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Perception of the Jute Growers on Attributes of Innovation- CRIJAF SONA

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ABSTRACT

To improve the quality of the jute fibres CRIJAF SONA was developed and disseminated by ICAR- Central Research Institute of Jute and Allied Fibres (CRIJAF). A study was carried out on 2021 in North 24 Parganas and Nadia districts respectively to assess the various aspects of CRIJAF SONA as perceived by the randomly selected 80 jute growers using structured interview schedule. The index values of perceived attributes of CRIJAF SONA for relative advantage, compatibility, complexity, observability and trialability were calculated as 93.87, 88.25, 43.08, 93.33 and 94.69 respectively. The technology effectiveness was found as 85.41 which shows that the technology is having favourable perception in selected jute growing areas.

INTRODUCTION

Jute is one of the major commercial crops in West Bengal, traditionally grown for its fiber through a microbial process called 'retting'. Usually, the mature stem of the harvested jute plant is soaked in pond. Retting is a preferred rotting process that split up the fibers from the jute stem without degrading the cellulose fibers. Microbes that assist in retting consume non-fibrous materials i.e., pectin and hemicellulose. Retting is one of the significant operations that determine the quality of jute yarn and therefore its price. In order to improve the quality of the jute fibres a microbial formulation, CRIJAF SONA, was developed by ICAR-Central Research Institute of Jute and Allied Fibres (CRIJAF) (Majumdar et al., 2011). The technology is very promising as retting of jute by the microbial formulation is completed within a shorter time than the conventional methods and also improves the grade of fibre. The talc-based formulation has been disseminated to the clientele group, so that the technology could become the integrated part and parcel of their farming practices. But only extension efforts are not sufficient to transfer the technologies to the farmers but also the perceived attributes of technology are the important factors that affect the transfer of technology process (Jamanal & Sadaqath, 2018).

The attributes of any technology refer to its typical characteristics that determines its position, its relation with the existing beliefs and values in any social system and thus differentiates it from other innovations in terms of its adoption and sustenance. The selection and purchase of farm innovations are related with the attributes of the technologies like relative advantage, trialability, durability, implement's simplicity and initial cost (Patil & Kokate, 2021). Moreover, the extent of adoption of modern technologies are substantially affected by attributes like relative advantage and observability, while, the complexity enforces a relatively negative impact on adoption (Singh et al., 2021).

The farmers' perceptions of the attributes of any innovation cannot be the equivalent to that of the experts' perceptions. The strength of need of the different components were perceived differently by both the stakeholders (experts as well as farmers), the experts concentrated on accuracy of information, practicability of information, use of language, profitability, clarity of information, economic parameters, technical details and procedural details in order as prime focus, whereas the farmers expressed the high relevance for materials required, technical details, precautions to be taken, clarity of information, procedural details, accuracy and practicability of information and use of illustrations (Nain et al., 2019). Therefore, farmers' perception of the attributes about any technology is very important for the extension scientists/ researchers that affect its rate of adoption as well as its sustainability (Rogers, 2003). In this context, the specific objective to measure the

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perception of the respondents with regard to attributes of CRIJAF SONA was framed in order to carry out the present study.

METHODOLOGY

The ICAR-CRIJAF has disseminated the innovative jute production technology i.e., CRIJAF SONA in their adopted villages of North 24 Parganas and Nadia districts in 2014. So, Kumra village under Habra Block, North 24 Parganas District and Brahmapur village under Haringhata Block, Nadia District were purposively selected for the present study. For the selection of respondents those farmers who have adopted the innovative jute technology, CRIJAF SONA, were considered; accordingly, 40 adopter jute growers from each village were selected as respondents following simple random sampling method. Thus, the total respondents were 80 jute growers adopting CRIJAF SONA. Exploratory research design was followed to carry out the present study as the study aims to explore the perception of the jute growers towards the technology.

Perception was operationalized in the present study as practical understanding of the jute growers regarding the utility and interpretation of various aspects of the technology, CRIJAF SONA during its adoption. The way how the attributes of a technology perceived by a farmer was classified into five ways i.e., relative advantage (extent to which a technology is perceived better than the previous one), compatibility (extent to which a technology is perceived as compatible with the existing beliefs, values and previous knowledge of adopters), complexity (extent to which a technology is perceived as difficult to comprehend and apply), observability (extent to which the consequences of a technology are visible prominently) and trialability (extent to which a technology may be applied and experimented in the limited area). To measure the perceived attributes of CRIJAF SONA, an index consisting of 26 items pertaining to the above-mentioned perceived attributes of the talc-based microbial formulation were selected through judge's rating which were having inter-rater reliability of more than equal to 60 per cent. Among the 26 items, 7 items of relative advantage, 5 items each of compatibility, complexity, observability and 4 items under trialability of CRIJAF SONA considered most relevant by the experts were selected for final administration to a sample of 80 jute growers. During administration to the respondents these items were rated on three-point continuum i.e., disagree, undecided and agree with scores 1, 2, 3 respectively. The total perception score for individual respondent was calculated by summation of individual score in each sub items elicited by the individual farmer.

The data were collected with the help of structured interview schedule in the month of March 2021. The responses were recorded and tabulated in order to carry out appropriate statistical analysis.

RESULTS AND DISCUSSION

Relative advantage of CRIJAF SONA as perceived by the jute growers

The data in Table 1 revealed that majority of the respondents have perceived that CRIJAF SONA could reduce the retting period along with improvement of the quality of fibres which had less root content and brought better market value. Some farmers also believed that the fibre recovery was improved due to the absence of the root content in the resultant fibre they got from using the microbial formulation. Approximately, three fourth respondents felt that it could be used in the same water source for repeated retting purpose and for subsequent retting relatively less formulation was required. In relation to the relative advantage of the technology previous studies found that application of CRIJAF SONA helped in retting of jute within 13-15 days duration and led to upgradation of the jute fibres by 1-2 grade(s) with golden yellow colour, strong and more lustrous (Majumdar et al., 2011). There was 9.7 to 12 per cent higher fibre recovery as compared with the conventional method (Das et al., 2017). Resultant fibres through improved retting by using the formulation had 3-4 per cent root content as compared to 18-20 percent in conventional retting (Das et al., 2012). The previous findings implied that the use of the technology had a relative advantage over the conventional retting.

Compatibility of CRIJAF SONA as perceived by the jute growers

A perusal of Table 1 revealed that majority of the adopters perceived the technology as well compatible with their social and cultural system. It was also compatible with '*jaks*' of different varieties of jute i.e., JRO 524, CO-58, JRO 128, JRO 8432, Rani etc as reported by the respondents. Some of the respondents perceived the talc-based formulation was well adapted with different sources of stagnant water available in their locality. The perception of the farmers with respect to compatibility of the technology was found to be parallel with the previous studies as well. The All India Network Project on Jute and Allied Fibres (AINP on JAF, 2013-14) reported the formulation is environmentally friendly and does not have any antagonistic effect on the aquatic flora and fauna or on humans or other terrestrial animals making the technology environmentally compatible. The improved jute retting using the

$$\text{Perceived attributes of technology index} = \frac{\text{Sum of actual score obtained}}{\text{Sum of maximum possible score}} \times 100$$

Technology effectiveness was operationalised as the average perceived attributes of the technology that determined its rate of adoption in a positive way.

$$\text{Technology Effectiveness} = \frac{\text{Relative advantage + compatibility + non complexity + observability + trialability}}{5}$$

Table 1. The attributes of CRIJAF SONA as perceived by the jute growers

S.No.	Attributes perceived by the adopters	Mean Perception scores	Standard Deviation	Perceived Attributes Index
	Relative Advantage			
1.	Shortening of retting period	3.00	0.00	100.00
2.	Enhancement of fibre quality	2.96	0.19	98.75
3.	Improved fibre recovery	2.65	0.55	88.33
4.	Ease of fibre extraction	2.96	0.19	98.75
5.	Feasibility for repeated retting	2.69	0.54	89.58
6.	Absence of root content in resultant fibre	2.51	0.73	83.75
7.	Better Market price	2.94	0.24	97.92
	Average Relative Advantage Index			93.87
	Compatibility			
8.	Fitted well in the prevailing cultural & social system	3.00	0.00	100
9.	Compatible with different sources of water for retting	2.56	0.67	85.42
10.	Compatible with different varieties of jute 'jak'	2.94	0.29	97.92
11.	Suitable for all climatic conditions	1.74	0.82	57.92
12.	Economically compatible	3.00	0.00	100.00
	Average compatibility Index			88.25
	Complexity			
13.	Difficulty in understanding the procedure of application	1.05	0.27	35.00
14.	Difficulty in application	1.00	0.00	33.33
15.	Difficulty in availability	1.71	0.90	57.08
16.	Difficulty in making pre requisite arrangements before application	1.36	0.64	45.41
17.	Difficulties in taking precautions to be taken care of	1.34	0.64	44.58
	Average Complexity Index			43.08
	Observability			
18.	Better gradation of fibre than traditional practice	2.93	0.31	97.5
19.	Ease of extraction of fibres	2.98	0.16	99.17
20.	Requirement of short period for retting	3.00	0.00	100.00
21.	Less labour requirement	2.61	0.70	87.08
22.	Less requirement of formulation for subsequent usage	2.49	0.60	82.92
	Average Observability Index			93.33
	Trialability			
23.	Formulation can be applied on small scale for trial purpose	2.93	0.38	97.50
24.	Applied in small/stagnant water sources	2.91	0.40	97.08
25.	Applied in small bundles of jute or '*Jak*'	2.91	0.40	97.08
26.	Provision of pre-requisite arrangements for trial	2.61	0.72	87.08
	Average Trialability Index			94.69

formulation is user friendly and has got minor amendment over the conventional method (Majumdar et al., 2014) making it well compatible with their existing beliefs and values. The optimum retting temperature is around 34°C. Retting is delayed if temperature fluctuates from 34°C. Heavy rainfall during retting time also delays the retting process because of sharp fall in the retting water temperature (Majumdar et al., 2013), and not suitable for adverse climatic conditions with high rainfall and low temperature as reported by half of the respondents. Majumdar et al., (2019) reported that the quality of the retting water was enhanced by using the formulation and hence its compatibility with different sources of water. Farmers have been benefitted from this product and is required @ 25 kg/ha entailing an investment of around 1100/- (Rs. 44/- per kg) making it highly economically compatible even for small farmers (Das et al., 2017).

Complexity of CRIJAF SONA as perceived by the jute growers

Table 1 shows that majority of the respondents did not find it difficult to understand the method of application of the formulation and also during practical application in field conditions. Although most of them found it relatively easy to make the pre-requisite arrangements before application as well as precautions to be taken during its application. But almost half of the respondents reported for non-availability of the authentic products in their nearby markets. Certain degree of complexity was observed in the areas where the jute growers should be very careful about the quantity of the talc-based formulation which is applied on the bundles. Over retting causes cellulosic fibre degradation, whereas under retting causes incomplete removal of gummy materials, pectic substances. Both under retting and over retting which are very difficult to regulate results in low-grade jute fibre (Banik et al., 2003). Complexity was also observed during pre-requisite arrangements made before application where farmers were using empty cement bags filled with sand, soil, aquatic weeds like azolla, water hyacinth etc. as covering material for immersion of '*jaks*' or jute bundles into the water instead of mud and banana plants as covering material (Saha & Maiti, 2021).

Observability of CRIJAF SONA as perceived by the jute growers

As indicated in Table 1 majority of the respondents clearly visualized the better quality of jute fibres which could be extracted easily within a short period of time as well as reduction in labour requirement during fibre extraction. While only half of the farmers experienced that less amount of formulation was required during subsequent retting of jute fibres. By using the microbial formulation, the extraction process gets accelerated which in turn leads to reduction in the man power for fibre extraction up to an extent of 3-man days/ ha (Das et al., 2017) which was prominently observed by the jute growers. Research found that recommended amount of this microbial formulation was evenly spread over each of the layers of jute bundles during drenching for first time only. For second time retting the doses of formulation is relatively halved and for retting for the 3rd time no talc-based microbial formulation could be used (Das et al., 2017). The farmers could not prominently observe that the doses of the formulation were gradually reducing if it was applied during subsequent retting in the same water source. But with continuous use of the formulation for a considerable period of time, the farmers would be able to know this typical characteristic of CRIJAF SONA.

Trialability of CRIJAF SONA as perceived by the jute growers.

Table 1 indicated that a greater proportion of respondents agreed that CRIJAF SONA could be applied on a very small scale for trial purpose in stagnant water sources. It is also applied in small bundles of jute stems *i.e., 'jaks'* and for that purpose adequate provision was available to them for setting up pre-requisite arrangements for retting using the formulation.

The perceived attributes index of CRIJAF SONA

Table 1 presents the index values of perceived attributes of CRIJAF SONA i.e., relative advantage, compatibility, complexity, observability and trialability that were estimated as 93.87, 88.25, 43.08, 93.33 and 94.69 respectively. Accordingly, by using the formula the technology effectiveness was calculated as 85.41.

$$\text{Technology Effectiveness} = \frac{\text{Relative advantage + compatibility + non complexity* + observability + trialability}}{5}$$

$$= \frac{93.87+88.25+56.92^{*}+93.33+94.69}{5} = 85.41$$

(*Complexity index is 43.08, it means 56.92 percent (100 – 43.08) technology was not complex, hence in the calculations index of non-complexity was considered)

Hence higher the value of the technology effectiveness index implies that the technology is well perceived by the jute growers. The technology had high relative advantage, compatibility, observability, trialability and relatively low complexity. Hence the jute growers preferred to take up the technology of talc-based formulation for retting purpose in the study area.

CONCLUSION

The farmers have perceived the technology of CRIJAF SONA as having relatively advantageous than previous technologies in terms of retting aspects. This microbial formulation was also considered as well compatible, having prominent observable results and easily triable within their farms. Results of the study revealed that farmers had more complexity with respect to the pre-requisite arrangements made before application as well as the precautions to be taken care of. These factors were important for proper utilization of the formulation for retting of jute fibers it drags the attention of extension agents and scientists to intensify their efforts in these areas. The effective extension methods like a series of awareness programmes, field days, field visits, interaction sessions along with adequate training and demonstrations would be employed to reduce the complexity of the technology (Patel et al., 2019).

REFERENCES

Banik, S., Basak, M. K., Paul, D., Nayak, P., Sardar, D., Sil, S. C., Sanpui, B. C., & Ghosh, A. (2003). Ribbon retting of jute - a prospective and eco-friendly method for improvement of fibre quality. *Industrial Crops and Products*, *17*(3), 183-190.

Das, B., Chakrabarti, K., Ghosh, S., Majumdar, B., Tripathi, S., & Chakraborty, A. (2012). Effect of efficient pectinolytic bacterial isolates on retting and fibre quality of jute. *Industrial Crops and Products*, *36*, 415–419.

Das, S., Majumdar, B., Saha, A., Sarkar, S., Jha, S., Sarkar, S., & Saha, R. (2017). Comparative study of conventional and improved retting of jute with microbial formulation. *Proceedings of the National Academy of Sciences, India - Section B: Biological Sciences*, *88*. 10.1007/s40011-017-0872-x.

Edwards, A. L. (1969). Techniques of attitude scale construction. Vakils. Feffer and Simons Private Ltd., Mumbai.

Jamanal, S., & Sadaqath, S. (2018). Perceived attributes of soybean production technologies. *Asian Journal of Agricultural Extension, Economics & Sociology*, *26*, 1-8.

Kumbhare, N. V., & Khonde, S. R. (2009). Impact of KVK training on farmers adoption behaviour and knowledge gain. *Indian Journal of Extension Education*, *45*(2), 60-62.

Majumdar, B., Bandopadhyay, P., Singh, M. V., Zaman, A. S. N., Laxman, K., Jena, S., Jagannadham, J., Roy, A., Subramanian, A., Mazumdar, Sonali Paul, Das, P. K., Pandey, S. K., Kumar, M., Saha, A. R., Mitra, S., Das, S., Chattopadhyay, & Kundu, D. K. (2015). CRIJAF SONA: A potential tool for improving fibre quality of jute & mesta. Director, ICAR-CRIJAF, Barrackpore, Bulletin No.1/2015.

Majumdar, B., Chattopadhyay, L., Barai, S., Saha, A., Sarkar, S., Mazumdar, S., Saha, R., & Jha, S. K. (2019). Impact of conventional retting of jute (Corchorus spp.) on the environmental quality of water: a case study. *Environmental Monitoring and Assessment*, 191. 10.1007/s10661-019-7589-7.

Majumdar, B., Das, S., Bhandra, A., Saha, A. R., Chowdhury, H., & Kundu, D. K. (2011). Development of talc based formulation of microbial consortium for retting. *Jute and Allied Fibres News*, *9*(1), 20.

Majumdar, B., Das, S., Saha, A. R., Chowdhury, H., Kundu, D. K., & Mahapatra, B. S. (2013). Improved retting of jute and mesta with microbial formulation (Bulletin No. 04 /2013). Central Research Institute for Jute and Allied Fibres (ICAR), Barrackpore, Kolkata, 32.

Majumdar, B., Das, Suparna, Saha, A. R., Chowdhury, H., Maitra, D. N., Saha, M. N., Sarkar, S., Paul Mazumdar, S., Biswas, S., Chattopadhyay, & Lipi. (2014). Jibanu powderer sahaytay paat o mestar unnato pachon paddhoti., Director, ICAR-CRIJAF, Barrackpore, Bulletin No. 01/2014.

Majumdar, B., Sarkar, S., Biswas, D., Saha, A. R., & Jha, S. K. (2014). Impact of field demonstrations of improved microbial jute retting technology using CRIJAF SONA. *Jute and Allied Fibres News*, *12*(2), 24-25.

Nain, M. S., Singh, R., Sharma, J. P., & Mishra, J. R. (2019) Filling the information gap through developing and validating entrepreneurial technical information packages (ETIPs) for Potential Agricultural Entrepreneurs. *Journal of Community Mobilization and Sustainable Development*, *14*(1), 44-48. https://indianjournals.com/ijor.aspx?target=ijor:jcmsd&volume=14&issue=1&article=009

Patel, D., Singh, S., Verma, A. P., Gupta, B. K., & Singh, M. (2019). Impact of different extension teaching methods for adoption of scientific package of practices of chickpea. *Indian Journal of Extension Education*, *55*(2), 91-93.

Patil, S. D. and Kokate, K. D. (2021). Feasibility index and attributes of farm implements as perceived by farmers. *Indian Journal of Extension Education*, *57*(2), 47-51.

Ramesh, P., & Santha, G. (2011). Attributes of sugarcane technologies as perceived by the formers of quasi-government and private extension services. *Agriculture Update*, *6*(3&4), 102-106.

Saha, T., & Maiti, M. (2021). Retting of jute in modern technique. *Vigyan Varta*, *2*(8), 66-70.

Singh, T., Kaur, M., & Singh, G. (2021). Extent of adoption of happy seeder technology among the farmers of Punjab (India). *Indian Journal of Extension Education*, *57*(4), 75-79.

Sujeetha, T. N., & Palaniswamy, S. (2014). A scale to measure the attitude of tribal women towards commercial horticulture in Nilgiris district, Tamil Nadu. *International Journal of Farm Sciences*, *4*(4), 287-292.