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Catalyzing Agri-Innovation and the Impact of SABAGRIs in Eastern India

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ABSTRACT

The Sabour Agri Business Incubation Centre (SABAGRIs) at Bihar Agricultural University, Sabour, represents a transformative initiative in Eastern India's agricultural landscape. By fostering entrepreneurship, promoting innovation, and offering comprehensive support to startups, SABAGRIs addresses key challenges in productivity, sustainability, and rural livelihoods. It is supported by RKVY-RAFTAAR and the Bihar Startup Policy 2022, which empowers innovators through programs like AOP, SAIP, and SABANKURAN, providing mentorship, funding, and capacity-building. Focused on inclusive growth, it especially supports youth, women, and marginalized communities. Sectoral interventions span organic farming, food processing, fisheries, livestock management, agri-mechanization, and digital agriculture. Case studies, such as Stepupify Labs Pvt. Ltd., illustrate the real-world impact of this incubation model. SABAGRIs has emerged as a blueprint for rural economic transformation, with recommendations to strengthen scale-up support, extend outreach to underserved regions, and build alumni networks for sustainable, long-term ecosystem development.

Keywords: Agri-entrepreneurship, Agricultural Innovation, Startup, Incubation, Rural Development

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INTRODUCTION

Agriculture plays a vital role in the economies of Bihar and Jharkhand, employing more than half of the workforce in both states. However, the sector continues to struggle with several longstanding problems such as low productivity, dependence on traditional farming methods, and restricted access to markets (Singh et al., 2022). These obstacles limit economic progress and contribute to ongoing rural poverty. Promoting innovative entrepreneurship is crucial for transforming the agricultural sector and driving sustainable development across Eastern India.

Agri incubation centres in India are emerging as powerful catalysts for transforming the agricultural landscape by nurturing innovation, entrepreneurship, and sustainable development. These centers, also known as agri incubators, provide a supportive ecosystem for startups and entrepreneurs working in the agriculture and allied sectors. By offering essential resources such as infrastructure, technical expertise, business mentorship, and financial support, they help early-stage ventures turn innovative ideas into viable and scalable agribusinesses. At their core, agri incubation centres are designed to address the unique challenges faced by agricultural entrepreneurs. Agriculture, being a traditional sector, often lacks access to modern technology, market intelligence, and business strategies. Incubators play a crucial role by bridging this gap, introducing scientific and technological innovations, and facilitating the commercialization of research (Rai et al., 2025). Many of these centres are associated with agricultural universities, research institutions, and government schemes like RKVY-RAFTAAR (Rashtriya Krishi Vikas Yojana – Remunerative Approaches for Agriculture and Allied sector Rejuvenation), which aim to boost rural entrepreneurship and employment (Ravichandran and Dixit, 2024).

The Sabour Agri Business Incubation Centre (SABAGRIs) at Bihar Agricultural University (BAU), Sabour, established to drive this transformation, has emerged as a pivotal player in the region's agricultural innovation ecosystem (Singh et al., 2024). This paper explores SABAGRIs' journey, programs, and success stories, offering insights into its contributions to agrarian reform and entrepreneurship in India.

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Institutional Framework and Objectives

The Sabour Agri Incubators (SABAGRIs), strategically hosted at Bihar Agricultural University (BAU), Sabour, serves as a pivotal hub for catalyzing innovation and entrepreneurship in the agricultural sector, with robust support from the Ministry of Agriculture under the Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR) scheme (Ministry of Agriculture & Farmers Welfare, 2023). This initiative is further strengthened through a synergistic partnership with the Government of Bihar, aligning with the Bihar Startup Policy 2022 (Bihar Startup Policy, 2022), which aims to create a conducive environment for startups to thrive. SABAGRIs is dedicated to nurturing agri-based startups that demonstrate scalable and sustainable business models, offering them a comprehensive support system that includes structured mentorship from industry experts, tailored capacity-building programs to enhance technical and business acumen, and access to critical funding opportunities to fuel growth. A cornerstone of its mission is to facilitate the commercialization of innovative ideas, whether they originate from cutting-edge university research or grassroots innovations developed by local communities, ensuring that transformative solutions reach the market effectively. Moreover, SABAGRIs places a strong emphasis on fostering inclusive entrepreneurship, actively encouraging participation from underrepresented groups such as youth, women, and rural innovators. By providing these groups with equitable access to resources, training, and networks, SABAGRIs not only drives agricultural advancement but also contributes to socio-economic empowerment and regional development in Bihar, positioning itself as a catalyst for sustainable and inclusive growth in the agri-entrepreneurship ecosystem.

Programs and Services offered

SABAGRIs supports startups across ideation to growth stages through:

Agripreneurship Orientation Program (AOP): 1-month training and Rs.5 lakh grant for early-stage ideas

Startup Agri-Incubation Programme (SAIP): Rs.25 lakh seed grant for MVP-ready startups

SABANKURAN (Student Orientation Program): Student innovators receive training and grants up to Rs.4 lakh

Support under Bihar Startup Policy: Includes interest-free loans, market grants, and additional incentives for women, Scheduled Castes (SC) and Scheduled Tribes (ST) founders.

SABAGRIs stands as a transformative force in India's agricultural innovation landscape, fostering entrepreneurship and sustainable development in the agrarian heartland of Bihar. Supported by the Ministry of Agriculture through the Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR) scheme, SABAGRIs operates as a dynamic incubator that nurtures agri-based startups from ideation to growth. Its collaboration with the Government of Bihar, under the Bihar Startup Policy 2022, amplifies its impact by aligning with state-driven initiatives to create a robust ecosystem for entrepreneurial success. SABAGRIs is not merely an incubator but a comprehensive support system, dedicated to empowering innovators, ranging from rural grassroots inventors to university researchers and student entrepreneurs, through tailored programs, funding opportunities, and extensive resources. Its mission is to cultivate scalable and sustainable business models, bridge the gap between innovation and commercialization, and promote inclusive entrepreneurship, particularly among youth, women, and marginalized communities such as SC and ST.

At the core of SABAGRIs' offerings are its meticulously designed programs, each catering to different stages of a startup's journey. The Agripreneurship Orientation Program (AOP) serves as an entry point for early-stage innovators with nascent ideas. This one-month intensive training program equips aspiring agritech entrepreneurs with the skills, knowledge, and tools needed to refine their concepts into viable business propositions. Participants in the AOP benefit from a Rs.5 lakh grant, providing crucial financial support to develop prototypes and validate their ideas. This program is particularly significant for first-time entrepreneurs, including rural innovators and women, who may lack access to traditional funding or technical expertise. By fostering an inclusive environment, the AOP ensures that diverse voices and ideas contribute to the agricultural innovation ecosystem.

For startups that have progressed beyond the ideation phase and developed a Minimum Viable Product (MVP), SABAGRIs offers the Startup Agri-Incubation Programme (SAIP). This flagship initiative provides a substantial Rs.25 lakh seed grant, enabling startups to scale their operations, refine their products, and establish market traction. The SAIP is designed to address the critical funding gap that many early-stage agritech ventures face, offering not only financial support but also access to advanced facilities at BAU, Sabour, including laboratories and testing grounds. This program underscores SABAGRIs' commitment to transforming innovative ideas into commercially viable enterprises that can address pressing challenges in agriculture, such as climate resilience, sustainable farming, and food security.

Recognizing the potential of young innovators, SABANKURAN, a dedicated Student Orientation Program is aimed at fostering entrepreneurial spirit among students. This initiative provides specialized training to help student innovators translate their creative ideas into practical

solutions. Participants can receive grants of up to Rs.4 lakh, enabling them to develop prototypes, conduct market research, and build early-stage ventures. SABANKURAN not only nurtures the next generation of agritech leaders but also strengthens the linkage between academic research and industry application, ensuring that university-driven innovations find real-world impact.

In alignment with the Bihar Startup Policy 2022, SABAGRIs offers additional financial incentives to bolster startup growth. These include interest-free loans, market access grants, and tailored benefits for women and SC/ST founders, ensuring that entrepreneurship is accessible to all. These incentives are critical in a state like Bihar, where socio-economic barriers often limit entrepreneurial participation. By prioritizing inclusivity, SABAGRIs empowers underrepresented groups to contribute to the agricultural economy, fostering equitable growth and social impact.

SABAGRIs' holistic approach positions it as a cornerstone of agritech revolution. By supporting startups at every stage—ideation, incubation, and growth—it drives the commercialization of university research and grassroots innovations, addressing critical agricultural challenges while fostering inclusive economic development. Its emphasis on empowering youth, women, and rural innovators ensures that the benefits of entrepreneurship reach the farthest corners of society. As SABAGRIs continues to expand its impact, it is poised to transform Bihar into a hub of agricultural innovation, contributing to India's vision of a sustainable and prosperous agrarian future.

Regional Focus and Sectoral Outreach

SABAGRIs is dedicated to fostering agri-entrepreneurship in the eastern Indian states of Bihar and Jharkhand. These states, with their unique agro-climatic zones and socio-economic conditions, present both significant challenges and opportunities for agricultural development. SABAGRIs aims to tap into this potential by nurturing a new generation of agripreneurs equipped to respond to local needs with innovative and sustainable solutions. The initiative provides tailored incubation programs that blend cutting-edge scientific advancements with community-based knowledge systems, ensuring that the solutions developed are both effective and contextually relevant. By empowering rural youth, farmers, and grassroots innovators, SABAGRIs seeks to build a resilient agri-ecosystem that can drive economic growth, food security, and climate adaptation across the region.

At the core of SABAGRIs' strategy is a focus on several critical sectoral domains that form the backbone of agricultural transformation. The first major area of emphasis is crop cultivation, organic farming, and protected agriculture. Recognizing the need to reduce chemical dependency and promote soil health, SABAGRIs encourages the adoption of organic farming techniques that are sustainable and market-friendly. In tandem, it promotes protected cultivation methods such as polyhouses, greenhouses, and shade net farming, which not only enhance productivity but also safeguard crops against erratic weather and pest attacks. These innovations allow farmers to grow high-value crops year-round, increasing income and improving food availability.

Another vital area of intervention is post-harvest technology, food processing, and value addition. Post-harvest losses in India are significant, especially in perishable commodities like fruits and vegetables. SABAGRIs addresses this by supporting startups that develop cost-effective and scalable post-harvest solutions such as cold storage systems, solar dryers, and efficient packaging methods. Additionally, it promotes value addition initiatives—turning raw agricultural produce into products like jams, pickles, juices, and ready-to-eat foods. These not only reduce waste but also open new revenue streams for farmers and rural entrepreneurs, particularly for women-led micro-enterprises that benefit from low-capital, high-impact interventions.

Beyond crops, SABAGRIs places a strong emphasis on fisheries, dairy, and livestock-based innovations. Animal husbandry and aquaculture are crucial livelihood sources in Bihar and Jharkhand, and SABAGRIs supports ventures that bring technological and business model innovations to these sectors. This includes breed improvement programs, scientific feed management, disease diagnostics, and mobile veterinary services. Cold chain development and milk processing units are also encouraged to boost productivity and market access. Such interventions help diversify incomes and improve nutritional security in rural communities. Agri-mechanization and engineering solutions form another key domain of SABAGRIs' focus. Small and marginal farmers often struggle with access to mechanization due to cost and scalability issues. SABAGRIs backs startups and innovators who are developing low-cost, user-friendly machinery suited to small farms—such as mini tillers, seed drills, solar-powered irrigation pumps, and multi-purpose threshers. These tools not only enhance efficiency but also reduce manual labor and increase the profitability of farm operations. Mechanization is also extended to women farmers through gender-sensitive tools designed to ease their workload.

In addition, SABAGRIs is deeply invested in promoting bio-inputs, agri-biotech, and seed technology. There is a growing demand for sustainable inputs that reduce environmental

damage while boosting productivity. To this end, SABAGRIs encourages the development of bio-fertilizers, bio-pesticides, and plant growth stimulants made from natural ingredients. Furthermore, it supports innovations in seed technology, including the breeding of climate-resilient, high-yielding, and pest-resistant crop varieties. By improving input quality and reducing dependency on imported or synthetic alternatives, these efforts help build more self-reliant farming communities. Digital transformation in agriculture is also a key agenda for SABAGRIs. Through its focus on ICT (Information and Communication Technologies), AI/IoT applications in agriculture, and mobile-based advisory systems, the initiative empowers farmers with real-time data, precision farming tools, and location-specific guidance. For instance, mobile platforms can provide weather updates, pest alerts, and customized crop advisories in local languages, ensuring that farmers make informed decisions. AI and IoT devices are used for soil health monitoring, crop surveillance, and smart irrigation, thereby optimizing inputs and increasing yields sustainably. Finally, SABAGRIs actively champions green energy, waste-to-wealth models, and climate-smart agricultural technologies. With the increasing urgency of climate change, there is a strong focus on sustainable energy solutions such as solar pumps, biogas units, and decentralized renewable power for agri-processing. Waste-to-wealth initiatives—like converting crop residues into briquettes, compost, or biochar—not only address environmental concerns but also create new income sources.

Moreover, SABAGRIs supports technologies that help farmers adapt to changing weather patterns, such as drought-tolerant seeds, micro-irrigation systems, and integrated water resource management strategies. As of March 2025, SABAGRIs has incubated 71 startups. These startups have collectively secured 9 patents and 30 trademarks. A total of 51 Memorandums of Agreement (MoAs) have been signed between SABAGRIs and the startups. The cumulative grant support provided to these startups amounts to Rs. 394.2 lakhs.

Case Studies of Impact

Over the years, SABAGRIs has emerged as a crucial enabler of agri-innovation in Bihar and Jharkhand, nurturing a thriving ecosystem of rural startups. With an impressive portfolio of over 90 startups incubated, the platform has directly influenced the agricultural transformation of the region. More than 50 of these ventures have secured government grants, underlining the credibility and impact of the incubation support provided. These startups span a wide range of innovations—from precision agriculture and digital platforms to sustainable inputs and women-centric mechanization—demonstrating the depth and diversity of SABAGRIs' incubation model.

Among the most noteworthy innovations supported by SABAGRIs is the development of AI-powered drones used for real-time crop health diagnostics and precision spraying. These drones, embedded with advanced sensors and machine learning algorithms, help farmers detect early signs of pest attacks, nutrient deficiencies, and diseases—enabling timely interventions and minimizing crop losses. This technology not only reduces the use of harmful chemicals but also cuts costs by ensuring precise input application. It is especially useful in large or difficult-to-access fields, making it a game-changer for improving productivity and sustainability.

Another significant example is the creation of functional foods and wellness products derived from flaxseed, a superfood increasingly recognized for its nutritional value. By processing flaxseed into oils, protein powders, and health snacks, one of the supported startups has tapped into the rising demand for plant-based and preventive health products. The initiative not only adds value to agricultural output but also opens up new market opportunities in the health and nutrition sector, especially for women entrepreneurs and SHGs engaged in micro-processing units.

In the area of livestock support, a startup supported by SABAGRIs has pioneered sustainable dried cattle feed made from agricultural residues, such as wheat straw, paddy husk, and pulse chaff. This feed is both cost-effective and rich in nutrients, addressing feed shortages and reducing the burden on grazing land. It also contributes to circular economy goals by utilizing crop waste that would otherwise be burnt or discarded. In regions like Bihar and Jharkhand, where cattle rearing is a key livelihood activity, such innovations significantly enhance productivity while supporting climate-smart agriculture.

The digital transformation of agriculture is another pillar of SABAGRIs' impact, with several ventures launching mobile-based advisory platforms and digital marketplaces tailored for rural farmers. These platforms offer services such as weather updates, pest alerts, crop-specific advisory, and market price comparisons—all accessible in local languages. Some also connect farmers directly to buyers, cutting out intermediaries and increasing profit margins. Such interventions have not only empowered farmers with information but have also brought transparency and efficiency to rural agri-markets.

Recognizing the need for inclusive technology, SABAGRIs has also supported the innovation of electric-powered farm tools designed specifically for women farmers. These tools are lightweight, ergonomically designed, and easy to operate, addressing the gendered challenges in farm mechanization. By reducing the physical burden of traditional agricultural work, these solutions enhance participation of women in agri-

production, improve their productivity, and contribute to economic empowerment.

Case study of Stepupify Labs Pvt Ltd, incubated by SABAGRIs

A flagship example of the incubator's transformative impact is the success story of Stepupify Labs Pvt Ltd, a startup founded by Ajit Kumar and incubated at SABAGRIs. Stepupify Labs specializes in developing smart, solar and battery-operated agricultural tools integrated with AI and robotics. Their innovative product line comprises over 30 zero-emission, smart farm machines that are approved by FMTTI (Farm Machinery Training and Testing Institute), maintenance-free, user-friendly, and specifically adapted for smallholder and women farmers. These machines not only reduce the drudgery of manual farm labor but also help in conserving energy and reducing carbon emissions (Singh et al. 2025).

Stepupify Labs directly addresses several pressing challenges faced by rural farmers, including acute labor shortages, rising input costs, crop theft, and lack of farm surveillance infrastructure. For instance, their AI-enabled monitoring systems allow for 24/7 farm surveillance, reducing crop theft incidents. Their weeding and irrigation tools significantly lower labor dependence, making them ideal for areas with shrinking rural labor availability. With incubation support from SABAGRIs, Stepupify Labs has received significant funding and accolades. These include Rs. 10 Lakh under the Startup Bihar scheme, Rs. 20 Lakh seed funding through RKVY-RAFTAAR, and a commitment of Rs. 1 Crore under the Atal New India Challenge. The startup has also been recognized as the Best Emerging Agritech Startup 2023 by the All India Council for Robotics & Automation (AICRA). Furthermore, participation in SELCO Foundation's Entrepreneur Development Programs (EDPs) has provided the team with valuable exposure and business acumen.

SABAGRIs played a crucial role in the growth of Stepupify by offering comprehensive support, including mentorship, product validation, and IP assistance—which led to 3 patents, 3 design registrations, and 2 trademarks. The incubator also facilitated industry linkages and investor connections, helping the startup scale to Technology Readiness Level 9 (TRL-9), which indicates full commercial deployment. As a result, Stepupify Labs generated an impressive Rs. 80 Lakh in revenue during FY 2023–24 and is currently in the process of raising Rs. 2 Crore to expand its operations.

The impact of these ventures goes beyond economic indicators. Many report tangible improvements in rural employment, farm incomes, and adoption of technology at the community level. As these innovations spread, they create ripple effects—encouraging more youth to consider agri-entrepreneurship and fostering a culture of innovation in the heartlands of India. Through such success stories, SABAGRIs continues to demonstrate the transformative power of grassroots incubation in shaping a resilient and inclusive agricultural future.

CONCLUSION

SABAGRIs exemplifies a successful model of collaboration between public institutions and academia, focused on fostering agribusiness innovation at the grassroots level. Rooted in the unique socio-economic and environmental conditions of Eastern India, particularly Bihar and Jharkhand, SABAGRIs effectively combines academic expertise, government support, and indigenous knowledge to drive agricultural innovation. Through its customized incubation programs, it has empowered a new generation of rural entrepreneurs and agri-innovators who are developing scalable, climate-adaptive, and economically sustainable solutions. These efforts are tackling persistent agricultural challenges like low productivity, post-harvest losses, and inefficient input use, while simultaneously contributing to rural development through employment generation, value-added production, and environmentally sound practices.

The initiative has achieved notable results, with several incubated ventures securing government funding, successfully commercializing their offerings, and experiencing significant revenue growth. Its integrated approach—offering technical guidance, skill development, and market linkages has proven especially impactful in areas with limited access to such resources (Du et al., 2025). However, to extend its reach and effectiveness, SABAGRIs now needs to support startups beyond their initial stages. Key recommendations include offering scale-up funding, assisting with regulatory certifications, and establishing export pathways for premium agricultural and processed goods. Many startups face hurdles when transitioning from pilot phases to full-scale operations, and focused support during this critical period could greatly improve their chances of long-term viability. Expanding its reach to tribal and flood-affected regions of Eastern India is another crucial step. These areas, despite their agricultural richness and developmental potential, remain underserved. By tailoring incubation efforts to the cultural and environmental conditions of these communities, SABAGRIs can promote more equitable and resilient agricultural growth. Initiatives such as mobile incubation services, training in local languages, and partnerships with grassroots organizations could enhance outreach and effectiveness.

To build a robust entrepreneurial ecosystem, SABAGRIs should also consider creating an alumni network of successful startups. This network could facilitate peer-to-peer learning,

provide mentorship opportunities, and foster collaboration among emerging entrepreneurs. Moreover, tracking the progress of startups after incubation will be essential for measuring impact, refining support strategies, and generating inspiring success stories. With ongoing policy support, consistent funding, and a responsive approach that incorporates grassroots insights, SABAGRIs has the potential to become a national leader in agri-innovation. Its model offers a scalable and inclusive framework for other regions aiming to build innovation-led, sustainable rural economies.

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