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Unveiling challenges and strategizing solutions for sustainable agri-entrepreneurship development

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The increasing emphasis on fostering agri-entrepreneurship in emerging economies is based on the understanding that it holds the potential to drive economic growth and sustainable development. Its impact transcends mere financial indicators, influencing facets such as innovation, job creation, and societal empowerment. This perspective is also relevant in the Indian context, where organizations promoting agri-entrepreneurship often encounter challenges. This study was carried out to identify the constraints faced by various stakeholders involved in providing and accessing entrepreneurial support, also strategizing solutions for the identified bottlenecks. Data was gathered through structured interviews involving about 200 agri-entrepreneurs and 43 extension professionals in selected states. Constraints as well as strategies in the promotion of agri-entrepreneurship were systematically categorized into four dimensions viz. administrative, financial, technical, and socio-cultural which were further ranked through Garrett's ranking method and Analytical Hierarchy Process. Financial and administrative constraints, including lack of priority lending, favoritism, and delays in fund release, emerged as significant hurdles for sustainable entrepreneurship development, other constraints among technical and socio-cultural domains include lack of prototype testing facility and orientation toward conventional ventures, respectively. Experts suggested strategies like post program funding support, timely disbursement of seed funding and transparency in pitch evaluation for mitigating the challenges. The overall consistency ratio of AHP matrix indicates a high level of agreement in suggestions among experts. Incorporating the suggestions through policy changes is expected to promote a sustainable food value chain thereby promoting sustainable agri-entrepreneurship.

KEYWORDS

agripreneurship, incubation, analytical hierarchical process, entrepreneurial support system, constraints

1 Introduction

Plenty on the plate, but not in the pocket is a reality in Indian context. The paradox of rising agricultural yields accompanied by falling profits is a significant challenge. Despite advancements in farming practices and technology leading to increased productivity, farmers often face declining profitability. The Indian agricultural sector often grapples with an excessive workforce, leading to disguised unemployment (Ministry of Finance, 2023). Despite a considerable rise in food production over the past four decades, farmers' incomes have only modestly increased by 20–30 times. This stands in sharp contrast to the substantial income growth seen in other professions (Sharma, 2017). The financial challenges faced by India's farming community, as evidenced by this income disparity, are a cause for concern. In response to this issue, one of the strategies recommended by the Doubling Farmers Income Committee, chaired by Dalwai (2018), is the promotion of agricultural entrepreneurship.

Engaging in agri-entrepreneurship is not just an opportunity but a crucial requirement for enhancing production and profitability in agriculture and allied sectors. It is essential at this time because rural areas are experiencing increasing unemployment and poverty (Kademani et al., 2020). About 89.4% of Indian farmers are classified as small and marginal (NSSO, 2021) yet they rarely engage in agri-entrepreneurship due to perceived risks, despite their inherent entrepreneurial potential. Effectively addressing the distinctive needs of these small-scale rural farmers & entrepreneurs involves a holistic approach that integrates high-quality training in small business and life skills, coupled with relevant technical training and ample funding (Nain et al., 2019). In line with recommendations from various committees, organizations such as State Agriculture Universities (SAUs), ICAR Institutes, Non-Government/Private Organizations, Krishi Vigyan Kendras and others collectively form an entrepreneurship ecosystem, actively engaged in promoting agri-entrepreneurship in the country for the past few years. The incubation support, especially the factors related to policy and institutional support are crucial for sustainable entrepreneurship development (Andreoni, 2014; Kademani et al., 2020). It is certain that such organizations promoting agri-entrepreneurship often encounter challenges in providing support. The primary objective of this paper is to identify the challenges faced by incubates, trainees, and entrepreneurs. Furthermore, insights from professionals associated with promoting organizations were sought to provide strategies for addressing the constraints identified by entrepreneurs.

Despite numerous studies on agri-entrepreneurship in India, a significant gap exists in understanding the specific constraints faced by both entrepreneurs and supporting organizations in the current ecosystem. This study aims to bridge the gap by examining challenges encountered by stakeholders across selected states. By identifying and ranking constraints across various dimensions and soliciting expert opinions on mitigation strategies, this research provides a unique, holistic view of the agri-entrepreneurship landscape. This approach offers practical insights to inform policy decisions and improve support mechanisms, potentially serving as a model for developing more effective and sustainable agri-entrepreneurship ecosystems in India.

2 Materials and methods

This study was conducted in the states of Rajasthan and Telangana purposively, since they excel in fostering

agri-entrepreneurship through grassroots-level institutions. Telangana was selected for its significant number of agri-entrepreneurship promoting institutions, while Rajasthan, despite its low Human Development Index (HDI), was chosen for its notable performance in the Agricultural Marketing and Farmer-Friendly Reforms Index, ranking third overall and first among the BIMARU states (Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh; Chand and Singh, 2016). Sequentially, two districts in each state were purposively chosen by considering the presence of supporting institutions and the number of assisted agri-entrepreneurs, i.e., Hyderabad and Rangareddy districts in Telangana and Kota and Jaipur in Rajasthan were chosen purposively. A total of 50 entrepreneurs were selected from each district randomly, making a total of about 200 respondent entrepreneurs for a detailed analysis of the constraints faced by them. Additionally, about 43 professionals, selected randomly, working in the selected entrepreneurship promoting institutions were interviewed to enumerate the strategies to overcome challenges.

Entrepreneurship-promoting organizations were defined in operational terms as institutions engaged in (i) Entrepreneurial Training, (ii) the organization of Entrepreneurship Development Programs (EDP's), (iii) Technology Business Incubator (TBI), (iv) Agribusiness Incubator (ABI), and (v) Agribusiness Accelerator. This research employed an exploratory research design, involving 16 institutes promoting agri-entrepreneurship, with an equal distribution of eight from each state. The study also included 200 agri-entrepreneurs and 43 professionals from these institutes, occupying diverse roles such as Director, Chief Executive Officer, Chief Operating Officer, Business Managers, and Chief Trainers. Challenges and strategies related to promoting agri-entrepreneurship were broadly categorized into four dimensions, i.e., Administrative, Financial, Technical and Socio-cultural for a comparative assessment. Challenges were identified from the perspective of agripreneurs through interactions and ranked based on relative importance using the Garrett ranking method. These rankings were then discussed with professionals to validate and formulate strategies for addressing the challenges. A Multi-Criteria Decision Making (MCDM) method, specifically the Analytical Hierarchy Process (AHP), was employed to further rank them based on relative importance, prioritizing the direction of policy recommendations.

2.1 Garrett's ranking

Constraints were identified through focused group discussions with agripreneurs, consultation of literature and insights from experts. A comprehensive list of constraints was incorporated into the interview schedule, and respondents were tasked with ranking these constraints based on their perception. Garrett's ranking technique facilitated the systematic identification and ranking of these constraints. A key advantage of this technique, in comparison to a simple frequency distribution, is that it organizes constraints based on their perceived importance from the respondents' standpoint (Christy, 2014).

Garret's formula for converting ranks into percent is as follows:

$$\text{Percent position} = (R_j - 0.5) / N_j \times 100.$$

where,

R_{ij} = Rank given for i_{th} factor by j_{th} individual.

N_j = Number of factors ranked by j_{th} individual.

The scores for each rank's percent position were computed using the table from [Garrett and Woodworth \(1969\)](#) and [Rohit et al. \(2017\)](#). For each factor, the individual scores of respondents were added together and divided by the total number of respondents whose scores were combined. Subsequently, these mean scores for all factors were arranged in descending order, ranks were assigned, and the most critical factors were identified.

2.2 Analytical hierarchical process

Every possible strategy under each dimension was assessed based on 9-point scale of importance ([Saaty, 1987](#)) through paired comparison method. AHP employs the pairwise comparison method to assess the overall priority of each alternatives/dimension. Respondents are tasked with assigning weightage to alternatives based on two considerations: 1. Relative importance of one alternative over another. 2. The degree of importance one alternative holds over the other. This process allows respondents to determine weights for each dimension and alternative, and priorities are subsequently computed.

Stepwise process for AHP:

1 Problem Modeling:

Level-1: Four dimensions: Administrative, Financial, Technical, Socio-cultural.

Level-2: Alternatives (suggestions) within each dimension:

Administrative: 5, Financial: 4, Technical: 5, Socio-cultural: 3.

2 Pair-wise comparison matrix:

$$M = (a_{ij}) = \begin{matrix} & \begin{matrix} D_1 & D_2 & \dots & D_n \end{matrix} \\ \begin{matrix} D_1 \\ D_2 \\ \vdots \\ D_n \end{matrix} & \begin{pmatrix} 1 & a_{12} & \dots & a_{1n} \\ 1/a_{12} & 1 & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{pmatrix} \end{matrix}$$

3 Judgemental Scale:

Based on 9-point ordinal scale [adopted from the fundamental scale of absolute numbers, [Saaty \(2008\)](#)].

4 Aggregation of judgment:

Aggregating Individual Judgment (AIJ) with geometric mean.

5 Determination of Consistency Ratio (C.R.):

Mathematically, CR is the ratio of Consistency Index (C.I.) and Random Index (R.I) i.e., $CR = CI/RI$.

Consistency Index.

$$CI = (\lambda_{\max} - n) / (n - 1)$$

where,

n = dimension of the matrix.

λ_{\max} = maximal eigenvalue.

After calculating priority factor and assessing consistency, the overall priority of each dimension was used to determine their relative importance. Consequently, ranking the importance of each sub-factor within the dimensions was achieved through the consideration of these overall priority values leading to global priority rankings. The rank received by each sub-factor within the dimension signifies its local priority weightage.

3 Results

3.1 Constraints in promoting agripreneurship

The challenges perceived by agripreneurs ($N=200$), along with their rankings, are mentioned in [Table 1](#). Rank within the dimension Further details about each dimension are provided below:

- **Administrative Constraints:** Respondents highlighted a perceived bias during the pitching for grants, indicating favoritism as a notable concern (Rank-I). Entrepreneurs noted a lack of specialized manpower, particularly Chartered Accountants and Business Managers, in incubation centers, which are often led by scientists or academicians often without day-to-day business management knowledge (Rank-II). Other challenges included, complex rules and regulations for registration (Rank-III), absence of adequate handholding and follow-up support after interventions, pointing to a need for ongoing assistance (Rank-IV) and excessive government control over incubation centers, potentially affecting their autonomy and operational efficiency (Rank-V).
- **Financial Constraints:** In the financial dimension, the most critical constraint is the lack of priority lending and subsidy provision, underscoring the crucial need for accessible financial support and incentives for entrepreneurs (Rank-I). Irregular release of seed funding tranches poses a notable challenge, potentially impacting entrepreneurs' plans and operations (Rank-II). Higher gestation periods highlight concerns about the time required for businesses to achieve break-even (Rank-III). Mortgage constraints for availing loan facilities (Rank-IV), a shortage of adequate financial resources (Rank-V), and limited credit accessibility (Rank-VI) are identified as less prioritized constraints. This suggests that, while credit is available, the primary challenge lies in making it accessible for entrepreneurs.
- **Technical Constraints:** Foremost among them is lack of prototype testing facilities (Rank-I), emphasizing a critical deficiency in the infrastructure for innovation and product development. Academic orientation of curricula (Rank-II) can be attributed to the fact that majority of the staff in surveyed business incubators are academicians/researchers. This aspect is crucial in preparing aspiring entrepreneurs for the practical complexities of real-world challenges. Market accessibility (Rank-III), handling and repairing expensive equipment (Rank-IV), less scope for quality improvement (Rank-V) are other challenges.
- **Socio-Cultural Constraints:** Among the constraints within socio-cultural dimension societal orientation toward conventional earning ventures is top rated (Rank-I), indicating an inclination toward traditional economic activities. This poses a significant challenge for agri-entrepreneurs seeking to diversify into innovative ventures. Fear of failure due to risk and uncertainties is ranked next (Rank-II), underscoring the psychological barriers that entrepreneurs encounter. Lack of motivational support (Rank-III) and lack of entrepreneurial culture (Rank-IV) are other challenges, suggesting a need for enhanced community encouragement to foster agri-entrepreneurship.

TABLE 1 Constraints in promoting agri-entrepreneurship.

				(N = 200)
Dimension	Constraints	Garret mean score	Rank within dimension	Overall rank
Administrative	Insufficient manpower of specialized business managers at the institution.	57.205	II	8
	Complex legal procedures and rules in setting up an enterprise.	54.39	III	11
	Favoritism for fund grants during pitching.	68.5	I	2
	Lack of handholding & follow up support after the intervention.	40.22	IV	14
	Excessive governmental control over incubator.	28.685	V	19
Financial	Lack of adequate financial resources.	36.575	V	16
	Insufficient mortgage/guarantor to avail loan facility.	44.055	IV	12
	Unavailability of priority lending and subsidy to entrepreneurs.	69.205	I	1
	Delays in release of tranches of seed funding.	66.265	II	4
	Long gestation period for break even.	57.57	III	7
	Credit facility is available but not accessible.	26.47	VI	20
Technical	Inadequate facilities for prototype testing at host institution.	67.975	I	3
	Lack of market accessibility.	56.175	III	10
	Less scope for quality improvement.	31.76	V	18
	Costly equipment is riskier to handle and get repaired.	32.24	IV	17
	Academic orientation of the curricula.	60.85	II	6
Socio-cultural	Lack of motivational support from society.	41.4	III	13
	Lack of entrepreneurial culture.	36.64	IV	15
	Societal orientation toward conventional earning ventures.	64.33	I	5
	Fear of failure due to risk and uncertainties.	56.63	II	9

From the [Table 1](#) it is implied that the most critical constraints ranked in the top five are: unavailability of priority lending and subsidy (financial), favoritism for fund grants during pitching (administrative), inadequate facilities for prototype testing (technical), delays in release of seed funding (financial) and orientation toward conventional earning (socio-cultural) ranging from Overall Rank 1 to 5, respectively.

3.2 Strategies to overcome constraints in agripreneurship promotion

The resulting suggestions organized within the same four dimensions *viz.* Administrative, Financial, Technical and Socio-cultural, as depicted in [Table 2](#). This curated list served as the foundation for the interview schedule used with experts ($N=43$) to gather their insights on the relevancy of perceived constraints and priorities of the strategies according to their relative importance. From the [Figure 1](#), it can be inferred that financial dimension has the highest priority weightage, in other words it could be said that financial support system is currently the weakest point of entrepreneurship promotion which is crucially needed for agripreneurs. Administrative reforms are second in terms of priority relating to procedural necessities and manpower issues. Technical dimension has the third-highest priority which relates to mentoring and testing facilities. Socio-cultural dimension, relating to

sensitization and networking, has the lowest priority weightage which means that cultural inhibitions are not a major hurdle as per experts. From [Table 3](#) it can be observed that the consistency indices (CI and CR) are reasonably low, suggesting that the decision matrix is relatively consistent. The ranks provide a clear order of importance among the dimensions. Priority weightages can be represented as per [Figure 1](#). The local priority weightages and local ranks depict a particular strategy's importance within that particular dimension, whereas global priority weightage and global ranks are assigned based on the weightage received by the overall dimension. The global rankings are dimension agnostic, i.e., their ranks cut across all the dimensions.

- **Administrative:** In this dimension, the suggestions provided by experts reveal several insights. The most emphasized suggestion is to bring transparency in evaluation process (Rank-I). This aligns with the earlier identification of favoritism during fund grants as a significant constraint. Appointment of full-time business consultants (Rank-II) also emerge as critical suggestion which underscores the perceived importance of dedicated professional guidance for agri-entrepreneurs aligning with the constraint identified regarding lack of specialized manpower. Experts are also vouching for a corporate-style, independent business incubator (Rank-III) and the need for simplified procedural necessities (Rank-IV), suggesting a desire for a more business-oriented and autonomous incubation environment. The

TABLE 2 Strategies for promotion of agripreneurship.

							(N = 43)
Factors/ dimensions	Scaling factor	Alternatives/suggestions	Consistency ratio	Local priority weights	Local rank	Global priority weights	Global rank
Administrative	0.263978	A1:Appointing full time business consultants	0.065285	0.244706	II	0.064597	5
		A2:Simplification of the procedural necessities for certifications.		0.101225	IV	0.026721	12
		A3:Transparency in evaluation of the idea by experts		0.425296	I	0.112269	3
		A4:360-degree support post incubation period to be provided.		0.066901	V	0.01766	13
		A5:Corporate style, independent business incubator.		0.161872	III	0.042731	10
	$\lambda_{(Max)} = 5.292477$			CI = 0.073119			
Financial	0.482742	F1:Attracting venture capitalists and angel investors for funds.	0.06102	0.168195	III	0.081195	4
		F2:Collateral free loan for creating a MVP.		0.106874	IV	0.051593	7
		F3:Provision of subsidy and loan facilities to incubates/trainees after completion of the program.		0.469872	I	0.226827	1
		F4:Timely disbursement and direct benefit transfers of the seed funds.		0.255059	II	0.123128	2
	$\lambda_{(Max)} = 4.164754$			CI = 0.054918			
Technical	0.167009	T1:Contact points and database for product testing at cheaper rates.	0.074987	0.167237	III	0.02793	11
		T2:Establishment of agro tech parks and Linkage with Farmer Producer Organizations		0.374629	I	0.062566	6
		T3:Mentoring by past incubates and experienced entrepreneurs.		0.294448	II	0.049175	8
		T4:Establishment of district hubs for equipment hiring		0.092431	IV	0.015437	14
		T5:Tailor made curricula for catering the needs of entrepreneurs.		0.071256	V	0.0119	16
	$\lambda_{(Max)} = 5.335943$			CI = 0.083986			
Socio-cultural	0.086271	S1:Sensitization programs for general mass	0.011806	0.040538	III	0.003497	17
		S2:Institutional networking and exposure visits to successful entrepreneurs.		0.547869	I	0.047265	9
		S3:Insurance of the product for uncertainties		0.161593	II	0.013941	15
	$\lambda_{(Max)} = 3.013695$			CI = 0.006847			

360-degree support post-incubation (Rank-V) indicates a recognition of the long-term support required beyond the initial stages.

- Financial: Within the financial dimension the provision of subsidy and loan facilities to incubates/trainees after program completion stands out as the top suggestion, emphasizing the need for continued financial support (Rank-I). Timely disbursement and direct benefit transfers of seed funds are prioritized, addressing the critical issue of funding delays (Rank-II). Attracting venture capitalists and angel investors is also

highlighted, emphasizing the importance of external funding sources (Rank-III). Collateral-free loans for creating a Minimum Viable Product (Rank-IV) reflect an understanding of the financial constraints faced by entrepreneurs in the early stages. These suggestions collectively point toward the need for diverse funding sources, streamlined financial processes, and ongoing financial assistance for agri-entrepreneurs.

- Technical: In this dimension, establishment of agro-tech parks and linkage with Farmer Producer Organizations is prioritized, indicating the recognition of the importance of infrastructure

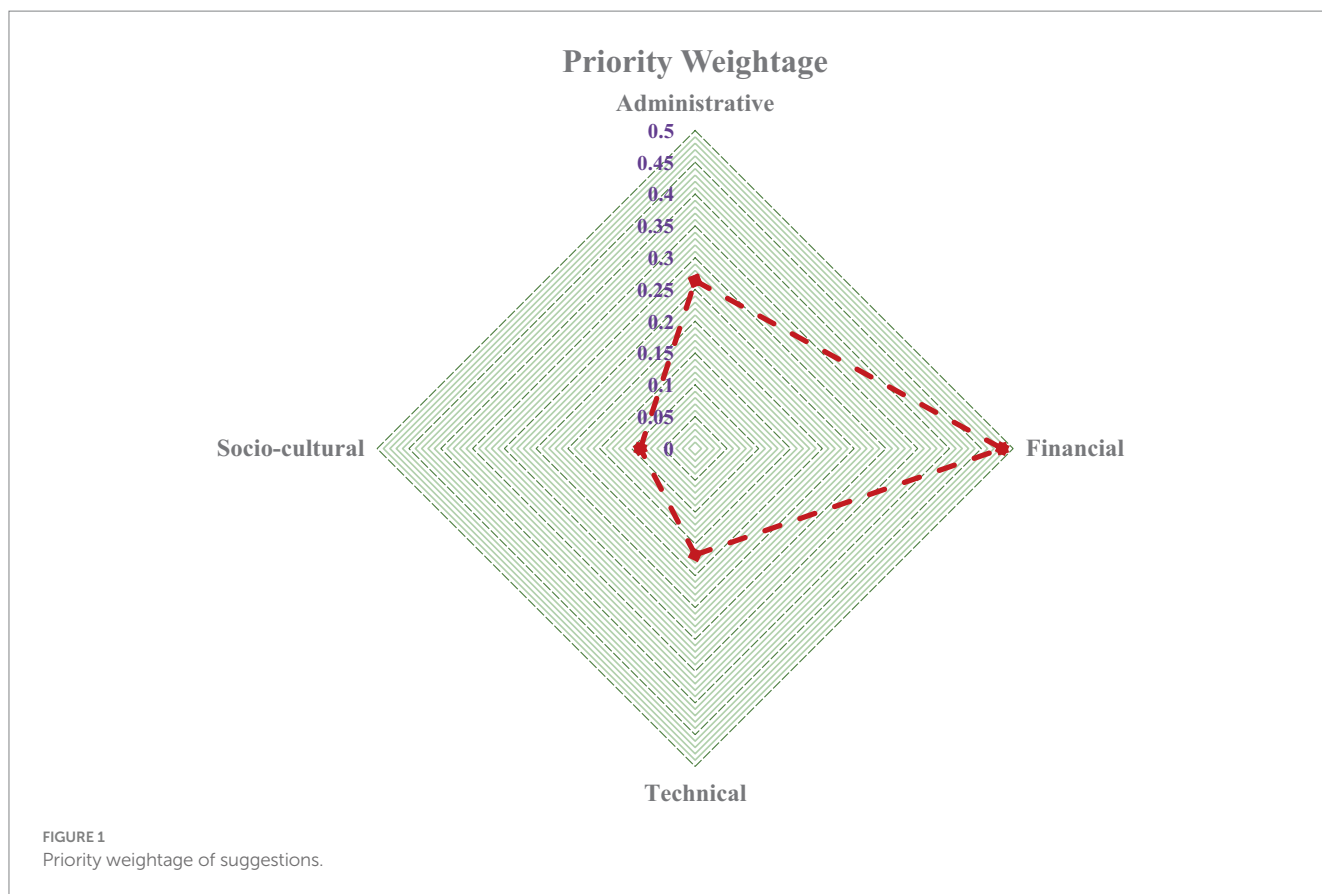


TABLE 3 Dimension wise analysis of priority weightage/scaling factor.

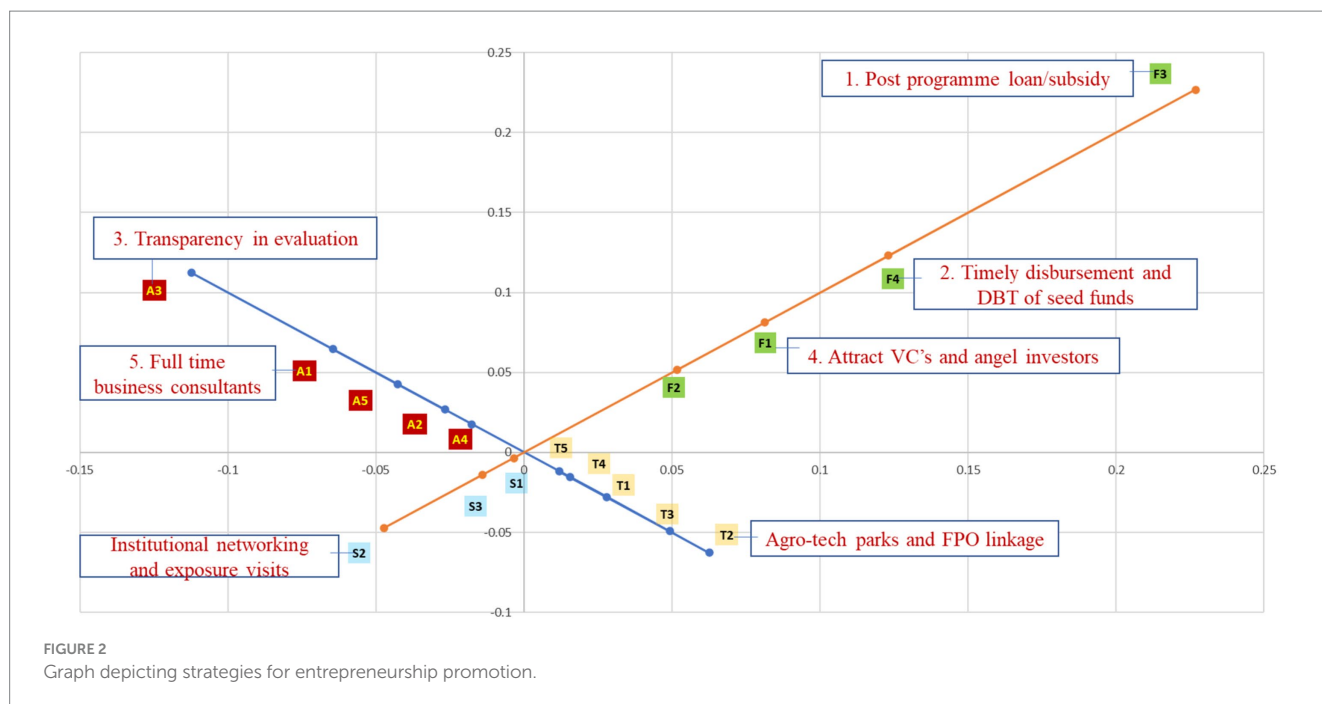
Dimension	Priority weightage	$\lambda(\text{Max})$	CI	CR	Ranks
Administrative	0.263978	4.047968	0.015989	0.017766	II
Financial	0.482742				I
Technical	0.167009				III
Socio-cultural	0.086271				IV

and collaboration (Rank-I). Mentoring by past incubates and experienced entrepreneurs (Rank-II) highlights the significance of experiential knowledge in navigating technical challenges. Contact points and databases for affordable product testing (Rank-III), as well as the establishment of district hubs for equipment hiring (Rank-IV), emphasize the practical aspects of technical support. Tailor-made curricula for entrepreneurs (Rank-V) suggest a need for specialized education aligned with practical skills. These suggestions collectively underscore the importance of infrastructure, mentorship, and specialized education for overcoming technical challenges.

- **Socio-cultural:** The suggestions within socio-cultural dimension reflect the need for a holistic approach to foster agri-entrepreneurship. Institutional networking and exposure visits to successful entrepreneurs emerge as the top suggestion (Rank-I), indicating the perceived importance of social connections and learning from successful models. Insurance of the product for uncertainties reflects a practical consideration to mitigate risks (Rank-II). Sensitization programs for the general mass suggest a recognition of the need to create awareness and understanding

of agri-entrepreneurship at a broader societal level (Rank-III). These suggestions collectively highlight the importance of social capital, awareness programs, and risk mitigation measures for the socio-cultural aspect of promoting agri-entrepreneurship.

Top ranked strategies for promoting entrepreneurship by addressing the identified constraints are depicted graphically in Figure 2. Topping the list is the provision of subsidy and loan facilities to incubates/trainees after program completion, emphasizing its importance in overcoming financial challenges. The second topmost ranked suggestion is timely disbursement and direct transfers of seed funds. Transparency in evaluating ideas by experts holds the third spot overall to address the issues of biasedness in grant allocation. There is emphasis on attracting venture capitalists and angel investors for funds for upscaling the enterprise, which is ranked fourth. In addition, appointing dedicated full-time business consultants and business development managers for enterprise development is ranked fifth. Establishment of agro tech parks and linkage with Farmer Producer Organizations is deemed crucial within the technical dimension, ranking sixth



overall but topmost ranked in technical dimension. Institutional networking and exposure visits occupy first rank within socio-cultural dimension, but it falls in a distant ninth rank overall. It can be inferred that these suggestions address key aspects across all the dimensions comprehensively.

A framework has been developed by the authors depicting the constraints and their corresponding strategies to overcome them, as represented in Figure 3. The framework contains three concentric ellipses, each divided into four parts corresponding the four dimensions. The innermost ellipse depicts different dimensions, the middle ellipse depicts the constraints outlined in the study and the outermost ellipse showcases the different strategies that have been formulated to overcome the challenges. Each strategy is corresponding to constraints that it aims to overcome.

4 Discussion

Agri-entrepreneurship promotion faces numerous challenges across administrative, financial, technical, and socio-cultural dimensions. This study examines multifaceted issues, drawing from both extensive literature review and primary research findings. By synthesizing insights from various studies and comparing them with the current research outcomes, this analysis aims to provide a comprehensive view of the agri-entrepreneurship landscape and propose strategies for fostering a more conducive environment for sustainable development.

The entrepreneurial journey of an individual, while filled with promise and potential, is often fraught with a myriad of challenges. Due to the complicated nature of market regulations agri-entrepreneurship faces new challenges (Dias et al., 2019). The government agencies directly or often through the incubation centers provide seed funds for the entrepreneurs aimed at creating a

supportive ecosystem where start-ups can thrive, resulting in employment generation and economic prosperity (Hendrikse et al., 2020; Vaz et al., 2022). Further it was noted that entrepreneurs faced bias during pitching of their business ideas for availing funds from the government agencies and incubators. Similar results were reported, that emphasized the fact that business incubators favored technology focused start-ups neglecting non-tech ventures (Fan, 2023; Clayton, 2024). The experts suggested to bring transparency in evaluation and extending support for a diverse range of business ventures. It was also noted that post-intervention/incubation support is often insufficient, resulting in startups lacking the essential guidance needed to overcome the challenges of scaling and gaining market traction (Awonuga et al., 2024). The results concluded from studies by Arumugam and Manida (2023) and John and Kispotta (2016) reported similar constraints with respect to complexity of procedures and handholding. Another important consideration was the need of appointing specialized manpower in incubations centers apart from technically sound scientific staff. Similar results were derived by Nani (2018) who reported that there should be involvement of various stakeholders such as bankers, professionals and practicing entrepreneurs in the entrepreneurship promoting organizations and suggested strict criteria for screening of grants. Regarding excessive control over incubation centers and lack of autonomy, Li et al. (2022) concluded similar results. However, Saberi and Hamdan (2019) argue that government regulation is necessary to ensure that entrepreneurship is successfully implemented, irrespective of the administration in power, to achieve the guiding objectives that are frequently unmet. In a study by Muralidharan et al. (2020), it was reported that entrepreneurs faced hurdles due to procedural compliance, lack of moral support from family, lack of networking and mentoring due to which it was suggested to establish a holistic entrepreneurial system through business incubators.

It has been reported by the United Nations Economic and Social Commission for Asia and the Pacific that there is severe



FIGURE 3
Framework of strategies vis-a-vis challenges.

shortfall of funding for the entrepreneurs in developing countries like India (UNESCAP, 2004). Similar results were concluded by Kaur et al. (2020) who expressed that the economic constraints like lack of subsidy, non-availability of loan or high interest are primary obstacles for agri based entrepreneurs. In our study respondents underscored that assured funding during or post incubation is required, like Agri-Clinics and Agri-Business Center (ACABC) scheme of the Govt. of India. In a study by Li et al. (2020), it was depicted that the capital support after intervention has significantly positive impact on sustainability of the entrepreneurs. In a study Hwang et al. (2019) reported that about 64.4% of the startups are funded from the personal or family savings of the founders whereas grants are about 0.2% which is concerning, in the study it was concluded that funding support is impactful both directly and indirectly which reduces the burden on resources of the founders. The finding of our study match with the research output from Karjagi et al. (2009) who suggested that the training institute should

be linked to financial organizations for facilitating continued funding of agripreneurs. Didoni (2020) also concluded that strong links with early-stage investors are necessary for incubators and agripreneurs to flourish, thus attracting venture capitalists and angel investors is an important aspect. It was also reported by Chand (2019) and Mashapure et al. (2022) that while the credit is available, the primary challenge lies in making it accessible for the entrepreneurs.

In a study of incubators hosted by universities, Jamil et al. (2015) concluded that policymakers should emphasize university incubators by providing financial and legislative support, as well as incentives to encourage active participation from the private sector. On the other hand, networking opportunities and connect with the key investors were noted as key support areas of the incubation centers by Mahmood et al. (2016) and Li et al. (2020). Such networking helps in cross learnings and mentoring from other entrepreneurs. However, they underline that university incubators

need not have a curricula whereas they are efficient to undertake need based guidance along with providing infrastructure, networking, human and technical support (McAdam and Marlow, 2011; Bruneel et al., 2012; Culkin, 2013). The results match with Didoni (2020), who implied that affordability of prototype testing and infrastructure availability are key factors of importance. It is revealed that Indian society tends to favor traditional earning ventures, likely due to a lack of training and education among agricultural entrepreneurs, which negatively impacts sustainable agricultural entrepreneurship. Results from Hosseini et al. (2012) support the findings, arguing that entrepreneurial awareness and education could improve the management of sustainable agricultural ventures. Similarly, Yaseen et al. (2018) claim that traineeship and educational programs are significant and powerful predictors of farmers' involvement in business. Lack of motivational support and fear due to the risk associated with entrepreneurship are also major factors in the Indian conditions that hinder individuals from taking up entrepreneurial ventures (Muralidharan et al., 2020).

Overall, the results are complying with (Karjagi et al., 2009; Bairwa et al., 2015; Nani, 2018; Chand, 2019; Didoni, 2020; Muralidharan et al., 2020; Li et al., 2022). This convergence in results strengthens the robustness of the identified constraints and suggestions that emphasizes the importance of addressing these specific challenges to foster a conducive environment for agri-entrepreneurship.

5 Conclusion

Building upon the past researches and careful discussion with experts, the challenges were grouped into administrative, financial, technical, and socio-cultural dimensions. The findings from this study offer a comprehensive view of these obstacles, as perceived by agripreneurs and validated by past researches. Further the strategies in order of their importance were elucidated from the experts in later part of the study. Administrative hurdles include favoritism in grant evaluations and lack of specialized business management expertise. Financial barriers, particularly the absence of priority lending and subsidies, along with delayed seed funding, are critical. Technical issues such as inadequate prototype testing facilities and market accessibility, alongside socio-cultural challenges like societal bias toward traditional ventures and fear of failure, are also significant. To address these, the study recommends transparent grant processes, continuous financial support post-incubation, and robust technical infrastructure like agro-tech parks. Enhancing entrepreneurial culture through networking and exposure visits is vital. Financial support emerges as the highest priority, followed by administrative reforms, technical mentoring, and socio-cultural initiatives. These comprehensive strategies aim to create a supportive ecosystem for agripreneurship, aligning with previous research and emphasizing the need for targeted interventions to foster economic growth and sustainability in agriculture. Another policy change could be, initiation of a network of entrepreneurship promoting institutions which can share best practices, pool the resources and enhance or withdraw certain support so as to offer specialized services as a single window system of incubation. A detailed study or establishment of one such pilot business

incubation center would throw further light on this. While numerous entrepreneurs undergo incubation programs within the same cohort, only a few achieve success. Even with comparable incubation and training support, some businesses thrive while others do not. It is essential for researchers to identify the challenges and strategize the solutions. The present study offers crucial insights into the actualities of sustainable agri-entrepreneurship development and promotion. The findings indicate a pronounced skew toward financial and administrative dimensions in both constraints and strategies. This underscores a policy imperative for stakeholders to foster a supportive ecosystem conducive to sustainable entrepreneurial success.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

SuK: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Validation, Visualization, Writing – original draft. MN: Conceptualization, Methodology, Supervision, Validation, Writing – review & editing. RS: Supervision, Writing – review & editing. ShK: Supervision, Writing – review & editing. RP: Methodology, Supervision, Validation, Writing – review & editing. DS: Supervision, Writing – review & editing. SR: Formal analysis, Methodology, Validation, Writing – review & editing. KK: Data curation, Writing – review & editing. IP: Data curation, Validation, Writing – review & editing. AM: Data curation, Formal analysis, Writing – review & editing. MP: Validation, Writing – review & editing.

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Conflict of interest

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