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# Relationship between Profile and Knowledge Level of Farmers about Pradhan Mantri Fasal Bima Yojana Scheme in Cuddalore District of Tamil Nadu, India

**Bevin.R [a++*], Kalidasan.T [a#] and Rajaguru. S [b†]**

*[a] Department of Agricultural Extension, Faculty of Agriculture, Annamalai University, Tamil Nadu- 608002, India.*
*[b] The Gandhigram Rural Institute, Dindigul – 624302, Tamil Nadu, India.*

***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Agriculture has always been a risky profession. Unlike the industrial sector it is subjected to the vagaries of the nature. It is facing so many difficulties such as drought, floods, cyclones, pest, diseases etc. The present need is protecting the famers from financial losses arising due to natural

*[++] PG Scholar;*
*[#] Associate Professor;*
*[†] Assistant Professor;*
**Corresponding author: Email: bevinregis@gmail.com;*

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calamities. The government gives protection to farmers in the way of crop insurance scheme. The recently launched crop insurance scheme is the Pradhan Mantri Fasal Bima Yojana, which is a kind of a “One Nation-One scheme” launched in the year 2016. Crop insurance is an important risk management tool used by farmers for stabilizing farm income against crop failure due to different types of natural calamities which reduce the production. Keeping in mind the importance of crop insurance scheme, the present study was undertaken to study on relationship between profile characteristics and knowledge level of farmers about Pradhan Mantri Fasal Bima Yojana scheme in Cuddalore district. The study revealed that about 40.84 per cent of the respondents had medium level of knowledge regarding PMFBY scheme. The variables educational status and farming experience were found to be significant at 1 per cent level of probability.

*Keywords: Crop insurance; natural calamities; risk management; farm income.*

## 1. INTRODUCTION

“Agriculture is an important sector of Indian economy. The share of agriculture and allied sector in total Gross Domestic Product (GDP) is 16.00 per cent in Indian economy. In India 54.60 per cent of population is engaged in agriculture and allied activities” (Census 2011). “Agriculture plays a vital role in development of Indian nation. But Indian agriculture is characterized by risk bearing and uncertainty because of many factors like, lack of technology, lack of knowledge on risk mitigation, irrigation, weather condition, usage of seeds, fertilizers, pesticide, uncertainty in monsoon, lack of input supply facilities, non-availability of proper market facility, pest and diseases, the higher expenditure as compared to production, uncertain income in each year. Due to dependence on weather and biological uncertainties in managing crops, the agriculture production fluctuates in India and thus has direct impact on both the national income and the farmers or the cultivators” (Shanker, 2018).

“Agriculture in India is highly susceptible to risks like droughts and floods. It is necessary to protect the farmers from natural calamities and ensure their credit eligibility for the next season. For this purpose, The Government of India introduced many agricultural schemes throughout the country. While the idea of insuring farmers against crop losses is not new, the PMFBY is an attempt to plug the helps in the older crop insurance schemes such as the National Agriculture Insurance Scheme (NAIS) and the Modified National Agriculture Insurance Scheme (MNAIS)” (Census 2011).

PMFBY is one of the crop insurances schemes for farmers to get recovery from failure. Banks are making compulsion for insurance while taking loans. So those who are loan holder, can take advantage of this scheme (Singh et al., 2024).

Pradhan Mantri Fasal Bima Yojana aims to provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crops because of natural calamities, pests, and diseases (Diyyala et al., 2024). Pradhan Mantri Fasal Bima Yojana has been piloted in the country since kharif season of 2016 (June,2016). It was implemented only in 14 states of India, which are most affected by weather calamities and later expanded to other parts of the country. States like Madhya Pradesh, Uttar Pradesh, Gujarat, Rajasthan, and Maharashtra etc. were in the list of the affected states. Pradhan Mantri Fasal Bima Yojana (PMFBY) operates on the concept of “Area Approach.”

## 2. METHODOLOGY

The present study is an ex-post-facto research design that was adopted as a strategy of investigation to obtain answer to the research questions. According to Kerlinger words, ex-post-facto research is a systematic empirical enquiry in which the researcher does not have direct control of influencing 'independent variables' because their manifestation has already occurred or because they are inherently not manipulatable. Influence about relationship among variables are made without direct intervention but from concomitant variation of independent (influencing) and dependent (consequent) variables.

The study was conducted in Cuddalore district of Tamil Nadu state. Cuddalore district has 14 blocks. Out of 14 blocks, Parangipettai block has highest number of insured farmers in this scheme. Ten villages were selected purposively based on highest number of insured farmers in PMFBY scheme. Proportionate random sampling procedure was applied to select one hundred and twenty respondents from the selected

panchayats. Proportionate random sampling ensures all samples in the population have same probability of selection irrespective of their cluster size. A well-structured interview schedule was used for collection of data.

The knowledge level of the respondents was calculated by using the formula followed by Karthiyaeeni (2020).

The formula used for the calculation of knowledge index of each respondent was

Knowledge index = (K/P) * 100

Where,

K = Knowledge scores obtained by an individual respondent
P = Maximum possible scores for all items

The respondents were classified into three categories such as low, medium, and high using cumulative frequency.

Zero-order correlation was worked out to find out the degree of relationship of independent variables with each of the dependent variable.

Zero-order correlation co-efficient.

$$'r' = \frac{\frac{\sum Xy}{n} - \bar{X}\bar{Y}}{\sigma X \cdot \sigma y}$$

Linear multiple regression was worked out to find the degree of functional relationship of the independent variable with the dependent variable. The following is the general formula of multiple regression equation,

$$Y=a+b_1X_1+b_2X_2\ldots\ldots\ldots\ldots +b_nX_n$$

Where,

Y - Dependent variable
a - Intercept
$X_1$ to $X_n$ - Independent variables;
$b_1$ to $b_n$ - Partial regression coefficient.

## 3. RESULTS AND DISCUSSION

The results in Table 1, shows that about 40.84 per cent of the respondents had medium level of knowledge followed by 33.33 per cent of the respondents had high level and 25.83 per cent of the respondents had low level of knowledge about Pradhan Mantri Fasal Bima Yojana scheme. "This might be due to majority of the respondents had formal education and medium level of social participation which gives basic knowledge about the scheme. Farmers may not be sufficiently informed about the existence of schemes and how they can benefit from the scheme. The awareness programs and outreach efforts to educate farmers about the benefits and details of the scheme can contribute to a high level of knowledge" (Darshan et al*.,* 2021) and Nagesha et al*.,* 2022).

The zero-order correlation analysis and regression analysis were computed to know the relationship of the profile characteristics of the respondents with their knowledge on PMFBY scheme. The results are given in Table 2.

The Table 2 indicates that educational status ($X_2$) and farming experience ($X_5$) were found to be significant at 1 per cent level of probability. The variables social participation ($X_8$), extension agency contact ($X_9$), information source utilization ($X_{10}$), scientific orientation ($X_{11}$) and risk orientation ($X_{13}$), were significant at 5 per cent level of probability. The correlation values of the variables age($X_1$), family size ($X_3$), occupational status($X_4$), farm size ($X_6$), annual income ($X_7$), economic motivation ($X_{12}$) and innovativeness ($X_{14}$) were found to be non-significant.

"Educational status had shown a positive and significant relationship at 0.01 per cent level of probability. Thus, it is obvious for the respondents with high educational status to have increased knowledge level on Pradhan Mantri Fasal Bima Yojana scheme" (Chauhan and Patel, 2021).

Farming experience had shown a positive and significant relationship at 0.01 per cent level of probability. Majority of the respondents had high farming experience which resulted in increased knowledge level on Pradhan Mantri Fasal Bima Yojana scheme. This result was in line with the findings of Nagesha et al*.* (2022).

"Social participation showed a positive and significant relationship at 0.05 per cent level of probability. Higher education and active participation in social organization might have provided the respondents more opportunity and exposure to gather knowledge regarding various government schemes. This might be the reason for having increased level of knowledge on Pradhan Mantri Fasal Bima Yojana scheme" (Darshan et al., 2021).

**Table 1. Distribution of respondents according to their overall knowledge level about Pradhan Mantri Fasal Bima Yojana scheme (n=120)**

| S. no | Category | Number of respondents | Per cent |
|---|---|---|---|
| 1. | Low | 31 | 25.83 |
| 2. | Medium | 49 | 40.84 |
| 3. | High | 40 | 33.33 |
| Total | | 120 | 100.00 |
| **Mean= 13.12** | | **SD= 4.72** | |

**Table 2. Zero-order correlation and Regression analysis of characteristics of the respondents with their knowledge level about PMFBY scheme**

| S. no | Variables | 'r' value | Regression coefficient | Standard error | 't' value |
|---|---|---|---|---|---|
| $X_1$ | Age | -0.083NS | 0.089 | 1.553 | 0.449NS |
| $X_2$ | Educational status | 0.292** | 0.268 | 0.089 | 3.011** |
| $X_3$ | Family size | -0.141NS | 1.000 | 0.672 | 1.488NS |
| $X_4$ | Occupational status | 0.114NS | 0.056 | 0.032 | 1.510NS |
| $X_5$ | Farming experience | 0.279** | 2.468 | 0.816 | 3.024** |
| $X_6$ | Farm size | -0.117NS | 0.500 | 0.371 | 1.347NS |
| $X_7$ | Annual income | 0.142NS | 0.039 | 0.002 | 0.457NS |
| $X_8$ | Social participation | 0.192* | 0.168 | 0.084 | 2.000* |
| $X_9$ | Extension agency contact | 0.198* | 0.592 | 0.316 | 1.873* |
| $X_{10}$ | Information source utilization | 0.205* | 0.350 | 0.071 | 2.443* |
| $X_{11}$ | Scientific orientation | 0.196* | 0.142 | 0.069 | 2.057* |
| $X_{12}$ | Economic motivation | 0.142NS | 0.696 | 0.549 | 1.267NS |
| $X_{13}$ | Risk orientation | 0.187* | 0.342 | 0.162 | 2.111* |
| $X_{14}$ | Innovativeness | 0.127NS | 0.125 | 0.795 | 1.125NS |

** - *Significant at 1per cent level of probability*
* - *Significant at 5 per cent level of probability*
*NS – non-significant*

Extension agency contact showed a positive and significant relationship at 0.05 per cent level of probability. This shows that more the extension agency contact, more will be the knowledge level on Pradhan Mantri Fasal Bima Yojana scheme. This result was in line with the findings of Jamanal et al. (2019).

"Information source utilization showed a positive and significant relationship at 0.05 per cent level of probability. The frequent contact with the personal cosmopolite and personal localite channel by the respondents helps them in gaining knowledge about the scheme. Also, the usage of television, newspaper, leaflets, and online resources might be the reason for having increased level of knowledge on Pradhan Mantri Fasal Bima Yojana scheme" (Dhande, 2017).

"Scientific orientation showed a positive and significant relationship at 0.05 per cent level of probability. The respondents with higher scientific orientation are more likely to adopt modern and best practices in crop management. This might have helped them to gain more knowledge about Pradhan Mantri Fasal Bima Yojana scheme" (Mariappan, 2016).

"Risk orientation showed a positive and significant relationship at 0.05 per cent level of probability. The probable reason might be that the respondents with higher risk orientation are more likely to undertake calculated risk in farming. This might have motivated them to avail the knowledge level regarding the Pradhan Mantri Fasal Bima Yojana scheme" (Karthiyaeeni, 2020).

The predictive power of the linear multiple regression was estimated with the help of the co-efficient of multiple determination ($R^2$ = 0.561). The $R^2$ value indicated that all the fourteen variables taken explained together as much as 56.10 per cent of variation in the knowledge level

of farmers on PMFBY scheme. The 'F' value was found to be significant at one per cent level of probability.

The prediction equation for the respondents is as follows:

$Y = 6.835 + 0.089(X_1) + 0.268(X_2) + 0.672(X_3) + 0.056(X_4) + 2.468(X_5) + 0.500(X_6) + 0.039(X_7) + 0.168\ (X_8) + 0.592\ (X_9) + 0.350(X_{10}) + 0.142(X_{11}) + 0.696(X_{12}) + 0.342(X_{13}) + 0.125(X_{14})$

The Table 2 indicates that educational status ($X_2$) and farming experience ($X_5$) were found to be significant at 1 per cent level of probability. The variables social participation ($X_8$), extension agency contact ($X_9$), information source utilization ($X_{10}$), scientific orientation ($X_{11}$) and risk orientation ($X_{13}$), were significant at 5 per cent level of probability. The correlation values of the variables age($X_1$), family size ($X_3$), occupational status($X_4$), farm size ($X_6$), annual income ($X_7$), economic motivation ($X_{12}$) and innovativeness ($X_{14}$) were found to be non-significant.

The variable educational status ($X_2$), farming experience ($X_5$), social participation ($X_8$), extension agency contact ($X_9$), information source utilization ($X_{10}$), scientific orientation ($X_{11}$) and risk orientation would bring about 3.011, 3.024, 2.000, 1.873, 2.443, 2.057 and 2.111 units increasing in knowledge respectively.

## 4. CONCLUSION

It can be concluded that about 40.84 per cent of the respondents had medium level of knowledge regarding Pradhan Mantri Fasal Bima Yojana scheme. The variables educational status and farming experience were found to be significant at 1 per cent level of probability. The variables social participation, extension agency contact, information source utilization, scientific orientation, and risk orientation, were significant at 5 per cent level of probability. The correlation values of the variables age, family size, occupational status, farm size, annual income, economic motivation, and innovativeness were found to be non-significant.

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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