https://doi.org/10.59277/AERD.2025.2.09

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EXAMINING THE WAY IN WHICH FARMERS' ATTITUDE MEDIATES THE ASSOCIATION BETWEEN FARMERS' KNOWLEDGE AND ADOPTION OF AGRI-INPUTS IN THE CHOSEN DROUGHT AREAS IN PRAKASAM DISTRICT

ABSTRACT

In India, the primary source of income for rural residents is the agricultural industry. Agri-inputs comprise seeds, fertilisers, insecticides, and agricultural equipment used in the agricultural industry. Nonetheless, the production of agriculture and related industries depends on agri-inputs, which might be chemical, biological, or inorganic substances. The study's primary goal is to investigate what types of agricultural inputs are used in the Prakasam district, to examine how farmers' attitudes (FA) mediate the link between farmers' knowledge (FK) and adoption (FAD) of agricultural inputs in a few drought-prone regions for better marketing practices in the Prakasam district. This study uses empirical study of research methodology and collects data from 12 randomly selected drought mandals area farmers in Prakasam district. For mediation analysis, the study uses the linear regression method. The result of the study is that FA mediates the relationship between FK and FAD. The study's findings include policy implications for relevant shareholders, manufacturing units and governing bodies.

Key words: marketing practices, mediation, farmers' attitude, farmers' knowledge, drought, agri-inputs.

JEL Classification: M31, Q12, Q13.

1. INTRODUCTION

Seeds, fertilizer, insecticides, and equipment used in agriculture are examples of agri-inputs. When each of these resources is used properly and optimally, productivity can increase (Shalini, 2014). It is more necessary than desirable for agriculture to produce more. To boost output, the National Commission of Agriculture has established goals. The goal is straightforward: India needs to feed its expanding population. As a result, it is anticipated that increased use of agricultural inputs would have more noticeable negative effects. Experts and

researchers are urging governments to implement sustainable agricultural techniques as soon as feasible (Shalini, 2014).

The prudent use of agricultural inputs is another aspect of sustainable agriculture. This meant that the agricultural inputs had to be economically viable, technically sound, and of non-degrading quality (Shalini, 2014).

The agricultural crisis has caused a gradual decline in agricultural growth and the gross domestic product. The lack of farmers' purchasing power makes the agricultural sector unprofitable when compared to other industries. In addition, the administration has reduced the agriculture problem with short-term rather than long-term solutions. Social programmes like the Mahatma Gandhi National Rural Employment Guarantee Scheme, rural health insurance, and midday lunches for schoolchildren would not enhance farmers' purchasing power (Dhas, 2009; Reddy Sai Sravanth & Sundaram, 2019). What constitutes an attitude? An attitude is a mental or neural state of preparedness that has been organised through experience and that has a directive or dynamic influence on how a person responds to all relevant objects and circumstances, according to Allport G. (1935). It is easier to define attitude as a mindset or inclination to behave in a specific manner because of one's temperament and experiences (Pickens, 2005).

Alfred Adler (1870–1937), a physician from Vienna who created the theory of individual psychology, highlighted that a person's behaviour was greatly influenced by their attitude towards their surroundings. According to Alfred, a person's thoughts, feelings and actions are the reflections of their social and physical environment, which can have a reciprocal effect. A person's behaviour and attitude may clash as a result of these encounters. Cognitive dissonance is the name given to this struggle. Inconsistency is known as cognitive dissonance. One's perception may be between "two or more of one's attitudes or between one's behaviour and attitudes in general" (Pickens, 2005).

Objectives: The goals of the study are the following:

1. To investigate the agricultural inputs used in specific drought mandals in Prakasam;
2. To examine how farmers' attitudes mediate the relationship between farmers' knowledge and their use of agri-inputs in chosen drought areas in the Prakasam district;
3. To recommend improved policy actions on agricultural inputs for the agricultural industry.

Hypothesis:

– **Null (HO)** The relationship between farmers' knowledge and their use of agri-inputs in chosen drought areas in Prakasam District is not mediated by farmers' attitudes.

– **Alternative (H1)** Farmers' attitudes have a mediating effect on the relationship between farmers' knowledge and their adoption of agricultural inputs to specific drought areas in the Prakasam District.

2. STATE OF KNOWLEDGE

The criteria provided by Edwards & Kilpatrick in 1948 was used to test farmers' attitudes on contemporary farming tools and methods. Modern farm mechanisation is seen with neutrality, even if it is well-oriented towards science and economics. Therefore, the study suggests that extension agents should work together to change the neutral mindset into a positive one so that farmers can raise their socio-economic standing by implementing modern agricultural mechanisation (Thakur & Sharma, 2016).

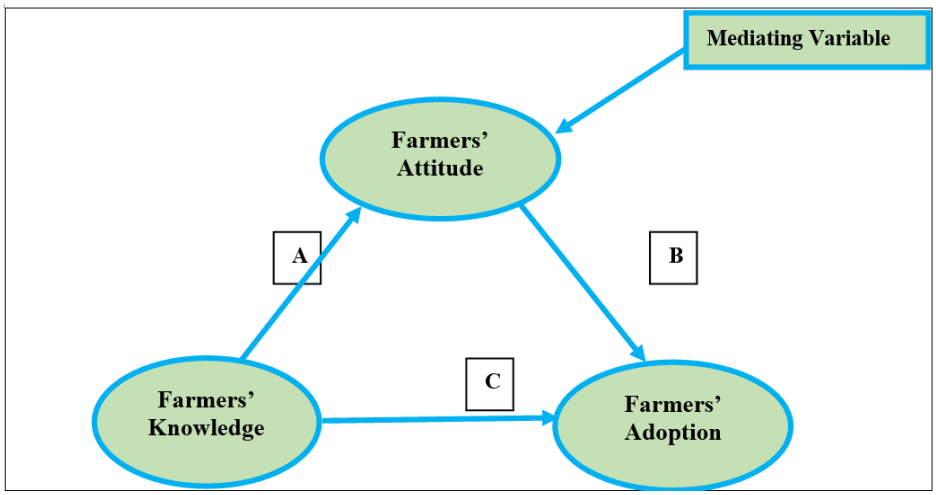
A positive or negative assessment of people, things, events, activities, ideas, or nearly everything in your surroundings is called an attitude. The degree to which farmers feel either positive or negative about agricultural inputs is known as their attitude. Attitude is a person's manner of behaving, thinking and feeling towards a circumstance or reason. The fact that a person's attitude has a significant impact on how they behave is widely acknowledged (Onima *et al*., 2017).

The only way to accomplish effective adoption of agri-inputs is for farmers to have sufficient or enough knowledge about them. However, not much research has been done in this area up until this point. The most comprehensive assessment of knowledge was conducted in Sweden in 2007 by Sundblad *et al*., although it was quite challenging because they evaluate particularly specific information about climate change (Sarkar *et al*., 2014).

Drought is defined as a prolonged period of precipitation or water scarcity, typically lasting a season or longer. Drought is a brief deviation from typical weather patterns (Service, 2006).

A broad overview of the state of drought is given by the US Drought Monitor. This weekly product is produced in partnership with the National Oceanic and Atmospheric Administration (NOAA), Department of Agriculture, and National Drought Mitigation Centre (Service, 2006).

The variety of information and theoretical or practical understanding is known as knowledge. Knowledge was operationalised in the current study as the degree to which respondents understood and possessed information regarding the suggested enhanced methods of animal husbandry and paddy agriculture in the study area. As the new practice that the respondents learned and practically applied, adoption has been operationalised.



Source: Andrew Hayes – 4th Model

Figure 1. Conceptual model.

3. MATERIAL AND METHOD

Both primary and secondary research data are used in the study. Several farmers in the chosen mandal districts were contacted directly to provide the primary data, while additional secondary sources of information were obtained from journals, articles, other research websites, notes, etc.

Research Design: To identify research gaps, this work uses exploratory research. The mediating role of farmers' attitudes on the relationship between farmers' knowledge and their adoption of agri-inputs in chosen drought areas in Prakasam District is examined in this study using descriptive research.

Data: The study uses primary source of data collection. The data is collected from the farmers whom directly interact in randomly selected 12 drought mandals, namely: Ardhaveedu, Bestavaripeta, Tarlupadu, Kandukur, Singarayakonda, Yeddanapudi, Ongole, Kanigiri, Kothapatnam, Vetapalem, Komarole and Kondepi of Prakasam district.

Table 1

Summary of the variables

No.	Variable Type	Variable
1	Independent Variable	Farmers' Knowledge (FK)
2	Dependent Variable	Farmers' Adoption (FA)
3	Mediator Variable (Intervening variables)	Farmers' Attitude (FA)

Source: Author's calculations.

Sample Design: The sample size for this research project was chosen using the random sampling approach. The sample size for the research study is 70. In Prakasam, there are three divisions in total: Kandukur, Markapur and Ongole. For the research study, from each division were chosen 20% of the mandals.

4. RESULTS AND DISCUSSIONS

The study uses mediation analysis and simple linear regression to examine how farmers' attitude mediates the relationship between farmers' knowledge and their adoption of agri-inputs in the chosen drought areas in Prakasam District. The study selects 20% of the mandals from each division (Kandukur, Ongole and Markapur) in Prakasam district for the scope of this research study. The primary data was collected through direct contact with the respondents. Regression Analysis is the most important tool and technique to forecasting and prediction.

Simple Linear Regression is the most common type of regression analysis. It is predictive analysis. The simplest form of regression analysis is Y= ax+b+e.

Here Y – dependent Variable, a, b are coefficients, e – error term. Y values depend proportionally to x (Table 2).

Table 2

Linear regression

Model Fit Measures

				Overall model test			
Model	**R**	**R^2**	**Adjusted R^2**	**F**	**df1**	**Df2**	**P**
1	0.548	0.300	0.298	116	2	540	< .001

Model coefficients – FAD

			98% Confidence Interval			
Predictor	**Estimate**	**SE**	**Lower**	**Upper**	**T**	**P**
Intercept	1.725	0.1569	1.3591	2.091	11.00	< .001
FA	0.178	0.04010	0.0827	0.274	4.35	< .001
FP	0.379	0.0357	0.2959	0.462	10.62	< .001

Note: Weighted by 'FK'

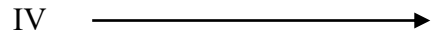
Normality Test (Shapiro-Wilk)

Statistic	**P**
0.979	< .001

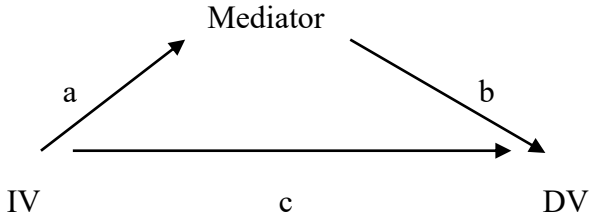
Source: Author's *calculations.*

Mediation Variable or Mediator: The independent and dependent variables are impacted by the mediation variable, which is an influencing variable. It clarifies how independent and dependent variables relate to one another. Mediation analysis describes how variables relate to one another. Andrew Hayes' fourth model of mediation is used in this investigation.

Total Effect – The impact of Independent Variable (IV) on Dependent Variable (DV) without the Involvement of Mediator (c).



Direct Effect – The Impact of IV on DV with presence of the Mediator (c).



Indirect Effect: The Impact of IV on DV through the Mediating Variable (c).

Mediation Types: In general, mediation can be divided into three categories:

1. NO Mediation: When the indirect effect is negligible, this happens.
2. Partial Mediation: This happens when both the direct and indirect effects are substantial.
3. When the direct effect is negligible and the indirect effect is substantial, full mediation takes place.

Mediation Analysis: To evaluate the mediating function of farmers' attitudes (FA) on the relationship between farmers' knowledge (FK) and farmers' adoption (FAD), mediation analysis was conducted. According to the results (Table 3, Figure 2), FK had a significant overall influence on FAD (H1: $\beta = 0.256$, $t = 6.47$, $P < 0.001$). When the Mediating Variable was included, the effect of FK on FAD was also significant ($\beta = 0.134$, $t = 3.77$, $P = 0.001$). It was determined that FK had a substantial indirect influence on FAD through FA ($\beta = 0.122$, $t = 5.62$, $P = 0.001$). This indicates that FA acts as a partial mediator in the interaction between FK and FAD.

Table 3

Mediation analysis

Total effect (_>_).e		Direct effect (_>_) e		Indirect effect of FK on FAD (a*b)					
Coefficient Value	P-value	Coefficient Value	P-value	H2: >_>_	Coefficient Value	SD	T-value	P-value	BI (%)
0.256	0.001	0.124	0.001	FK>FA>FAD	0.133	0.0215	6.18	0.001	0.0827; 0.183

Estimates of Mediation

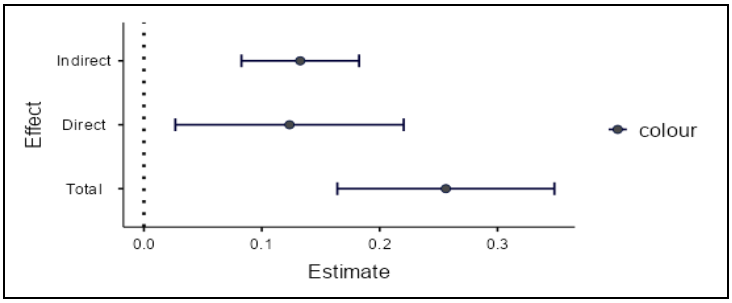
				95% Confidence Interval				
Effect	Label	Estimate	SE	Lower	Upper	Z	P	% Mediation
Indirect	a × b	0.133	0.0215	0.0827	0.183	6.18	< .001	51.8
Direct	C	0.124	0.0416	0.0267	0.220	2.97	0.003	48.2
Total	c + a × b	0.256	0.0396	0.1641	0.348	6.47	< .001	100.0

Path Estimates

				95% Confidence Interval			
	Label	**Estimate**	**SE**	**Lower**	**Upper**	**Z**	**P**
FK→FA	a	0.408	0.0372	0.3212	0.494	10.95	< .001
FA→FAD	b	0.325	0.0434	0.2242	0.426	7.49	< .001
FK→FAD	c	0.124	0.0416	0.0267	0.220	2.97	0.003

Source: Author's calculations.

The adoption of agricultural inputs by farmers is directly impacted by their knowledge, with 42.8% of mediation occurring. It is known as direct effect. Farmers' attitudes, a mediating variable, have a 51.8% impact on farmers' adoption at the same time. It is known as indirect impact. However, based on the findings of the study, farmers' attitudes are partially mediated between their adoption and their knowledge through mediating variables. As a result, the study concludes that farmers' attitudes regarding agricultural inputs for improved marketing strategies are influenced by the mediating variable.



Source: Author's calculations

Figure 2. Estimate Plot.

Findings:

a. The study concludes that there is partial mediation between farmers' knowledge and their adoption through the mediating variable of farmers' attitude. When there is partial mediation, both the direct and indirect effects are noteworthy.
b. Direct effect denotes a direct, mediator-free relationship between farmers' adoption (DV) and their knowledge (IV). Through a mediator variable, such as farmers' attitudes, farmers' knowledge (IV) influences farmers' adoption (DV) in an indirect manner. In order to improve marketing strategies, farmers' attitudes towards agri-inputs in specific drought zones of the Prakasam district are crucial mediating factors.
c. Additionally, the study examines how farmers' attitudes mediate the relationship between farmers' knowledge and their adoption of agri-inputs in chosen drought areas in Prakasam District.
d. The report also identifies "poor irrigation, a high interest rate from non-institutional agencies, a lack of government policies, and a lack of institutional credit. "The assessment clarified that little research had been done in particular on the problem of tenant farmers' suicides in India" (Reddy Sai Sravanth & Sundarm, 2019). A prudent use of agricultural inputs is another aspect of sustainable agriculture. This meant that the agricultural inputs had to be economically viable, technically sound and of non-degrading quality.
e. As a result, businesses that sell agricultural inputs must market their goods as a sustainable and lucrative way to do business for the company and its stakeholders.
f. To evaluate the mediating function of farmers' attitudes (FA) on the relationship between farmers' knowledge (FK) and farmers' adoption (FAD), a mediation analysis was conducted. The findings indicate that FA acts as a partial mediator in the interaction between FK and FAD.
g. Finally, the study used farmers' attitudes as a mediating variable to explain the association between farmers' education and adoption of agri-inputs in a few drought areas in the Prakasam district. The findings indicate that farmers' attitudes, the mediating variable, have a significant influence on their adoption. The study also shows that farmer's mindset has a significant effect in the adoption process. Thus, when farmers wish to implement new agricultural inputs in their fields, their mindset largely determines the outcome.

Recommendations:

a. The report advises agricultural manufacturing firms to create agricultural inputs after taking farmers' attitudes into account. The report also recommends that the Government of Andhra Pradesh enhance the number of agri-input awareness training programs for farmers and use

RBKs or other extension centres/sources to facilitate timely delivery of necessary inputs to farmers.

b. To aid in their rehabilitation, the corporate and non-governmental organisations (NGOs) have taken in the villages impacted by the drought. Financial aid for farmers is not a solution to the problem of farmer suicides. The Indian and Andhra Pradesh governments should take preventative action against farmer suicides (Reddy Sai Sravanth & Sundarm, 2019).

c. Following data analysis, the study recommends that agricultural manufacturing companies set cheap, subsidised prices for agricultural inputs like fertilisers, equipment, and other items depending on farmer attitudes and needs. This will benefit both farmers and businesses.

d. Additionally, the report recommends that the AP government give farmers access to cutting-edge equipment and technology at a reduced cost in order to improve their standard of living and the agriculture industry as a whole.

5. CONCLUSIONS

Agriculture is the main source of income for those living in the rural areas of India. Farming is the livelihood of over 70% of farmers. Typically used in the agricultural sector, agri-inputs include seeds, fertilisers, pesticides, and agricultural machinery. The findings indicate that the mediating variable or farmers' attitudes, has a significant influence on farmers' adoption. In other words, if farmers want new agricultural inputs to be included into their farming operations, their mindset is crucial. According to the study, agri-manufacturing firms should start producing agricultural inputs after evaluating farmers' attitudes. Furthermore, the report recommends that the AP government establish more awareness-raising training programs and use RBKs to schedule and maintain timely access to necessary farmers for agricultural supplies. Using a random selection technique, the study has chosen a limited number of mandals from Prakasam district, including Ardhaveedu, Bestavaripeta, Kanigiri, Kandukur, Ongole and S Konda, among others (12 mandals in total), which are covered by the three revenue divisions of Kandukur, Markapuram, and Ongole, respectively. The study's further scope includes doing research in drought-prone areas of Prakaam District and offering recommendations to other drought districts and regions. The investigation comes to a close at the end, finding that FA mediates the connection between FK and FAD.

ACKNOWLEDGEMENTS

I want to sincerely thank my parents, friends and research supervisor for their support, inspiration, and drive, all of which have been crucial to the successful completion of my research project. Additionally, I would want to

express my gratitude to the chosen Mandal farmers for their assistance during the data collection process.

CONFLICT OF INTEREST

There are no conflicts of interest to declare.

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