify monetary returns under intercropping systems, along with optimizing mechanization to reduce manual labour and improve efficiency.

Domain

Multi-crop Vegetable cultivation practices,

45. Diversified High-Density Guava Orchard: Triple Profit with Varietal Innovation

Profile of Innovator

Name	:	Manoj Khandelwal
Age	:	48 Years
Education	:	Post graduate (M. Com)
Experience	:	7 Years
Contact Details	:	Village-Badodiya, PO-Pipalda, Block-Itawa, Dist. -Kota, Rajasthan
Mobile No.	:	7014153350

Brief Description of Innovation

Sh. Khandelwal focussed on diversification of Guava varieties and high density HDP) and ultra-high density plantation (UHDP) to have better production from his orchards. New orchard of Guava varieties VNR, Thaipink, Barafkhan Gola established while other farmers in the locality only plant Barafkhan.

He planted Guava var. VNR under High Density (HDP) (3.5x2.5 m, 1141 plants/ha) on 3.0 ha and Guava var. Taiwan Pink under Ultra High Density (UHDP) (2x1.5m, 3333 plants/ha) on 3.0 ha area. He also adopted bagging of fruits with protective paper bag. On an average fruit yield per plant was 20-40 kg per plant. With the better-quality bagged guava of var. Taiwan Pink and VNR fetched market

Manoj Khandelwal at his high density guava orchard

Fruiting in guava plant and packging guava fruits

selling rate of Rs. 20-25 and Rs. 30-40 per kg respectively. Thus from Taiwan Pink var. under UHDP on 3.0 ha area produced 198 tonnes of Guava and generated gross income of Rs. 49.50 lakh with B:C ratio of 2.28 while VNR var under HDP on 3.0 ha area produced 120 tonnes of Guava and generated gross income of Rs. 42.0 lakhs with B:C ratio of 1.71. Thus from 6.0 ha orchard of Guava Sh. Khandelwal got gross income of Rs. 91.50 lakh and net income of Rs. 44.30 lakhs.

The innovative strategy of Sh. Khandelwal of high-density planting of Guava maximized land productivity as compared to traditional orchard, and varietal diversification of Taiwan Pink and VNR fetching better market price. The pruned leaves used as organic mulching which conserve soil moisture and reduced cost of production. Bagging of fruits with protective paper bag to protect from pests, diseases, physical damage and enhance their quality and marketability. This strategy along with high density plantation gave better yield third year onwards.

Potential of Innovation for Wider Reach/Out Scaling

Guava cultivation in Mewar and Hadouti Region of Rajasthan

Scientific Validation required

No

Domain

Diversification of Guava cultivation in Hadauti and Mewar region of Rajasthan

46. Bamboo Ventilated Structure for sustainable Onion & Garlic Storage

Profile of Innovator

Name : Santosh Kumar
Age : 47 Years
Education : Graduate (BA)
Experience : 20 Years
Contact Details : Post-Beethdi, PO-Phalodi, Block- Phalodi, Dist. -Phalodi, Rajasthan
Mobile No. : 9166220756

Brief Description of Innovation

The structure is designed with a ventilated bamboo floor, a central ventilation pathway and an extended roof. The framework is constructed using galvanized iron (GI) channels for durability and stability. The roof is made of asbestos sheets and is extended by 2 feet to prevent rainwater splashes, thereby reducing the risk of sprouting and black mould in stored bulbs.

Innovation's Highlights

The ventilation is provided from both the bottom and the sides of the structure to ensure adequate airflow. The floor and side walls are built using bamboo poles with a diameter of 1.5 inches, spaced 1.5 inches apart for effective ventilation. The dimensions of structure are as follows-

» Length: 40 feet,
» Width: 16 feet,
» Height from ground level: 1.5 feet,

Santosh Kumar with bamboo-framed ventilated storage house

View of bamboo ventilated storage structure

» Side wall height: 6 feet,
» Central height of structure: 10 feet.

Benefits/Advantages

The storage capacity of structure is 25 metric tonnes (MT) with estimated cost of ₹1.75 lakhs. The storage life of bulbs in the structure is four months. The USP of the structure is that the bamboo walls reduce the excessive heat in summer and help proper aeration. Platform to stack the bags ~ 2 ft above ground, allows proper air flow and avoid moisture contact.

Potential of Innovation for Wider Reach/Out Scaling

Onion and garlic growing areas-Baran, Jhalalwar, Kota, Bhilwara, Alwar, Sikar districts of Rajasthan

Scientific Validation required: To analyse the strength and life of structure, economics and produce quality in storage, scientific validation is required.

Domain

Onion and Garlic storage in production area of these crops in Rajasthan.

47. *Machaan* Magic: Mulched bottle gourd revolution

Profile of Innovator

Name	:	Hareram Chaurasia
Age	:	50 Years
Education	:	Intermediate
Experience	:	30 Years
Contact Details	:	Village: Maniar Block: Sikandarpur, District: Ballia, Uttar Pradesh
Mobile No	:	8737080769

Brief description of Innovation

The use of trellis (*machaan*) system and plastic mulch in bottle gourd cultivation to enhance fruit quality, reduce rotting, and increase yield. This method optimizes space, moisture, and sunlight, resulting in a 33% higher yield compared to traditional practices.

Innovation's Highlights

The method has improved fruit quality with uniform size and shape, while preventing direct contact of fruits with soil, thereby minimizing rotting and post-harvest losses. It ensures efficient use of space and sunlight, promoting better photosynthesis and plant health.

Hanging bottlegourd cultivation using machan

Good quality fruit of bottlegourd with uniform shape

Benefits/Advantages

Higher income due to better yield advantage (20-25%); saves water (15%) and labour; low-cost and efficient method; and reduces crop damage and spoilage.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Already adopted by 45 farmers, 20 more farmers are convinced to adopt. Demonstrated significant yield enhancement (20-25%) and visual quality improvement and strong scope for horizontal spread in vegetable-growing regions, especially with smallholders.

Scientific Validation Required

Needs validation.

Domain

Vegetable Production Systems in Eastern Uttar Pradesh (26 districts)

48. Integrating Raised bed, Drip & Mulch: Cultivating Cucumber and Watermelon in sequence

Profile of Innovator

Name : Nawab Singh
Age : 46 Years
Education : Graduate
Experience : 9 Years
Contact Details : Address: Village & Post – Mantodi,
Block – Jansath, District: Muzaffarnagar (UP)
Mobile No : 9259222910/8954451440

Brief description of Innovation

This innovation involves cultivation of Cucumber and Watermelon on raised beds, with mulch and drip irrigation system, specifically designed for regions prone to water-logging during the rainy season. The planting schedule is aligned to target peak market demand in October–November, maximizing market returns. Then, it is followed by cultivation of Watermelon in February -March by transplanting, followed by harvesting in May.

Innovation's Highlights

The raised bed system prevents crop loss from water-logging and allows for dual income generation through both Cucumber and Watermelon cultivation. This system serves as a viable alternative to sugarcane.

Raised bed and mulch system for cucumber and watermelon cultivation

Cucumber and watermelon crops

Benefits/Advantages

The system yields a net return of ₹1.5 lakh per hectare from Cucumber and ₹1,30,000 per hectare from watermelon. Besides high profitability, it offers long-term benefits, such as, improved soil health, indicating a favourable Benefit-Cost (B:C) ratio, despite heavy rain and water-logging.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The model has been adopted by 10 farmers across 3 villages, covering approximately 20 hectares. Its economic viability, rainfed adaptability, and soil health benefits make it highly replicable and scalable in similar agro-climatic zones.

Scientific Validation Required

Validation is necessary to assess yield performance, soil fertility impact, and economic returns of the Cucumber–Watermelon intercropping system.

Domain

Sustainable Intercropping Systems for Waterlogged and Rainfed Agro-Ecologies in Western Uttar Pradesh

49. Smart Triple-Layer Cropping: Maximizing Returns with Sugarcane-Vegetable-Banana Integration

Profile of Innovator

Name : Hardik Murarka
Age : 30 Years
Education : MBA
Experience : 9 Years
Contact Details : Village: Husainpur Block: Sitapur, District : Sitapur, Uttar Pradesh
Mobile No : 9598743106

Brief description of Innovation

This innovative agricultural practice involves planting sugarcane in October using the High-Tech Plantation (HTP) trench method, with row-to-row spacing of 4.5 feet and plant-to-plant spacing of 1.5 feet. The crop is grown under black plastic mulch and supported by a drip irrigation system throughout the cropping period. Additionally, intercropping of vegetables with banana is integrated into the system, enhancing land use efficiency, crop diversity, and income generation.

Innovation's Highlights

This approach offers a triple-layer cropping system that maximizes land productivity and resource efficiency. Fertigation through drip irrigation enables precise application of water and nutrients. The use of plastic mulch significantly cuts down on labour and weed control efforts.

Banana and vegetable cultivation with plastic mulch in triple layer cropping

Sugarcane in triple layer cropping

Benefits/Advantages

The model is economically viable, with an additional net income of ₹4,50,000 per hectare through intercropping. It boasts a high benefit-cost ratio of 4.25, reflecting strong returns on investment. Resource-efficient practices reduce irrigation and labour costs, further enhancing profitability.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Already adopted by 15 farmers, 10 more farmers are convinced to adopt. Demonstrated significant yield enhancement and visual quality improvement. Strong scope for horizontal spread in vegetable-growing regions, especially with smallholders.

Scientific Validation Required

Needs validation. Formal field trials under different agro-climatic conditions should be conducted to evaluate yield impact, water and nutrient use efficiency, and crop interactions in the triple-layer system.

Domain

High-Intensity Multilayer Cropping Systems suitable for maximizing Land and Resource Use Efficiency in Central Uttar Pradesh

50. Bamboo-Structured Low-Cost Betel Vine Shade House

Profile of Innovator

Name : Shyam Sundar Kumar
Age : 25 Years
Education : Primary level
Experience : 5 Years
Contact Details : Village: Pipar, Dist.: Gaya, Bihar
Mobile No. : 9508520073

Brief description of Innovation

The structure is designed to maintain ideal microclimatic conditions such as adequate humidity, filtered light, and proper soil moisture—crucial for the delicate Magahi betel vine. The shade house is 2-2.5 m high and provide slope for run-off and provide 30-35% shade. It also plays a crucial role in protecting the crop from leaf burn, black spot disease, and environmental stress, thereby enhancing the quality and yield of betel leaves. Moreover, high density planting at 30cm apart which also suppress weed growth. In modified shade farmers harvest 100 leaves whereas in normal 20-25 leaves each wine.

Innovation's Highlights

Use of locally available, eco-friendly materials bamboo and dry grass (Jhalasi) able to provides protection from heatwaves, excessive rain, and frost; Maintains humidity and shade, critical for betel vine growth of shoot and new leaves; Sustainable and low-cost solution for small and medium betel vine growers/farmers; and improves resilience and supports continuous harvesting. Higher leaf productivity inside the modified structure with reduced disease incidence by 5-10%.

Bamboo structured betel vine shade house

Betel vine cultivation in low cost bamboo structure

Benefits/Advantages

Minimizes crop loss from climatic extremes; improves leaf quality and productivity; reduces disease incidence, especially leaf burn and black spot; enhances farmer's income through sustained yield; and eco-friendly and replicable with local resources. Farmer income enhanced Rs. 1.4 lakh to 2.0 lakh per annum.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation has significant potential in betel vine-growing regions where small and marginal farmers face climate-related cultivation challenges. It can be adopted across Magahi Paan belts and similar agro-ecological zones of Bihar. Its low-cost and locally adapted design makes it ideal for mass adoption and promotion through KVKs, NGOs, and agricultural extension programs.

Scientific Validation required

Needs validation of microclimate parameters inside vs. outside the structure; leaf quality, disease incidence, and yield impact.

Domain

Suitable for betel vine growing areas for better management of resources.

51. Tyre-Trellis System: A Low-Cost Vertical Frame for Dragon Fruit Cultivation in Non-Traditional Areas

Profile of Innovator

Name	:	Nagraj Nakhat
Age	:	78 Years
Education	:	Graduate
Experience	:	12 Years
Contact Details	:	Village: Thakurganj, Dist.: Kishanganj, Bihar
Mobile No.	:	9006265380

Brief description of Innovation

Shri Nagraj Nakhat has developed low-cost frame structure using brick, cement, sand, and steel rods to hold old motorcycle tyres for supporting dragon fruit stems. Enhances canopy area and sunlight exposure, leading to better yields. Planting distance is 3 ft × 3 ft, 1,200 plants/ acre. The circular tyre on top acts as a stable crown for stem training, facilitating better light interception and ease of harvesting. The structure supports vertical growth, which reduces disease incidence due to less contact with soil and enhances fruit quality.

Innovation's Highlights

Low-cost materials used; Efficient support for dragon fruit. The structure is constructed using locally available materials—bricks, cement, sand, and steel rods—combined with discarded motorcycle tyres, which are mounted at the top to support the upright growth of dragon fruit stems. Each unit is approximately 5.5 to 6 feet in height, providing adequate canopy development and air circulation.

Low cost vertical frame for dragon fruit cultivation

Views of Dragon fruits cultivation

Benefits/Advantages

Promotes horticultural diversification through use of fallow land and intercropping; Increases income. Av. yield ranges between 10–12 kg per plant; sale at prevailing market rate ₹80–₹100 per kg, a farmer can earn an annual income of ₹9.6 fruit and additionally, surplus saplings from mature plants can be propagated and sold at a rate of ₹30–₹40 per cutting, potentially generating an extra income of ₹1–₹2 lakh annually. The estimated cost of one unit is ₹250–₹300, with a life span of over 15 years, making it economically viable and environmentally sustainable.

Scope & Potential of Innovation for Wider Reach/Out Scaling

High potential for replication in similar agro-climatic zones. It can be promoted through schemes and SHGs. This low-cost technology can be promoted to increase area under dragon fruit in similar agro-ecologies.

Scientific Validation required

Needs validation of economic viability, productivity and durability of the structure.

Domain

Horticulture, Climate-Resilient Agriculture, Low-Cost Technology, Waste Utilization.

52. Glucose Coating: Enhancing Shelf-Life and Quality of Litchi Fruits

Profile of Innovator

Name	:	Bhola Nath Jha
Age	:	70 Years
Education	:	Postgraduate
Experience	:	30 Years
Contact Details	:	Village: Jhapha, Dist.: Muzaffarpur, Bihar
Mobile No.	:	7488582883

Brief description of Innovation

Litchi, a delicate non-climacteric fruit, deteriorates appearance quickly after harvest due to browning and microbial incidence on peel. Shri Bhola Nath Jha has enhanced shelf life of Litchi by applying glucose solution coating. Fruit loose attractive colour due to browning of the peel and incidence microbial growth. Applying a glucose solution coating forms a protective layer over the fruit's surface, which helps slow down discolouration, inhibits microbial incidence, and thereby extends the shelf life, allowing for longer storage, better transportation, and improved marketability.

Glucose coated harvested litchi for increasing shelf-life

View of glucose coating of litchi fruits for enhancing shelf-life

Innovation's Highlights

Glucose treatment supports metabolism, maintains cell turgor, reduces ROS, preserves anthocyanins, and extends self-life by preventing shrivel, micro-cracking and senescence; Dipping litchi bunches in 5% glucose solution and covering with cotton. Freshly harvested litchi bunches are dipped in a 5% glucose solution to form a protective coating, and then covered with a layer of cotton to minimize moisture loss, protect against physical damage, and further slowdown the deterioration process during storage and transportation.

Benefits/Advantages

This treatment effectively extends the shelf-life of litchi to about 5–6 days after harvest, thereby providing growers and traders with a longer marketing window to reach distant markets, ensuring higher price realization, and significantly reducing post-harvest losses that typically occur due to spoilage, discolouration, and microbial decay.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The technology has huge scope for litchi growers for highter income due to increase in shelf-life of fruits; and it could be adoptable in Bihar and other Litchi-growing regions.

Scientific Validation required

Needs validation for shelf-life of fruits.

Domain

Post-Harvest Technology, Fruit Crops, Litchi, higher prices due to extended shelf-life.

53. Straw Stack Grow Racks: Space Smart Home Mushroom Farming

Profile of Innovator

Name	:	Biraja Prasad Panda
Age	:	45 Years
Education	:	Graduation
Experience	:	15 Years
Contact Details	:	Village: Koluhapatana, Block: Begunia, District: Khordha, State: Odisha
Mobile No	:	87631869260

Brief Description of Innovation

In response to limited space availability and the growing demand for home-based food production, Shri Biraja Prasad Panda has designed an innovative, low-cost mushroom cultivation rack suited for urban and peri-urban households. His solution addresses both spatial constraints and the need for supplementary income among marginal growers and women entrepreneurs.

Innovation's Highlights

Shri Panda's design is a lightweight, four-foot-high structure measuring 19 inches in length and width, constructed using durable iron metal and 1-inch PVC pipes. It features two cultivation beds with carefully measured ventilation gaps—6 inches between the ground and the first bed, and 21 inches between the first and second—for optimum air circulation crucial to healthy mushroom growth.

Mushroom cultivation in straw stack racks

Innovative low cost mushroom production system

Benefits/Advantages

» Total Cost: Only ₹900, making it highly affordable for small-scale growers
» Ease of Use: The rack is designed for six-sided access, enabling easy watering, monitoring, and harvesting
» Space Efficiency: Ideal for use in compact areas, such as balconies, rooftops, or small courtyards

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation is fostering urban and micro-farming models, especially among women and youth, by enabling nutritious mushroom cultivation in confined spaces. It offers an accessible entry point into sustainable agripreneurship, thereby contributing to household nutrition security and livelihood diversification. Its simplicity and affordability make it easily replicable across similar urban and peri-urban contexts. Affordable for small-scale growers, thereby making it ideal for use in compact areas.

Scientific Validation required

Yes, it requires validation to determine the structure durability.

Domain

Propagation of mushroom cultivation among urban & peri-urban households having confined spaces.

54. Sustainable Innovative Propagation of Large Cardamom

Profile of Innovator

Name	:	Dadup Lepcha
Age	:	38 Years
Education	:	BA
Experience	:	9 Years
Contact Details	:	Village Juthi Gaon, Ringhim, Ringhim Namptam GPU Mangan District, Sikkim-737116,
Mobile No	:	9800844201

Brief description of Innovation

Large cardamom is usually propagated through suckers but Dadup Lepcha developed this innovation, which involves producing saplings propagated through seeds in his 2.5 hectare farm land. The propagation of large cardamom through seeds is an innovative approach aimed at overcoming the limitations of traditional vegetative propagation using suckers. This method involves raising healthy seedlings from seeds collected from high-yielding, disease-free mother plants, enabling mass propagation of planting material. Unlike vegetative propagation, seed-based propagation significantly reduces the risk of transmitting viral diseases.

Seeds are usually collected from high yielding and disease free plant and well matured capsules from the bottom and middle position of the spikes. After de-husking, seeds are mixed and rubbed with sand and then washed with water to remove the mucilage completely. Once the water is completely drained, the seeds are mixed with wood ash, dried in shade and sown in the primary nursery.

Propagation through seeds in large cardamom

View of large cardamom

Innovation's Highlights

A disease-free method for producing healthy large cardamom seedlings by propagating through seeds instead of traditional suckers.

Benefits/Advantages

The propagation through seeds enables production of large number of healthy and disease free seedlings. Viral diseases like chirkey and foorkey diseases are not transmitted through seeds and therefore, the seedlings are healthy. The approach enables mass multiplication, allowing one to generate 3 to 5 times more saplings per plant compared to suckers, bringing down the cost of per sapling by up to 40%, besides disease free planting materials.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This method can be successfully scaled up and adopted in other cardamom-producing areas such as Sikkim West Bengal, Arunachal Pradesh, Nagaland and Mizoram highlands, Hilly areas of Uttarakhand and Himachal Pradesh with similar agro-climatic conditions. Geographically, this technique is particularly beneficial for expanding large cardamom cultivation in the hilly regions of Northeast India, where there is high demand for quality disease-free planting material. Training is required for gaining expertise in the propagation method for other farmers.

Scientific Validation required

Validation is required to examine whether it can successfully propagate viral free saplings as compared to saplings grown from suckers.

Domain

Production of high-quality saplings- nursery sector, Spices (horticulture) and plant propagation techniques.

55. V-shaped Wooden Double Row Furrow Maker for Potato (TPS) Production

Profile of Innovator

Name	:	Mohan Sarkar
Age	:	59 Years
Education	:	Matriculation
Experience	:	35 Years
Contact Details	:	Village: Sulanala Narayanpur, District: Unakoti, State: Tripura
Mobile No	:	9612226383

Brief Description of the Innovation

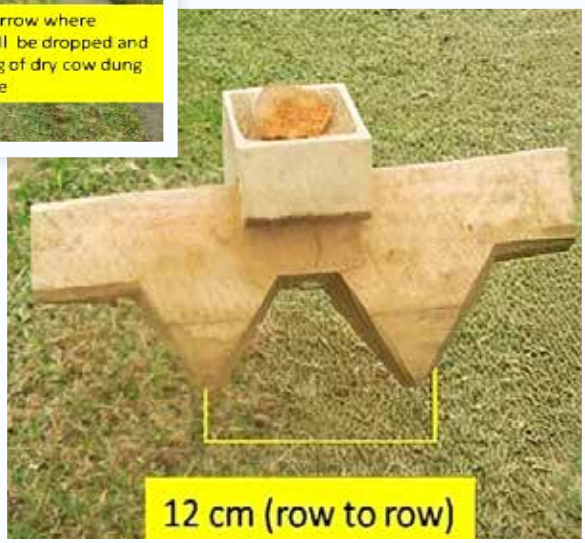
Mr. Sarkar has developed an innovative wooden implement features two V-shaped projections designed for the Double Row Method, enabling precise sowing of true potato seed (TPS) at optimal depth. The tool maintains a modified spacing of 12 cm between rows (instead of the recommended 10 cm), with a configuration of 12 cm × 4 cm × 25 cm (row-to-row: 12 cm; double-row-to-double-row: 25 cm; seed-to-seed: 0.5 cm). This adjustment enhances planting efficiency while ensuring proper seed placement for improved crop establishment.

Innovation's Highlights

This dual-row furrow opener creates perfectly spaced planting lines in a single pass while maintaining uniform depth and spacing—crafted from local timber for easy village-level fabrication and maintenance to revolutionize True Potato Seed (TPS) cultivation accuracy.

View of true potato seed production using v-shaped wooden row furrow maker

V-shaped wooden double row furrow maker suitable for true potato seed (TPS)



Close view of V-shaped furrow maker

Benefits/Advantages

This wooden tool features dual V-shaped projections for precise True Potato Seed (TPS) sowing in double rows. By increasing row spacing to 12 cm (from the standard 10 cm), it facilitates easier weeding, irrigation, and intercultural operations. The implement creates uniform, shallow furrows (0.5 cm depth) that remain open until seedlings reach 5 cm height, allowing fog moisture accumulation for better germination. Its permanent V-shaped design ensures consistent seed placement, significantly reducing labour while improving germination rates.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Ideal for smallholder potato growers, this tool boosts yields while cutting labour costs through efficient double-row planting. suitable for both slope and terrains regions of Northeast India, enabling efficient double-row planting systems.

Scientific Validation required

Not required, as the innovation is field-tested and proven, besides being effective under practical farming conditions.

Domain

Precision agriculture for true potato seed (TPS) cultivation.

56. Cost-Effective Laminar Flow Hood for Small-Scale Mushroom Spawn Production

Profile of Innovator

Name : Luingaingam Thaimei
Age : 45 Years
Education : Graduation
Experience : 10 Years
Contact Details : Village: Wainem, District: Senapati, State: Manipur
Mobile No : 8787810004

Brief Description of the Innovation

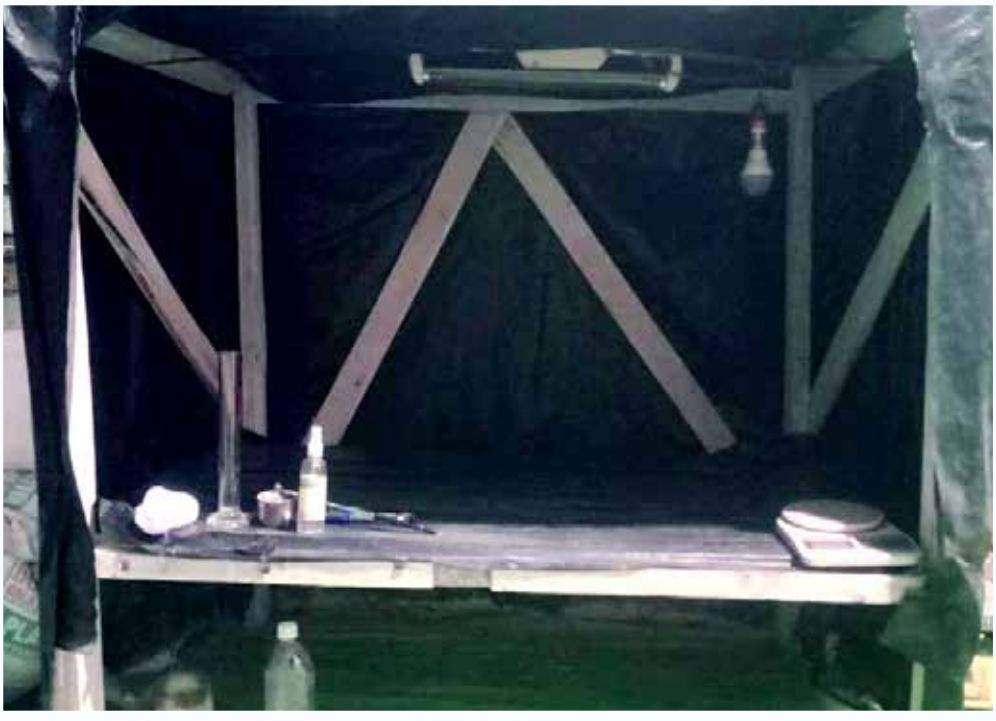
This low-cost laminar flow cabinet, constructed from a locally sourced wooden frame, 2mm PVC film, and 15W UV bulb, provides an aseptic environment for mushroom spawn incubation—slashing airborne contamination by 80% while enabling 100 kg/day production at 10% the cost of commercial units.

Innovation's Highlights

Uses only locally sourced wood/PVC/UV components, this compact (1.5m x 1m) system achieves ISO Class 5 airflow with 80% fewer contaminants than open methods, multiplying spawn yields 3-5-fold at CFL-level power consumption (15W).

Benefits/Advantages

This high-return spawn cabinet generates ₹1.2 lakh monthly profits (3.2:1 BC ratio) by doubling survival rates, slashing input costs by 60% versus commercial units, and enabling year-round production—transforming small farms into profitable spawn hubs.



Low cost laminar flow cabinet for small scale Spawn production

Spawn production in low cost wooden laminar flow cabinet

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Ideal for Manipur's rapidly expanding small-scale mushroom farmers, this innovation boosts yields sustainably while cutting costs, ideal for urban peri-urban and rural areas embracing mushroom cultivation as a profitable venture. enabling affordable spawn production for oyster/button mushrooms using low-cost, locally-sourced materials, ideal for SHGs and marginal farmers venturing into commercial cultivation.

Scientific Validation required

Requires air purity testing, cross-species spawn viability studies, and UV exposure optimization protocols.

Domain

Small-scale mushroom farming in rural areas of Manipur,

57. Charcoal-fired Multipurpose Drying Oven

Profile of Innovator

Name : Kedoneikho Suosahie
Age : 49 Years
Education : Intermediate
Experience : 8 Years
Contact Details : Village: Peducha, District: Kohima, State: Nagaland
Mobile No : 9436400772

Brief Description of the Innovation

This portable charcoal-fired dryer (35 kg, CGI sheet construction) combines a combustion chamber, heat exchanger, and dual drying trays (21.5"x15") to efficiently process 3-4 kg king chili in 2 hours or 10-15 kg meat in 3 hours providing small-scale processors with an off-grid, affordable drying solution that's durable and simple to operate.

Innovation's Highlights

Designed for harsh rural conditions, this 35kg portable unit delivers multi-product drying (spices to seafood) without electricity, using 25% less charcoal through smart airflow design – all housed in weather-resistant CGI sheets for years of reliable service.

Portable charcoal-fired dryer

Charcoal-fired multi product drying oven

Benefits/Advantages

Priced at just ₹15,000, this dryer delivers a 1.5:1 BC ratio, helping small processors recoup costs in under 6 months through premium dried products, add 40% value to perishables, and eliminate glut-season losses transforming waste into wealth.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Ideal for high-value crop and meat processing clusters, this innovation empowers agri-entrepreneurs by enhancing productivity, reducing waste, and enabling premium market access for higher profits. enabling value-addition through energy-efficient drying, ideal for SHGs and marginal farmers lacking electricity access.

Scientific Validation required

Requires moisture uniformity testing to ensure consistent drying, microbial safety certification for meat/fish applications, fuel efficiency calibration across different products, and market valuation studies comparing premium prices for oven-dried versus traditional sun-dried goods.

Domain

Small-scale agro-processing for spices, meats, and herbs in off-grid rural areas,

58. Low-Cost Solar Dryer for Small-Scale Farmers Using Recycled Materials

Profile of Innovator

Name	:	Swuyievezo Dzudo
Age	:	26 Years
Education	:	Post Graduation
Experience	:	4 Years
Contact Details	:	Village: Porba, District: Phek, State: Nagaland
Mobile No	:	9366343056

Brief Description of the Innovation

This innovative solar dryer crafted from locally sourced recycled materials (bamboo, wood, aluminium cans, and fan parts) provides small farmers with an affordable, eco-friendly solution to preserve high-value crops like kiwi, persimmon, turmeric, and king chili. Operating entirely on solar energy, it protects produce from pests, dust, and UV damage while significantly reducing post-harvest losses and boosting incomes.

Innovation's Highlights

This solar dryer powered by upcycled fan parts ensures reliable, fuel-free operation. The adaptable modular design accommodates diverse crops and climates, from humid highlands to dry regions, with a farmer-friendly build for easy assembly and maintenance.

A view of Low-Cost Solar Dryer

Dried potatoes ready for market

Recycled aluminium cans used in Solar dryer

Benefits/Advantages

Priced at ₹5,000–8,000 (90% cheaper than industrial dryers), this solar unit cuts drying time by 30% with a BC ratio of 2.8:1, offering year-round operation even in monsoons for smallholder profits.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Ideal for small farms in areas with unstable grid power, this solution ensures uninterrupted operation, cutting energy dependence while boosting output in remote or underutilised agricultural communities. enabling farmers to preserve fruits, vegetables, and spices sustainably while reducing post-harvest losses, ideal for solar-rich developing regions.

Scientific Validation required

Requires nutrient retention studies (measuring vitamins/antioxidants against conventional drying), economic impact evaluations across diverse crops and regions, and humidity-control optimization trials for different agro-ecologies.

Domain

Small-scale agro-processing in off-grid rural areas,

59. Empowering Farmers through Hybrid Silkworm Seed Production

Profile of Innovator

Name	:	Sadashiv Gopinath Gite
Age	:	45 Years
Education	:	Intermediate
Experience	:	7 Years
Contact Details	:	Village: Devgaon, Tq. Paithan, Dist. Chhatrapati Sambhajinagar (M.S.) – 431010
Mobile No.	:	8888524074

Brief description of Innovation

Till 2018-19, Shri. Sadashiv Gopinath Gite was solely dependent on cultivation of crops like cotton, pigeon pea and pearl millet earning the net income of only Rs.93,000/-. Later he ventured into sericulture in 3 acres of land. Leveraging the opportunity, he partnered with Mahyco Silk and began commercial hybrid silkworm seed (coccon) production. His efforts have laid the foundation for sustainable, year-round sericulture-based entrepreneurship in the region.

Innovation's Highlights

His primary focus was producing FC1 and FC2 hybrid seeds, with a buy-back agreement in place with Mahyco Silk, ensuring assured market linkage. He got silkworm seed from Mahyco Silk and after seed production of FC1 and FC2 he sold back to Mahyco. Innovative ideas like application of FYM @ 1-2 t/ha and maintain temperature of 18-24^0 C helps in enhancing longevity of cocoons. He produces 10 batches per year of hybrid silkworm seeds. Innovation is entirely centred around commercial seed production for enhanced income generation.

Hybrid silkworm seed production

Visitors in the field having an overview of Hybrid silkworm seed production

Commercial hybrid silkworm seed (coccon) production

Benefits/Advantages

Enabled diversification from traditional farming systems, offered higher economic returns (Rs. 5,80,000/- from 3 acre through cocoon production in 2020-21 and Rs. 13,20,000/- from 6 acres through commercial seed production of FC1 and FC2 in 2022-23) and facilitated year-round sericulture activity ensuring continuous livelihood opportunities. His success story has inspired many farmers, and they have established more than 90 sericulture units in the village.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation holds strong replication potential across all agro-climatic zones of Maharashtra. It can be promoted among small and marginal farmers as a sustainable alternative income source, particularly in regions conducive to mulberry cultivation and silkworm rearing.

Scientific Validation required

Needs validation to assess seed quality, hybrid vigour and adaptability across varied environmental conditions.

Domain

Parental bivoltine hybrid seed cocoon production in sericulture.

60. Heritage Harvest: Championing Traditional Varieties with Seed Museums

Profile of Innovator

Name	:	Babulal Dahiya
Age	:	82 Years
Education	:	Graduate
Experience	:	35 Years
Contact Details	:	Village- Village and Post- Pithaurabad, District-Satna (M.P.)
Mobile No.	:	9981162564

Brief description of Innovation

Padam Shri Babulal Dahiya, a veteran conservationist from Satna, Madhya Pradesh, has preserved over 203 traditional rice varieties, along with several varieties of maize, millets, and vegetables. He has established a crop and seed museum on his farm to showcase this rich biodiversity and promote the value of indigenous crops. Through his efforts, he motivates farmers to conserve and reuse their own seeds, reducing dependency on commercial seed systems.

Conservation of traditional varieties of various crops

Glimpses of traditional varieties of various crops

Shri Babulal Dahiya receiving "Padma Shri" Award from the Hon'ble President of India

Innovation's Highlights

He has conserved more than 203 varieties of rice, 4 varieties of maize, 12 varieties of millets, 34 varieties of vegetables; and is having a crop and seed museum at his farm in Satna, motivating other farmers to conserve own seeds.

Benefits/Advantages

Promotes seed sovereignty, climate resilience and biodiversity conservation through preservation and use of traditional crop varieties.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Together with other organizations he has built a movement "save our Bio-Diversity Campaign- from farmers to consumers, policy makers to media and scientists to students. It has potential to be used in future breeding programmes.

Scientific Validation required

No

Domain

Conservation of traditional varieties.

61. Sunken Poly Tunnel for High-Yield Milky Mushrooms

Profile of Innovator

Name	:	Padmini Gowda
Age	:	52 Years
Education	:	SSLC
Experience	:	6 Years
Contact Details	:	Sri Sairam Farm, Sy No 13/6&7, Kenjiganahalli, Madhure Hobli, Doddaballapur Tq, Karnataka
Mobile No	:	9686344199, 7338459996

Brief description of Innovation

Smt. Padmini Gowda has developed an innovative, low-cost poly tunnel system for milky mushroom cultivation, using a sunken chamber technique. The chamber is constructed by excavating soil to a depth of 13.5 feet below ground, with dimensions of 72 ft × 16 ft, and reinforced with concrete walls to prevent seepage and retain humidity. A cone-shaped roof made of GI pipes is covered with a 500-micron thick, light blue transparent polythene sheet, which allows sufficient light diffusion while maintaining internal temperature and humidity. This design significantly reduces energy consumption and construction costs as compared to conventional mushroom chambers. The structure supports the growth of up to 4,800 grow bags, producing approximately 12,000 kg of milky mushrooms annually, offering a highly profitable and replicable model for small and marginal farmers.

Low cost polytunnel system for milky mushroom production

Views of sunken poly tunnel for cultivation of milky mushrooms

Innovation's Highlights

Low-cost sunken poly tunnel for mushroom cultivation. Uses natural insulation to maintain ideal temperature and humidity. Structure made with GI pipe frame and 500-micron transparent polythene. Capacity: 4,800 grow bags producing 12,000 kg/year

Benefits/Advantages

Cost-effective alternative to concrete mushroom chambers. Reduces energy use for climate control. Space-efficient and suitable for small landholders. High profitability with a B:C ratio of 2.5.Easily adoptable and scalable for other farmers.

Scope & Potential of Innovation for wider reach/ out scaling

» This tunnel growth chamber is cost-effective and occupies less space as well as conducive for cultivation of milky mushroom.
» This low cost fabricated sunken chamber is highly cost suitable for milky mushroom growers.
» For promoting potential agri-preneurship

Scientific Validation Required

Yes, in terms of comparison of the conventional mushroom cultivation in terms of quality and yield difference.

Domain

Commercial Mushroom producing units.

62. *Pullan*: Kerala's Premium Nutmeg for High Yields

Profile of Innovator

Name : P. V. Jose
Age : 82 Years
Education : Intermediate
Experience : 58+ (in spice cultivation)
Contact Details : Pullan House, Potta (P.O.), Chalakkudy 680722, Thrissur, Kerala
Mobile No. : 9447227717

Brief description of Innovation

Mr. Jose developed Pullan by mass propagation; stable yield, large fruit, 8–10 kg/tree, good market value, suitable for high-density planting; also developed cost-effective spice dryer.

Innovation's Highlights

This variety is adaptable, regular, stable bearer. The variety became popular among the farmers of Kerala state for preferable aroma/scent.

Benefits/Advantages

This genotype has consistent yield, good fruit/mace quality, low investment, suitable for Kerala. Profitability of this variety is higher (B:C ratio 2.7:1) in comparison to other nutmeg varieties.

Pullan: A high yield variety of nutmeg

Views of Farm of P. V. Jose

Scale & Potential of Innovation for Wider Reach/ Out Scaling

This variety has huge market demand, well adopted throughout Kerala and suitable for export/domestic market.

Scientific Validation required

Yes, Identification of gene linked for its stability and adaptability with large fruit and potential yield.

Domain

Nutmeg producers of rainfed, hilly and transmission zone.

63. Root-Fusion Nutmeg: Multi-Root Approach Grafted Saplings for Enhanced Yield & Resilience

Profile of Innovator

Name : Gopi C. M.
Age : 67 Years
Education : 7th
Experience : 35 Years
Contact Details : Cherukunnel, Near KSEB Sub station, NH Road, Chattuppara, Adimaly Block ; Dist. Idukki (Kerala)
Mobile No. : 9447613755

Brief description of Innovation

Approach grafting of wild and high-yielding nutmeg to create multiroot saplings, enhancing nutrient uptake, stability and yield.

Innovation's Highlights

Multi-root nutmeg system producing high-quality and high-yielding nutmeg saplings.

Benefits/Advantages

This variety can produce 1 kilo of nutmeg mace form 75-80 nuts while local varieties requires 300-350 nuts to produce.

This variety posse more immunity to fight persistence diseases. Greater wind resistance, higher mace and nut yield, improved plant uniformity, and early bearing.

Multi-root grafting sapling of nutmeg

Glimpses of Farm of Gopi C. M.

Scale & Potential of Innovation for Wider Reach/Out Scaling

Suitable for spice belts across Kerala; can be promoted via FPOs, SHGs, nurseries; aligns with NHM and MIDH.

Scientific Validation required

Yes, identification of gene contributing in multiple routine and difference in nutrient uptake between local nutmeg and this variety.

Domain

Nutmeg cultivated areas of high rainfall and foothill region of Kerala and Karnataka states.

64. *KG Gold*: A Farmer's Innovation in Cashew Cultivation

Profile of Innovator

Name	:	George Philip
Age	:	65 Years
Education	:	SSLC
Experience	:	50 Years
Contact Details	:	Kaliyani (H), Chandanakkampara P.O Payyavoor, Kannur, Kerala-670633
Mobile No.	:	9745985279

Brief Description of Innovation

KG Gold is a farmer-developed cashew variety selected by George Kaliyani, known for its distinct agronomic and economic advantages.

Innovation's Highlights

The variety stands out due to its exceptionally high nut weight of 14.6 g, which significantly surpasses that of conventional cashew varieties, offering higher returns per unit of harvest. Its extended flowering duration ensures a broader pollination window, thereby increasing fruit set and yield stability. Notably, KG Gold exhibits tolerance to tea mosquito bug (***Helopeltis spp***.), a major pest in cashew plantations, which reduces the need for frequent chemical pesticide applications.

'KG Gold' variety of cashew

Matured fruits of 'KG Gold' variety developed by George Kaliyani

Benefits/Advantages

The variety is tolerant to pests, needs reduced input costs and profitable for farmers. Benefit-cost ratio is 3.1:1, especially under low-input systems. The combination of high yield potential, pest resistance and reduced dependency on chemicals makes KG Gold a unique and scalable innovation for enhancing cashew productivity and profitability across cashew growing regions.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The KG Gold cashew variety has immense potential for replication on a larger scale due to its adaptability, sustainability, and ease of propagation. Well-suited to humid and sub-humid climates, it performs effectively across major cashew-growing regions of India. Its natural tolerance to pests like the tea mosquito bug reduces the need for chemical interventions, making it ideal for sustainable and eco-friendly farming. The variety promotes higher productivity through an extended flowering period and better nut weight, contributing to increased farmer income.

Scientific Validation required

Yes, to estimate the quality of cashew apple wine produced and varietal suitability for various agro-climatic zone.

Domain

Cashew production zone with low productivity like arid and semi-arid conditions.

65. Protection of Young seedlings from heat of plastic mulch during Summer

Profile of Innovator

Name : Balgond Mastiholi
Age : 45 Years
Education : SSLC
Experience : 15 Years
Contact Details : Kakati, Belagavi-591113 (Karnataka)
Mobile No. : 9663549450

Brief description of Innovation

Young seedlings of chilli crop grown on plastic mulching are likely to be affected by heat of the plastic mulching sheet during summer. Seedlings will shrink and dry in early stage. This will increase the gap filling of seedlings which in turn, lead to high cost of production.

Innovation's Highlights

To minimize the loss of young seedlings, Mr. Balgond Mastiholi collected waste drawing sheets from paper mill. The sheets are cut in rectangular shape, with 2.5 to 3 inch height; and it are covered to the stem and Stapled. It protects the seedlings from heat of plastic mulch.

Plastic mulching for protection of young seedlings

Close view of protection of plantings from heat of plastic mulch

Benefits/Advantages

» Minimises loss of young seedlings
» Avoids gap filling of seedlings
» Saves labour and seedlings cost

Scope & Potential of Innovation for wider reach/out scaling

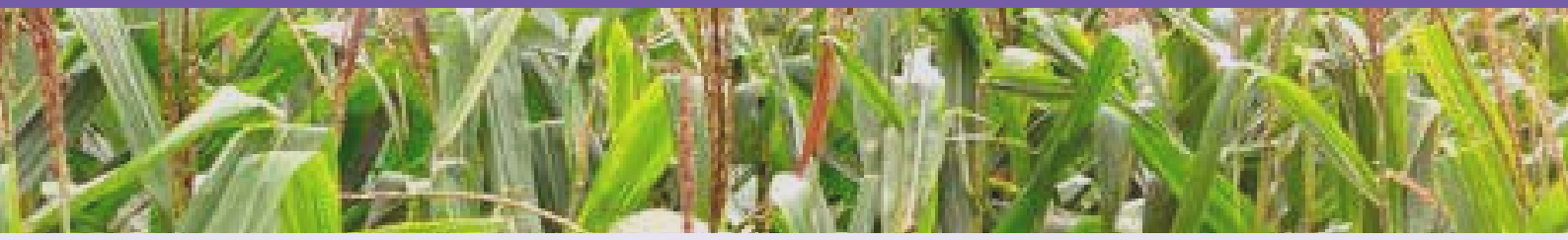
This innovation is very easy to replicate by farmers who are cultivating vegetables with plastic mulching during summer. It only takes 2-3 women labour to complete one-acre area in a day. This technology is being adopted by adjoining farmers. It can be replicated by farmers growing chilli in summer season in similar agro-ecology.

Scientific Validation Required

No

Domain

Wealth from Waste.

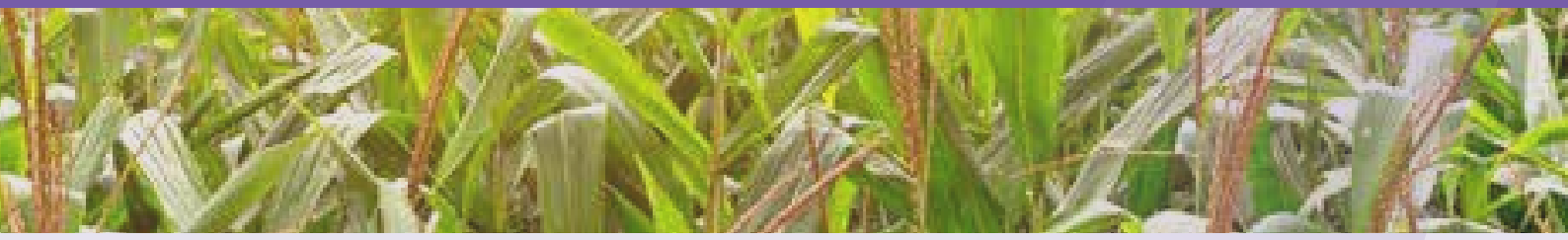


PART-III

PART - III

Innovations related to Livestock, Fishery & Animal Science

These innovations improve livestock rearing, fish farming, and poultry practices. Focus Areas: Milking equipment, silage, hatcheries, poultry housing, herbal treatments, and fish aeration systems.



66. Reinventing Dairy: Cleaner Milk, Smarter Farming, and Bigger Profits

Profile of Innovator

Name	:	S. Harpreet Singh
Age	:	39 Years
Education	:	Intermediate
Experience	:	19 Years
Contact Details	:	VPO: Sohal, District: Tarn Taran, State: Punjab
Mobile No	:	9877848203

Brief description of Innovation

The dairy farm with approximately 150 cattle, having infrastructure comprising 20,000 square feet of covered area and an additional 12,000 square feet of open space. The farm maintains an average daily milk production of around 1,800 liters, with seasonal variations—approximately 1,200 liters per day during the summer months and up to 2,400 liters per day in winter. The farm has four silo pits, each with a volume of 14,400 cubic feet, providing a total storage capacity of 1200 tonnes for preparing high quality silage. Feeding total mixed balanced ration to ensure proper nutrition of cattle at low cost. The farmer has adopted advanced technologies to ensure efficient and scientific dairy farm management.

Innovation's Highlights

Silage making: Corn is cultivated on 70 acres of land specifically for silage production, ensuring the year-round availability of high-quality silage for the dairy herd.

AI-based monitoring System: The AI monitoring system enables real-time tracking of all animals, facilitating early detection and effective management of health issues such as heat stress, illness, and behavioural changes.

Milk Parlour: A modern milking parlour combined with a bulk milk chilling tank ensures hygienic milking processes and maintains milk quality through immediate cooling and safe storage.

Scraper system: A mechanized scraper system is used to efficiently remove dung from cattle sheds. The collected manure is utilized in Integrated Nutrient Management (INM) for fodder cultivation, reducing the need for chemical fertilizers and promoting sustainable agriculture.

Remarkably, the entire operation, spanning 150 cattle is managed effectively by just five trained personnel, highlighting the efficiency of scientific dairy management practices.

View of silage making at dairy farm

Cattle with AI collar in neck

Foggers to manage heat stress in animals during summer months

Benefits/Advantages

Milk produced on the farm is procured by Nestlé at a premium rate, reflecting the high standards of hygiene and quality maintained throughout the production process. AI-based monitoring system enables efficient management of a large herd by providing real-time data on animal health, behaviour, and reproductive status, thus improving overall productivity and reducing labour dependency. The production of high-quality silage from 70 acres of corn ensures a consistent and nutritious silage supply throughout the year. Feeding of TMR significantly reducing feeding costs and enhancing milk yield. The year-round quality feed and silage supply, thus reducing feeding cost.

Inspection of silage by experts team from KVK, Tarn Taran

Scope & Potential of Innovation for Wider Reach/Out Scaling

Yes, if replicated will ensure profitable dairy farming business. This farmer-led innovation is scalable, sustainable, and replicable across various agro-climatic zones. With institutional support, training, and awareness-building, they can be rapidly out scaled to improve productivity, profitability, and resilience in dairy farming sectors across the country.

Scientific Validation Required

Yes, further scientific research and validation is required for curtailing operation costs for small farmers.

Domain

Integrated Smart and Sustainable Dairy Farming leveraging precision technologies, efficient resource use, value addition, and eco-friendly practices in dairy sector.

Awards/Recognitions

» Chief minister award in category of Cattle by Guru Angad Dev Veterinary and Animal Sciences University Ludhiana in year 2024
» Recognition certificate from NESTLE India Ltd. for supply of maximum milk during year 2022
» Best Dairy farmer Award in 2019 at by Progressive Dairy Farmers Association, Ludhiana (Punjab)

67. Urea Mineral Molasses Block (UMMB) Maker: Manual Block Press for Livestock Nutrition

Profile of Innovator

Name	:	Karnadeb Roy
Age	:	39 Years
Education	:	Matriculation
Experience	:	27 Years
Contact Details	:	Village: Moulani Haat, Krant, District: Jalpaiguri, State: West Bengal
Mobile	:	9800698035

Brief Description of Innovation

Recognizing the need for cost-effective and efficient livestock supplementation, Shri Karnadeb Roy developed a Urea Mineral Molasses Block (UMMB) making unit. UMMBs play a crucial role in enhancing ruminant health by providing essential nutrients, leading to improved milk yield in cattle and weight gain in goats—both of which directly impact rural livelihoods and income.

Innovation's Highlights

The unit has been engineered with a user-friendly and sturdy structure suited for farm-level operations:

» **Dimensions:** Length – 22", Breadth – 11.5", Height – 36"
» **Weight:** ~65 kg, with scope lesser weight for portability based on user preference
» **Production Efficiency:** Capable of producing 20–25 UMMB blocks per hour
» **Cost of Unit:** ₹9,000, making it an affordable option for progressive livestock farmers

Cost effective UMMB Maker

View of Block Making Machine

Benefits/Advantages The adoption of UMMBs produced using this unit has resulted in

» 23% increase in milk yield from dairy cattle
» 21% increase in body weight of goats, enhancing their market value and saleability

Such outcomes translate to better returns for smallholder farmers and promote the sustainable intensification of animal husbandry in mixed farming systems.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Shri Roy's innovation not only reduces dependence on commercial supplements but also encourages on-farm feed production, empowering farmers with greater control over animal nutrition. With its high productivity and proven impact, this farm-level UMMB unit has the potential to be scaled up through farmer producer groups, self-help groups, and rural youth training programs focused on value-added livestock practices. Potential to be scaled up by involving FPOs, SHGs, etc. Huge scope for rural entrepreneurship in livestock for higher milk production in remote areas.

Farmer with UMMB blocks

Scientific Validation required

Yes; to some extent

Domain

Animal Nutrition;

68. Homemade Aeration Technology for Improving Dissolved Oxygen Levels in Aquaculture Systems in Punjab

Profile of Innovator

Name : S. Jasvir Singh Aujala
Age : 52 Years
Education: : 10th
Experience : 26 Years
Contact Details : Village: Karoudian, District: Ludhiana, State: Punjab
Mobile No : 9417047147

Brief description of Innovation

Dissolved oxygen (DO) is crucial for healthy fish production in pond aquaculture. DO depletion—especially below 3 mgl-l can trigger sudden mass fish mortality. To avoid such catastrophic losses, many farmers strive to maintain DO concentrations above 5 mgl-l. Paddle-wheel or surface aerators are widely used to achieve this, but are often beyond the financial reach of many small and medium-scale farmers due to high purchase and electricity costs. While these mechanical aerators effectively mix and oxygenate pond water, their reliance on electricity increases both capital and operational expenses. For many farmers, particularly in rural areas, such costs make continuous aeration impractical.

Healthy fish production under homemade aeration technology

Cost effective design for aquaculture of oxygen in water

Innovation's Highlights

This pioneering system is uniquely engineered by the innovative farmer to maximize the surface area of water, thereby significantly enhancing the natural dissolution of oxygen. As a result, it substantially elevates dissolved oxygen levels without relying heavily on electrical inputs, leading to considerable energy savings. The increased oxygen availability creates an optimal aquatic environment, directly contributing to healthier fish populations and a marked improvement in overall fish yield. This innovation represents a sustainable and efficient breakthrough in aquaculture practices.

Benefits/Advantages

It can act as a critical safeguard for aquaculture farmers, mitigating the risk of substantial economic losses caused by abrupt declines in dissolved oxygen levels—an event that can trigger widespread fish mortality and severely disrupt production cycles.

Scope & Potential of Innovation for Wider Reach/Out Scaling

With its cost-effective design and ease of implementation, this system holds strong potential for widespread adoption even among small-scale farmers. By preventing fish mortality, it can avert substantial financial losses—often ranging between ₹2 to ₹3 lakh per acre, thereby offering both economic resilience and operational sustainability.

Scientific Validation Required

Yes; scientific validation for changes in oxygen status is required.

Domain

Low-energy water oxygenation systems for enhanced yield and ecosystem health in dominant fish growing areas.

69. Multipurpose Paddle-Propelled Boat: An Indigenous Innovation for Feeding and Medicating Fish Ponds

Profile of Innovator

Name : S. Parminderjit Singh
Age : 48 Years
Education : 12th
Experience : 05 Years
Contact Details : Village – Kalewal (Khokhar jadid), P.O & Tehsil- Sultanpur Lodhi, District- Kapurthala, State- Punjab
Mobile No : 9855300934

Brief description of Innovation

Feeding fish in pond-based aquaculture is often a labour-intensive and tedious task. Farmers typically rely on methods such as bag feeding or broadcasting feed at fixed locations, which frequently results in uneven distribution and significant feed wastage. This not only increases operational costs but also leads to the accumulation of organic matter at the pond bottom, adversely affecting water quality. Similarly, the uniform application of medicines across large water bodies presents a considerable challenge. Inconsistent dosing can delay disease control, compromising fish health and productivity. To address these issues, a self-designed, manually operated boat has been developed using repurposed plastic cans for flotation and an iron frame fitted with a cycle seat and paddles for propulsion. This innovative solution enables farmers to efficiently distribute feed and apply medications evenly throughout the pond, enhancing both operational efficiency and fish health management.

Multipurpose paddle-propelled Boat

Farmer with fishes

Innovation's Highlights

This pioneering system has been ingeniously developed by an innovative farmer as a cost-effective alternative to expensive wooden or plastic boats. By utilizing readily available materials, it offers a sustainable and practical solution, marking a significant breakthrough in efficient and affordable aquaculture practices.

Benefits/Advantages

By enabling uniform feed distribution, the system minimizes feed wastage, thereby improving the Feed Conversion Ratio (FCR) and enhancing overall fish production. Additionally, it allows for even application of pond disinfectants, helping to prevent sudden disease outbreaks. In the event of a disease occurrence, the system facilitates more efficient and targeted application of medicines, significantly improving the effectiveness of treatment and reducing the risk of widespread fish mortality.

Scope & Potential of Innovation for Wider Reach/Out Scaling

With its cost-effective design and ease of implementation, this system holds strong potential for widespread adoption, particularly among small-scale farmers. Priced at just ₹8,000–₹9,000, it offers a significantly more affordable alternative to conventional wooden or plastic boats, which typically cost between ₹10,000 and ₹25,000.

Scientific Validation Required

No

Domain

Low-cost mechanized solutions to optimize feed distribution, medication application, and sustainable fish farming.

70. Solar Float Feeder-Aerator: Automated Pond Feed & Oxygen System

Profile of Innovator

Name	:	Javed Akhtar Barbhuiya
Age	:	29 Years
Address	:	Village- Ujangram, City: Sribhumi. State: Assam
Experience	:	5 Years
Education	:	Graduate
Mobile	:	7636979752

Brief description of Innovation

The lack of uniform and timely distribution of fish feed in fish pond systems poses a significant challenge, leading to reduced feed efficiency and reduce the growth of fish. Sh. Javed developed solar based feed dispenser cum aerator, which also integrates an aeration system to enhance water quality and support fish health. The solar-powered feed dispenser with integrated aerator is designed to float and move continuously across the surface of the fish pond. And also, vessel auto-returns to start point or stops after path completion. In addition, the system enhances dissolved oxygen levels in the water through its built-in aerator (aeration mechanism).

The system is powered by a photovoltaic solar panel, typically rated between 100W to 200W, capable of charging a 12V or 24V deep-cycle battery that powers the device during low sunlight conditions or at night. The feed dispensing unit is equipped auto continues feeding schedules and ensures uniform distribution through a motorized rotary or auger mechanism. The feed storage hopper is made of corrosion-resistant material with a capacity ranging from 20 to 30 kilograms, suitable for medium-scale fish ponds.

Solar powered float feeder-aerator

Solar powered feed dispenser-cum-aerator floating in pond

Innovation's Highlights

The solar-powered feed dispenser with integrated aerator is designed to float and move continuously across the surface of the fish pond ensuresing uniform feed distribution across the pond.

Benefits/Advantages

The equipment ensures uniform distribution of fish feed across the pond. The device facilitates sustained and timely release of feed and saving of labour cost. It operates automatically; distributing fish feed uniformly and dispenses feed timely throughout the pond.

Further, the device reduces feed wastage, enhancing overall feed conversion efficiency and clean feeding mechanism in aquaculture. It is promoting unconventional solar energy. The aeration component, delivering oxygen at a rate sufficient to maintain optimal dissolved oxygen levels in the water.

Scope & Potential of Innovation for Wider Reach/Out Scaling

It is highly scalable for large-scale adoption across the inland fisheries sector nationwide, contributing to more efficient and sustainable aquaculture practices. It can be replicated and scaled up in the country especially Inland fisheries are popular. Expertise is not required and the operation required training for farmers.

Scientific Validation required

Yes, The innovation needed validation for rate of feed dispense, rate of fish growth, testing for quality of water

Domain

Renewable Energy-based Aquaculture Technology,

71. Herbal *Kaadha:* Natural Immunity Boost for Poultry Health

Profile of Innovator

Name	:	Abbasi Chikhaly
Age	:	52 Years
Education	:	Intermediate (12th)
Experience	:	5 Years
Contact Details	:	Village-Khantwara, PO-Kharagda, Block- Galiyakot, Dist.- Dungarpur, Rajasthan
Mobile No.	:	+91-9929552352

Brief Description of Innovation

Herbal Kaadha prepared by locally available herbs- Turmeric, gur, ginger, clove, black pepper, garlic, and ajwain etc. It is given one time in a week from 7-day old chicks to adult stage. The ingredients and their quantities for 100 birds dose is as under- Garlic 100g, ginger 100g, Ajwain 50g, clove 10 nos, black pepper 20g, turmeric powder 5g and gur 50g. All the ingredients mixed in 500 ml water and boiled for 30 minutes till the mixture remain 400 ml and kept in cool and dry place. Out of this 80 ml KADHA is used for 100 birds with drinking water once in a week. Works as immunity booster-prevent various diseases of poultry. Herbal treatment helps preventing poultry diseases including- CRD, coccidiosis, fowl pox, gout aspergillus, infectious croaza, e-coli, IBH, ranikhet, gamboro etc. It improves immunity of birds and results into good quality egg laying capacity. It costs only Rs. 45 for weekly dose for 100 birds.

View of backyard poultry farming

Ingredients of Herbal Kaadha

Making of herbal Kaadha

Potential of Innovation for Wider Reach/Out Scaling

Can be replicated after validation, Potential users-all poultry farms and backyard poultry in Rajasthan, Huge potential for tribal areas where vaccination is low or not accessible. It need scientific validation before upscaling on large scale.

Scientific Validation required

Yes, to validate the claim that it helps in preventing occurrence of incidence of various poultry disease by boosting immunity.

Domain

Poultry Production in southern Rajasthan

72. Portable Plastic Drum Silage System for Small Dairy Units

Profile of Innovator

Name : Uttam Chand
Age : 55 Years
Education : 8th
Experience : 38 Years
Contact Details : Village-Rihalpura, District-Kangra, Himachal Pradesh
Mobile Number : 9418654201

Brief description of Innovation

Addressing the challenge of year-round fodder availability in rainfed hill areas, Sh. Uttam Chand developed a method for making silage using plastic drums. Using seasonal fodder crops like maize in kharif and oats or berseem in rabi, he prepares 2-quintal capacity airtight silage drums. These drums are portable, space-saving, and adequate for small dairy units with 1–3 animals.

Innovation's Highlights

The innovation eliminates the need for permanent silo structures. It is farmer-friendly and economical, ideal for marginal dairy farmers in hilly regions. Drums are 200–250 liters in capacity, sealed tightly for anaerobic fermentation. Filling is done layer by layer, compressing to remove air. Each drum lasts about 20 days for a single cow.

Portable plastic drum for silage making

Animal feeding on silage

Benefits/Advantages

Substantially reduces fodder shortages during lean periods. Improves animal health and milk productivity. Reusable drums are a low-cost solution for thousands of small dairy farmers.

Scope & Potential of Innovation for Wider Reach/Out Scaling

High impact for small dairy units in hilly and rainfed areas across India.

Scientific Validation required

Yes, studies on silage quality parameters, animal performance, and feed conversion ratio are required.

Domain

Low-cost livestock feed management innovation for smallholder dairy systems.

73. Elevated Bamboo *'Machaan'* Shelter: Low-Cost Hygienic Housing for Goats in Tribal Areas

Profile of Innovator

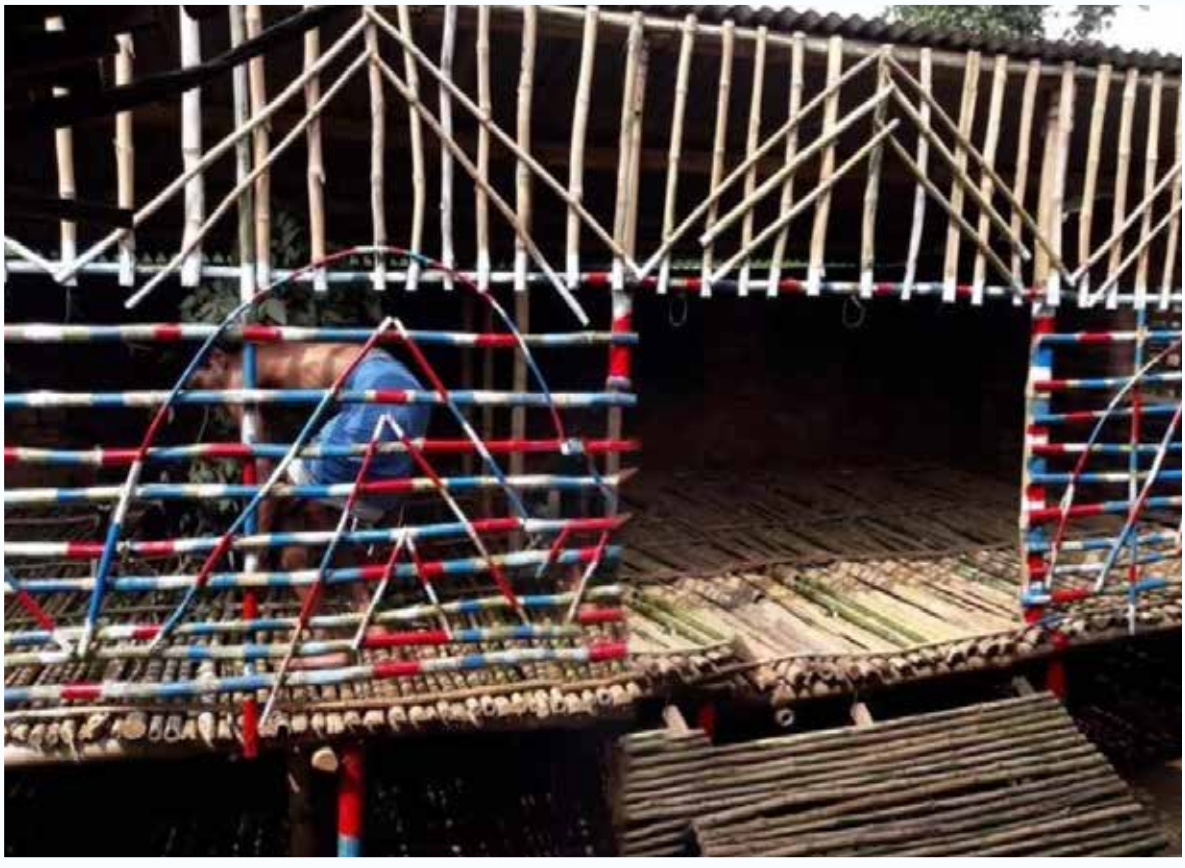
Name	:	Puja Verma
Age	:	34 Years
Education	:	Intermediate
Experience	:	8 Years
Contact Details	:	Village: Mandrakha, Dist.: Giridih, Jharkhand
Mobile No.	:	6299311092

Brief description of Innovation

It is an innovative low-cost, eco-friendly shelter management technique using locally available bamboo/ wooden platform known as "Baans Machaan or Lakdi Machaan" designed for resting and feeding of goat and kids. This shelter model is elevated on wooden or bamboo scaffolding (Machaan) raised 1.5 to 2 feet above the ground 3 feet wide and 10 feet in length sufficient for accommodating for 8-10 goats. Entire structure can be prepared in 5-6 days with cost involvement of Rs. 4000-5000 only. The structure promotes effective drainage for animal waste, maintains a hygienic microclimate, and supports steady growth for diseased free kids.

Innovation's Highlights

Elevated (२–१,० ft) shelter made of bamboo or wood. Ensures cross ventilation, dry bedding, and cold/wind protection. Designed specifically for small ruminants like goats and kids. The shelter is climate resilient and environmentally friendly able to maintain १०-८ OC lower temperature inside during summer than outside temperature (४४-४३ OC).



Elevated Bamboo 'Machaan' shelter for goats

Goats housed in low cost 'Machaan' shelter

View of low cost machaan

Benefits/Advantages

Reduces mortality and disease occurrence in goat kids due to pneumonia and cold. Maintains clean and dry housing conditions and low-cost and easy to construct.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Highly useful for economically weaker tribal farmers. Significant potential for replication in rural, tribal, and semi-arid regions where goat farming is a key livelihood. It can be promoted by KVKs, livestock extension agencies, FPOs and rural development programs of state to strengthen climate-resilient housing management.

Scientific Validation required

Needs validation of mortality and morbidity rates before and after shelter adoption, temperature and humidity control within shelters.

Domain

This shelter is quite suitable for tibal farmers, where goatary is a livelihood business.

74. Desi Teat Milker: Tailored Milking for Indigenous Cows

Profile of Innovator

Name	:	Milan Jyoti Das
Age	:	45 Years
Educational	:	12th pass
Experience	:	14 Years
Contact Details	:	Vill/PO- Soneswar, District – Kamrup (Rural) Assam, Pin-781382
Mobile No.	:	9085260582/8134094274

Brief description of Innovation

Standard commercial milking machine especially teat cups are suitable and compatible to crossbred cattle like Holstein Friesian (HF) and Jersey, which has longer and thicker teats. While smaller indigenous cows have shorter and thinner teats. The standard commercial milking machines have oversized teat cups for small indigenous cattle leading to poor fitting, milk leakage, and inadequate suction pressure. This causes discomfort to the animal and reduces milking efficiency. Mr. Das came forweard to slove this problem of indigenous cow and designed portable device.

Customised milking of indigenous cows

Modified teatcups for indigenous cows

This, innovation focused on designing teat cup which is suitable for small indigenous cows. The customized teat cup is designed with 3–5 cm mouth diameter and 11–13 cm liner length, which is specifically suited for indigenous/local cow breeds, ensures optimal fit, proper suction pressure, and comfort during milking. The milking machine is a portable single or double bucket system equipped with a vacuum pump powered by a 0.75 to 1 HP single-phase motor operating at 220V. It has a milking capacity of 8 to 10 cows per hour.

Innovation's Highlights

The Milking Machine for Small Indigenous cows is a portable device specially designed with smaller teat cups to suit smaller indigenous cow breeds, ensuring efficient and comfortable milking.

Benefits/Advantages

This innovation addresses a practical challenge faced by indigenous cattle farmers, particularly in Assam and other North-Eastern states, where small local cattle breeds are common. The device lead to prevent milk leakage and comfort to the cow and enhance milking efficiency, reduces labour effort, and supports better milk yield, ultimately benefiting smallholder indigenous cattle farmers.

Cost of production Rs. 3,000/-

Scope & Potential of Innovation for Wider Reach/Out Scaling

The machine holds high potential for adoption in other parts of India where small indigenous cattle like Lakhimi cattle in Assam had smaller teats. Dairy sector, this innovation promotes indigenous cattle production and enhances production of indigenous milk products across the country wherever small indigenous breeds are available and also promotes natural farming. Farmers can operate the device after training.

Scientific Validation required

Needs validation for further refinement to improve this technology.

Domain

The Innovation can be quite useful for milking of indigenous cows.

75. Fish Chocolate: A Protein-Packed Delight for Malnutrition Relief

Profile of Innovator

Name : Gargee Gitom Borah
Age : 34 Years
Education : M.Sc,
Experience : 6 Years
Contact Details : Mori Kollong, Nagaon, Assam Pin: 782002
Phone No. : 9365070353

Brief description of Innovation

Gargee Gitom Borah has developed a nutritious and innovative confection combining fish meat with chocolate to offer a protein-rich treat with familiar taste and high health value. Nutrient rich small fish are carefully processed, dried or cooked, and finely blended into a smooth paste. This fish paste is then mixed with high-quality liquid chocolate to create a unique fusion of taste and nutrition. The mixture is poured into customized moulds to give it a distinct shape and allowed to set. Once solidified, the fish chocolates are attractively wrapped in colourful foil papers, enhancing their visual appeal.

Innovation's Highlights

First-of-its-kind chocolate enriched with fish protein, making it a healthy, tasty, and shelf-stable product designed to combat malnutrition.

Fish chocolates

Packing of fish chocolate in different shapes & sizes

Benefits/Advantages

Fish Chocolate integretes the nutritional benefits of small indigenous fish into a popular and widely accepted format, "chocolate". The innovation also helps in the productive utilization of nutrient-rich small fish species, which are often underutilized or wasted. It creates an appealing way to deliver essential nutrients without changing eating habits for children. It can also be used in various segments like Health and wellness food sector, children's snacks and school nutrition programs, urban and export markets, and emergency nutrition and relief kits.

Cost of making 1 kg of fish chocolate is around Rs.400/-.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation has immense potential for replication across India, particularly in high fish producing states like West Bengal, Kerala, Assam, Odisha, and Andhra Pradesh. It required training for making the products

Scientific Validation required Yes

The innovation can be validated for nutritive analysis

Domain

Value Addition in Fisheries / Fish-based Functional huge scope for Foods.

76. Turbo Grind: High-Efficiency Maize Grinder for Small-Scale Feed Production

Profile of Innovator

Name	:	C.B. Lalthlamuanzuala
Age	:	43 Years
Education	:	Diploma in Computer Science & Engineering
Experience	:	8 Years
Contact Details	:	Village: Thiltlang, District: Lunglei, State: Mizoram
Mobile No	:	6909549921

Brief Description of the Innovation

This high-efficiency, farmer-friendly maize grinder revolutionizes small-scale feed production by processing 120 kg of grain per hour – three times faster than traditional methods – while slashing labour requirements by 91.6%. Its fuel-efficient design consumes just 2 litres per hour, cutting operational costs by 60% compared to conventional grinders.

Innovation's Highlights

This high-performance maize grinder delivers triple the speed of traditional methods while slashing fuel use by 60%, virtually eliminating manual labour through its smart design. Crafted from locally sourced materials for easy maintenance, its space-saving footprint adapts effortlessly to small farms and processes multiple grains like sorghum and millet with equal efficiency.

Innovator operating the high efficiency maize grinder

View of maize grinder

Innovator with his innovation: maize grinder

Benefits/Advantages

Priced at ₹55,000, this grinder delivers an exceptional BC ratio of 2.8:1, recovering its cost within 8 months through labour and feed savings.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Perfect for smallholder livestock farmers in India's maize-growing belts, this innovation enhances feed efficiency and reduces production costs, ideal for resource-limited farms seeking sustainable, high-quality fodder solutions

Scientific Validation required

Requires durability testing during extended operation, particle-size analysis for optimal feed quality, fuel efficiency comparisons across different grains, and ergonomic evaluations focusing on women farmers' usability, & drudgery.

Domain

Small-scale livestock farming across rural India, reducing labour costs, ideal for rural poultry and pig farms lacking reliable electricity access.

77. Lightweight Chaff Cutter for Small-Scale Livestock Feed

Profile of Innovator

Name	:	C.B. Lalthlamuanzuala
Age	:	43 Years
Education	:	Diploma in Computer Science & Engineering
Experience	:	8 Years
Contact Details	:	Village: Thiltlang, District: Lunglei, State: Mizoram
Mobile No	:	6909549921

Brief Description of the Innovation

This lightweight (15 kg) smart chaff cutter, powered by a 1HP motor, efficiently processes 3 quintals of fodder/hour—perfect for banana pseudo-stems and green fodder. Designed for small-scale pig and poultry farmers, it cuts feed preparation time by 70% while being energy-efficient and easy to operate.

Innovator operating the light weight chaff cutter

Innovator with chaff cutter

View of light weight chaff cutter

Innovation's Highlights

This chaff cutter slashes physical effort by 93.3% compared to manual chopping while costing 60% less than commercial models. Its energy-smart design uses 40% less power, effortlessly handles everything from tough banana stems to delicate fodder, and stays compact for small farms—all with minimal maintenance using locally sourced parts.

Benefits/Advantages

Priced at just ₹25,000–30,000, this smart chaff cutter delivers an exceptional BC ratio of 3.1:1, paying for itself in under 6 months through labour and feed waste reduction.It reduces labour by 80%, while maintaining affordable operation.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

Perfect for small livestock farmers across India, this smart chaff cutter boosts feed production efficiency while reducing labour and costs, ideal for rural areas with limited electricity access.

Scientific Validation required

Required tests under heavy use, comparative nutrient retention analysis between machine-chopped and manual-cut fodder, and energy efficiency evaluations under variable voltage conditions.

Domain

Small-scale livestock farming across rural India, enabling efficient fodder processing for dairy/ poultry farmers with limited electricity access.

78. Straw Harvest Pro: Tractor-Mounted Combine with Integrated Straw Collector

Profile of Innovator

Name	:	Rajpal Singh Narwariya
Age	:	47 Years
Education	:	Intermediate
Experience	:	15 Years
Contact Details	:	Village- Jamakhedi, District-Ashoknagar (M.P.)
Mobile No.	:	8103118384

Brief description of Innovation

Sh. Rajpal Singh Narwariya has designed and developed a low-cost, tractor-mounted combine harvester equipped with a straw collection mechanism. It operates efficiently with a 45 HP tractor. The machine consists of three main units; harvesting unit conveying unit and threshing unit together which can do three separate operations viz. reaping, threshing and winnowing as a single process. This harvester is suitable for harvesting of various crops like (wheat, soybean, sorghum and maize etc.).

Innovation's Highlights

A simple reaper with folding mechanism has been used as threshing unit. The crops get cut and conveyed to the threshing unit where grains are separated from stalks and stored in collecting tank.

View of combine harvester with straw collection mechanism

Innovator with his innovative Straw Harvest machine

A view of combine with straw collector during field operations

A separate tank is fitted over the machine for the collection of straw. There are two separate tanks available one for grain store and other for straw which is a unique feature of machine. Powered combine harvester, with provision of collecting the straw. Traditional combine harvester can be used with a tractor of more than 45 HP.

Benefits/Advantages

One acre of land can be harvested in 1 hour with fuel consumption of 3- 4 litre / hour costing at Rs 750/-acre only, while manual costing for harvesting and threshing is Rs.3000/-acre. This machine also collects husk for animals (about 15 quintals from one acre), which is costing Rs 4500/- acre. (Cost/benefit ratio 4.0).

Scope & Potential of Innovation for Wider Reach/Out Scaling

Tractor mounted combine harvester with straw collector technology are widely adopted by local farming community. During the testing of machine at farmer's field farmers are widely satisfied due to low cost, ease of operation and multipurpose machines.

Scientific Validation required

The efficacy of the machine, cost saving, fuel saving and time consuming parameter.

Domain

Tractor-mounted combine harvester with straw collector technology for farming community.

79. Puli Safe: The Smart Magnet-Bell Collar for Pulikulam Cattle

Profile of Innovator

Name : Subramanian
Age : 48 Years
Education : Matriculate
Experience : 15 Years
Contact Details : At- Pinnalankottai, PO: Pinnalankottai,
Dist- Sivaganga, State- Tamil Nadu, Pin-630561
Mobile No. : 9514858592

Brief description of Innovation

Pulikulam cattle are strong and can adapt well to their surroundings. But since they roam freely, they don't often get regular veterinary care. This makes it hard to keep track of their health or treat them when needed. To solve this problem, Mr. Subramanian, a traditional cattle rearer from Sivagangai district, created a special collar for Pulikulam cattle. It has a strong magnet and a bell. The magnet helps stop the cattle from swallowing metal objects, and the bell sound helps the owner know where the cattle are. The bell also scares away snakes and alerts nearby farmers, helping to reduce crop damage.

Subramanian with cows wearing smart magnet bell collar

A herd of cattle wearing magnetic bell collars

Close view of one cow with smart magnet bell collar

Innovation's Highlights

The magnetic bell collar developed by Mr. Subramanian is a simple and low-cost innovation made from easily available metal materials found in rural areas. It consists of a strong rope collar with a cylindrical magnet placed near the animal's mouth. This magnet helps attract and trap harmful metal objects that the cattle might accidentally eat while grazing. The collar weighs around 500 grams and lasts for about 3 years. Attached below the magnet is a traditional iron bell that makes a sound when the animal moves. This sound helps scare away snakes and wild animals, lets the owner know where the cattle are, and alerts nearby farmers to prevent crop damage.

Benefits/Advantages

The magnetic bell collar is a low-cost, practical solution, costing under ₹78 and made from locally available materials like rope, magnets, and iron bells. It prevents hardware disease caused by ingesting sharp metal objects, avoiding livestock deaths that can cost farmers around ₹40,000 per animal. The bell sound also deters snakes, a common threat in remote grazing areas, especially at night when veterinary help is unavailable. This reusable, non-electric device requires no maintenance and is ideal for rural use, offering a sustainable way to protect livestock and conserve native breeds like Pulikulam cattle. It can save approximately ₹4,000 per animal per year on veterinary treatment.

Scope & Potential of Innovation for Wider Reach/ Out Scaling

The magnetic bell collar is a low-cost, zero-maintenance solution ideal for native cattle breeds reared under free-grazing systems, protecting them from metal ingestion and snakebites. With strong potential for adoption across Tamil Nadu and other states, it supports livestock safety, indigenous breed conservation, and sustainable rural farming.

Scientific Validation required

Scientific validation to assess its long-term impact on animal behavior, comfort, and overall safety before large-scale adoption.

Domain

This intervention will be adopted for cattle breeds reared under free-grazing systems, especially in hilly and forest areas. It can be further standardized for small ruminants.

80. Sheep Cell: Precision Rearing in Controlled Environment

Profile of Innovator

Name : Arunadevi
Age : 45 Years
Education : B.Sc., (Agri), LL.B.
Experience : 16 Years
Contact Details : Parnadhama Farm, Balekatte Road,
Dodderi Village, Bhadravathi Taluk
Shivamogga District, Karnataka
Mobile No : 94489 16310

Brief description of Innovation

Single Cell Ram Farming – an individual concept of rearing sheep in a single cage indoors with a controlled diet, rather than relying on grazing. This approach prevents aggression of the animals. This technique of rearing animals maintains hygiene health from parasitic infections and achieves faster body weight for meat purpose. This technology ensures controlled feeding by balanced diet with specific nutrients, leading to better growth rates and overall health. Also requires more initial setup, single cell feeding can reduce the daily labour needed for herding and managing grazing sheep

View of Sheep cell feeding

View of precision rearing of sheep in individual cage

Innovation's Highlights

Individual indoor rearing of rams in single cages promotes controlled feeding and balanced nutrition, reduces animal aggression by avoiding group fights and improves hygiene and reduces risk of parasitic infections. It also accelerates weight gain, making it ideal for meat production and reduces labour as no herding or grazing is required.

Benefits/Advantages

Less space is required for rearing and lower feed consumption as compared to open grazing and faster body weight gain for market readiness. High profitability with B:C ratio of 2.4. disease incidence was nil for the last one year. Protection from horizontal spread of diseases.

Scope & Potential of Innovation for wider reach/ out scaling

The technique is highly suitable for small and marginal farmers with limited grazing land. It offers a space-efficient, labour-saving, and health-focused alternative to traditional grazing. This model has scope of scaling up in peri-urban, semi-arid, and intensive farming systems. With proper training and minimal infrastructure investment, it has strong potential for wider adoption across regions, especially where land is scarce or grazing resources are limited.

Scientific Validation Required

Needs validation for dynamics and kinetics involved in disease outbreaks and cost reduction with locally available materials.

Domain

Livestock and Animal Husbandry, especially for small & marginal sheep rearing farmers of peri-urban, intensive and semi-arid region.

81. Floating Duck Shed to overcome Flooding Situations

Profile of Innovator

Name	:	Stanly Baby
Age	:	47 Years
Education	:	B.Com
Experience	:	15 Years
Contact Details	:	Thottakkattuparambil Thalavady P O Thalavady, Alappuzha, Pin-689572 Kerala
Mobile No	:	7025424288

Brief description of Innovation

As his plot was flood-prone, Mr. Stanly Baby thought of fixing the duck shelter over the fish pond and designed a floating duck shelter which floats freely in water and will not submerge when the water level rises. This shelter floats freely on water which rises along with the water level and is tethered with a long rope. For feeding the ducks and collection of eggs, the shelter is pulled near to the bund using the rope and then released back. His experience was documented in a popular article and published by the KVK. Nearly 50 farmers have replicated this technology in Kuttanad thaluk after visiting this unit.

Innovation's Highlights

The duck shelter was fabricated using GI and PVC pipes, and Trafford sheets in 8 x 5 x 7 ft size and fixed over sealed plastic barrels (4 barrels, one on each side) for floating. The floor of the shelter is made by paving PVC pipes (3/4") on a gap of 1.5 cm which allows the faecal materials of duck to drop down, which could indirectly form feeding material to the fish.

Stanly and his family with floating duck shed

Innovator giving information about the shed to visitors

Innovator with the floating duck shed

Benefits/Advantages

This shelter floats freely on water which rises along with the water level. Collection of eggs can be done by pulling the shelter near to the bund using the rope and then released back. An amount of Rs. 35000/- invested towards the fabrication of this floating duck shelter and up to 8 years no maintenance cost required. Earning an amount of Rs.1.41 lakhs through sale of eggs and fishes with an investment of Rs.81000/- every year from the 30 cents of fish pond.

Scope & Potential of Innovation for wider reach/out scaling

School students, two batches of RAWE students and more than 25 farmers groups from the different parts of district have visited his farm. This encourages him to involve more in this farming operation and also getting wider publicity.

Scientific Validation Required

Needs validation

Domain

Integrated Farming System

82. Automatic drinking system for Dairy Animals

Profile of Innovator

Name : H.M. Dhyamappa
Age : 51 Years
Education : Matriculation
Experience : 15 Years
Contact Details : Haluvarthy, Anagodu Hobli,
Taluk & District: Davanagere (Karnataka)
Mobile No : 99720-89517

Brief description of Innovation

One thousand litre Syntex Tank connected to 7 inches diameter CPVC Pipe of 1 ½ feet height (Blue coloured to avoid fungal growth) through 1 ¼ inch PVC pipe serially at 4 feet interval via Cement Tank provided with Ball Valve to control water level.

Innovation's Highlights

As much or as often as necessary or desired drinking water can be provided to dairy animals.

Dhyamappa with his innovative system of watering

View of cattle shed with automatic drinking system

View of ball valve

Benefits/Advantages

- Saves water and Labour
- Provides *ad-libitum* water to animals
- Less cost (Rs.300.00 as against Rs.7000.00 for ready unit) involved per unit.
- Electricity not required
- Easy to clean and maintain.

Scope & Potential of Innovation for wider reach/out scaling

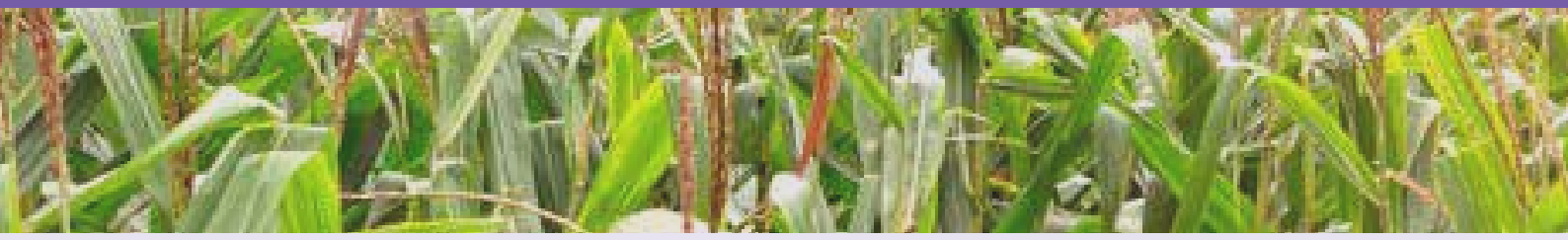
This technology can be easily adopted by other dairy farmers. Already 6 farmers from the nearby villages have adopted this technology.

Scientific Validation Required

Yes

Domain

Commercial Dairy Farming

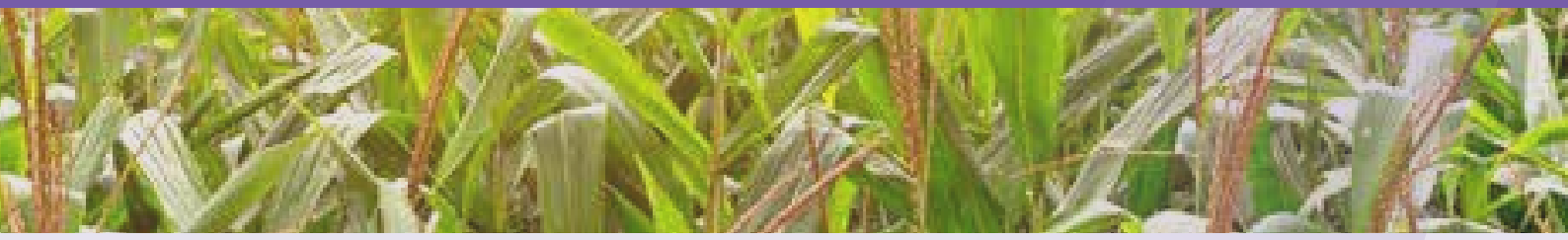


PART-IV

PART - IV

Innovations in Farm Mechanization & Post-Harvest Management

This category includes tools, machines, and equipment developed or modified by farmers to reduce labour, improve efficiency, and make farming operations more cost-effective. Focus Areas: Harvesting, threshing, processing and value addition.



83. Locally Fabricated Power Lift Reducing Labour Costs in Multi-Storey Mushroom Farming

Profile of Innovator

Name : Naresh Mankotia
Age : 38 Years
Education : Graduation
Experience : 12 Years
Contact Details : Village-Bhadiyara
District-Kangra, Himachal Pradesh
Mobile No. : 9805171583

Brief description of Innovation

This innovation is a pulley-operated power lift, developed specifically for use in a two-storey mushroom cultivation house, designed and developed by Naresh. It has a carrying capacity of 1.5 tonnes (approximately 150 bags) and was fabricated locally at a cost of only Rs. 1 lakh, making it highly affordable as compared to commercial lifts, priced at around Rs. 2.5 lakh. The power lift drastically reduces manual labour and enables efficient vertical transport of materials.

Innovations Highlights

The innovation addresses labour scarcity and high operational costs, associated with mushroom farming. It is designed to be space-efficient and extendable for use in multi-storey mushroom houses. The power lift makes daily tasks manageable, enhancing productivity while reducing dependency on manual labour. The lift comprises a steel frame, pulley system, and a compact motor-driven mechanism. It is built to transport up to 150 mushroom bags at once and can be scaled to operate across two or more storeys. All components are sourced locally, keeping the fabrication cost low.

Benefits/Advantages

The cost of lifting 150 bags manually would be around Rs. 1,000 per day, while the lift completes the task at just Rs. 12, leading to an annual saving of approximately Rs. 70,000. In addition to cost savings,

View of fabricated power lift

Close view of fabricated power lift

the lift improves operational safety and reliability. The innovation is poised to save mushroom farmers across India over Rs. 1,000 crore in operational expenses.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This model can be upscaled and adopted in mushroom farming setups across India, especially in regions with space constraints or where vertical farming is practised. It also holds potential for adaptation in other farming or warehouse-based enterprises.

Scientific Validation required

Yes, structural and performance validation under various operational loads, along with economic feasibility studies, are required.

Domain

Agro-mechanical innovations for vertical farming systems, particularly suited to hilly terrains and compact farming environments in Himachal Pradesh and beyond.

Innovator with mushrom bags being lifted by power lift

84. Carrot Washing Machine for Enhanced Quality and Labour Efficiency

Profile of Innovator

Name : S. Gurcharan Singh
Age : 44 Years
Education : Matriculation
Experience : 22 Years
Contact Details : Village-Bohan
District-Hoshiarpur, Punjab
Mobile No. : 9815347630

Brief description of Innovation

To address post-harvest handling challenges, S. Gurcharan Singh developed a carrot washing machine featuring rotating brushes and water jets. This machine ensures effective cleaning of carrots, removing soil, mud, and residues far better than manual methods, which often leave behind contaminants. The design is simple, robust, and highly suitable for both small and large farms. It has a processing capacity of approximately 1.0–1.5 tons per hour, depending on the size and soil adherence of the produce. While primarily designed for carrots, the machine is also effective for cleaning other root crops such as radish, beetroot, turnip, sweet potato, and turmeric, offering broad utility across diversified vegetable farms.

Unloading the carrot after washing in carrot washing machine

View of carrot washing machine

Innovation's Highlights

The innovation results in cleaner and more attractive produce, extending shelf-life and enhancing marketability, while saving labour and time. The machine is constructed with food-grade stainless steel. It includes motorized rotating nylon brushes and a continuous water spray system, with drainage for waste water and soil residues.

Benefits/Advantages

By mechanizing the cleaning process, the machine reduces labour dependency and time requirements. It ensures better produce quality, fetches higher market prices, and operates at minimal maintenance cost.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Applicable to all root vegetable-producing areas, particularly where hygiene and quality are important.

Scientific Validation required

Yes, performance trials comparing manual versus machine cleaning efficiency, microbial contamination reduction, and ROI analysis.

Domain

Post-harvest mechanization and value addition in vegetable farming.

Inside view of a carrot washing machine

85. Cost-Effective Mechanized Gladiolus Corm Digger

Profile of Innovator

Name : S. Gurvinder Singh
Age : 39 Years
Education : Intermediate
Experience : 17 Years
Contact Details : Village-Nanowal Khurd
District-Fatehgarh Sahib, Punjab
Mobile No. : 9915310703

Brief description of Innovation

S. Gurvinder Singh developed a mechanized gladiolus corm digger that minimizes damage and speeds up harvest, replacing labourious and slow manual digging with hoes and spades. The tool is economical and specifically designed to protect the delicate corms from injury. The mechanized gladiolus corm digger has a working capacity of approximately 0.2 to 0.3 hectares per hour, significantly enhancing the speed and efficiency of corm harvesting as compared to manual methods. The tool is particularly suited for use in floriculture and bulbous crop cultivation, such as tulip, onion bulbs, and tuberose, offering scalability across varied agro-climatic zones.

Innovation's Highlights

This innovation increases harvesting speed, reduces labour requirements, and ensures corms remain intact for market or replanting. Made using mild steel blades attached to a frame drawn by a tractor or operated manually. The digger lifts soil and separates corms efficiently.

Benefits/Advantages

Reduces manual labour costs during peak harvest, saves time, and minimizes post-harvest damage to gladiolus corms.

Gladiolus corm digger shaft design

Gladiolus corm after harvesting

View of gladiolus corm digger

View of gladiolus corm

Scope & Potential of Innovation for Wider Reach/Out Scaling

Ideal for floriculture units across India, especially where gladiolus and similar bulbous crops are grown.

Scientific Validation required

Yes, trials for efficiency, corm damage rate, and labour cost savings.

Domain

Mechanization in floriculture and horticultural crop harvesting.

86. Eco-friendly storage structure *(Orhana)* for storing perishable products

Profile of Innovator

Name : Hem Raj Bheel
Age : 40 Years
Education : Intermediate (12th)
Experience : 20 Years
Contact Details : Village-Gudarmal, PO-Dikawani, Block-Shahabad District- Baran, Rajasthan
Mobile No. : 9799586719

Brief description of Innovation

This innovation is a low-cost, eco-friendly, traditional storage structure locally known as "Orhana", designed for storing perishable household products such as milk, curd, vegetables, and fruits. Handcrafted by skilled elderly women using traditional knowledge, the structure is made from a locally available mixture of soil, black clay, wheat straw, and water.

Innovation's Highlights

The box-shaped unit is carefully designed with about 80-100 ventilation holes on all four sides to allow natural air circulation, which helps keep the stored items cool and fresh for up to 24 to 36 hours without the use of electricity.

Benefits/Advantages

The approximate dimension of structure used to be–1.5ft x 1.5ft x 2.0ft providing approximately storage space of 3.5-4 ft3. It takes around 6 days in construction with total cost of Rs. 1200.00. The USP of the structure is that it is -completely handmade by experienced rural women, natural cooling system without electricity, low-cost alternative to refrigerators, locally sourced materials and indigenous knowledge and supports women's skills and traditional craftsmanship. It is highly economical due to- zero recurring energy costs, use of locally available and inexpensive materials, no need for expert intervention or machinery, can be replicated in resource-poor rural households and ideal for areas without electricity access.

View of eco-friendly storage strucrture (Orhana)

Insider view of orhana

Potential of Innovation for Wider Reach/Out Scaling

It is highly suitable for remote and tribal villages with no electricity, and useful for economically weaker households. It promotes sustainable rural livelihoods and traditional knowledge systems and can be replicated, promoted, and up-scaled through women self-help groups and rural innovation platforms.

Scientific Validation required

Yes, the innovation demonstrates strong traditional merit and utility; however, scientific validation of its cooling efficiency, temperature regulation, and shelf-life extension capacity is recommended for wider adoption.

Domain

Storage of perishable products in remote triable areas of Eastern Rajasthan

Rural woman with orhana

87. Multipurpose Food Processor for Farm-to-Table Value Addition

Profile of Innovator

Name	:	Dharambir
Age	:	62 Years
Education	:	12th
Experience	:	18 Years
Contact Details	:	Village-Damla, PO-Damla, Block-Radaur District-Yamunanagar, Haryana
Mobile No.	:	9896054925

Brief Description of Innovation

The multipurpose food processor developed by Sh. Dharambir is a versatile, farmer-friendly innovation designed for processing a wide variety of fruits, herbs, and vegetables. The machine performs multiple functions such as- Extracts juice from aloe vera, strawberry, jamun, guava, orange, tomato, amla, etc., separates pulp efficiently from fruits like guava, amla, mango, pear, banana and jamun, capable of distilling essential oils from herbs like tulsi, rose, lemongrass, turmeric leaves, peppermint, and cumin using steam distillation method, and capable of making khoya, paneer, makhan and other milk products.

Innovation's Highlights

The machines are available in different capacities (ranging from 40 kg to 200 kg per batch) to cater to both domestic and commercial scale processing. These are fabricated using food-grade stainless steel for hygiene and durability, and operates on single-phase or three-phase electric supply depending on model.

Benefits/Advantages

The USP of these devices are- one machine with multiple functions: Juice extraction, pulp separation, oil distillation, peeler and more, user-friendly and low maintenance, enables value addition at the farm level, supporting self-employment and rural entrepreneurship, portable models available

View of multipurpose feed processor machine

Shri Dharambir operating the machine

Food processor machines of different capacity

for on-field demonstrations and small-scale processors, and at low temperature, it acts as vacuum dryer. It dries honey to form honey powder which is portable and easily stored.

The Cost of machine ranges from ₹1,13,000 to ₹2,70,000 depending on size and capacity. The small scale enterprise of value-added products like aloe vera juice, herbal extracts, and fruit-based drinks gives estimated B:C ratio of 2.5:1 under regular processing operations for aloe vera, jamun, and amla juice with a minimum scale of production.

Potential of Innovation for Wider Reach/Out Scaling

The machine is replicable. Different capacity processing units are available suiting to domestic and commercial purposes

Scientific Validation required

The machine is well-proven device, and the innovator himself produces them and sells them.

Domain

Fruit and Vegetable Processing in anywhere

88. Smart Thresh Harvester: Reaping Grain-saving Straw

Profile of Innovator

Name : Aagya Ram Verma
Age : 51 Years
Education : 12th
Experience : 13 Years
Contact Details : Village: Kharika Devri (Piprahia), Post: Kodai Block: Kaptanganj, District: Basti (UP)
Mobile No. : 7398349644

Brief description of Innovation

The small-scale combine harvester is designed for small landholdings, featuring an integrated straw threshing mechanism. It operates efficiently on diverse terrains with low fuel consumption, offering a cost-effective, eco-friendly solution for smallholder farmers.

Innovation's Highlights

The compact combine harvester is a cost-effective, labour-saving solution ideal for small and marginal farmers. It enables timely harvesting, operates on varied terrains with low fuel use (12-15%), and ensures wheat straw availability for dairy needs—where large machines are not feasible.

Benefits/Advantages

The small-scale combine harvester significantly reduces harvesting costs to ₹10,000/ha as compared to ₹15,000/ha for manual methods. With a high Benefit-Cost (B:C) ratio of 2.5, it offers better economic returns. An added advantage is the ability to harvest early, helping farmers to avoid potential crop damage from unexpected rainfall.

View of smart thresh-harvester in operation

Straw collection during operation

View of smart thresh harvester

Scope & Potential of Innovation for Wider Reach/Out Scaling

The innovation has already been adopted by 823 farmers and utilized across 276 hectares in Basti district, demonstrating convincing field-level acceptance. Its efficiency, cost-effectiveness, and multipurpose utility make it highly suitable for horizontal spread in smallholder farming regions, especially where labour shortages are common. The growing demand highlights its potential for wider adoption and impact across similar agro-ecological zones.

Scientific Validation Required

Scientific validation is essential to assess the machine's performance, fuel efficiency, durability, and impact on crop yield and straw recovery. This will ensure standardized benchmarks for quality, safety, and scalability, further supporting its broader adoption.

Domain

Smallholder wheat growers of Eastern and Central Indo-Gangetic Plains

89. Sieving Precision: Indigenous *Makhana* Grader

Profile of Innovator

Name	:	Amit Kumar
Age	:	37 Years
Education	:	Graduate
Experience	:	7 Years
Contact Details	:	Village: Satan Patti District: Supaul, Bihar
Mobile No.	:	9471414516

Brief description of Innovation

Grading of Makhana pop using indigenous grader, a unique specialized equipment. It sorted and grade makhana (fox nuts or *Euryale ferox*) into different grades or sizes as per APEDA norms. Grading is important step in makhana processing.

Innovation's Highlights

The machine operates using a series of vibrating or rotating sieves with varying mesh sizes; raw makhana is fed from the top and, as it moves over the sieves, it is separated by size, with clean, graded makhana collected in separate bins. The capacity of the machine ranges from 50 kg/hour for small units to 500–1000 kg/hour for commercial units.

Benefits/Advantages

Improves product quality and uniformity, saves manual labour and time, and enhances processing efficiency, making it suitable for both small-scale and commercial processors. This device can be attached to automatic model. The total pop production is approx. 60,000 q in district from 1,05,000 q of raw seed. The expenditure of manual cleaning and grading on 1 quintal pop is Rs. 1600 while grading

View of indigenous makhana grader

Packing of makhana after grading

and cleaning by machine is 1000 per quintal. If promoted, this machine can help farmers save Rs. 3,60,000.

Scope & Potential of Innovation for Wider Reach/Out Scaling

In view of the present scenario, wherein *"Makhana"* is being highlighted as a "Super food", this indigenous grader may have a huge scope and potential, in terms of replicability across small-scale & commercial processors, engaged in the field of *Makhana* cultivation.

Scientific Validation required

Yes, to some extent.

Domain

Development of indigenous tool, Vast scope, Makhana pop grading

View of makhana cultivation

90. Mechanized *Ber*-Shredder: A Low-Cost Solution for Pruning and Organic Recycling

Profile of Innovator

Name	:	Ananda Kumar Sahoo
Age	:	51 Years
Education	:	Matriculation
Experience	:	35 Years
Contact Details	:	Village: Sargiguda, District: Kalahandi, State: Odisha
Mobile No.	:	7978575862

Brief Description of Innovation

"Ber orchards require regular post-harvest pruning to stimulate fresh shoot growth and enhance productivity. However, the thorny nature of Ber branches poses serious challenges to manual pruning and disposal, often leading to injuries, higher labour costs, and delays. To address this, Shri Ananda Kumar Sahoo developed a mechanized Ber Shredder, enabling farmers to manage pruned biomass efficiently, safely, and in a cost-effective manner.

Mechanized ber-shredder in operation

Different views of mechanized ber-shredder

Innovation's Highlights

- This farmer-engineered machine integrates with existing farm infrastructure and ensures high efficiency in pruning management:
  - *Power Source:* Tractor PTO-driven system
  - *Cutting Mechanism:* 4 robust blades (10 inch each) fixed on a 2-feet diameter cutting plate
  - *Drive System:* Cutter pulley (16 inch), PTO pulley (8 inch), using C-type belt (54 inch)
  - *Frame Dimensions:* 6 feet (Length) × 20 inch (Width) × 20 inch (Height)
  - *Operational Output:* Shreds up to 10 quintals per hour

Benefits/Advantages

The mechanized Ber shredder has brought about a major shift in orchard waste management:

- *Labour Replacement:* Replaces the effort of nearly 56 manual labourers, substantially reducing pruning costs
- *Single-Operator System:* Requires just one trained operator, enhancing safety and ease of use
- *Resource Conversion:* The shredded biomass can be effectively used as organic manure or converted into value-added compost, supporting circular economy practices in horticulture

Scope & Potential of Innovation for Wider Reach/Out Scaling

Shri Sahoo's innovation demonstrates the power of grassroots engineering in addressing post-harvest challenges in perennial fruit crops. With minimal maintenance needs and high adaptability to small and medium orchard settings, this mechanized shredder offers a replicable model for dryland and tribal regions where Ber cultivation is gaining prominence. Effective use of shredded biomass as organic manure and/or valve-added compost to be used for horticulture crops.

Scientific Validation required

No

Domain

Orchard waste management, good scope in orchard management.

91. Affordable Jute Ribbon Extractor with Intact Stick Recovery

Profile of Innovator

Name	:	Krishna Pada Biswas
Age	:	52 Years
Education	:	Higher Secondary
Experience	:	20 Years
Contact Details	:	Village: Ambarpur, Bongaon District: North 24 Parganas, State: West Bengal
Mobile No.	:	8670321060

Brief Description of Innovation

High-speed decorticators often compromise the integrity of jute sticks, which are essential for fencing, fuel, and artisanal use. To address this, Shri Krishna Pada Biswas developed a cost-effective jute ribbon extractor that preserves intact sticks during ribbon extraction—meeting a critical quality preference of jute farmers.

Innovation's Highlights

- *Processing Speed:* 40–50 jute plants/minute
- *Stick Integrity:* Ensures stick preservation.
- *Cost:* ₹40,000 only, which is five times cheaper than the price of commercial decorticator (₹2,00,000)
- *Usability:* Suitable for smallholder farmers and FPOs, easy to operate and maintain
- *Deployment:* Six units procured by Jute Corporation of India (JCI), Ministry of Textiles, Government of India, and distributed to farmer groups

View of operation of Jute Ribbon Extractor machine

Extracted jute ribbon

View of jute cultivation

Benefits/Advantages

» Enables value retention from both jute ribbon and stick
» Empowers small and marginal jute growers with an affordable mechanization solution
» Demonstrated success has led to grassroots-level adoption and scaling through institutional support
» Balances processing efficiency with quality preservation, which is often lacking in existing high-speed machines

Scope & Potential of Innovation for Wider Reach/Out Scaling

It has high potential for promotion through Jute Council of India (JCI) schemes and custom hiring centers. It is suitable for integration into SHG- and FPO-based jute clusters and offers a model for public–private–institutional convergence, wherein design improvements can be pursued in collabouration with ICAR institutes and state departments.

Scientific Validation required

Yes

Domain

Indigenous cost-effective tool to extract Jute ribbon, while keeping the jute-sticks intact.

92. Wood Fan Winnower: Cleaning grains made easy

Profile of Innovator

Name	:	Gopen Ray
Age	:	55 Years
Education	:	12th Pass
Experience	:	24 Years
Contact Details	:	Vill. Khara Medhipara P.O. Dudhnoi District Goalpara, Assam
Mobile No.	:	6003850876

Brief description of Innovation

Traditional methods of winnowing such as tossing grains in the air manually are highly labour-intensive, time-consuming, and dependent on wind conditions. In many rural and hilly areas, especially during the monsoon or in enclosed spaces, natural wind is not reliable, making manual winnowing difficult. Therefore, a manually operated wooden winnower designed for efficient grain cleaning and separation of paddy chaff using artificial airflow. To address issues, Mr. Gopen Roy designed and developed a wooden frame winnower. This innovation uses a wooden frame with slanting platforms is used in combination with high speed electrical stand fan. Capacity of the unit is 6.5 Q/hr.

Gopen Ray with his wooden winnower

Winnowing in operation

Fresh grain after winnowing

Innovation's Highlights

Portable Small scale efficient low-cost winnower for paddy and it is easy replicate and operate. It is ideal for lowland and hilly areas as well as drudgery reduction, especially respiratory problems due to paddy dust during the winning processing.

Benefits/Advantages

The innovation provides a low-cost, and weather-independent solution for separating grains or seeds from chaff. It is particularly useful for smallholder farmers where wind speed is less. Its simple design and local materials make it easy to repair and replicate. Major advantages are labour saving, energy efficient, faster than manual winnower with efficient drudgery reduction. The cost of making the tool is ₹3500, Traditional winnowing takes 3–4 person per hours for 6.5 quintals while the small unit unit requires only one person per hour, besides drudgery reduction.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The innovation has high potential to scale up among small scale paddy farmers since it is easy to replicate across entire country. It is simple unit, farmers can operate easily and expertise not required for the operation.

Scientific Validation required

Yes; the validation is required to assess the time taken to completely remove/separate the husk and dust and efficiency and quantification of drudgery reduction

Domain

Farm equipment specifically for Post-Harvest management of crops produce; and well-suited for lowland, upland, and hilly paddy cultivation areas, making it ideal for small and marginal farmers.

93. Fuel-Efficient Diesel Drum Thresher: Empowering Small-Scale Paddy Farmers

Profile of Innovator

Name	:	Medoveyi Tetseo
Age	:	51 Years
Education	:	6th
Experience	:	25 Years
Contact Details	:	Village: Thipuza, District: Phek, State: Nagaland
Mobile No.	:	9436828252

Brief description of Innovation

Mr. Medoveyi Tetseo has designed a diesel-powered drum-type paddy thresher to deliver high output and efficiency for small and marginal farmers. With a threshing capacity of 500–600 kg/hour and fuel consumption as low as 0.5 litres per hour, this machine drastically reduces manual labour by 80% and offers a cost-effective mechanized solution for paddy post-harvest operations.

The unit can be locally manufactured at a cost of ₹40,000–₹50,000, making it accessible and scalable for widespread rural use.

Shri Medoveyi Tetseo operating the paddy thresher

Shri Medoveyi Tetseo with his machine

Diesel operated drum-type paddy thresher

Innovation's Highlights

This efficient paddy thresher processes 500–600 kg per hour while consuming just 0.5 litres of diesel, slashing manual labour by 80%. Its low-cost local manufacturability and user-friendly design make it ideal for rural farming communities.

Benefits/Advantages

Priced at ₹40-50K, this thresher processes 500kg/hour (0.5L fuel), cuts labour cost up to 80% with BC ratio of 3.2:1, reducing post-harvest losses, while easing drudgery in labour-scarce regions during peak seasons.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Ideal for rice-growing regions in India and can transform post-harvest operations for marginal farmers, boosting productivity.

Scientific Validation required

Required to formally evaluate performance metrics such as threshing efficiency, grain damage, and fuel consumption under varying field conditions.

Domain

Agricultural machinery for paddy processing, ideal for small farms in rural, off-grid regions with limited electricity access.

94. Hand Operated Ginger-Turmeric Slicer

Profile of Innovator

Name	:	Genesius Rymbai
Age	:	55 Years
Education	:	4th
Experience	:	10 Years
Contact Details	:	Village: Thadnongiaw, District: Ri Bhoi State: Meghalaya
Mobile No.	:	9089611347

Brief description of Innovation

This hand-operated slicer is specifically designed for ginger and turmeric slicing, as these two crops are largely cultivated in the Northeastern region. Made using recycled materials like tin sheets, bicycle chains, and bearings, this machine is lightweight (8–10 kg), portable, and user-friendly, especially for women. It slices 40–50 kg of turmeric per hour and 25–30 kg of ginger per hour, significantly reducing time, labour, and effort in post-harvest processing.

Close view of hand operated ginger cum turmeric slicer

Hand operated ginger- turmeric slicer

A view of ginger cum turmeric slicer under operation

Innovation's Highlights

This eco-friendly manual slicer, crafted from recycled materials, delivers uniform cuts for superior drying quality without electricity. Its lightweight, portable design with women-centric ergonomics makes it ideal for both field and household processing.

Benefits/Advantages

Priced affordably at just ₹5,000–6,000, this slicer reduces labour costs by 50–60% while enabling uniform, export quality slicing delivering professional-grade results at a fraction of electric machine costs.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Ideal for Meghalaya's ginger-turmeric belts, this slicer replaces slow hand-cutting, saving 60% labour while ensuring uniform slices for better market prices and scalable across spice-growing regions.

Scientific Validation required

Requires field performance trials recommended to assess output quality, durability, and slicing efficiency.

Domain

Small-scale spice processing for ginger and turmeric farmers, enabling value-addition at farmgate level with manual operation, ideal for rural areas lacking electricity and commercial processing infrastructure.

95. Triveris Cocoon Harvester: Integrated Harvest Clean Bag System

Profile of Innovator

Name : G. Gurumoorthy Setty
Age : 51 Years
Education : Matriculate
Experience : 15 Years
Contact Details : At- Tallapalli, PO: Dandapalli,
Dist- Chittoor, State-Andhra Pradesh
Mobile No. : 9849126223

Brief description of Innovation

Chittoor district is popularly known as "The district of Silk and Milk" due to large scale adoption of sericulture and dairy enterprises as income generating activities in allied sector. Sericulture is practised in about 15,600 hectares in the district, especially in western part of erstwhile Chittoor district. Silk worms for cocoons come to maturity (pupae stage) and spin the cocoons. On the 6th day of spinning, within one day, farmers have to harvest, clean and bag the cocoons and bring to the market, which is labourious and requires more labour in a day. Integrated harvester can do harvesting, cleaning and bagging of cocoons at a time by using manual power or mechanical power or electrical power.

Innovation's Highlights

Sri Gurumurthy Chetty developed the machine by using locally available machine components and other local materials. It is operated using 0.5 HP motor. Dimensions of the cocoon harvester is 8 ft (L) × 2 ft (W) × 4 ft (H); It weighs approx. 160 kg. The machine can be operated either by manually or using electric power or mechanical power using motor bike (attaching harvesters' shaft with bikes rear wheel). The cost of the machine is Rs.40000/-. The floss on the cocoon can be removed by changing the sieve or net in the machine.

Innovator explaining the function of triveris cocoon harvester

Shri. G. Gurumoorthy setty with cocoon harvester

A glimps of triveris cocoon harvester during operation

Benefits/Advantages

Integrated Cocoon harvester can harvest, clean and bag 120 netrikas per (a type of plastic nets) hour and 700 netrikas in a day (Requiring 6-8 labours). About 60% of labour can be saved by using this harvester (35-40 labours members are required in manual method of cocoon harvesting). Farmers can take their produce to the market on the day of harvest itself, which fetches good market price to the farmers.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The machine has a huge potential in silkworm rearing industry, which requires a greater number of labour for harvesting of cocoons from netrikas. The machine cost is Rs. 40,000/- per unit and it is affordable to all the farmers, especially for small and marginal farmers.

Scientific Validation required

Needs validation for verification & perfection

Domain

Development of Innovative Tool for Silkworm cocoon harvesting.

96. TURMEX: The Power Tiller-Powered Turmeric Harvester

Profile of Innovator

Name	:	P. Ramaraj
Age	:	45 Years
Education	:	Intermediate
Experience	:	12 Years
Contact Details	:	At- Kothukaarar Thottam, PO: Kettisamudram, District- Erode, State- Tamil Nadu, Pin-638004
Mobile No.	:	9865171790

Brief description of Innovation

Turmeric is an important spice crop in the western zone of Tamil Nadu, especially in Erode district due to its favourable climate. Despite its market value and potential for value addition, turmeric cultivation is declining because of labour shortages, particularly during weeding and harvesting. Mr. P. Ramaraj grows turmeric along with vegetables, banana, and sugarcane. Though profitable, turmeric is highly labour-intensive, requiring about 300 labourers per acre for various operations. Delays in harvesting due to labour scarcity often lead to fungal attacks and yield loss. To address this challenge, Mr. Ramaraj developed a 'Turmeric Harvester', investing Rs. 75,000 in its development.

Innovation's Highlights

The turmeric harvester is a power tiller-drawn equipment requiring 13 HP power. It consists of a shaft connected to small diggers, an arm, and a shaker. During operation, the diggers lift the turmeric clumps while the shaker loosens the soil from them. The harvester was tested under various soil conditions and was found to harvest one acre in approximately 7 hours. For optimal performance, certain preconditions are required: row spacing of 1.5 to 2 feet, long ridges and furrows, and preferably fields equipped with a drip irrigation system. It is compact in nature; Portable; Fuel- efficient; and compatible with Power Tiller.

Shri P. Ramraj with his jugad

Power tiller-turmeric harvestor in operation

Benefits/Advantages

This machine helps save labour and money. It needs only one man to operate and 15–20 women to collect the turmeric rhizomes from one acre. In manual harvesting, about 40 workers are needed, costing ₹14,000–₹16,000. By using this harvester, farmers can save ₹7,000–₹9,000 per acre. The machine can harvest one acre in 7 hours and uses only one litre of diesel per hour, which is affordable for small farmers. A special part of the machine shakes off the soil stuck to the rhizomes, making them clean and easy to collect. This harvester also helps farmers avoid delays in harvesting due to labour shortages.

Close view of turmeric harvester

Scope & Potential of Innovation for Wider Reach/Out Scaling

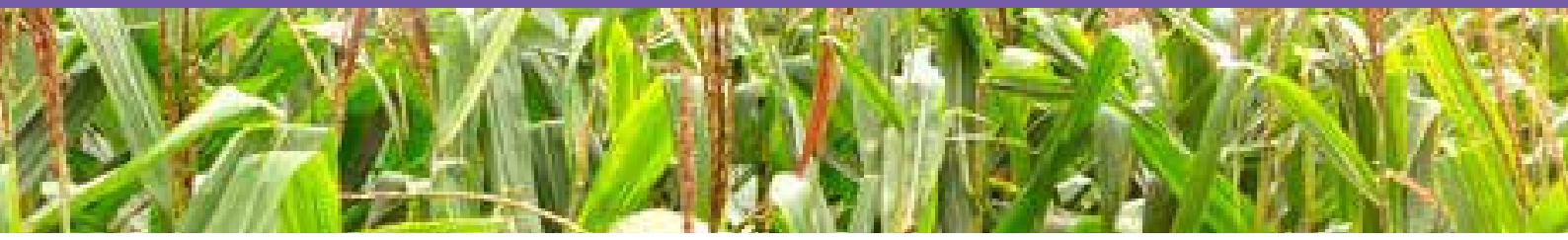
Mr. Ramaraj demonstrated the performance of the turmeric harvester in Tamil Nadu, Karnataka, and Andhra Pradesh. The cost of the harvester is only ₹35,000. He has sold 372 units across various districts in Tamil Nadu. This innovation has also inspired young entrepreneurs to take up the activity by making similar equipment with small improvements, creating opportunities for income and employment.

Scientific Validation required

Needs validation for efficiency.

Domain

Innovative tool for turmeric crops grown on plain terrain with a long ridge and furrow planting system.



PART-V

PART - V

Innovations related to Plant Protection

This catagory Includes eco-friendly and indigenous pest/disease management solutions developed by farmers. Focus Areas: Bio-pesticides, traps, repellents, organic seed treatment, and pest barriers.

97. Self-designed Solar Light Trap for Apple Root Borer Management

Profile of Innovator

Name : Jayant Atreja
Age : 31 Years
Education : Graduation
Experience : 5 Years
Contact Details : Village-Rohru, District-Shimla
Himachal Pradesh
Mobile No. : 7807500091

Brief description of Innovation

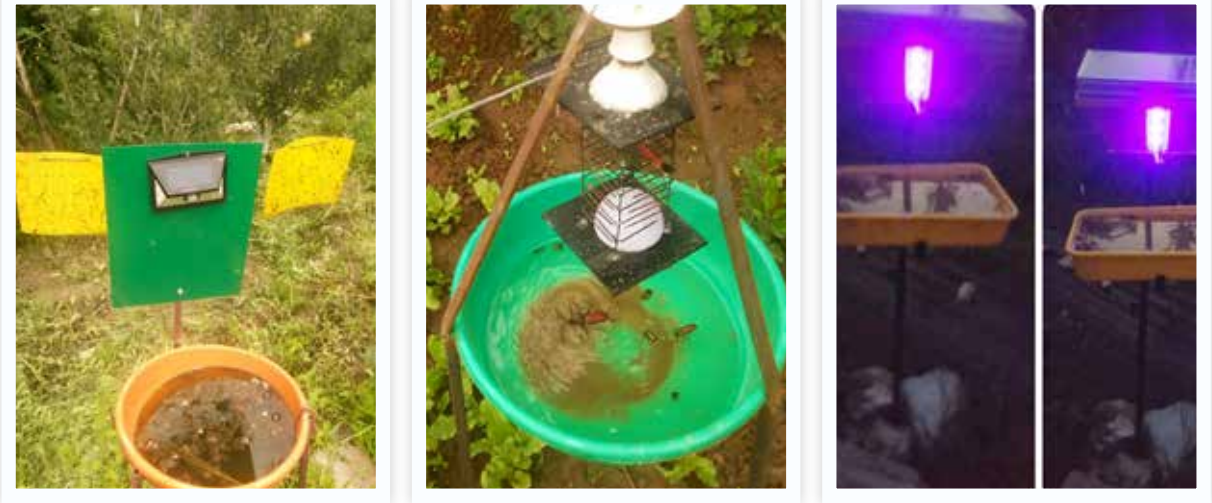
Sh. Jayant designed a solar-powered light trap in order to target the Apple Root Borer, a pest notorious for its extended 3-year larval cycle. The device is equipped with a solar panel that powers an LED light, which automatically activates at dusk and deactivates at dawn, eliminating the need for external power sources. Insects attracted to the LED are captured on glue pads affixed to both sides of a galvanized iron sheet. To enhance the trapping efficiency, a water container mixed with detergent is placed beneath the trap to drown additional insects. The structure is made stable with mild steel vertical supports, making the set up robust and field-friendly.

Innovation's Highlights

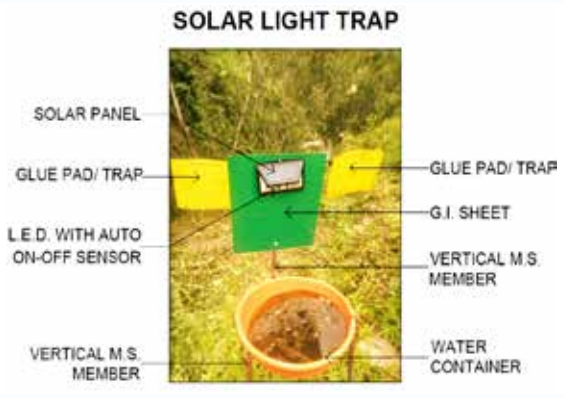
The trap is unique in offering eco-friendly pest control using solar energy. It is highly effective against Apple Root Borer due to its continuous operation throughout the night. The integration of glue traps and a detergent-treated water basin ensures a dual mechanism for capturing pests. Its reusability and independence from chemical treatments make it an ideal choice for sustainable apple farming. The trap consists of a 10W solar panel with a backup battery to ensure consistent LED lighting during cloudy days. It includes a photo sensor to automate the lighting cycle, and a galvanized iron sheet structure holds glue pads on both sides. A 5-liter water tray placed below the sheet is treated with detergent to prevent insect escape. The trap stands on adjustable mild steel supports that can be extended up to 5 feet.

Benefits/Advantages

This innovation reduces the dependency on chemical pesticides by up to 30%, which can significantly reduce input costs and environmental risks. Given that apple trees generate an average net income of Rs. 6,000 annually and are valued between Rs. 1.5 to 1.8 lakh each, the potential loss prevention due to Apple Root Borer is estimated at Rs. 60,000 crore for about 35 lakh trees. Thus, the innovation provides substantial economic and ecological benefits.



Solar light trap for apple root borer in working condition



Apple root borers attracted by trap

A field view of Solar light trap

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation has vast applicability in apple-growing regions across Himachal Pradesh, Jammu & Kashmir, and Uttarakhand, especially in orchards facing persistent pest issues. It is suitable for pest surveillance and eco-friendly IPM practices and has the potential to save losses worth ₹60,000 crore affecting ~35 lakh apple trees.

Scientific Validation required

Yes; efficacy trials focusing on specific pest life stages and comparisons with chemical control methods are needed to scientifically validate this innovation.

Domain

Eco-friendly pest management, specifically within apple-growing regions of the Western Himalayas.

98. In-Hive Garlic Clove Application as a Natural Remedy for Varroa Mite Infestation

Profile of Innovator

Name	:	Ashwani Shukla
Age	:	45 Years
Education	:	Diploma (ITI)
Experience	:	26 Years
Contact Details	:	Village-Jandla, District-Rupnagar, Punjab
Mobile No.	:	9417541410

Brief description of Innovation

Sh. Ashwani Shukla used 4–5 garlic cloves hung inside beehives to repel mites naturally. Garlic emits allicin, a sulfur-containing compound with acaricidal properties, which repels or kills mites without harming bees.

A view of Bee keeping farm

Garlic cloves in bee hives to repel varroa mite

Innovation's Highlights

This method is organic, cost-effective, and ensures no chemical residue in honey. It supports organic apiary management. Garlic cloves are wrapped in breathable material and suspended inside hives. Cloves are replaced every 7–10 days.

Benefits/Advantages

Negligible cost, no need for synthetic acaricides. Ensures healthier colonies and improved honey yields.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Easily adoptable, low-cost innovation for widespread use in eco-conscious and resource-poor apiaries.

Scientific Validation required

Yes, entomological trials on mite suppression and impact on bee's behaviour and productivity.

Domain

Organic bee-keeping and natural pest control solutions.

99. Parachute Net Fencing: A Sustainable Solution to Blue Bull Menace in Crop Protection

Profile of Innovator

Name	:	Vijay Bahadur Singh
Age	:	58 Years
Education	:	Graduate
Experience	:	8 Years
Contact Details	:	Village: Sabeya, District.: Rohtas, Bihar
Mobile No.	:	8002119937

Brief description of Innovation

Parachute Net Fencing is a low-cost, farmer-devised innovation, aimed for preventing crop damage from Blue Bulls (Nilgai) and other wild animals. Shri Vijay Bahadur Singh is a leading farmer, who converted this fencing with the element of creativity. The fencing height is 6 ft and using 12 ply parachute net with bamboo support and used rope. The durability of the fencing is about 12-15 years and bamboo needs to be replaced every 4th year. The innovation uses durable parachute material as fencing, which is both strong and flexible. Unlike traditional barbed wire or thorny bushes, this fencing effectively deters animals, without harming them, offering a humane and sustainable solution. This innovation has been recognized for its effectiveness and has received the "Mahindra Samriddhi Award" in 2016. It is now widely adopted across Bihar and other Nilgai-affected areas.

A view of Parachute Net Fencing

Blue bull trapped in fence

Innovation's Highlights

Made from strong, flexible, and reusable parachute netting, this durable, weather-resistant barrier effectively protects crops from Nilgai and other large herbivores, proving more efficient than barbed wire or thorn-fencing and is widespread adopted by the farmers across multiple districts of the Bihar.

Benefits/Advantages

The total cost involved in fencing is Rs. 25000 per ha. This affordable, reusable, and easy-to-install fencing solution serves as an effective physical barrier that humanely prevents wild animals from entering crop fields, thereby safeguarding harvests without causing them harm; by significantly reducing crop damage (70-80%), it helps farmers to increase yields, improve profitability, and maintain long-term field protection, while also offering greater durability and sustainability compared to conventional fencing methods.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This fencing solution is highly suitable for regions facing Blue Bull menace and other wild and stray animal interference, scalable for marginal and small landholders, eligible for inclusion in government wildlife-safe fencing subsidy schemes, promotable by FPOs, cooperatives, and NGOs in wildlife-conflict zones, and easily replicable in other states also. Huge scope in Bihar around the rivers side cultivation.

Scientific Validation required

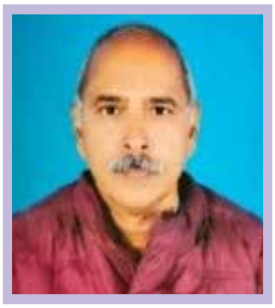
It requires validation of net durability under field conditions, assessment of long-term effectiveness with optimized fencing layouts, and scientific trials to evaluate animal deterrence rates and their impact on crop yield.

Domain

Crop Protection/Wildlife Management/Farm Innovation. It opens vistas for community fencing of land through Government support.

100. Banana Bait Eco-Trap: Natural Fruit Fly Control

Profile of Innovator



Name : Amarjeet Kumar Sinha
Age : 61 Years
Education : Matriculate
Experience : 30 Years
Contact Details : Lodipur Chandmari, District: Patna, Bihar
Mobile No. : 9934713788

Brief description of Innovation

Shri Amarjeet Kumar Sinha has developed low-cost fruit fly management technique for mango, guava, and other soft fruits involves preparing a bait using overripe bananas with a few drops of Nuvacron, placed inside half-cut waste plastic bottles. These bait stations are then hung on trees. The bait attracts and traps fruit flies within hours. It remains effective for 6–7 days, significantly reducing fruit fly populations and preventing crop damage.

Innovation's Highlights

Easy preparation method, no sophisticated skill is required, very cheap and highly effective and reducing fruit fly infestation to a larger extent thereby farmers getting higher marketable yield.

Benefits/Advantages

This bait is easy to prepare and easy to install, since no sophisticated skill is required. Only 25-30 baits (one bait costing Rs. 3-4) can easily manage one-acre area of Mango and other rainy season fruit crops. Cost involved per ha is only Rs. 400- 450. But the cost involved in readymade trap is about Rs. 2000 per ha. This technique has no side effect on consumer, and is eco-friendly, less cumbersome and can be prepared easily at farm level. About 90% reduction in fruit fly infestation in orchard was observed, which reflected the significance of innovation.

Banana bait for managment of fruit fly

The farmer making banana bait

Scope & Potential of Innovation for Wider Reach/Out Scaling

Since Bihar holds the fourth position in India for mango production. This innovation holds, huge potential for scaling up in larger areas. After assessing the success of this innovation, it can be used for guava, banana, and other fruit crops where farmer can reduce their economic losses caused by fruit fly.

Scientific Validation required

Needs validation for use in other soft fruit like Jamun, vegetable crops like cucumber, long melon, bottle gourd, etc.

Domain

Horticulture, Fruit Pest Management, Low-cost Farm Innovation

101. *"Achook*- The Antipest": The 24x7 Solar Light Trap

Profile of Innovator

Name	:	Levekios L
Age	:	20 Years
Education	:	Graduation
Experience	:	2 Years
Contact Details	:	Village: Thonoknyu, District: Kiphire, State: Nagaland
Mobile No.	:	7005140214

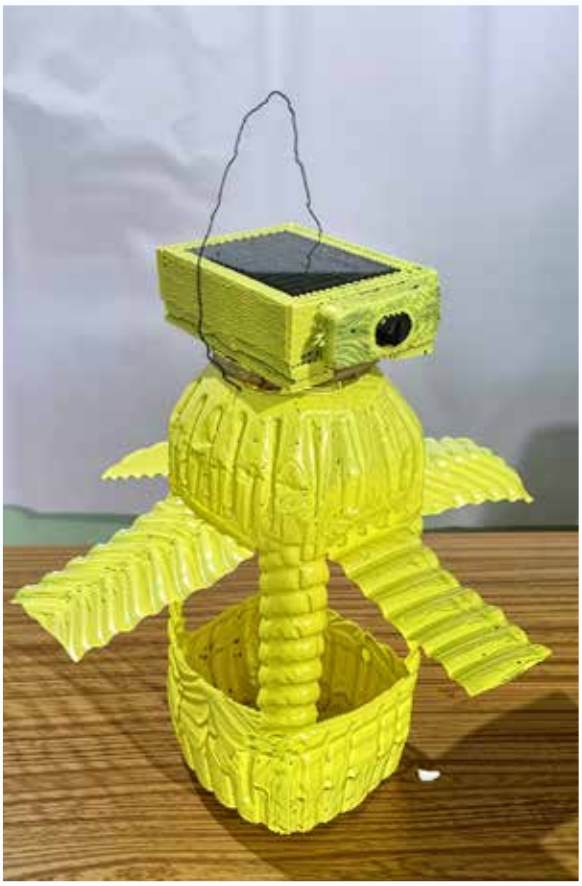
Brief description of Innovation

"*Achook* – The Antipest" is an eco-friendly, 24x7 solar-powered insect trap that provides round-the-clock pest control using a dual-action approach:

» Yellow sticky panels with plant-based dyes/latex to trap daytime pests like aphids and whiteflies
» LED light system for attracting nocturnal pests like moths and borers

Crafted largely from locally available materials, this trap requires only a small solar panel costing ₹150–180, making it one of the most cost-effective solutions available for chemical-free pest control.

Solar Powered eco-friendly insect trap-'Achook'



Close view of 'Achook'

'Achook' installed in the field

Innovation's Highlights

This solar-powered pest trap combats both day and night insects using plant-based adhesives, eliminating chemicals while requiring just 2 units per acre, an eco-friendly, locally made solution adaptable to diverse crops and climates.

Benefits/Advantages

Priced at just ₹300–350 (4-5 times cheaper than store-bought traps), this solar-powered trap safely controls pests without chemicals. It gives a BC ratio of 4:1, making organic/natural farming easier and more profitable for small farms. It is providing chemical-free insect control for crops like cotton, vegetables, and pulses through solar-powered light traps in off-grid agricultural regions.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Ideal for smallholder farmers across India, this affordable innovation boosts productivity while reducing costs, ideal for diverse crops and regions, empowering rural livelihoods with scalable, easy-to-adopt technology.

Scientific Validation required

Required to validate trap effectiveness across seasons, document pest species captured, and measure yield improvements, ensuring reliable performance for diverse crops and regions before farmer adoption.

Domain

Organic/natural farming and integrated pest management (IPM) systems,

102. Eco-Shield: Smart Wildlife Deterrent for Sustainable Farming

Profile of Innovator

Name : Jishoy V.V.
Age : 33 Years
Education : B.Tech.
Experience : 5 Years
Contact Details : Valiyaveetil House, Ayankalam P.O, Thavanur, Malappuram, Kerala
Mobile No. : 9633242552

Brief description of Innovation

This innovation is based on battery/solar-powered, sensor-based device with flashing lights & noise deterrents to repel wild animals (including elephants) from farm boundaries; portable and energy efficient. Highly adaptable to all weather and terrain conditions, huge reduction in the incident of wild animals menace in the field where the device is installed.

Scared elephant running away by flash and sound device

Smart wildlife deterrent device installed in the field

Innovation's Highlights

Operates day/night, 360° coverage, solar hybrid, lightweight, sensor-actuated for power savings. Battery capacity- 12 volts, requires 4-5 hrs of charging, for once in 15 days.

Benefits/Advantages

Reduces crop loss, power efficient, portable, minimizes human-wildlife conflict.
Cost of the devise is Rs. 10,000 per devise with solar panel and Rs.7,500 for chargeable option

Scope & Potential of Innovation for Wider Reach/Out Scaling

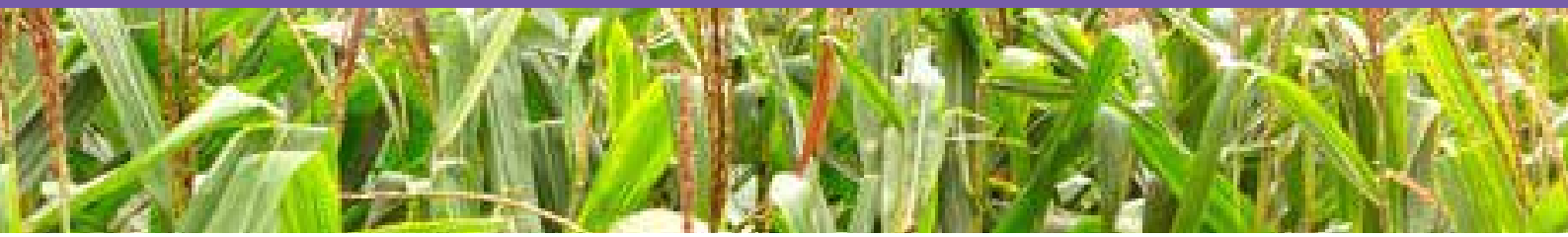
Device is in field use; suitable for farms, forest fringes and scalable with local assembly. It is useful for farmers located in hilly areas, nearer to forest area, buffer zones and fields having wild animal and thief menace. Applicable in all type of terrain rather common crops.

Scientific Validation required

Yes, The development of sensitivity of the animals for the device over the period of time. The public acceptance of the device need to carried out due to high scarring noise and high frequency light made by the device.

Domain

In the areas infested with wild animals especially in forest fringe areas where human-wild life conflict is more common.



PART-VI

PART - VI

Miscellaneous Innovations

Captures creative, out-of-the-box farmer solutions related to rural livelihood, environment, health, or crafts. Focus Areas: Cow-dung products, eco-ornaments, sustainable crafts, therapeutic products, and social innovations

103. *Aanchal* Straw Art: From Paddy Fields to Pride

Profile of Innovator

Name	:	Sunita Devi
Age	:	38 Years
Education	:	Intermediate
Experience	:	5 Years
Contact Details	:	Village: Tehta Dist.: Jehanabad, Bihar
Mobile No.	:	7004320186

Brief description of Innovation

The initiative of women's group called "Anchal" led by Sunita Devi provides home-based work and enables women to earn Rs. 20,000–25,000 annually. Appliques are themed around freedom fighters, deities, monuments, and more, showcasing creativity. The paddy straw is used for making the art. Straw of fresh season is creamy colour where as one-year-old straw gives appearance of golden colour. Paddy straw Applique remain in good condition for more than 20 years with raisin painting and framing. It has unique appearance which can be visualized.

Innovation's Highlights

Utilizes agricultural crop residue (paddy straw) creatively; Promotes women empowerment and rural entrepreneurship; Supported and scaled by Self Help Groups (SHGs).

Benefits/Advantages

Additional income of Rs. 700–3000 per craft; Waste-to-wealth model: Reduces paddy straw

Aanchal Paddy Straw Art

Innovator's Aanchal straw art used to honour the VVIPs

Preparation of applique from paddy straw

burning; Social upliftment through group participation. Employment generation in rural areas. Vast scope for inter and intra state trade apart from export.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Scope for market linkage through exhibitions, fairs, and e-commerce; Potential to create micro-enterprises and SHGs in rural India; Training programs can onboard more women into the initiative.

Scientific Validation required

Needs validation of durability of straw-based products.

Domain

Women Empowerment, Waste Management / Crop Residue Management, Handicrafts and Cultural Art by organising structure capacity development programmes to train women.

104. Cultivating Harmony: Musical-Grade Bottle Gourds for Traditional String Instruments

Profile of Innovator

Name	:	Basudeb Jana
Age	:	68 Years
Education	:	Higher Secondary
Experience	:	40 Years
Contact Details	:	Paliarah, Block: Udaynarayanpur District: Howrah, State: West Bengal
Mobile No.	:	9735450818

Brief description of Innovation

In the heart of rural Howrah, Shri Basudeb Jana has revived and refined the traditional cultivation of Tumba Lau (bottle gourd) for use in Indian classical music. These specially grown and dried gourds serve as resonating chambers for instruments like the Tanpura and Sitar, where natural acoustic properties are indispensable. Shri Jena is raising the Tumba Lau crop organically, using 1.5 kg seed/ha and preparing pits of1' X 1' X 1' at 2.5 × 2.0 m spacing. In each pit, two seeds are sown along with 8–10 kg of well-decomposed vermicompost, ensuring healthy plant growth and chemical-free, high-quality produce. With a focus on sound clarity, shape symmetry, and shell strength, his innovation supports both cultural heritage and artisan livelihoods.

Innovation's Highlights

Each gourd is meticulously cultivated and dried to meet the acoustic and structural needs of professional instrument makers:

- Diameter: 44–48 inches
- Shell Thickness (Dried): 5 mm
- Dry Weight: 750–950 g
- Sound Quality: Offers excellent natural resonance, vital for the tonal depth of Tanpura, Sitar, and other Indian string instruments

Bottle gourd for peration of musical Instrument

Collection of musical grade gourds

Tanpura prepared from bottle gourd

Benefits/Advantages

Post-curing, these gourds develop a tough, resilient shell that ensures long-term storage stability under dry conditions. This makes them highly preferred among luthiers and craftsmen who demand both form and functionality.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Shri Jana's specialized cultivation practice not only contributes to sustaining Indian classical music traditions but also opens up alternative agri-artisanal income streams for marginal farmers. His work has strengthened the supply chain for handcrafted musical instruments, encouraging synergies between agriculture and performing arts. To increase the size of the gourd, only 4/5 main branches per plant are maintained.

Scientific Validation required

No

Domain

Agri-artisanal income source for Marginal farmers

105. Tradition Meets Innovation: Low-cost Fermentation Technique for Virgin Coconut Oil Extraction

Profile of Innovator

Name	:	Patrick Jerimah
Age	:	72 Years
Education	:	No formal education.
Experience	:	10 Years
Contact Details	:	Village: Tapoiming District: Nicobar UT: Andaman & Nicobar Islands
Mobile No.	:	9474236082

Brief description of Innovation

Recognizing the nutritional and economic potential of coconuts in the Nicobar Islands, Shri Patrick Jerimah has adopted and refined a traditional fermentation method for producing Virgin Coconut Oil (VCO). This heat-free, chemical-free approach leverages natural microbial fermentation to separate coconut oil from fresh milk, preserving its nutritional and therapeutic value.

Innovation's Highlights

» *Technique*: Cold-process fermentation of coconut milk
» *Oil Quality*: Unrefined VCO with natural aroma, high antioxidant content, and moisturizing properties
» *Shelf Life*: Superior due to absence of chemical degradation
» *Safety & Sustainability*: Eco-friendly, free from synthetic additives or heat-induced deterioration
» *Scalability*: Ideal for low-cost, small-scale setups in rural and tribal areas

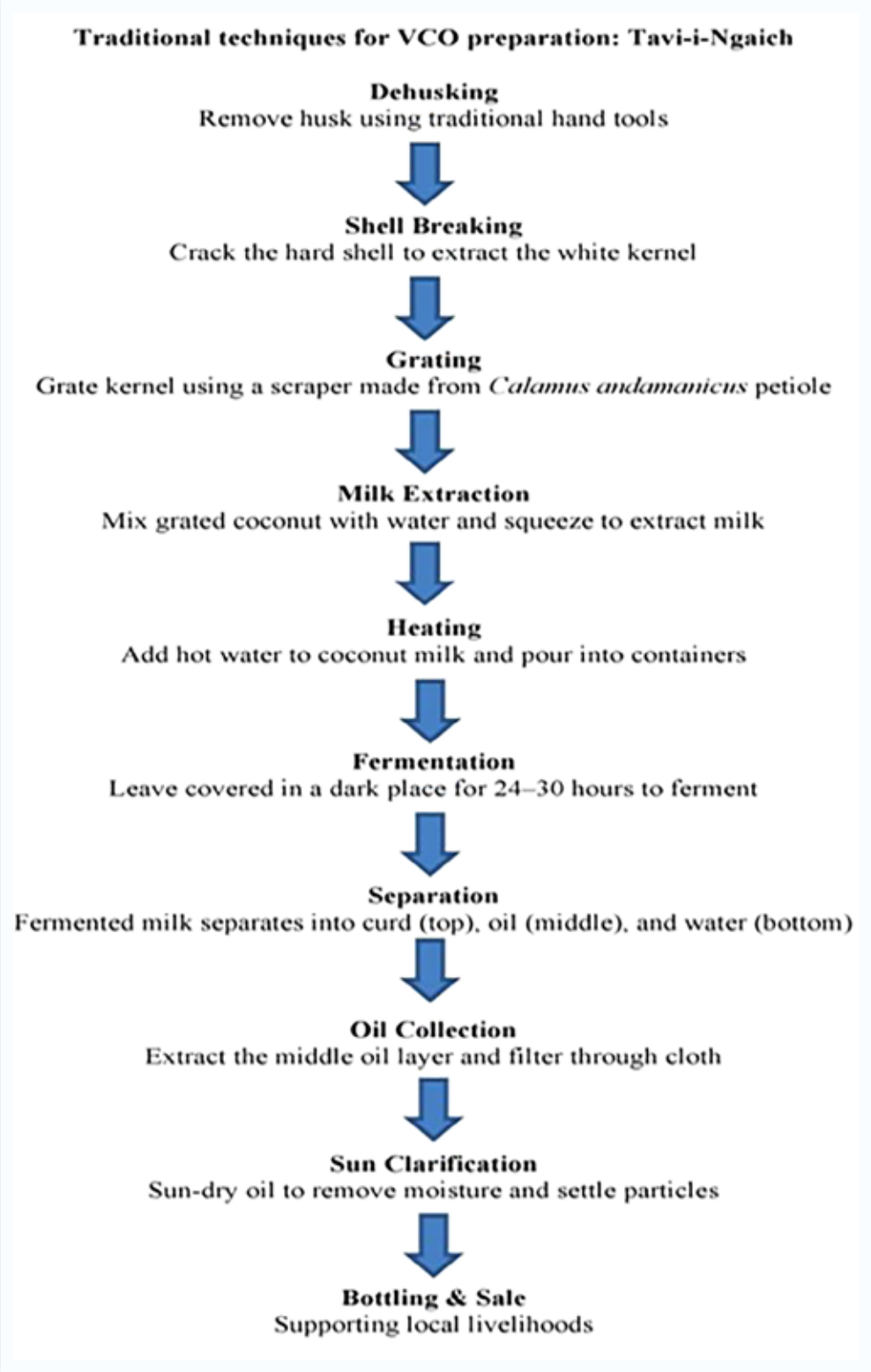
Benefits/Advantages

This innovation adds value to local coconut resources while opening new livelihood avenues for SHGs, women-led microenterprises, and eco-tourism-based marketing of health-conscious, organic products. It strengthens traditional knowledge systems and promotes sustainable entrepreneurship in remote island communities.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Further R&D support is needed to enhance yield efficiency, optimize shelf stability, and integrate quality standards for broader market access. The innovation holds promise for replication across other coconut-growing regions in India, particularly ideal for low-cost, small scale setups in rural & tribal areas. It has good scope in coastal region.

Process of tradition formation method of producing virgin coconut oil (VCO)



Steps of Virgin Coconut Oil Extraction

Scientific Validation required

Yes

Domain

Extraction of Oil from virgin coconut

106. Cow Dung Press: Eco-Friendly Nursery Pot Maker

Profile of Innovator

Name	:	Milan Jyoti Das
Age	:	45 Years
Education	:	12th pass
Experience	:	14 Years
Contact Details	:	Vill/PO - Soneswar, District – Kamrup Rural, Pin-781382, Assam
Mobile No.	:	9085260582 / 8134094274

Brief description of Innovation

Traditional plastic pots contribute significantly to less shelf-life, environmental pollution and are often non-recyclable and this has increased the demand for eco-friendly and biodegradable alternatives to plastic nursery. In addition, cow dung, an abundantly available bio-waste in rural areas, remains underutilized. Looking in to the needs, Sh. Milan Jyoti Das devised the manual screw-type press machine was innovated to addresses both challenges, by converting cow dung mixed with natural binding agents into biodegradable flower pots, offering a zero-waste, low-cost alternative. The innovation focused on Cow Dung Nursery Tub making prototype.

The prototype is a manual screw-type press designed for producing cow dung pots mixed with binding agents such as husk and paper pulp. It has production capacity of 50 to 150 pots per day, depending on pot size and operator efficiency, the machine operates entirely manually without any power requirement. Its frame is constructed from mild steel with an anti-rust coating for durability. The process involves manual feeding of the mixture, hydraulic pressing, followed by air or sun drying for 1 to 2 days to cure the pots fully. The tubs have a 3-month shelf life before use.

Innovation's Highlights

A biodegradable and eco-friendly utility tub made from sun-dried cow dung, reinforced with natural fibers for nursery Tub.

Press Machine for preparing cow dung nursery cup

Cow dung pot preparation from Press Machine

Benefits/Advantages

The tub is made using agricultural waste and cow dung, resulting in a biodegradable and eco-friendly product. It promotes the efficient use of agricultural residues by turning waste into a valuable resource. Additionally, unlike plastic nursery bags, this biodegradable tub reduces transplanting stress in plants. Since it can be planted directly into the soil, it minimizes root disturbance and damage, ensuring a smoother and healthier transplant process. The cost of making the machine is around ₹1500 while the cow dung nursery tubs can be sold at ₹20 per piece.

Plants in cow dung pots

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation holds great promise for scaling across the country. It aligns well with national missions like *"Swachchh Bharat Abhiyaan,"* and "National Mission on Natural Farming". It can be promoted across urban and semi-urban areas of the country since it is environmental friendly innovation (plastic free). Farmers/common man can operate the device after training and the eco-friendly nursery tub.

Scientific Validation required

Needs validation and designing of mechanized system.

Domain

Eco-friendly nursery sector.

107. Seed Sculpt: Eco-Chic Jewellery from Nature's Bounty

Profile of Innovator

Name : Jagadish Ray
Age : 47 Years
Education : H.S.S.C Pass
Experience : 18 Years
Contact Details : Vill- Nowapara No.1, P.O.- Manikpur
Dist- Bongaigaon, Assam PIN-783392
Mobile No. : 9678861426

Brief description of Innovation

There is increasing global and domestic interest on eco-friendly and handcrafted products. Eco-friendly handcrafted ornaments were made from dried vegetable seeds. The ornaments are of various design types like Earrings, pendants, bracelets, and necklaces, which are Hand-painted or natural matter finish. The Binding Material used are Cotton thread, jute string, or metal hooks. These ornaments made from terracotta and locally available seeds (like rice, cucumber, bottle gourd, watermelon, pumpkin, etc.). The size of the ornaments varies depending on the items (typically 4–6 cm for pendants, 1–3 cm for earrings). Mr. Ray has developed a protocol in this endeavour.

Innovation's Highlights

Eco-friendly, handcrafted ornaments made from dried vegetable seeds. The use of natural dyes further enhances their eco-friendly appeal.

Benefits/Advantages

It offers a biodegradable, affordable, and culturally rich alternative. The cost of raw materials is less than ₹2 per ornament (using locally available seeds like bottle gourd, pumpkin, tamarind, etc.) whereas the Selling Price: ₹30–₹150 depending on design and embellishments. It is Eco-friendly, biodegradable and handmade and enhance the value of agricultural produce. Their uniqueness, affordability, and sustainable appeal also make them ideal for promotion of tourism, handicrafts, and export as souvenir items; also creating new livelihood opportunities. Growing demand for sustainable and biodegradable

Handicraft ornaments made from dried vegetable seeds

Ornament Preparation

products offers a wide market for seed-based ornaments as an alternative to plastic or metal-based accessories. Seed-based ornaments carry a natural, earthy charm that appeals to eco-conscious consumers.

Scope & Potential of Innovation for Wider Reach/Out Scaling

This innovation has strong potential for replication and scaling up in other parts of India, especially for rural women and artisans who can make them with minimal tools and training.

Scientific Validation required

No

Domain

Agri-based Rural Handicrafts /Value-Addition in Horticulture, specifically for small scale rural enterprise.

108. Periphyton-based aquaculture using bamboo mat as substrate

Profile of Innovator

Name : Angam Kamei
Age : 37 Years
Education : Intermediate
Experience : 10 Years
Contact Details : Village: Tokpa Kabui
District: Churachandpur, State: Manipur
Mobile No. : 9856052387

Brief description of Innovation

This scientifically validated, sustainable aquaculture innovation boosts natural feed availability, slashing external input costs while achieving an 88–90% fish survival rate. With productivity soaring to 2,050 kg/ha (36% above Manipur's average) and a stellar 1.7–1.8% daily growth rate, it redefines eco-friendly, high-yield fish farming.

Innovation's Highlights

This sustainable aquaculture system utilizes bamboo mats to cultivate nutrient-rich periphyton, enabling low-input, high-efficiency fish farming with faster harvest cycles—a field-tested solution ideal for rural and tribal aquaculture.

Benefits/Advantages

This cost-saving periphyton-based system slashes feed expenses by 40–50% while enhancing water quality, survival rates, and fish growth—delivering 2.5–3:1 BC ratio with adaptable, eco-friendly technology ideal for resource-limited areas.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Ideal for smallholder and resource-limited farmers, this affordable, low-tech solution enhances productivity while reducing costs, ideal for rural areas with limited access to electricity or expensive machinery.

Preparation of bamboo mat

Using bamboo mat as substrate

Scientific Validation required

Requires validation in terms of feed conversion ratio, biomass yield, water quality metrics, and economic feasibility.

Domain

Small-scale freshwater aquaculture in ponds/tanks, utilizing bamboo mats to grow nutrient-rich periphyton, enhancing fish productivity sustainably while reducing feed costs for farmers in resource-limited tropical regions.

109. Farm2Table: Empowering Fig Farmers through Direct Consumer Linkages

Profile of Innovator

Name	:	Samir Mohanrao Dombe
Age	:	35 Years
Education	:	Graduate
Experience	:	12 Years
Contact Details	:	At/Po. Khor, Tal. Daund Dist. Pune – 412203, Maharashtra
Mobile No.	:	9552435003

Brief description of Innovation

Shri Samir Dombe started fig cultivation in 2013 and introduced fig in the region. About 350 farmers collabourated with him and started fig cultivation. Then he started fig processing startup focused on branding and direct marketing of value-added fig products. The innovation creates a direct bridge between fig farmers and consumers through national retail chains and e-commerce platforms, enhancing market access, increasing farmer income and generating rural employment.

Value Addition in fig

Farmer interacting with interested women farmers

Products & value addition of fig

Innovation's Highlights

In the initial stage, Shri Dombe himself approached Star Bazar store and convinced to purchase his products, with the assurance that payment will be received only after selling of his products by Star Bazar. This step helped him to succeed in getting higher demand from the consumers. This innovative approach has helped him to successfully establish a strong market presence further by marketing its products through leading retail and e-commerce platforms such as Amazon, Big Basket, Zepto, Reliance Fresh, Star Bazaar and Kisan Konnect. It offers a diversified product range that includes fresh figs, vegetables and various fig-based byproducts, all presented in attractive branded packaging. By creating robust market linkages and promoting direct farmer-to-consumer sales channels, the initiative has significantly enhanced market access for fig growers.

Benefits/Advantages

The innovation has positively impacted the farming community by guiding over 350 fig farmers in improved cultivation and marketing practices. Through organized and collective procurement of agricultural inputs, it helped to reduce the cost of cultivation by 12%, thereby enhancing profitability. Small and marginal farmers are the major beneficiaries of this initiative. The turnover of group of 350 farmers is around Rs. 8 crore in 2024-25. Additionally, the initiative has created employment opportunities for 123 individuals, including 58 men and 65 women, fostering inclusive rural development. Farmers have also benefited from improved access to quality inputs and increased savings, further strengthening their economic resilience.

Scope & Potential of Innovation for Wider Reach/Out Scaling

The model is highly replicable in various agro-climatic zones across Maharashtra and Gujarat. It supports value addition, promotes entrepreneurship, enhances rural livelihoods and offers a scalable model for other niche fruit crops through farmer collectives and startups.

Scientific Validation required

No

Domain

Processing and marketing of fig

110. Bio-Leather: 100% Biodegradable Vegan Leather from Nature's Fibres

Profile of Innovator

Name : Suresh, S. R.
Age : 53 Years
Education : B.Sc., MBA
Experience : 30 Years
Contact Details : M/s Bhoomi Agri Venture, No.4, Nagaraja Complex, Opp. to Shubhamangala Kalyana Mandir, Vinobhanagara, Shivamogga – 577 204, Karnataka
Mobile No. : 94482 03888

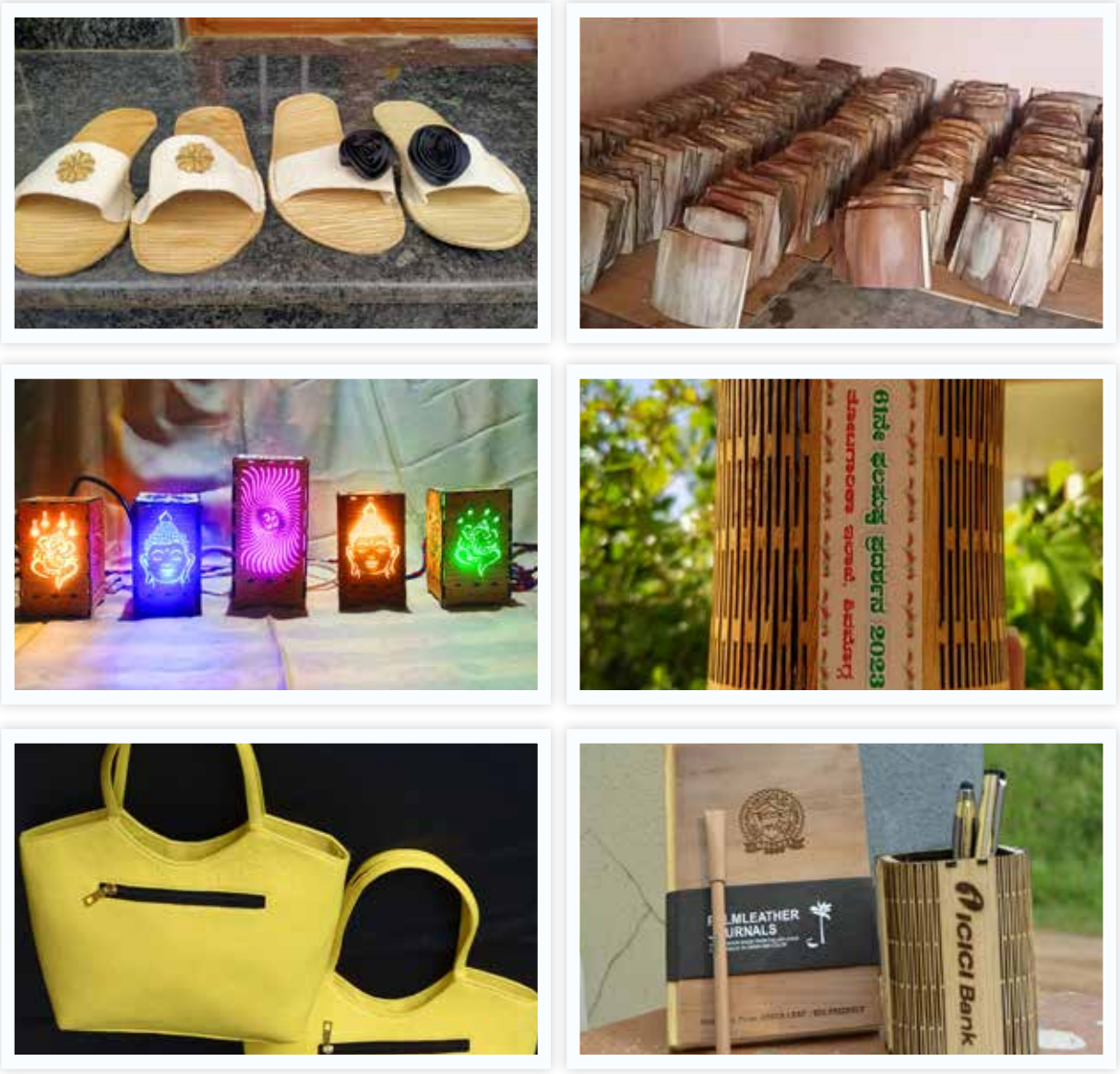
Brief description of Innovation

Fibre extraction from pineapple leaf and arecanut husk for leather preparation, retting process and fungal inoculation. This natural fibre-based vegan leather offers an eco-friendly alternative to traditional leather while promoting sustainability and supporting rural economy. Crafted with care and precision, each sheet of our vegan leather is 100% biodegradable, ensuring minimal environmental impact.

Innovation's Highlights

Vegan leather is developed from natural fibres like pineapple leaf and areca nut husk, offers a 100% biodegradable alternative to animal leather and supported by ICAR-NINFET Kolkata for technology and validation. It promotes waste-to-wealth through sustainable fibre utilization and engages women self-help groups (SHGs) in rural Karnataka, fostering women empowerment and social inclusiveness. It is available in customizable sheet sizes, thickness, and embossing and suitable for use in bags, footwear, upholstery, and fashion accessories. Eco-friendly production with no harmful environmental impact.

Biodegradable vegan Leather



Products of vegan leather

Benefits/Advantages

The innovation is 100% bio-degradable and eco-friendly, utilizes agri-waste (pineapple leaves & areca nut husk) and promotes rural livelihoods and women empowerment. It is customizable for various commercial uses, sustainable alternative to animal leather and does not involve harmful chemicals. The return over the investment in 300 per cent.

Scope & Potential of Innovation for Wider Reach/Out Scaling

Abundant raw material availability (pineapple leaves, areca nut husk) and high demand for eco-friendly alternatives in fashion and lifestyle industries can promote this innovation. The innovation has potential for outscaling and is scalable through SHGs and rural enterprises. It supports circular economy and green innovation and suitable for national and international markets.

Scientific Validation required

Validation needed for durability of the vegan leather, their quality endurance, and consumer preference.

Domain

Waste-to-Wealth; Bio-Degradable

Names of contributors for the Book on Farmer-led Innovations

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