

International Journal of Agriculture Extension and Social Development

Volume 9; Issue 4; April 2026; Page No. 256-259

Received: 14-01-2026
Accepted: 19-02-2026

Indexed Journal
Peer Reviewed Journal

Assessing the risk dominance in agricultural enterprises: Extent of utilization of management strategies

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i4d.3478>

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Abstract

Agriculture is a risky enterprise particularly in developing countries. Understanding risk in agriculture is complex distinguished into two major types of risks in agriculture (i) business risk which includes production, market, institutional and personal risks and (ii) financial risk which results from different methods of financing the farm business. Exploratory design was taken to study about different types of risks, extent of utilization of risk management strategies in different agri-enterprises of erstwhile Andhra Pradesh state i.e., from 3 three regions namely Telangana, Rayalaseema, Andhra with a total of 225 respondents. The results of the study revealed that, major risk sources affecting the agri enterprises as stated by the entrepreneurs was financial risks (75.12%). Among different types of agro based enterprises in the study area were (43.6%) agro based produce processing units, whereas the extent of utilization of risk management strategies were categorized in medium level in all the three regions (56.0%) whereas region wise extent of risk management strategies were Telangana, Coastal Andhra and Rayalaseema regions were (52.0%), (58.7%), (57.3%) respectively. Based on this, it was recommended that policies should frame in such way that it should encourage investors and should reduce the risk by highlighting the risk management strategies.

Keywords: Sources of risks, types of agri-enterprises, risks and risk management strategies

Introduction

India is a global agricultural powerhouse. Agriculture and allied sectors are the mainstay of the Indian economy, holding the second largest agricultural land in the world. But agriculture's share in India's economy has progressively declined to less than 22 per cent due to the high growth rates of the industrial and services sectors. About 58 per cent of the population is dependent on agriculture and allied sectors as their principal means of livelihood. Agriculture is a risky enterprise (Hardaker *et al.*, 1997) ^[6], particularly in developing countries (Akcaoz and Ozkan, 2005) ^[2]. Understanding risk in agriculture is multifaceted (Hardaker *et al.* 2004 and Raza Ullah *et al.* 2016) ^[7, 13] distinguished two major types of risks in agriculture (i) production, market, institutional and personal risks come under business risk (ii) results from different methods of financing the farm business comes under financial risk. Enterprise of agriculture and allied sectors is subject to risk and uncertainty and affects India's food security. To do so, a risk free productive, competitive, diversified and sustainable agriculture need to emerge at an accelerated pace. Nto *et al.* (2011) ^[11] in their study on analysis of risk among agribusiness enterprises investment in Abia State of Nigeria revealed that majority (85%) of respondents used risk reducing aversion strategy as diversification. It served the

best by spreading risk across a number of enterprises and stabilize firms' income and results were in consistent with findings of (Alimi and Ayanwale, 2005; Akinsulire, 2006; Pandey, 2004 and Van Horne, 2004) ^[4, 3, 12, 16]. More so, 80 per cent respondents also used integration to reduce risk and similar results were revealed by (Ndugbu, 2003 and Akinsulire, 2006) ^[9, 3]. While forward contracting 55 per cent and insurance 50 per cent are other risk reducing strategies. But, according to Nnadi *et al.* (2013) ^[10], Aina and Omonona (2012) ^[1] have shown that cooperative participation and use of insurance have been recommended as good strategies for reducing business risks, but they are not well used by a lot of the respondents in agri business. Sekumade and Ogunro (2013) ^[15] in their study on risk assessment and management for agribusiness enterprises investment in Ondo State of Nigeria observed that majority 85 per cent of the firms adopted diversification strategy as a way of reducing risks. This involves investment in more than one portfolio. Some of the agribusiness operators also engaged in non agribusiness activities. Engagement in and earning of non-agribusiness income lowered the variants of income from agribusiness operation. Some of the agribusiness investors engaged in diversification of products produced, that is, they are involved in the production of two or more agribusiness products simultaneously. Babalola

(2014) ^[5] in his study on risk preferences and coping strategies among poultry respondents in Abeokuta Metropolis of Nigeria showed that significant major proportion of the poultry entrepreneurs 97 per cent in agri business stated that increase in staff working hours, 94 per cent cut back household spending or expenditure, diversification of enterprise 91 per cent, cancel or postpone plans to expand business 90 per cent, borrowing 89 per cent and spend business reserves 86 per cent in order to cope with business risks. Seema Unnikrishnan *et al.* (2015) ^[14] in their study on safety management practices in small and medium enterprises in India revealed that out of 30 units taken for the study, 16 mentioned an increase in operational risks in past 3 years and six mentioned a decrease in operational risks in the past 3 years due to use of safety practices in the operations; one unit mentioned both an increase and decrease in operational risks. There is lack of data regarding increases or decreases in operational safety in the eight units. Survey results specify that risks are actually rising across many SMEs, driven by inadequate worker training, expanding workforces, and employee negligence. This risk is further intensified by an aging workforce, particularly in roles requiring high levels of precision, the risk becomes higher. In a few small and medium enterprises, the risk decreased due to the use of new technologies. Improvements in the automation, machine guarding and safety committees effectively reduced the ergonomic risks. Safety dive has been evolved among the small and medium enterprises. We can see the steps towards implementation of safety practices by the small and medium enterprises with healthy financial budget but in the units of small medium enterprises with financial budgets have not taken major steps towards safety practices. To address the sources of risk and risk types/categories which are deteriorating the enterprise and also the risk management strategies were discussed here.

Methodology

The study was conducted purposively in combined Andhra Pradesh state consist of Telangana, Coastal Andhra and Rayalaseema. The state is selected for this study because of plentiful agri enterprises and also the researcher hails from the same state and there is no language problem. Exploratory research design was followed for the present study. Exploratory research design is to discover significant variables in the field situation and lay the foundation for later, more systematic, and rigorous testing of hypotheses (Kerlinger, 1973) ^[8].

Sample and data collection

The study utilized the following sampling technique to select the agri-entrepreneurs running the agribusiness firms. The first stage was selection of registered respondents in the different Government institutes. Preliminary visit was conducted to some of those agribusiness firms in the three regions. The reason is to validate the list of entrepreneurs. From each region 75 respondents were selected randomly, thus a total of 225 respondents constituted the sample for the study. The visit facilitates pretesting the research instruments to ensure validity and reliability, enabling successful data collection.

Data for this study were generated through cross sectional

method using survey instruments administered to investors or their representatives in the firms who are in positions to provide the necessary data.

1. Ranking of major sources of risks
2. Distribution of entrepreneurs according to the type of enterprises
3. Extent of risk management strategies

During the ranking process, several risks received identical scores. To address this, entrepreneur experts assigned specific positions to these risks within the general hierarchy, ordered by decreasing rank. We utilized a weighting scale of 1 to 6, where factors with tied weights were assigned a value equal to the arithmetic mean of their shared positions. The resulting expert judgments and risk weights are detailed in Tables 2 and 3. Following this, we calculated the coefficient of concordance to verify the level of agreement among the experts.

$$W = \frac{12S^2 - 3m^2k(k+1)^2}{m^2(k^3 - k) - mT}$$

Where; S = Sum of deviation squares (derived from processing of expert judgments); M = number of experts (50); k = number of risks, and T_j = Indicator that allows taking into consideration coincidence of ranks and was estimated by the formula;

$$T_j = \sum_g (t_g^3 - t_g) \quad T = \sum_{j=1}^m T_j$$

Where; t_g = number of rank g coincidences while ranking factor by expert j. Thus, coefficient of concordance varied within the range of 0 ≤ w ≤ 1. The decision rules were that if w ≥ 0.5 then the concordance may be regarded as satisfactory, if w ≥ 0.7, then concordance is considered as good. W = 1 means entire coincidence of expert judgments. (that is, excellent and more reliable result). The probability of concordance coefficient was verified by Pearson criterion. This criterion was calculated thus:

$$\chi^2 = \frac{s}{1/12 * m * n * (n+1) - 1/n - 1 * 1/12 * \sum_{j=1}^M T_j}$$

We compared the calculated value χ^2_{Calc} with the table value χ^2_{table} . If χ^2_{Calc} exceeds χ^2_{table} , we reject the null hypothesis of independent rankings. This confirms that the concordance of the forty experts' judgments regarding the ranking of agricultural enterprise risk factors is statistically significant (non-random). Consequently, these expert rankings accurately identify the factors with the most extreme impact on profitability. Following are the risk sources considered for the following study:

X1=Financial risks

X2=Market risks

X3=Regulatory and Political risks

X4=Production Risks

X5=Hazard risks

X6=Social and cultural risks

Results and Discussion

Here, in the various types of enterprises, sources of risks and its degree of influence, various types of risk management strategies adopted by the respondents in the study area were noticed and respondent's distributions according to the available enterprises, sources of risks were discussed below with the simple frequency and percentage.

Table 1: Distribution of respondents according to the type of Agri enterprises

Sl. No.	Type of enterprise	Frequency	Percentage (%)
1	Agri & allied based produce processing units	98	43.6
2	Agri & allied based produce manufacturing units	35	15.6
3	Agri & allied Input manufacturing units	17	7.6
4	Allied enterprises	49	21.7
5	Service sector (export traders and agro advisory services)	26	11.5

It was evident from the table 1 that from all the three regions, 43.6 per cent of enterprises were Agri –allied based produce processing units followed by allied enterprises (21.7%), Agri –allied based produce manufacturing units (15.6%), service sector (exporters and agro advisory centers) (11.5%) and Agri and allied based input manufacturing units (7.6%). The ratio of agri-allied based produce processing units is high compared to other enterprises because these units established in almost all villages, towns and cities. Other reason might be, commodities like paddy, pulses, cotton and groundnut were the major and staple crops of respective areas resulted in establishment of commodity-based enterprises to convert them to value added products.

Major sources of risks

As presented in table 2, the risk sources identified to be affecting agribusiness enterprises in the study area were financial risks, market risks, production risks, hazard risks, regulatory and political risks, social and cultural risks. Though six major risks were identified by the representing sample of respondents, but their degree of influence may not be the same on the productivity or profitability. This finding aligns with the research of Mbanasor and Nwankwo (2001), Nwaru *et al.* (2007), Alimi and Ayanwale (2005) ^[4], and Mikhaylova (2005), all of whom identified these factors as the primary sources of risk in agribusiness operations.

Ranking of major sources of risks

Table 2 presents the identified risk sources and their relative importance as ranked by the experts. Because simple descriptive statistics lack econometric rigor and can be misleading, we further analyzed these rankings using Kendall's W-statistics and the Pearson Chi-square (χ^2) criterion. This process began with a systematic. The entrepreneurs who can generate data in the position of directors and managing directors of the firms were selected. Each director and managing director judgment was multiplied by 1 to give the weight of the risk variable. Table 2 summarizes the risk weights and the results of the expert judgments. The analysis revealed a central tendency of 191 (calculated as the total weight of 1,146 divided by six risk sources), a sum of squared deviations of 664, and a mean rank sum of 28.645.

To verify the level of agreement among the 40 experts, we

Types of enterprises

As presented in table 1, the types of risks identified in the study area were Agro based produce processing units, Agro based produce manufacturing units, Agro based Input manufacturing units, Allied enterprise, Service sector (export traders and agro advisory services).

calculated the coefficient of concordance (W), which yielded a value of 0.792. According to Mikhaylova (2005), a value exceeding 0.70 indicates "good" concordance. Further validation using the Pearson Chi-square criterion (χ^2) resulted in a calculated value of 4.81. At 5 degrees of freedom and a 5% significance level, the critical table value is 11.07. Since the calculated value does not exceed the table value, the null hypothesis regarding the randomness of expert agreement is maintained, allowing us to isolate the most critical risk factors. The four most significant risks—ranked by decreasing influence—are financial, marketing, currency (exchange rate), and production risks. Because lower total weights signify higher influence on our 1-to-6 scale, financial risk emerged as the primary concern. This hierarchy aligns with Table 2 and matches *a priori* expectations regarding the challenges of credit access and price volatility in agribusiness.

Table 2: Distribution of respondents according to major sources of risk

Sl. No	Major sources of risk	Percentage	Rank
1	Financial risks	75.12	I
2	Market risks	69.94	III
3	Regulatory and Political risks	66.42	V
4	Production Risks	74.05	II
5	Hazard risks	66.51	IV
6	Social and cultural risks	58.0	VI

It was noticed from the table 2 revealed that, nearly three fourth of the entrepreneurs (75.12%) in all the three regions stated that intensity of loss is due to financial risk (ranked I) followed by production risks (74.05%) ranked II, market risks (69.94%) ranked III, hazard risk (66.51%) ranked IV, regulatory and political risks (66.42%) ranked V, social and cultural risks (58.0%) ranked VI. Major source of risk score indicates the cumulative score of all independent scores of each source under each respective major risk group. It means that the intensity of loss caused by each source of risk.

Extent of utilization of risk management strategies

Risk management strategies utilized by sampled firms (entrepreneurs) of the three regions are summarized and presented in the Table 3.

Table 3: Distribution of entrepreneurs according to extent of utilization of risk management strategies

	Categories	Telangana (n=75)		Coastal Andhra (n=75)		Rayala-seema (n=75)		Total (N=225)	
		F	%	F	%	F	%	F	%
Extent of utilization of risk management strategies	Low (60-76)	9	12.0	8	10.7	11	14.7	28	12.4
	Medium (76-92)	39	52.0	44	58.7	43	57.3	126	56.0
	High (92-109)	27	36.0	23	30.7	21	28.0	71	31.6

*F= frequency

From the table 3, it was known that, majority (56%) of the entrepreneurs from three regions had medium level of extent of utilization of risk management strategies followed by high (31.6%) and low level of extent of utilization of risk management strategies (12.4%). In Telangana region, majority (52%) of the entrepreneurs had medium level of extent of utilization of risk management strategies followed by high (36.0%) and low level of extent of utilization of risk management strategies (12.0%). While in Coastal Andhra region, slightly more than half (58.7%) of the entrepreneurs had medium level of extent of utilization of risk management strategies followed by high (30.7%) and low level of extent of utilization of risk management strategies (10.7%). Further, in Rayalaseema region, 57.3 per cent of the entrepreneurs had medium level of extent of utilization of risk management strategies followed by high (28.0%) and low level of extent of utilization of risk management strategies (14.7%). Hence it could be inferred that similar trend is noticed in all the three regions.

Here, the documented risk management strategies represent all the sectors of agriculture and allied enterprises. From the table 3, it was more clearly depicted that, slightly more than half (56.0%) of the entrepreneurs categorized under medium level followed by high level of extent of utilization of risk management strategies (31.6%). It means that almost (87.6%) of entrepreneurs were effectively utilizing risk management strategies. This indicates that every enterprise is utilizing strategies to mitigate/ reduce the effect of risk. The other reason might be due to the fact that most of the entrepreneurs were highly educated i.e. highly cautious and highly aware about risk and their management strategies. Besides the solo proprietorship might be the reason as one can take independent action without any delay.

Conclusion

This study constitutes a significant contribution to the existing body of literature regarding the identification, analysis and management of risks. By providing comprehensive frame work for ranking the severity of the various risks affecting the agribusiness investment and proposes actionable strategies to mitigate. This study findings revealed that financial risk emerging as the dominant challenge, followed in order of severity by production risks, marketing risks related to price fluctuations, and subsequently, hazards, regulatory and political uncertainties, and socio-cultural factors. Drawing from the empirical findings, the study highlights an urgent need for targeted efforts to foster the development of specialized agencies and institutional mechanisms designed to reduce the financial and market risks that critically threaten the sustainability of agribusiness enterprises. Strengthening these area is fundamental to foster the growth, resilience and long term viability and development of agribusiness enterprises.

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