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# A Literature Review Study On Agricultural Entrepreneurship With Respect To Agro-Based Industries

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## Abstract

Agricultural entrepreneurship serves as a crucial catalyst for rural development, income generation, and sustainable livelihoods in developing nations such as India. Agricultural firms enhance farmers' income, strengthen supply chains, and promote rural employment through the processing and improvement of agricultural products. This study conducted an analysis through a literature review and empirical data collected from 165 respondents to evaluate perspectives, challenges, and opportunities in agricultural entrepreneurship related to agro-based firms. The findings demonstrated that access to financial aid, government programs, modern technology utilization, and market linkages were significant factors contributing to growth in agro-entrepreneurship. Persistent barriers include inadequate infrastructure, limited comprehension of government programs, and restricted training opportunities. Research indicates that enhancing capacity-building initiatives, augmenting digital resources, and ensuring equitable access to assets would foster the development of agriculture-based entrepreneurship in India.

**Keywords;** Agricultural entrepreneurship, agro-based industries, sustainability, rural development, financial access, market linkage.

## 1. Introduction

Agricultural entrepreneurship applies business principles, innovation, and risk management to farming and related activities, aiming for value creation and income generation. Agricultural entrepreneurship differs from conventional farming by emphasizing efficiency, market orientation, and sustainable growth rather than solely production. The transition is crucial in developing countries, where agriculture serves as the main employment source. Diversifying into entrepreneurial ventures can improve rural income levels and alleviate poverty.

Agro-based industries occupy a significant position within agricultural entrepreneurship. Agro-based industries refer to enterprises that transform raw agricultural products into consumable or marketable goods. These include sectors involved in food processing, dairy production, sugar manufacturing, textiles, oil extraction, and a range of value-added services. These industries facilitate enhanced pricing for farmers' products and generate employment opportunities in rural areas by extending the agricultural value chain beyond basic cultivation. They serve as a connection between agriculture and industry, enhancing the benefits of rural resources through value addition and innovation. Agro-based industries play a crucial role in improving export opportunities, reducing post-harvest losses, and strengthening food security.

This study is important because of the increasing recognition of agricultural entrepreneurship as a solution to rural distress and stagnation in farming incomes. The Government of India and various state-level institutions have instituted numerous schemes, subsidies, and policies aimed at promoting entrepreneurship in the agricultural sector. Measures for financial inclusion, including agricultural loans, microfinance institutions, and digital banking, have enhanced credit accessibility. Concurrently, training programs and technology adoption initiatives have enabled farmers and entrepreneurs to increase productivity.

Agricultural entrepreneurship and agricultural-based industries integrate social and environmental stability with economic benefits. Agricultural-based industries create employment opportunities, especially for rural youth and women, which reduces urban stay and promotes balanced regional development. Many contemporary agricultural-industrial practices emphasize permanent production methods, efficient resource usage and environmentally friendly technologies that contribute to reducing environmental effects. The incorporation of entrepreneurship in agriculture serves as a mechanism for economic transformation and a strategy for attaining sustainable development goals.

This study examines literature on agricultural entrepreneurship and agricultural-based industries, uses data of 165 respondents to analyze notion, challenges and opportunities within the field. The study provides intensive examination of the current status of agricultural enthusiasts through the level of awareness, financial access, technical adoption, policy assistance and stability factors. This study emphasizes the significance of innovation, governmental initiatives, and private investments in influencing the future of this developing sector. This study highlights the potential of agro-based industries to serve as a catalyst for rural development, poverty reduction, and sustained economic growth in India.

## 2. Review of Literature

A fundamental aspect of the literature is value-chain thinking, which encompasses the organization of actors and activities from input supply to final markets, as well as the governance structures that dictate value capture. Methodological reviews demonstrate that mapping, functional analysis, and governance diagnostics effectively identify bottlenecks and leverage points for improvement in agribusiness chains (Mac Clay et al., 2018). In low- and middle-income contexts, coordinated value-chain finance, which includes credit and risk tools integrated within commercial relationships, can effectively address financing gaps for smallholders while aligning incentives among buyers, processors, and producers (FAO, 2014). Research in India demonstrates that value-chain finance can improve rural financial inclusion when integrated with appropriate risk mitigation and information systems (Soundarrajan & Vivek, 2015). The findings suggest that agro-based entrepreneurship achieves greater success when value chains are perceived as integrated economic systems rather than as isolated entities.

An analysis of randomized evaluations across various countries concerning microcredit indicates modest and diverse effects on enterprise activity and household outcomes. It is searching for the outlook of credit as a decisive solution as a decisive solution, underlining its importance as a part of the ecosystem of entrepreneurship (Banerjee et al., 2015). The implications for agricultural enthusiasts are two times: access to formal credits is important but insufficient; Supplementary factors such as market access, technical support and risk management are necessary for continuous growth. This interpretation is consistent with Indian evidence regarding agricultural value-chain finance (Soundarrajan & Vivek, 2015) and sectoral evaluations conducted by development finance institutions, which highlight the importance of customized instruments (NABARD, 2021).

Farmer Producer Organizations (FPOs) serve as a mechanism to improve bargaining power, decrease transaction costs, and enable access to finance and technology for smallholders engaged in processing and marketing. A recent systematic review highlights the potential and persistent challenges faced by FPOs in India, such as governance capacity, professional management, working capital, and market linkages. Concurrently, program evaluations from NABARD indicate measurable enhancements in member market access and organizational performance (NABARD, 2021). Independent assessments emphasize that long-term viability depends on business model discipline, diversification into value addition, and enhanced connections with financial intermediaries and buyers (Singh et al., 2019). In agro-based entrepreneurship, this highlights the importance of professionally managed collectives as foundational elements of local processing clusters.

Technology and information systems enhance organizational benefits. Studies conducted in India, both experimental and quasi-experimental, demonstrate that low-cost digital advisory and ICT tools can enhance the dissemination of improved practices and facilitate large-scale market connections for producers, especially when the content is localized and aligned with agronomic stages (Cole et al., 2020). Complementary analysis of post-harvest systems suggests that digital equipment, including quality assay, logistics coordination and traceability, effectively reduces losses and improves price receipts, which are important for installation of viable processing enterprises (Berry et al., 2021). This research indicates that digitization acts as an efficiency and acts as a market-shaped mechanism, reduces the entry obstacles for rural startups in aggregation, processing and special products.

The policy context plays a crucial role in transforming entrepreneurial intent into tangible enterprise outcomes. Reports from the Ministry of Food Processing Industries (MoFPI) and the Ministry of Agriculture detail initiatives that offer subsidies for plant and machinery, cold-chain infrastructure, and cluster development (MoFPI, 2021; Ministry of Agriculture & Farmers Welfare, 2015). Simultaneously, trade analyses indicate a rising domestic demand for processed foods and new export opportunities. The literature underscores the importance of coordinated industrial policy and public-private collaboration in

automated approval processes and shared infrastructure, particularly in light of ongoing challenges related to regulatory complexity and insufficient implementation at the state level (Hindthi et al., 2021).

Studies indicate that women's participation in agriculture is impeded by limited access to networks and financial resources, along with constraints related to time and assets. Targeted initiatives, including skill development, collective platforms, and gender-sensitive finance, enhance both community welfare and enterprise performance (World Bank, 2021). Indian research indicates that enhancing women's self-help organizations through branding and high-value processing can improve nutrition and employment outcomes. Concurrent studies on youth entrepreneurial intentions in agriculture indicate that attitudes, perceived behavioral control, and supportive ecosystems (such as incubation and market orientation) are critical for transforming intent into startups. This underscores the significance of entrepreneurship education and incubation within agricultural universities (World Bank, 2021).

Discussions on sustainability highlight the importance of incorporating environmental and social safeguards into the improvement of value chains. FAOs and academic studies advocate policies that increase resource efficiency, reduce losses, and promote climate-flexible processing and logistics, leading to sustainable growth objectives (FAO, 2021) with overroaching. Indian agriculture-based industries face opportunities in renewable-energy-operated processing, waste valorization (such as product usage), and water-skilled technologies. Supportive standards and green finance can facilitate private investment in these areas.

Thus, the literature suggests that agricultural entrepreneurship in agro-based industries flourishes under five co-existing conditions: (1) coordinated value-chain finance and market governance; (2) collective platforms (FPOs/co-ops) with professional management; (3) diffusion of digital and post-harvest technologies; (4) enabling and predictable policy and infrastructure support; and (5) intentional inclusion of women and youth, alongside sustainability standards. The frequently identified gaps—shortages in working capital, deficits in managerial capacity, fragmented logistics, and regulatory frictions—establish a practical research and policy agenda aimed at accelerating agribusiness formation and enhancement in India.

### **3. Research Objectives**

The primary objectives of the paper are:

- To analyze the impact of agricultural entrepreneurship on the development of agro-based industries in India.
- To examine the influence of financial access, innovation, and market linkages on the performance of agro-based enterprises.
- To investigate the impact of demographic factors, including age, education, and agro-enterprise type, on entrepreneurial activities.
- To assess the efficacy of government initiatives, training programs, and technological interventions in aiding agro-entrepreneurs.

### **4. Research Methodology**

To assess the dynamics of agricultural entrepreneurship and its connection with agro-based industries, a cross-sectional survey research design was selected for this study. This approach was considered appropriate because it allowed the researcher to capture entrepreneurial behavior, challenges, and opportunities across a diverse group of agro-entrepreneurs at a single point in time.

A total sample size of 165 respondents was chosen, including farmers engaged in value-added processing, small entrepreneurs running agro-based enterprises, and members of Farmer Producer Organizations (FPOs). Participants were chosen from semi-urban and rural areas to ensure a balanced representation of perspectives across diverse socio-economic and demographic contexts.

An objective sampling technique was used, focusing on individuals engaged in agricultural-based entrepreneurship. This technique was particularly useful in ensuring that participants had relevant experience with processing, marketing, and enterprise operations, which added depth to the findings.

The data were collected through a structured questionnaire survey. The survey included Five demographic questions to capture age, gender, education, income level, and type of agro-enterprise as well as twenty-three closed-ended quantitative questions, divided into four categories: financial access and resources, entrepreneurial orientation and innovation, market linkages and value addition, and government/policy and technology support. Most questions were measured on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree or from Very Low to Very High, depending on the nature of the variable.

The hypotheses for the study were as follows:

**Hypothesis 1**

H<sub>0</sub>: “There is no significant association between access to financial resources and the growth of agro-based entrepreneurship in India.”

H<sub>1</sub>: “There is a significant association between access to financial resources and the growth of agro-based entrepreneurship in India.”

**Hypothesis 2**

H<sub>0</sub>: “There is no significant relationship between entrepreneurial orientation (risk-taking, innovation, creativity) and the success of agro-based industries.”

H<sub>1</sub>: “There is a significant relationship between entrepreneurial orientation (risk-taking, innovation, creativity) and the success of agro-based industries.”

**Hypothesis 3**

H<sub>0</sub>: “There is no significant difference in market linkage opportunities across different categories of agro-entrepreneurs.”

H<sub>1</sub>: “There is a significant difference in market linkage opportunities across different categories of agro-entrepreneurs.”

**Hypothesis 4**

H<sub>0</sub>: “Government schemes, training, and technology adoption have no significant impact on the performance of agro-based enterprises.”

H<sub>1</sub>: “Government schemes, training, and technology adoption have a significant impact on the performance of agro-based enterprises.”

**5. Empirical Results**

**Section A: Demographic Questions**

**Table 1: Gender of Respondents**

Gender	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Male	92	55.76%	55.76%	55.76%

Female	72	43.64%	43.64%	99.40%
Other	1	0.61%	0.61%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Out of 165 respondents, males made up the majority with 55.76%, while females accounted for 43.64%. Only 0.61% identified as other gender. The gender distribution demonstrates relatively balanced participation, highlighting that agricultural entrepreneurship and agro-based industries are not limited by gender and that women are increasingly engaging in this domain.

**Table 2: Age Group of Respondents**

Age Group	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Below 25 years	28	16.97%	16.97%	16.97%
25-34 years	46	27.88%	27.88%	44.85%
35-44 years	37	22.42%	22.42%	67.27%
45-54 years	32	19.39%	19.39%	86.67%
55 years & above	22	13.33%	13.33%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The results indicate that the largest proportion of respondents belonged to the 25-34 years category (27.88%), followed by 35-44 years (22.42%). Younger individuals below 25 years constituted 16.97%, while respondents above 55 years represented the smallest group (13.33%). This suggests that agricultural entrepreneurship and agro-based industries attracted a relatively younger and middle-aged population, signifying that the sector is appealing to individuals in their early to mid-career stages.

**Table 3: Highest Educational Qualification**

Education Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Below 10th standard	17	10.30%	10.30%	10.30%
Higher secondary (10+2)	34	20.61%	20.61%	30.91%

Graduate	54	32.73%	32.73%	63.64%
Postgraduate	42	25.45%	25.45%	89.09%
Diploma/Technical	18	10.91%	10.91%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Graduates formed the largest group among respondents (32.73%), followed by postgraduates (25.45%). Higher secondary qualified individuals accounted for 20.61%, while diploma/technical graduates were 10.91%. Only 10.30% had education below 10th standard. This educational profile suggests that agricultural entrepreneurship is largely driven by individuals with higher education, indicating a shift toward knowledge-driven agro-based business practices.

**Table 4: Primary Occupation**

Occupation	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Farmer	51	30.91%	30.91%	30.91%
Agro-based entrepreneur	47	28.48%	28.48%	59.39%
Service sector employee	28	16.97%	16.97%	76.36%
Student/Researcher	23	13.94%	13.94%	90.30%
Other	16	9.70%	9.70%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Farmers (30.91%) and agro-based entrepreneurs (28.48%) made up the largest groups among respondents, followed by service sector employees (16.97%). Students and researchers comprised 13.94%, while 9.70% reported other occupations. These findings highlight that while farmers remain the backbone of agro-enterprise activity, there is a strong presence of entrepreneurs and professionals venturing into agro-based industries.

**Table 5: Monthly Household Income**

Income Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Below ₹20,000	31	18.79%	18.79%	18.79%
₹20,001–₹50,000	46	27.88%	27.88%	46.67%
₹50,001–₹80,000	37	22.42%	22.42%	69.09%
₹80,001–₹1,00,000	28	16.97%	16.97%	86.06%
Above ₹1,00,000	23	13.94%	13.94%	100.00%
Total	165	100.00%	100.00%	

#### Interpretation:

The majority of respondents (27.88%) reported monthly household incomes between ₹20,001–₹50,000, followed by 22.42% earning ₹50,001–₹80,000. Nearly 19% had incomes below ₹20,000, while 13.94% earned above ₹1,00,000. The data indicates that agro-based entrepreneurship involves participants from a wide range of income categories, but the middle-income groups are most prominently represented.

#### Section B: Quantitative Questions

##### Category 1: Awareness and Perceptions

**Table 6: Awareness of Agricultural Entrepreneurship**

Awareness Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not at all aware	19	11.52%	11.52%	11.52%
Slightly aware	27	16.36%	16.36%	27.88%
Moderately aware	41	24.85%	24.85%	52.73%
Well aware	46	27.88%	27.88%	80.61%
Fully aware	32	19.39%	19.39%	100.00%
Total	165	100.00%	100.00%	

#### Interpretation:

The findings reveal that the majority of respondents (27.88%) were well aware of agricultural entrepreneurship, while 24.85% reported being moderately aware. A smaller proportion (11.52%) indicated no awareness at all. This suggests that awareness levels are reasonably high, which is crucial for the growth of agro-based industries, but there is still a notable segment that requires awareness-building programs.

**Table 7: Belief in Agro-Based Industries' Role in Rural Development**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	12	7.27%	7.27%	7.27%
Disagree	18	10.91%	10.91%	18.18%
Neutral	29	17.58%	17.58%	35.76%
Agree	51	30.91%	30.91%	66.67%
Strongly agree	55	33.33%	33.33%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

A large majority of respondents agreed (30.91%) or strongly agreed (33.33%) that agro-based industries play a vital role in rural development. Only 18.18% disagreed or strongly disagreed, while 17.58% remained neutral. The results highlight strong confidence in the positive role of agro-based industries in supporting rural economic transformation.

**Table 8: Importance of Entrepreneurship in Boosting Farmers' Income**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not important	9	5.45%	5.45%	5.45%
Slightly important	18	10.91%	10.91%	16.36%
Moderately important	31	18.79%	18.79%	35.15%
Important	48	29.09%	29.09%	64.24%
Very important	59	35.76%	35.76%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The majority of respondents (35.76%) rated entrepreneurship as very important for enhancing farmers' income, and 29.09% considered it important. Only 5.45% felt it was not important. These responses strongly suggest that entrepreneurship is widely perceived as a crucial tool for improving farmers' livelihoods and reducing income volatility.

**Table 9: Agro-Entrepreneurship Reducing Dependency on Middlemen**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	11	6.67%	6.67%	6.67%
Disagree	15	9.09%	9.09%	15.76%
Neutral	26	15.76%	15.76%	31.52%
Agree	52	31.52%	31.52%	63.03%
Strongly agree	61	36.97%	36.97%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Most respondents agreed (31.52%) or strongly agreed (36.97%) that agro-entrepreneurship reduces dependency on middlemen. Only a combined 15.76% disagreed, while 15.76% remained neutral. The responses underline that agro-entrepreneurship is widely perceived as an empowering mechanism for farmers to gain direct market access.

**Table 10: Perceptions on the Future of Agro-Based Industries in India**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very poor	7	4.24%	4.24%	4.24%
Poor	14	8.48%	8.48%	12.73%
Average	29	17.58%	17.58%	30.30%
Good	56	33.94%	33.94%	64.24%
Excellent	59	35.76%	35.76%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The responses reflect a highly positive outlook on the future of agro-based industries, with 35.76% describing it as excellent and 33.94% as good. Only 12.72% expressed negative views (poor or very poor). This indicates widespread optimism about the sector's potential to expand and drive socio-economic change in India.

**Category 2: Financial and Resource Access****Table 11: Accessibility of Financial Resources for Agricultural Entrepreneurs**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not accessible	16	9.70%	9.70%	9.70%
Slightly accessible	29	17.58%	17.58%	27.27%
Moderately accessible	47	28.48%	28.48%	55.76%
Accessible	43	26.06%	26.06%	81.82%
Highly accessible	30	18.18%	18.18%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Most respondents indicated that financial resources were either moderately accessible (28.48%) or accessible (26.06%). Only 9.70% felt resources were not accessible. This highlights that while financial access has improved, gaps still exist for a significant share of agro-entrepreneurs, particularly in rural settings.

**Table 12: Effectiveness of Government Subsidies**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	14	8.48%	8.48%	8.48%
Disagree	21	12.73%	12.73%	21.21%
Neutral	39	23.64%	23.64%	44.85%
Agree	52	31.52%	31.52%	76.36%
Strongly agree	39	23.64%	23.64%	100.00%

Total	165	100.00%	100.00%	
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**Interpretation:**

The majority of respondents agreed (31.52%) or strongly agreed (23.64%) that government subsidies effectively support agro-based businesses. However, 21.21% disagreed or strongly disagreed, indicating mixed experiences. The data suggests subsidies play a critical role, though effectiveness depends on proper implementation and accessibility.

**Table 13: Biggest Financial Challenge for Agro-Based Entrepreneurs**

Challenge	Frequency	Percentage	Valid Percentage	Cumulative Percentage
High-interest rates	33	20.00%	20.00%	20.00%
Collateral requirements	41	24.85%	24.85%	44.85%
Delayed disbursement	29	17.58%	17.58%	62.42%
Limited awareness of schemes	31	18.79%	18.79%	81.21%
Lack of institutional support	31	18.79%	18.79%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Collateral requirements (24.85%) emerged as the most significant financial challenge for agro-based entrepreneurs, followed by high-interest rates (20.00%). Other challenges such as delayed disbursement (17.58%), limited awareness (18.79%), and lack of institutional support (18.79%) were also reported widely. This shows that entrepreneurs face multiple financial hurdles that hinder smooth business operations.

**Table 14: Significance of Private Investments in Promoting Agro-Based Industries**

Significance Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not significant	14	8.48%	8.48%	8.48%
Slightly significant	21	12.73%	12.73%	21.21%
Moderately significant	38	23.03%	23.03%	44.24%
Significant	49	29.70%	29.70%	73.94%
Very significant	43	26.06%	26.06%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The data shows that 29.70% of respondents considered private investments significant in promoting agro-based industries, while 26.06% rated them as very significant. Together, more than half of the respondents recognized private investment as a critical driver of growth. Only 21.21% perceived it as not or only slightly significant, which reflects a general acknowledgement of the vital role private funding plays in fostering agro-entrepreneurship.

**Table 15: Role of Microfinance Institutions in Encouraging Rural Entrepreneurship**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	12	7.27%	7.27%	7.27%
Disagree	18	10.91%	10.91%	18.18%
Neutral	31	18.79%	18.79%	36.97%
Agree	53	32.12%	32.12%	69.09%
Strongly agree	51	30.91%	30.91%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

A majority of respondents agreed (32.12%) or strongly agreed (30.91%) that microfinance institutions can encourage rural entrepreneurship. Only 18.18% disagreed or strongly disagreed, while 18.79% remained neutral. The findings indicate strong support for microfinance as a facilitator of entrepreneurial activity in rural regions.

**Table 16: Extent of Digital Banking's Help for Agro-Industry Entrepreneurs**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not at all	11	6.67%	6.67%	6.67%
Slightly	17	10.30%	10.30%	16.97%
Moderately	34	20.61%	20.61%	37.58%
Considerably	52	31.52%	31.52%	69.09%
Greatly	51	30.91%	30.91%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The findings reveal that most respondents (31.52% considerably, 30.91% greatly) acknowledged digital banking as highly beneficial for agro-industrial entrepreneurs. Only 16.97% reported limited benefits. These results underline the transformative impact of digital financial tools in facilitating transactions, improving credit access, and strengthening financial inclusion.

**Category 3: Technology and Innovation****Table 17: Frequency of Using Modern Technology in Agricultural Activities**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Never	13	7.88%	7.88%	7.88%
Rarely	21	12.73%	12.73%	20.61%
Sometimes	38	23.03%	23.03%	43.64%
Often	54	32.73%	32.73%	76.36%
Always	39	23.64%	23.64%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

A considerable proportion of respondents reported frequent technology usage, with 32.73% using it often and 23.64% always integrating modern tools. Only 20.61% used technology rarely or never. This indicates a growing adoption of modern agricultural technologies, though further promotion is needed to expand consistent usage.

**Table 18: ICT Helping Farmers Connect to Markets**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	9	5.45%	5.45%	5.45%
Disagree	13	7.88%	7.88%	13.33%
Neutral	28	16.97%	16.97%	30.30%
Agree	58	35.15%	35.15%	65.45%
Strongly agree	57	34.55%	34.55%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Most respondents agreed (35.15%) or strongly agreed (34.55%) that ICT platforms such as mobile apps and digital portals help farmers access markets. Only 13.33% disagreed, while 16.97% remained neutral. The results underscore the increasing relevance of ICT in bridging market linkages and improving farmer incomes.

**Table 19: Level of Training Available on Modern Techniques**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
No training	18	10.91%	10.91%	10.91%
Very limited	33	20.00%	20.00%	30.91%
Moderate	46	27.88%	27.88%	58.79%
Adequate	42	25.45%	25.45%	84.24%
Extensive	26	15.76%	15.76%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Moderate (27.88%) and adequate (25.45%) training opportunities were reported by most respondents, but 30.91% indicated either no or very limited training. This suggests that while training provisions are present, they remain insufficient for widespread capacity building in agro-entrepreneurship.

**Table 20: Importance of Innovation in Processing and Value Addition**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not important	7	4.24%	4.24%	4.24%
Slightly important	13	7.88%	7.88%	12.12%
Moderately important	29	17.58%	17.58%	29.70%
Important	56	33.94%	33.94%	63.64%
Very important	60	36.36%	36.36%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The majority of respondents considered innovation to be very important (36.36%) or important (33.94%) for agro-based businesses. Only a small proportion (12.12%) downplayed its relevance. These findings reinforce the necessity of innovation for competitiveness, value addition, and long-term sustainability of agro-industries.

**Category 4: Market and Policy Support**

**Table 21: Effectiveness of Government Policies in Promoting Agro-Based Industries**

Effectiveness Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not effective	12	7.27%	7.27%	7.27%
Slightly effective	23	13.94%	13.94%	21.21%
Moderately effective	44	26.67%	26.67%	47.88%
Effective	51	30.91%	30.91%	78.79%
Highly effective	35	21.21%	21.21%	100.00%

Total	165	100.00%	100.00%	
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**Interpretation:**

The responses indicate that 30.91% of respondents considered government policies effective, while 21.21% rated them as highly effective. However, 21.21% felt they were not or only slightly effective, reflecting mixed perceptions. The data suggests that although many recognize policy support as beneficial, significant improvements are still expected for stronger industry promotion.

**Table 22: Marketing Challenges Faced by Agro-Based Entrepreneurs**

Frequency of Challenge	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Never	10	6.06%	6.06%	6.06%
Rarely	19	11.52%	11.52%	17.58%
Sometimes	39	23.64%	23.64%	41.21%
Often	52	31.52%	31.52%	72.73%
Always	45	27.27%	27.27%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The findings reveal that 58.79% of respondents stated they often or always face marketing challenges, while 17.58% reported minimal or no challenges. This highlights that market linkages, branding, and distribution remain major obstacles for agro-based entrepreneurs, potentially restricting growth and profitability.

**Table 23: Role of Cooperatives and FPOs in Entrepreneurship**

Role Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very poor	11	6.67%	6.67%	6.67%
Poor	16	9.70%	9.70%	16.36%
Average	36	21.82%	21.82%	38.18%
Good	58	35.15%	35.15%	73.33%
Excellent	44	26.67%	26.67%	100.00%

Total	165	100.00%	100.00%	
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**Interpretation:**

Respondents rated the contribution of cooperatives and FPOs positively, with 61.82% assessing them as good or excellent. Only 16.36% gave poor or very poor ratings. This indicates that FPOs are increasingly recognized as effective platforms for collective marketing, bargaining, and capacity building in agro-entrepreneurship.

**Table 24: Impact of Export Opportunities on Agro-Based Entrepreneurship**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	9	5.45%	5.45%	5.45%
Disagree	13	7.88%	7.88%	13.33%
Neutral	27	16.36%	16.36%	29.70%
Agree	55	33.33%	33.33%	63.03%
Strongly agree	61	36.97%	36.97%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The majority of respondents (70.30%) agreed or strongly agreed that export opportunities could boost agro-based entrepreneurship, while only 13.33% disagreed. This demonstrates strong optimism about international markets as a pathway for growth and value addition in the agro-sector.

**Category 5: Sustainability and Social Impact**

**Table 25: Sustainability of Current Agro-Based Practices**

Sustainability Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Not sustainable	12	7.27%	7.27%	7.27%
Slightly sustainable	19	11.52%	11.52%	18.79%
Moderately sustainable	46	27.88%	27.88%	46.67%

Sustainable	53	32.12%	32.12%	78.79%
Highly sustainable	35	21.21%	21.21%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

Nearly 53.33% of respondents rated agro-based practices as sustainable or highly sustainable, while 18.79% considered them unsustainable. This indicates progress toward sustainable development but also highlights the need for further ecological and resource-efficient practices.

**Table 26: Employment Creation by Agro-Based Industries**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	11	6.67%	6.67%	6.67%
Disagree	15	9.09%	9.09%	15.76%
Neutral	32	19.39%	19.39%	35.15%
Agree	54	32.73%	32.73%	67.88%
Strongly agree	53	32.12%	32.12%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The responses suggest that 64.85% of participants agreed or strongly agreed that agro-based industries create employment in rural areas. Only 15.76% disagreed, while 19.39% were neutral. This highlights the sector's positive role in reducing rural unemployment and supporting livelihoods.

**Table 27: Contribution of Women in Agro-Based Entrepreneurship**

Contribution Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Very low	8	4.85%	4.85%	4.85%
Low	17	10.30%	10.30%	15.15%
Moderate	39	23.64%	23.64%	38.79%

High	56	33.94%	33.94%	72.73%
Very high	45	27.27%	27.27%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

A large proportion of respondents (61.21%) rated women’s contribution as high or very high, while only 15.15% believed it was low. This reflects growing acknowledgment of women’s active involvement in agro-entrepreneurship and their role in driving inclusive growth.

**Table 28: Youth Participation in Agro-Based Entrepreneurship**

Response Level	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Strongly disagree	10	6.06%	6.06%	6.06%
Disagree	14	8.48%	8.48%	14.55%
Neutral	28	16.97%	16.97%	31.52%
Agree	55	33.33%	33.33%	64.85%
Strongly agree	58	35.15%	35.15%	100.00%
Total	165	100.00%	100.00%	

**Interpretation:**

The majority of respondents (68.48%) agreed or strongly agreed that agro-based industries encourage youth participation in entrepreneurship. Only 14.55% disagreed, showing optimism about the sector’s capacity to attract young talent and foster innovation.

**Hypothesis Testing**

**Hypothesis 1**

**Table 29: Chi-Square Test for Association Between Access to Financial Resources and Growth of Agro-Based Entrepreneurship**

Value	Df	Asymp. Sig.
Pearson Chi-Square	21.482	4
Likelihood Ratio	22.963	4

N of Valid Cases	165	
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**Interpretation:**

The relationship between access to financial resources and the development of agro-based entrepreneurship was examined through the Chi-Square Test for Independence. The Pearson Chi-Square statistic is 21.482, with four degrees of freedom, and the Asymptotic Significance (p-value) is 0.000, significantly lower than the 0.05 threshold. This finding demonstrates a statistically significant correlation between access to financial resources and the growth of entrepreneurship. The null hypothesis ( $H_0$ ) is thus rejected, while the alternative hypothesis ( $H_1$ ) is accepted.

**Hypothesis 2**

**Table 30: Chi-Square Test for Relationship Between Entrepreneurial Orientation and Success of Agro-Based Industries**

Value	Df	Asymp. Sig.
Pearson Chi-Square	18.673	3
Likelihood Ratio	19.225	3
N of Valid Cases	165	

**Interpretation:**

The Chi-Square Test for Independence was conducted to examine the relationship between entrepreneurial orientation (risk-taking, innovation, creativity) and industry success. The Pearson Chi-Square statistic of 18.673 with three degrees of freedom yielded a p-value of 0.000, less than the 0.05 significance level. The result confirms a strong and statistically significant relationship, implying that entrepreneurial orientation directly contributes to the success of agro-based industries. Thus,  $H_0$  is rejected and  $H_1$  is accepted.

**Hypothesis 3**

**Table 31: Chi-Square Test for Differences in Market Linkage Opportunities Across Agro-Entrepreneur Categories**

Value	Df	Asymp. Sig.
Pearson Chi-Square	14.927	4
Likelihood Ratio	15.804	4
N of Valid Cases	165	

**Interpretation:**

The Chi-Square Test showed a Pearson Chi-Square value of 14.927 with four degrees of freedom and a significance level of 0.005. Since the p-value is less than 0.05, the result suggests a statistically significant

difference in market linkage opportunities across different categories of agro-entrepreneurs. This implies that certain categories of entrepreneurs have better access to markets than others. Hence,  $H_0$  is rejected and  $H_1$  is accepted.

#### Hypothesis 4

**Table 32: Chi-Square Test for Impact of Government Schemes, Training, and Technology Adoption on Enterprise Performance**

Value	Df	Asymp. Sig.
Pearson Chi-Square	20.315	3
Likelihood Ratio	21.428	3
N of Valid Cases	165	

#### Interpretation:

The impact of government support factors was examined using the Chi-Square Test. The Pearson Chi-Square statistic is 20.315, with three degrees of freedom and a significance value of 0.000. The p-value, which is below the 0.05 threshold, signifies a statistically significant impact of government schemes, training, and technology adoption on enterprise performance. The null hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted.

All four tested hypotheses exhibited statistically significant associations, confirming that financial resources, entrepreneurial orientation, market linkages, and government support significantly influence the growth and performance of agro-based entrepreneurship in India.

## 6. Conclusion

This study illustrates that access to financial resources, entrepreneurial orientation, market linkages, and government support significantly affect the growth and performance of agro-based entrepreneurship in India. The findings indicate that entrepreneurs possessing enhanced financial accessibility and innovative orientations achieved greater success in establishing sustainable businesses. Market linkage opportunities and supportive policies have strengthened agro-based enterprises' capacity to expand, diminish reliance on intermediaries, and significantly contribute to rural development.

The results demonstrate that government initiatives, training programs, and technology adoption are essential for empowering agro-entrepreneurs. The statistical analysis indicated that these interventions significantly affect entrepreneurial outcomes, highlighting the necessity for a cohesive ecosystem where financial institutions, governments, and entrepreneurs collaborate to improve rural industries. Agro-based entrepreneurship serves as a vital catalyst for enhancing rural employment and income by addressing deficiencies in knowledge, market access, and resources.

The study offered significant insights; however, it was constrained by a sample size of 165 respondents, potentially failing to represent the diversity of agro-based entrepreneurs in India. The cross-sectional methodology constrained the examination of long-term effects associated with policies, financial access, and technology adoption.

Future research should utilize larger, regionally diverse samples to obtain more representative insights into agro-based entrepreneurship. A longitudinal study may investigate the effects of government policies, technological innovations, and financial inclusion on entrepreneurial performance over time. Comparative studies across states or between rural and semi-urban entrepreneurs would assist policymakers in developing targeted interventions, thereby enhancing the sustainability, inclusivity, and global competitiveness of agro-based industries.

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