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Socio-psychological Determinants for Technology Socialisation of Jute Production in West Bengal

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ABSTRACT

Jute is a major commercial crop grown by majority of the small and marginal farmers of West Bengal. To make this venture profitable ICAR-Central Research Institute of Jute and Allied Fibres (CRIJAF) had developed innovative jute production technologies. The study was conducted during 2021 at villages of North 24 Parganas and Nadia districts of West Bengal where ICAR-CRIJAF had disseminated its innovative technologies. A sample of 160 jute growers comprising of 80 adopter farmers and 80 non-adopter farmers were selected randomly. The objective was to identify the influence of the socio-psychological characteristics of the jute growers on their level of technology socialisation. Canonical correlation analysis was carried out to find the association between these two sets of variables. The variables; achievement motivation, innovativeness, education, land holdings etc. moved together with adoption whereas farming experience and age followed the same direction as rejection and discontinuance.

INTRODUCTION

In West Bengal, the total cultivated area of jute was 12.47 thousand hectares, total production is 162.10 thousand bales with a productivity of 2340 kg/ha in the year 2020-21. As compared to the financial year 2017-18 with area of 525.44 thousand hectares, production of 7637.85 thousand bales and productivity of 2616 kg/ha (Office of Jute Commissioner, 2022) jute farming is declining over the past few years. There was an overall decrease in the production, area and productivity over the past few years. In fiscal year 2021, India produced 962 thousand metric tons of jute products and goods. An overall decline was recorded over the last decade (Statista Research Department, 2022) owing to the cost advantageous polypropylene as a packaging material.

Therefore, to improve this scenario of jute venture, ICAR-Central Research Institute for Jute and Allied Fibres (CRIJAF) has introduced innovative jute production technologies that could boost up the jute cultivation. The innovative jute production technologies that were developed and disseminated by ICAR- CRIJAF are improved varieties of jute seeds, integrated weed control strategies, soil testing based fertilizer application, efficient microbial consortium for retting, cost effective machineries like multi-row seed drill, flax extractor, bast fibre extractor, herbicide brush, nail weeder, etc. (Mahapatra et al., 2012).

In India, jute is mostly produced by the marginal (65%) and small farmers (25%) of West Bengal comprising of 80 per cent of jute production of the nation. Therefore, the positive impact of the adoption of jute production technologies will directly benefit these farming communities (Chapke, 2013). Although the innovative jute production technologies are effective technology that can make the venture of jute cultivation more profitable, the actual adoption of such technology is low and is mainly confined to the trainee farmers (Sadat et al., 2017). Although the extension wing of the research stations, SAUs and KVKs are putting their efforts to motivate the farmers for adopting the improved production technologies related to jute cultivation. But, still there exists a socio-psychological gap that restricts the jute growers to adopt such innovative technologies. A study carried out by Chapke (2009)

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revealed that about 83 per cent jute growers were unaware about the technologies developed by ICAR-CRIJAF such as jute varieties, fibre extractor machine, herbicide, intercropping, recommended fertilizer dose, line sowing by furrow seed drill and seed treatment. The lack of awareness and low adoption of modern agricultural technologies have increased the vulnerability of the farm households towards production risks (Nain et al., 2014; Singha et al., 2016). Therefore, it is important to recognize the particular characteristics that will determine not only their adoption behaviour but their rejection and discontinuance as well. Nain et al., (2018) observed that characteristics of innovation like its relevancy and financial sustainability becomes utmost important. Previous studies revealed that environmental factors along with socio-economic and psychological attributes of the farmers effect significantly towards adoption and diffusion of agricultural technologies in different farming systems (Lestrelin et al., 2012). For this purpose, the study has been carried out with an objective to find out the association between levels of socialisation of jute technology with those socio-psychological variables.

METHODOLOGY

In order to carry out the ex-post facto research those villages were selected purposively where ICAR-CRIJAF disseminated the innovative jute production technologies to the practicing jute cultivators. Therefore, Kumra village under Habra Block and Brahmapur village under Haringhata Block of 24 Parganas (North) and Nadia districts respectively were selected purposively for the present study respectively. Forty jute growers were selected randomly from each village who had already adopted the innovative jute production technology developed by ICAR-CRIJAF, Similarly, 40 jute growers were selected from each village randomly who have not adopted the recommendations of ICAR-CRIJAF. Therefore, a total 80 respondents were selected from each village using simple random sampling method. A total of 160 respondents were selected in order to carry out the study. An exploratory research design was followed as it aims to identify the underlying relationships between the sets of variables.

To measure the socio psychological characteristics of the jute growers, fourteen independent variables were selected *viz*. achievement motivation, innovativeness proneness, risk orientation, marketing orientation, scientific orientation, economic orientation, age, education, farming experience, extension contact, land holding, mass media exposure, economically active member of the family and family size.

Similarly, technology socialisation was dependent variable which was operationalised as the complex interaction of the social processes like technology adoption, discontinuance and rejection. The adoption, rejection and discontinuance scores of the respondents were computed considering twelve technology indicators recommended by ICAR-CRIJAF. These recommendations include improved variety of seeds viz. JRO 204, seed treatment, optimum sowing period of jute, optimum seed rate, fertilizer application, weed management, insect, pest and disease management, optimum harvesting period, CRIJAF SONA, CRIJAF Nail Weeder and use of multirow seed drill for sowing of jute seeds. The scores indicate how much the technologies were adopted, rejected or discontinued by the jute growers.

Accordingly, the extent of adoption/rejection/discontinuance was measured through improvisation over the adoption scale developed by Pareek & Chattopadhyay (1966). The following formula was given in order to measure the variable.

$$A_E = \frac{\sum_{i=1}^{n} Y_{Ai} \times L_{Ai}}{n_A}$$

Where, A_E = Adoption / Rejection / Discontinuance Quotient of the respondent

Y_{Ai}= Period of Adoption / Rejection / Discontinuance for i^{th} items of adoption of the respondent.

L_{Ai}= Level of Adoption / Rejection / Discontinuance for i^{th} items of adoption of the respondent.

n_A= Total number of items of Adoption / Rejection / Discontinuance.

The data were collected using structured interview schedule during May-July 2021. Canonical correlation analysis was carried out through SPSS v26.

RESULTS AND DISCUSSIONS

Association between level of technology socialisation and socio-psychological variables

Figure 1 present CCA (Canonical Correlation Analysis) wherein two sets of variables were elucidated based on the cross loadings. CCA was carried out since there were more than one set of dependent variables (Y) and multiple numbers of independent variables (X). It was found that the left side variables (adoption-Y_1) had preferred to move in a solitary manner, while the other two variables rejection and discontinuance had created a sub-conglomeration which has been impacted by right side (X) variables i.e., age and farming experience. So, adoption behaviour of a respondent was distinctly impacted by the variables like achievement motivation, innovativeness proneness, risk orientation, market orientation, scientific orientation, economic orientation, education, extension contacts, land holdings, mass media exposure, family size and economically active member.

The results implied that discontinuance and rejection had built up a close kinship and this is simply because of the nature of the two eventualities of having neighbourhood proximity. The innovative jute production technologies which were discontinued subsequent to adoption, had it been gone through a proper contemplation, could have been rejected earlier and these two variables took farming experience and age as contributing causal factors. Adoption can take place as an impromptu effect of induced extension intervention, away from this. For rejection and discontinuance, the same respondent may need deeper insights and logical discourses. The entire paradigm suggests that these complex interactions amongst and between two sets of variables go occurring isochronously, yet with some clandestine relationship having exerted between two sets of variables. Adoption can here be considered as an ephemeral phenomenon while rejection and discontinuance merit more time and deeper insights.

Similar outcomes were found from the study by Mondal & Bandyopadhayay (2015), identified the factors *viz*. personal cosmopolite sources, mass media exposure, extra village contact and

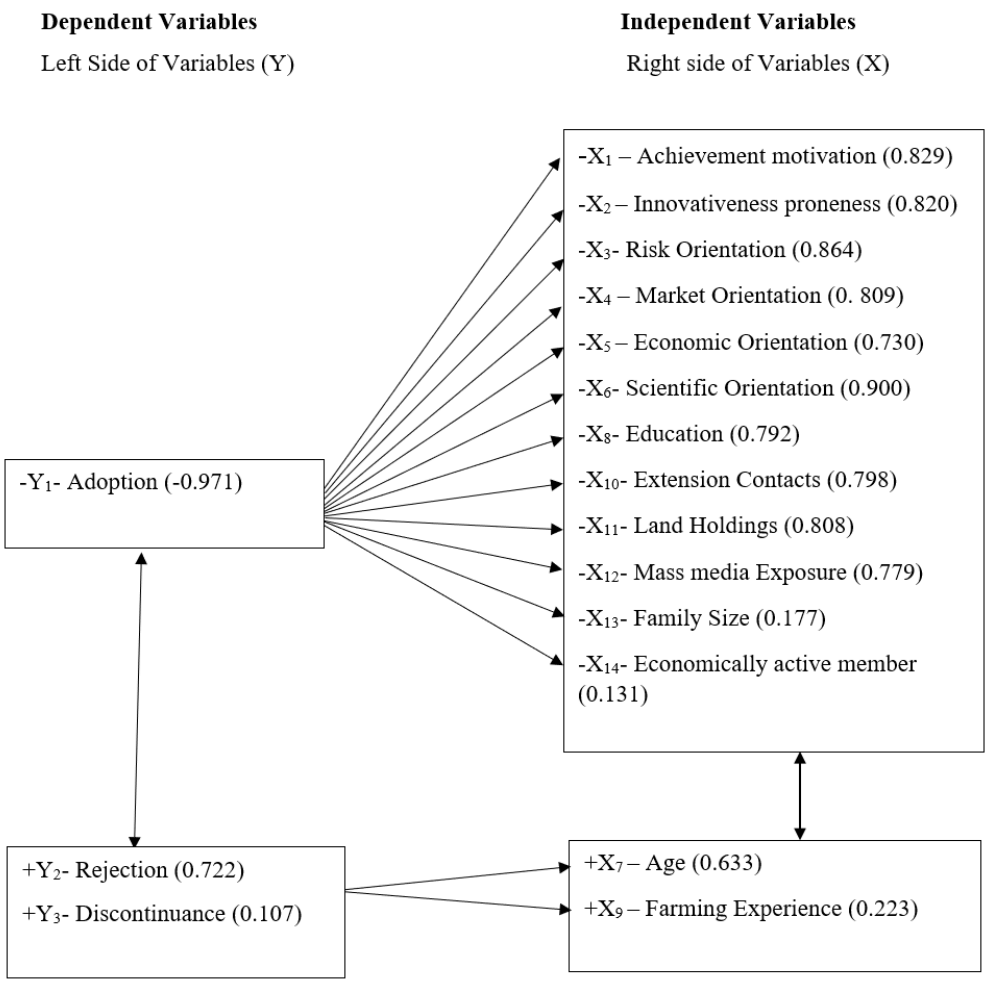

Figure 1. Canonical correlation analysis to derive the interaction pattern of left and right side variables (dependent and independent variables)

education having a significant influence on the extent the knowledge and adoption of the jute production technologies. Kumar et al., (2017) found that the sources of information utilization, scientific orientation and social participation of the respondents exhibited significant relationship with adoption of jute production technologies. Mishra et al., (2020) found that age, annual income, education, social participation, family type, mass media exposure, use of information sources, land holdings, knowledge and socio-economic status were correlated with adoption of improved practices. Shasani et al., (2020) revealed variables *viz.*, social participation, extension participation, attitude, mass media exposure and knowledge had positive and significant association with the adoption of the technology. Kakkad et al., (2019) found education, social participation, extension contacts, land holdings, economic motivation and risk orientation had significant association with extent of adoption. Gautam et al., (2007) revealed that social participation, herd size, family education and occupation had positive correlations with adoption while farm size was correlated negatively with adoption of dairy practices.

CONCLUSION

It is the farmer who put the ideas into actions; to implement the new technology to his field. The factors like achievement motivation, innovativeness proneness, risk orientation, market orientation, scientific orientation, economic orientation, education, extension contacts, land holdings, mass media exposure, family size and economically active member are found to move congruently with adoption, whereas farming experience and age were found to be moving in the same direction with rejection and discontinuance of the innovative jute production technologies in the study area. These determinants should be considered by the extension agencies to redesign the methods and techniques to transfer the technologies in the study areas having similar conditions. So that, it could lead to enhancement of adoption and reduce the rate of rejection and discontinuance of the available technologies. This would lead to improvement of their livelihood and well-being and that will help to achieve economic prosperity of jute growers.

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