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Multidimensional profiling of agri-entrepreneurs: A comparative study of trained and non-trained agricultural graduates in Rajasthan

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ABSTRACT

The present study was conducted to compare the socio-personal, socio-economic, occupational, economic, communicational and psychological characteristics of trained and non-trained agricultural graduates engaged in agri-entrepreneurial activities. The study was based on 160 respondents comprising 80 trained and 80 non-trained agricultural graduates. The findings indicated that a substantial majority of the respondents (81.25%) belonged to the young-to-middle age group of 22.02-29.44 years. The respondents were predominantly male (99.37%), largely belonged to Other Backward Classes (83.75%) and were mainly members of joint and large-sized families. Regarding entrepreneurial experience, 78.75 per cent of the respondents had relatively limited experience of 0-3 years, while 86.87 per cent reported no membership in any social organisation. Occupationally, trained agricultural graduates demonstrated greater diversification with 48.75 per cent combining agriculture with business or self-employment compared with 23.75 per cent among non-trained agricultural graduates. In contrast, agriculture alone was the primary occupation of 58.75 per cent of non-trained agricultural graduates. The majority of respondents possessed small to semi-medium landholdings and reported a medium level of annual income (85.63%). With regard to communicational and psychological characteristics, most respondents exhibited a medium level of extension agency contact, mass media exposure, risk orientation, innovativeness, self-confidence and achievement motivation. However, trained agricultural graduates showed a relatively higher representation in the high category of risk orientation, self-confidence and achievement motivation than their non-trained counterparts. Overall, the findings highlight the relevance of entrepreneurship-oriented training in promoting occupational diversification and strengthening selected psychological attributes among agricultural graduates. The study underscores the need for need-based entrepreneurial training, stronger extension linkages and improved institutional support to facilitate sustainable agri-entrepreneurship among agricultural graduates.

Keywords: Agricultural graduates, Agri-entrepreneurship, Entrepreneurship training, Trained and non-trained graduates, Socio-economic characteristics, Psychological characteristics

Introduction

Agriculture continues to be a fundamental sector of the global economy, contributing substantially to food security, livelihood generation and sustainable economic development. Although agriculture, forestry and fisheries together accounted for approximately 4.00 per cent of global GDP in 2024, their importance extends well beyond their direct economic contribution particularly through their role in food production, employment generation, nutrition security and maintenance of ecological balance (Anonymous, 2026a) [1]. In developing countries, the agrifood sector remains a major source of employment and livelihood support (Ramaswami et al., 2024) [2]. However, the increasing pressure on natural resources, land degradation, climate variability and the growing demand for food necessitate a transition towards more productive, resource-efficient and environmentally sustainable agricultural systems. Farmland expansion accounts for nearly 90.00 per cent of global deforestation, while land degradation imposes an estimated economic cost of US\$300 billion annually. Moreover, every 10.00 per cent increase in land degradation is associated with an approximately 2.00 per cent decline in crop yields relative to their potential. The predominance of small-holder farming further intensifies these challenges as nearly 85.00 per cent of the world's 570 million farms operate on less than two hectares of land. With the global population projected to reach 8.8 billion by 2034, meeting the anticipated 14.00 per cent increase in food production will require greater emphasis on climate-smart technologies, efficient resource use, knowledge-based interventions and entrepreneurship-led transformation of agriculture (OECD-FAO, 2025) [3]. In this changing agricultural environment, entrepreneurship is increasingly relevant for converting knowledge, technologies and available resources into economically viable and locally appropriate enterprises. The transformation of agriculture is also being influenced by the growing application of digital and knowledge intensive technologies including precision agriculture, mobile-based advisory services, remote sensing and data-driven decision-support systems. These developments are

creating new opportunities for technically qualified individuals to provide specialized services and entrepreneurial solutions to farmers. Consequently, the role of agriculture graduates is no longer confined to conventional employment in government departments, research institutions or educational organizations. Their technical knowledge, professional training and understanding of agricultural production systems can enable them to participate in diverse entrepreneurial activities across the agricultural value chain.

In India, agriculture continues to be a major pillar of the rural economy supporting the livelihoods of 58.40 per cent of the population, contributing approximately 18.00 per cent to national GDP and providing employment to nearly 42.30 per cent of the workforce (Ministry of Agriculture and Farmers' Welfare, 2024) [4]. The sector recorded a *kharif* food-grain production of 1,647.05 LMT in 2024 reflecting its continuing importance to national food security (Ministry of finance, 2025) [5]. Nevertheless, the agricultural sector continues to face structural challenges particularly low labour productivity, inadequate mechanization and gaps in human-capital development. Labour productivity in agriculture remains three to four times lower than that in the formal non-farm sector (Ramaswami *et al.*, 2024) [2]. At the same time, the nature of agricultural employment is changing with women accounting for nearly 38 million of the 40 million new agricultural jobs generated between 2021-22 and 2023-24 (Anonymous, 2026b) [6]. These changes underline the need for improved professional support, skill development, entrepreneurship and capacity-building mechanisms within the agricultural sector. Rajasthan, the largest state in India in terms of geographical area, presents a distinctive agricultural setting characterized by arid and semi-arid conditions, low and erratic rainfall and limited irrigation facilities. Agriculture and allied activities including animal husbandry, horticulture, forestry and fisheries nevertheless remain important sources of livelihood for the state's rural population. Rainfed agriculture integrated with livestock-based activities constitutes an important component of rural livelihood systems, although water scarcity, climatic variability and limited access to modern technologies continue to affect agricultural productivity and farm incomes. The agriculture and allied sectors of Rajasthan have shown considerable economic expansion with Gross State Value Added increasing from ₹1.19 lakh crore in 2011-12 to ₹4.23 lakh crore in 2024-25. However, water availability remains a major concern with nearly 49.34 per cent of the state's net irrigated area dependent on tube wells (Ministry of Agriculture and Farmers' Welfare, 2025) [7]. Rajasthan is also a leading producer of millets (*Shree Anna*), oilseeds and pulses, although climatic variability has adversely influenced agricultural production including a reported decline of nearly 29.61 per cent in cotton output in recent years (Government of Rajasthan, 2025) [8]. Such conditions create a strong need for innovative, knowledge-based and locally adapted agricultural enterprises capable of responding to the diverse requirements of farmers and rural communities. The changing agricultural environment has also transformed the nature of agricultural extension and rural service delivery in India. Agricultural extension has progressed from the Community Development Programme introduced in 1952 and the Training and Visit system of the 1970s towards a pluralistic system involving ICAR institutions, State Agricultural Universities, Krishi Vigyan Kendras, private agribusiness firms, Farmer Producer Organisations, Self-Help Groups and non-governmental organizations. However, an estimated shortage of nearly 90,000 public extension personnel has constrained the effective delivery of agricultural advisory services at the grassroots level (Saha *et al.*, 2025) [9]. The extension gap becomes particularly important in remote and resource-constrained areas where farmers may not receive timely information regarding crop production, plant protection, input management, emerging technologies and markets. At the same time, India has developed a substantial human-resource base through its network of agricultural universities, comprising 67 State Agricultural Universities, four Deemed Universities and three Central Agricultural Universities including five agricultural universities in Rajasthan (Toracto, 2025) [10]. The availability of technically qualified agricul-

tural graduates, coupled with limited employment opportunities in the formal sector highlights the potential of these graduates as providers of agricultural services and as entrepreneurs within rural economies. Entrepreneurship can contribute to economic growth, technological dissemination, employment generation and income enhancement (Patel *et al.*, 2020) [11]. In the agricultural sector, agripreneurship provides an avenue for converting technical knowledge and agricultural resources into commercially viable, market-oriented and technology-driven enterprises (Arora *et al.*, 2022) [12]. Agripreneurship differs from conventional entrepreneurship because agricultural enterprises are closely influenced by agro-climatic conditions, production cycles, seasonality, local resource availability and the socio-economic characteristics of farming communities. Agricultural graduates, therefore, possess considerable potential to establish enterprises that combine technical expertise with commercial opportunities while simultaneously addressing local agricultural needs. India is estimated to require nearly one million professionally trained agriculture graduates, whereas only about half of this requirement is currently being met (Anonymous, 2025) [13]. Further, agricultural exports reached USD 51.1 billion during FY 2024-25 (PIB, 2026) [14], indicating the expanding commercial dimensions of the agricultural sector. The emergence of opportunities in input supply, custom hiring services, agricultural consultancy, processing, value addition, agri-tourism and other allied activities has consequently widened the scope for agricultural graduates to pursue self-employment and enterprise development.

Within this context, the Agri-Clinics and Agri-Business Centres (ACABC) Scheme launched by the Government of India in 2002 with financial support from NABARD represents an important institutional initiative for promoting entrepreneurship among agricultural graduates. The scheme seeks to utilize the technical knowledge of agriculture graduates by encouraging them to establish agri-ventures that provide advisory services, quality agricultural inputs and other business solutions to farmers while creating avenues for self-employment. The scheme also covers diploma holders in agriculture and allied subjects, candidates with intermediate-level agricultural education and post-graduates in biological sciences with an agricultural background. Eligible candidates undergo a mandatory 45-day residential training programme, followed by support from Nodal Training Institutes in areas such as project preparation, mobilization and post-training hand-holding. Financial assistance is provided up to ₹20 lakh for individual ventures, ₹25 lakh in exceptional cases and ₹100 lakh for group projects with back-ended subsidy provisions of 44 per cent for women, SC/ST and North-Eastern/Hill State beneficiaries and 36 per cent for other beneficiaries. The scheme encompasses diverse enterprises including agri-clinics, soil-testing laboratories, custom hiring centres, dairy, poultry, apiculture, agri-tourism and post-harvest value addition. The significance of such training and institutional support is reflected in previous studies. Sharma *et al.* (2019) [15] reported improved access to technology and income among farmers receiving services from women agripreneurs. Venkattakumar *et al.* (2016) [16] and Parihar *et al.* (2018) [17] elucidated that approximately 35-43 per cent of trained candidates established agri-ventures with Rajasthan occupying sixth position nationally, while nearly 90 per cent of farmers associated with these ventures adopted improved technologies. These findings indicate that entrepreneurial training can facilitate the conversion of technical agricultural knowledge into practical services for farming communities. However, successful establishment and sustainability of an agri-venture cannot necessarily be attributed to training alone. Entrepreneurial outcomes may also be influenced by an individual's socio-personal characteristics, socio-economic circumstances, occupational background, economic resources, communication behaviour and psychological attributes, together with access to institutional and market support. Constraints such as inadequate credit, insufficient post-training mentoring, market competition and infrastructural limitations may further affect enterprise establishment and continuity (Arora *et al.*, 2022) [12]. Therefore, understanding agricultural graduates engaged in agripreneurship requires a broader

assessment than examining training status or enterprise establishment alone. A multidimensional profile encompassing socio-personal, socio-economic, occupational, economic, communicational and psychological characteristics can provide a more comprehensive understanding of the attributes associated with agricultural graduates who enter and sustain entrepreneurial activities. A comparison between trained and non-trained agricultural graduates is particularly relevant because it can help identify the extent to which these dimensions differ across the two groups and provide empirical insight into the characteristics of agricultural graduates participating in agripreneurship. Such comparative evidence can also contribute to the refinement of training programmes, entrepreneurial support mechanisms, institutional interventions and strategies for promoting self-employment among technically qualified agricultural youth. Against this background, the present study was undertaken in Rajasthan to develop a multidimensional profile of agricultural graduates engaged in agripreneurship and to compare trained and non-trained agricultural graduates across selected socio-personal, socio-economic, occupational, economic, communicational and psychological characteristics.

Objective of the study

To develop a multidimensional profile of trained and non-trained agricultural graduates engaged in agripreneurship and compare the two groups with respect to their socio-personal, socio-economic, occupational, economic, communicational and psychological characteristics in Rajasthan.

Materials and methods

Study area

The present study was conducted in Rajasthan with the objective of comparing the socio-personal, socio-economic, communicational and psychological characteristics of trained and non-trained agricultural graduates engaged in agri-entrepreneurship. The state provides an appropriate setting for examining the characteristics of agricultural graduates involved in agri-entrepreneurial activities.

Sampling procedure

A multistage sampling procedure was adopted for selection of respondents. In the first stage, the Saswat Seti Vikash Pratisthan Nodal Training Institute was selected purposively as the top-performing Nodal Training Institute under the ACABC scheme in Rajasthan. In the second stage, Agro-Climatic Zone IIIa (Semi-Arid Eastern Plains) was selected purposively based on the highest number of trained agricultural graduates. In the third stage, Jaipur district was selected purposively as it had the maximum concentration of trained agricultural graduates. In the fourth stage, four tehsils, namely Shahpura, Jaipur, Phulera and Amber were selected purposively based on the highest density of trained agricultural graduates. In the final stage, 80 ACABC-trained agricultural graduates were selected from the four selected tehsils using proportionate random sampling. To facilitate comparison, an equal number of 80 non-trained agricultural graduates were selected as the control group. Thus, a total of 160 agricultural graduates constituted the sample for the study. The distribution of trained respondents was 25 from Shahpura, 23 from Jaipur, 22 from Phulera and 10 from Amber, making a total of 80 trained agricultural graduates. An equal number of non-trained agricultural graduates were selected from the respective tehsils, resulting in a grand total sample size of 160 respondents.

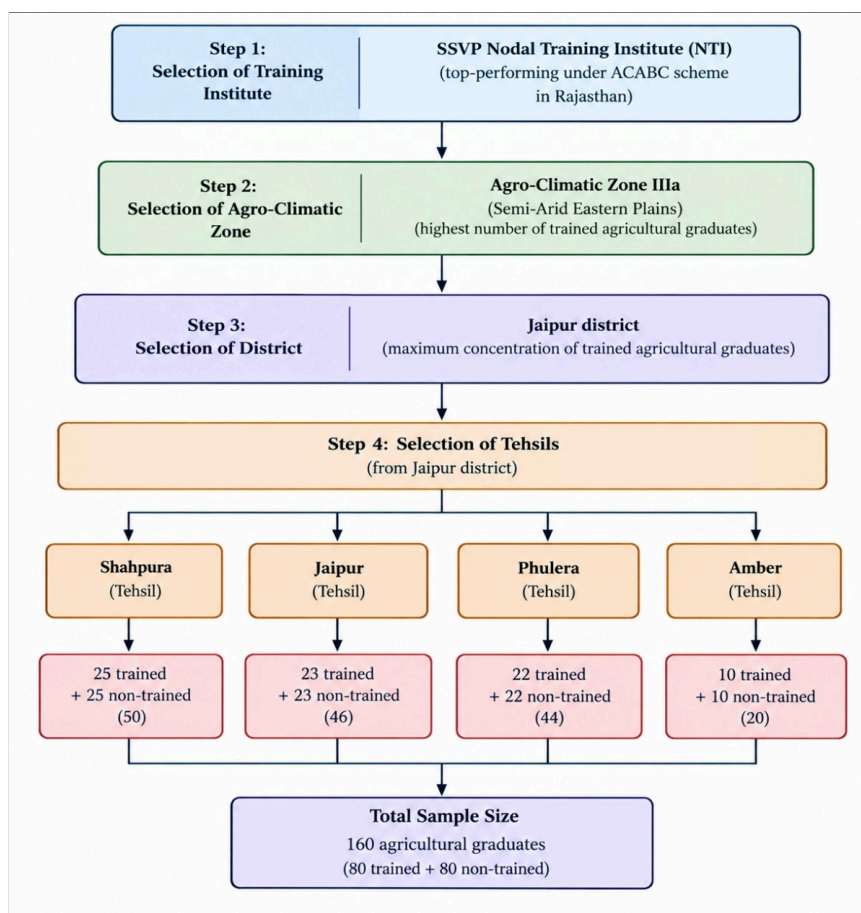


Figure 1. Sampling procedure of the study

Measurement of variables

The study covered seventeen independent variables related to socio-personal, socio-economic, communicational and psychological characteristics, along with two dependent variables, namely knowledge and attitude of agricultural graduates regarding services received through Agri-Clinics and Agri-Business Centres (ACABCs). The variables were measured using standardized and modified scales suitable for agricultural extension research. Data were collected through a pre-tested, structured interview schedule administered through personal interviews in Hindi/local language. Before the final data collection, the interview schedule was pre-tested on 25 respondents who were not included in the final sample. Necessary modifications were made in the schedule based on the pre-testing to improve its clarity and suitability for field administration. Respondents were classified into different categories using the Mean $\pm$ Standard Deviation method for most of the variables.

$$\text{Percentage (\%)} = \frac{\text{Frequency}}{\text{Total respondents}} \times 100$$

$$\text{Arithmetic Mean } (\bar{X}) = \Sigma X / N$$

$$\text{Standard Deviation (SD)} = \sqrt{\frac{\Sigma (X - \bar{X})^2}{N}}$$

$$\text{Mean Percent Score (MPS)} = \frac{\text{Obtained score}}{\text{Maximum obtainable score}} \times 100$$

Pearson's correlation coefficient (r) was used to determine the degree and direction of relationship between the selected independent variables and knowledge and attitude of the respondents.

Standard Normal Deviate (Z-test) was used to test the significance of differences between the trained and non-trained agricultural graduates.

Results and Discussion

Socio-personal characteristics

The findings of socio-personal variables in Table 1 revealed that the 81.25 per cent of trained agricultural graduates and non-trained agricultural graduates belonged to the of 22.02-29.44 years age group, whereas in the less than 22.02 years age group, 06.52 per cent of trained agricultural graduates and 16.25 per cent of non-trained agricultural graduates were found in the less than 22.02 years age group and the representation of trained and non-trained agricultural graduates in more than 29.44 years was 12.50 per cent and 02.50 per cent, respectively. Among the trained agricultural graduates 98.75 per cent were male and 01.25 per cent was female, whereas all non-trained agricultural graduates were male. 81.25 per cent of the trained agricultural graduates belong to the Other Backward Classes, 07.50 per cent to General, 06.25 per cent came from Scheduled Tribe and 05.00 per cent from Scheduled Caste, while in the non-trained group the corresponding figures were 86.25 per cent, 06.25 per cent, 06.25 per cent and 01.25 per cent, respectively. In the trained category 20.00 per cent of the graduates had female head at their home and possessed 18.75 per cent secondary education, whereas among the non-trained category, 31.25 per cent had secondary education and 17.50 per cent had higher/senior secondary education. Also, 12.50 per cent of the trained agricultural graduates had family heads with post-graduation and above while only 01.25 per cent in the non-trained category. Among the trained agricultural graduates, majority (80.00%) belonged to joint families and 20.00 per cent to nuclear families, while among the non-trained agricultural graduates 63.75 per cent and 36.25 per cent belonged to joint and nuclear families respectively. The findings related to the family size revealed that the 72.50 per cent and

Statistical analysis

The collected data were coded, tabulated and analysed using appropriate statistical techniques. Descriptive statistics such as frequency, percentage, arithmetic mean and standard deviation were used to summarize the characteristics of the respondents. Mean Percent Score (MPS) and ranking were used wherever required for assessing and comparing the responses. The Standard Normal Deviate (Z-test) was employed for comparison between the trained and non-trained agricultural graduates. Pearson's correlation coefficient was used to determine the relationship between the selected independent variables and the dependent variables namely knowledge and attitude. The data were analysed to examine the socio-personal, socio-economic, communicational and psychological characteristics of agricultural graduates and their relationship with knowledge and attitude regarding ACABC services. The following statistical measures were used:

55.00 per cent of the trained and non-trained agricultural graduates had large-size families whereas medium-sized families accounted for 22.50 per cent and 40.00 per cent, respectively, with small-sized families equally represented at 5.00 per cent in both the categories. Among the trained graduates 66.25 per cent possessed low, 28.75 per cent medium and 05.00 per cent had high levels of entrepreneurship experience, whereas in the non-trained category the corresponding figures were 91.25 per cent, 06.25 per cent and 02.50 per cent, respectively. The social participation findings under trained agricultural graduates revealed that 77.50 per cent had no membership, 11.25 per cent were members of one organization and 08.75 per cent were members of more than one organization, whereas among the non-trained agricultural graduates most (96.25%) of the respondents had no membership, 02.50 per cent were members of one organization and 01.25 per cent was a member of more than one organization. No one of the non-trained agricultural graduates was an office bearer or a wide public holder.

The findings of the present study are in conformity with Deshmukh *et al.* (2024) [18] who also observed that a majority of agricultural graduates or beneficiaries of the ACABC Scheme belonged to the young or early-middle age group. The results of the present study are in agreement with the findings of Kumari (2025) [19] who likewise reported that male participants constituted the majority of beneficiaries and agricultural entrepreneurs under the ACABC programme. It may be because the respondents are young and have taken up the enterprise recently after completing their graduation. The findings of the present investigation are in close agreement with those of Ahmad *et al.* (2026) [20] who reported that most agricultural graduates possessed limited entrepreneurial experience during the initial years of establishing their enterprises.

Socio-economic characteristics

Table 2 indicated that the majority 48.75 per cent of the trained agricultural graduates were engaged in agriculture along with business/self-employment and only 28.75 per cent were engaged in agriculture alone whereas among the non-trained agricultural graduates, 58.75 per cent were engaged in agriculture alone and 23.75 per cent in agriculture along with business/self-employment while

Agriculture along with service was reported by 22.50 per cent of the trained and 15.00 per cent of the non-trained agricultural graduates and agriculture along with labour was reported by 02.50 per cent of the non-trained agricultural graduates and none in trained agricultural graduates. The landholding size among the trained agricultural graduates was 31.25 per cent had small, 28.75 per cent semi-medium, 22.50 per cent medium, 15.00 per cent marginal and 02.50 per cent large land holdings, while among the non-trained agricultural graduates the

corresponding figures were 30.00 per cent, 31.25 per cent, 25.00 per cent, 10.00 per cent and 03.75 per cent, respectively. Thus, the majority of both categories of respondents fall under the small to semi-medium land holding group. In the trained category 85.00 per cent had medium and 15.00 per cent had high annual income, with none falling in the low income category, whereas among the non-trained agricultural graduates, majority 86.25 per cent had medium, 11.25 per cent had high and 02.50 per cent had low annual income.

Table 1. Distribution of Respondents on the basis of Socio-Personal Characteristics

S. No.	Variables	Categories	Respondents					
			Trained Agricultural Graduates (n = 80)		Non-trained Agricultural Graduates (n = 80)		Overall Agricultural Graduates (N = 160)	
			f	%	f	%	f	%
1	Age	Less than 22.02 years	05	06.25	13	16.25	18	11.25
		22.02-29.44 years	65	81.25	65	81.25	130	81.25
		More than 29.44 years	10	12.50	02	02.50	12	07.50
		Total	80	100	80	100	160	100
2	Gender	Male	79	98.75	80	100.00	159	99.37
		Female	01	01.25	00	00.00	01	00.63
		Total	80	100	80	100	160	100
3	Caste	Scheduled Caste	04	05.00	01	01.25	05	03.13
		Scheduled Tribe	05	06.25	05	06.25	10	06.25
		Other Backward Classes	65	81.25	69	86.25	134	83.75
		General	06	07.50	05	06.25	11	06.87
		Total	80	100	80	100	160	100
4	Family Head Education	Illiterate	14	17.50	12	15.00	26	16.25
		Primary Education	08	10.00	05	06.25	13	08.13
		Middle Education	09	11.25	12	15.00	21	13.13
		Secondary Education	15	18.75	25	31.25	40	25.00
		Higher/Senior Secondary Education	08	10.00	14	17.50	22	13.75
		Graduation	16	20.00	11	13.75	27	16.88
		Post-graduation and above	10	12.50	01	01.25	11	06.86
		Total	80	100	80	100	160	100
5	Family Type	Nuclear	16	20.00	29	36.25	45	28.13
		Joint	64	80.00	51	63.75	115	71.87
		Total	80	100	80	100	160	100
6	Family Size	Small Sized Family (Up to 3 members)	04	05.00	04	05.00	08	05.00
		Medium Sized Family (4-5 members)	18	22.50	32	40.00	50	31.25
		Large Sized Family (Above 6 Members)	58	72.50	44	55.00	102	63.75
		Total	80	100	80	100	160	100
7	Entrepreneurship Experience	Low (0-3 years)	53	66.25	73	91.25	126	78.75
		Medium (4-6 years)	23	28.75	05	06.25	28	17.50
		High (7-9 years)	04	05.00	02	02.50	06	03.75
		Total	80	100	80	100	160	100
8	Social Participation	No membership in any social organization	62	77.50	77	96.25	139	86.87
		Member of one organization	09	11.25	02	02.50	11	06.87
		Member of more than one organization	07	08.75	01	01.25	08	05.00
		Office bearer of such organization	01	01.25	00	00.00	01	00.63
		Wide public holder	01	01.25	00	00.00	01	00.63
		Total	80	100	80	100	160	100

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Table 2. Distribution of Respondents on the basis of Socio-Economic Characteristics

S. No.	Variables	Categories	Respondents					
			Trained Agricultural Graduates (n = 80)		Non-trained Agricultural Graduates (n = 80)		Overall Agricultural Graduates (N = 160)	
			f	%	f	%	f	%
1	Occupation	Agriculture alone	23	28.75	47	58.75	70	43.75
		Agriculture + Labour	00	00.00	02	02.50	02	01.25
		Agriculture + Business/ Self Employment	39	48.75	19	23.75	58	36.25
		Agriculture + Service	18	22.50	12	15.00	30	18.75
		Total	80	100	80	100	160	100
2	Land Holding	Marginal (< 1 ha)	12	15.00	08	10.00	20	12.50
		Small (1-2 ha)	25	31.25	24	30.00	49	30.62
		Semi-Medium (2.1-4 ha)	23	28.75	25	31.25	48	30.00
		Medium (4.1-10 ha)	18	22.50	20	25.00	38	23.75
		Large (> 10 ha)	02	02.50	03	03.75	05	03.13
		Total	80	100	80	100	160	100
3	Annual Income	Low (< ₹95671)	00	00.00	02	02.50	02	01.25
		Medium (₹95671- ₹793203)	68	85.00	69	86.25	137	85.63
		High (> ₹793203)	12	15.00	09	11.25	21	13.12
		Total	80	100	80	100	160	100

The findings of the investigation related to the socio-economic characteristics are in close conformity with those reported by [Ahmad et al. \(2026\)](#) [20] who also observed that the majority of respondents possessed small land holdings. The findings of the present investigation are in accordance with those reported by [Jat et al. \(2025\)](#) [21] who depicted that the majority of respondents belonged to the medium annual income category.

Communication and psychological characteristics

Table 3 indicated that majority 68.75 per cent of the trained agricultural graduates and 55.00 per cent of the non-trained agricultural graduates had medium extension contact, whereas in the low extension contact, trained and non-trained agricultural graduates were found to be 13.75 per cent and 30.00 per cent, respectively. The representation in the higher extension contact was 17.50 per cent and 15.00 per cent, respectively. Among the trained agricultural graduates, majority (68.75%) had medium, 18.75 per cent high and 12.50 per cent low mass media exposure, whereas among the non-trained agricultural graduates, 52.50 per cent had medium, 35.00 per cent low and 12.50 per cent high mass media exposure.

The results related to the psychological characteristics revealed that more than half (65.00%) of the trained agricultural graduates had

medium and 33.75 per cent had high risk orientation with only 01.25 per cent fell under low-risk orientation category as compared to the non-trained agricultural graduates 55.00 per cent had low, 42.50 per cent medium and only 02.50 per cent high risk orientation. 76.25 per cent of the trained agricultural graduates and 57.50 per cent of the non-trained agricultural graduates possessed medium level of innovativeness, while the 08.75 per cent of the trained and 32.50 per cent of the non-trained agricultural graduates possessed low level of innovativeness and the higher innovativeness found in 15.00 per cent and 10.00 per cent of the respondents, respectively. Among the trained agricultural graduates, majority (78.75%) had medium and 20.00 per cent had high self-confidence with only 01.25 per cent came under low category, while among the non-trained agricultural graduates, majority (57.50%) had medium, 41.25 per cent had low and only 01.25 per cent had a high level of self-confidence. The findings of achievement motivation revealed that 75.00 per cent had medium, 22.50 per cent high and 02.50 per cent low level of achievement motivation, whereas in the non-trained category, 57.50 per cent had medium, 37.50 per cent low and 05.00 per cent higher level of achievement motivation.

Table 3. Distribution of Respondents on the basis of Communication and Psychological Characteristics

S. No.	Variables	Categories	Respondents					
			Trained Agricultural Graduates (n = 80)		Non-trained Agricultural Graduates (n = 80)		Overall Agricultural Graduates (N = 160)	
			f	%	f	%	f	%
1	Extension Agency Contact	Low (< 6.30 score)	11	13.75	24	30.00	35	21.87
		Medium (6.30-13.72 score)	55	68.75	44	55.00	99	61.88
		High (> 13.72 score)	14	17.50	12	15.00	26	16.25
		Total	80	100	80	100	160	100
2	Mass Media Exposure	Low (< 12.02 score)	10	12.50	28	35.00	38	23.75
		Medium (12.02-19.72 score)	55	68.75	42	52.50	97	60.63
		High (> 19.72 score)	15	18.75	10	12.50	25	15.62
		Total	80	100	80	100	160	100

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S. No.	Variables	Categories	Respondents					
			Trained Agricultural Graduates (n = 80)		Non-trained Agricultural Graduates (n = 80)		Overall Agricultural Graduates (N = 160)	
			f	%	f	%	f	%
3	Risk Orientation	Low (< 18.28 score)	01	01.25	44	55.00	45	28.13
		Medium (18.28-28.80 score)	52	65.00	34	42.50	86	53.75
		High (> 28.80 score)	27	33.75	02	02.50	29	18.12
		Total	80	100	80	100	160	100
4	Innovativeness	Low (< 21.29 score)	07	08.75	26	32.50	33	20.62
		Medium (21.29-31.33 score)	61	76.25	46	57.50	107	66.88
		High (> 31.33 score)	12	15.00	08	10.00	20	12.50
		Total	80	100	80	100	160	100
5	Self-Confidence	Low (< 17.55 score)	01	01.25	33	41.25	34	21.25
		Medium (17.55-27.61 score)	63	78.75	46	57.50	109	68.12
		High (> 27.61 score)	16	20.00	01	01.25	17	10.63
		Total	80	100	80	100	160	100
6	Achievement Motivation	Low (< 21.07 score)	02	02.50	30	37.50	32	20.00
		Medium (21.07-33.56 score)	60	75.00	46	57.50	106	66.25
		High (> 33.56 score)	18	22.50	04	05.00	22	13.75
		Total	80	100	80	100	160	100

The findings of the present investigation are in agreement with those reported Zala *et al.* (2024) [22] who also observed that the majority of respondents had a medium level of extension agency contact. The findings of the present investigation are in conformity with those reported by Deshmukh *et al.* (2024) [18], who also found that a majority of respondents possessed a medium level of self-confidence.

Relationship between profile characteristics and knowledge & attitude of agricultural graduates regarding ACABCs

The data pertaining to the relationship between the profile characteristics of trained agricultural graduates and their knowledge about services received through Agri-Clinics and Agri-Business Centres (ACABCs) are presented in Table 4. The data clearly revealed that age (0.70**), extension agency contact (0.79**), mass media exposure (0.73**), risk orientation (0.83**), innovativeness (0.79**), self-confidence (0.78**) and achievement motivation (0.81**) were positively and highly significantly correlated at the 0.01 level of probability with the knowledge of trained agricultural graduates. So, it can be concluded that age, extension agency contact, mass media exposure, risk orientation, innovativeness, self-confidence and achievement motivation positively influence the knowledge level of trained agricultural graduates about ACABCs. However, family head education (0.05^{NS}), family size (0.02^{NS}), entrepreneurship experience (0.06^{NS}), social participation (0.01^{NS}) and occupation (0.13^{NS}) were positively and non-significantly correlated with knowledge. Thus, it can be concluded that these characteristics do not influence the knowledge level of trained agricultural graduates about ACABCs. Whereas, gender (-0.06^{NS}), caste (-0.12^{NS}), family type (-0.12^{NS}), land holding (-0.05^{NS}) and annual income (-0.09^{NS}) were negatively and non-significantly correlated with knowledge. Thus, it accepts the null hypothesis. So, it can be concluded that gender, caste, family type, land holding and annual income do not influence the knowledge level of trained agricultural graduates about ACABCs. The probable reason might be attributed to the fact that extension contact, mass media exposure, risk-taking ability, innovative outlook, self-confidence and achievement motivation of the trained agricultural graduates were built through the structured ACABC training, thereby strengthening their knowledge of the scheme. The data presented in Table 4 further revealed that among non-trained agricultural graduates, age (0.32**), extension agency contact (0.31**), mass media exposure (0.32**), risk orientation (0.42**), innovativeness (0.41**), self-confidence (0.38**) and achievement motivation (0.95**) were positively and highly significantly correlated at the 0.01 level of probability with knowledge about ACABCs. Hence, it can be concluded that these characteristics positively influence the knowledge level of non-trained

agricultural graduates. However, caste (0.07^{NS}), family type (0.06^{NS}) and family head education (0.10^{NS}) were positively and non-significantly correlated with knowledge. Therefore, it can be concluded that these characteristics do not influence the knowledge level of non-trained agricultural graduates. Whereas, gender (-0.12^{NS}), family size (-0.07^{NS}), entrepreneurship experience (-0.01^{NS}), social participation (-0.16^{NS}), occupation (-0.02^{NS}) and land holding (-0.07^{NS}) were negatively and non-significantly correlated with knowledge. Thus, it can be concluded that these characteristics do not influence the knowledge level of non-trained agricultural graduates. Annual income (0.92^{NS}) was positively but non-significantly correlated with knowledge. The probable reason for the generally weaker associations among non-trained agricultural graduates might be their limited exposure to structured extension, media and institutional inputs in the absence of ACABC training.

The data pertaining to the relationship between the profile characteristics of trained agricultural graduates and their attitude towards services received through ACABCs are presented in Table 5. The data reveal that age (0.87**), extension agency contact (0.91**), mass media exposure (0.90**), risk orientation (0.93**), innovativeness (0.95**), self-confidence (0.91**) and achievement motivation (0.94**) were positively and highly significantly correlated at the 0.01 level of probability with the attitude of trained agricultural graduates. Thus, it rejects the null hypothesis. So, it can be concluded that these characteristics positively influence the attitude of trained agricultural graduates towards ACABCs. However, entrepreneurship experience (0.00^{NS}) and social participation (0.03^{NS}) were positively and non-significantly correlated with attitude. Thus, it accepts the null hypothesis. So, it can be concluded that these characteristics do not influence the attitude of trained agricultural graduates. Whereas, gender (-0.12^{NS}), caste (-0.19^{NS}), family head education (-0.05^{NS}), family type (-0.05^{NS}), family size (-0.12^{NS}), occupation (0.17^{NS}), land holding (-0.07^{NS}) and annual income (-0.14^{NS}) were non-significantly correlated with attitude. Thus, it accepts the null hypothesis. So, it can be concluded that these characteristics do not influence the attitude of trained agricultural graduates towards ACABCs. The data presented in Table 5 further reveal that among non-trained agricultural graduates, age (0.35**), extension agency contact (0.20**), mass media exposure (0.33**), risk orientation (0.37**), innovativeness (0.46**), self-confidence (0.47**) and achievement motivation (0.42**) were positively and highly significantly correlated at the 0.01 level of probability with attitude. Thus, it rejects the null hypothesis. So, it can be concluded that these characteristics positively influence the attitude of non-trained agricultural graduates towards ACABCs. However, family head education (0.02^{NS}), family type

(0.17^{NS}) and family size (0.15^{NS}) were positively and non-significantly correlated with attitude. Gender recorded a correlation of 0.00 with attitude among non-trained agricultural graduates, indicating no discernible relationship. Whereas, caste (-0.11^{NS}), entrepreneurship experience (-0.03^{NS}), social participation (-0.06^{NS}), occupation

(-0.10^{NS}), land holding (-0.04^{NS}) and annual income (-0.02^{NS}) were negatively and non-significantly correlated with attitude. Hence, it can be concluded that these characteristics do not influence the attitude of non-trained agricultural graduates towards ACABCs.

Table 4. Correlation Analysis between Selected Personal Characteristics and Knowledge & Attitude of Agricultural Graduates regarding Services Received through Agri-Clinics and Agri-Business Centres (ACABCs)

S. No.	Variables	Correlation Coefficient (r)					
		With Knowledge			With Attitude		
		Trained (n = 80)	Non- trained (n = 80)	Overall (N = 160)	Trained (n = 80)	Non- trained (n = 80)	Overall (N = 160)
A. Socio-personal							
1	Age	0.70**	0.32**	0.53**	0.87**	0.35**	0.67**
2	Gender	-0.06 ^{NS}	-0.12 ^{NS}	0.02 ^{NS}	-0.12 ^{NS}	0.00	-0.05 ^{NS}
3	Caste	-0.12 ^{NS}	0.07 ^{NS}	-0.13 ^{NS}	-0.19 ^{NS}	-0.11 ^{NS}	-0.16 ^{NS}
4	Family Head Education	0.05 ^{NS}	0.10 ^{NS}	0.10 ^{NS}	-0.05 ^{NS}	0.02 ^{NS}	0.01 ^{NS}
5	Family Type	-0.12 ^{NS}	0.06 ^{NS}	0.12 ^{NS}	-0.05 ^{NS}	0.17 ^{NS}	0.13 ^{NS}
6	Family Size	0.02 ^{NS}	-0.07 ^{NS}	0.12 ^{NS}	-0.12 ^{NS}	0.15 ^{NS}	0.07 ^{NS}
7	Entrepreneurship Experience	0.06 ^{NS}	-0.01 ^{NS}	0.21**	0.00 ^{NS}	-0.03 ^{NS}	0.10 ^{NS}
8	Social Participation	0.01 ^{NS}	-0.16 ^{NS}	0.16*	0.03 ^{NS}	-0.06 ^{NS}	0.09 ^{NS}
B. Socio-economic							
9	Occupation	0.13 ^{NS}	-0.02 ^{NS}	0.15 ^{NS}	0.17 ^{NS}	-0.10 ^{NS}	0.13 ^{NS}
10	Land Holding	-0.05 ^{NS}	-0.07 ^{NS}	-0.08 ^{NS}	-0.07 ^{NS}	-0.04 ^{NS}	-0.07 ^{NS}
11	Annual Income	-0.09 ^{NS}	0.92 ^{NS}	0.00 ^{NS}	-0.14 ^{NS}	-0.02 ^{NS}	-0.10 ^{NS}
C. Communication Pattern							
12	Extension Agency Contact	0.79**	0.31**	0.76**	0.91**	0.20**	0.91**
13	Mass Media Exposure	0.73**	0.32**	0.47**	0.90**	0.33**	0.62**
D. Psychological Characteristics							
14	Risk Orientation	0.83**	0.42**	0.67**	0.93**	0.37**	0.62**
15	Innovativeness	0.79**	0.41**	0.57**	0.95**	0.46**	0.68**
16	Self Confidence	0.78**	0.38**	0.67**	0.91**	0.47**	0.66**
17	Achievement Motivation	0.81**	0.95**	0.64**	0.94**	0.42**	0.64**
18	Attitude	0.74**	0.94**	0.83**			

** = Significant at 0.01 level of probability

* = Significant at 0.05 level of probability

NS = Non-significant

Conclusion

The study revealed that ACABC-trained and non-trained agricultural graduates were largely young to middle-aged, male, belonged predominantly to Other Backward Classes and were generally from joint and large-sized families. Most respondents had limited entrepreneurial experience and low participation in social organisations. A notable difference was observed in occupational engagement between the two groups. ACABC-trained agricultural graduates exhibited greater occupational diversification with a comparatively larger proportion combining agriculture with business or self-employment, whereas non-trained graduates were more frequently dependent on agriculture as their sole occupation. With respect to communicational and psychological characteristics, respondents from both groups generally exhibited medium levels of extension agency contact, mass media exposure, innovativeness, self-confidence and achievement motivation. However, risk orientation differentiated the two groups more distinctly. Trained agricultural graduates were concentrated mainly in the medium and high categories, while non-trained graduates were predominantly in the low category, indicating a substantial difference between the groups in their orientation towards risk-taking in entrepreneurial activities. The correlation analysis further revealed that age, extension agency contact, mass media exposure, risk orientation, in-

novativeness, self-confidence and achievement motivation were positively and highly significantly associated with both knowledge and attitude towards the ACABC scheme. In contrast, socio-economic characteristics such as gender, caste, family type, landholding and annual income did not exhibit significant associations with either knowledge or attitude. A strong positive and significant association was also observed between knowledge and attitude suggesting that graduates with greater knowledge of the ACABC scheme tended to exhibit a more favourable attitude towards it. Overall, the findings indicate that communicational exposure and selected psychological attributes are closely associated with agricultural graduates' knowledge and attitude towards ACABC, while conventional socio-economic characteristics showed limited association. The comparatively greater occupational diversification and more favourable levels of certain psychological attributes observed among trained graduates further highlight the relevance of entrepreneurship-oriented training. Therefore, strengthening the quality and practical orientation of ACABC training, improving extension and institutional linkages and providing systematic post-training mentoring and handholding support may facilitate greater occupational diversification and entrepreneurial engagement among agricultural graduates. Such measures could contribute to strengthening agri-entrepreneurship and the delivery of farmer-oriented advisory and support services in Rajasthan.

Policy implications

The findings of the study have several implications for strengthening the implementation of the Agri-Clinics and Agri-Business Centres (ACABC) Scheme in Rajasthan. The comparatively greater involvement of trained agricultural graduates in agriculture-based businesses and self-employment along with their relatively higher levels of risk orientation, innovativeness, self-confidence and achievement motivation underscores the need to strengthen both the entrepreneurial and behavioural dimensions of ACABC training. The training programme may therefore move beyond a predominantly technical orientation and provide greater emphasis on opportunity recognition, entrepreneurial decision-making, risk management, business planning, innovation and confidence development. Based on the findings of the present study, the following policy implications are suggested:

Strengthen structured post-training handholding and mentoring:

The findings indicate the need to complement formal training with systematic post-training support particularly during the early stages of enterprise establishment. Nodal Training Institutes may develop a structured mentoring mechanism involving periodic enterprise reviews, business counselling, troubleshooting, technical guidance and facilitation of linkages with relevant institutions. Such continued support is particularly important as 78.75 per cent of the respondents had only 0-3 years of entrepreneurial experience, indicating that a substantial proportion of the respondents were in the initial stages of their entrepreneurial journey.

Integrate entrepreneurial and psychological competencies into ACABC training: The positive associations observed between risk orientation, innovativeness, self-confidence and achievement motivation and the knowledge and attitude of agricultural graduates highlight the relevance of behavioural and entrepreneurial competencies in ACABC implementation. Among trained graduates, risk orientation, innovativeness, self-confidence and achievement motivation were positively correlated with knowledge at $r = 0.83, 0.79, 0.78$ and 0.81 , respectively and with attitude at $r = 0.93, 0.95, 0.91$ and 0.94 , respectively. Accordingly, ACABC training may incorporate experiential learning approaches such as enterprise simulations, case-based learning, problem-solving exercises, opportunity-identification activities and entrepreneurial decision-making situations to strengthen graduates' preparedness for venture creation and management.

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