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## Livestock farmer's attitude towards ICT-based livestock extension services in the Jaipur District of Rajasthan, India

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### Abstract

In Rajasthan, India, an exploratory study was done to assess the attitudes of livestock farmers concerning the use of information and communication technologies (ICTs) as a source of support for extension services. For the study, a total of 120 respondents were chosen at random. Data were gathered using a systematic interviewing schedule, and several statistical methods were used for analysis. The study found that the majority of livestock farmers (73.33%) had a favourable attitude toward the distribution of information through various ICT tools in the livestock sector, with 15.83 per cent having a more favourable attitude and 10.83 per cent having a less favourable attitude. Age, family size, land ownership, herd size, contact with extension agents and social involvement all had positive but insignificant relationships with livestock farmers' attitudes toward ICTs. In contrast, experience in the industry had a negative but non-significant relationship. The attitudes of livestock farmers toward ICTs were positively and significantly correlated with education, exposure to the mass media and annual gross income.

**Keywords:** Attitude, education, extension, ICTs, income and livestock farmers

### Introduction

India is primarily an agrarian nation, with agriculture having the foundation of its economy. The livestock industry is a crucial factor in India's agricultural system and significantly impacts GDP. It assures the security of food and nutrition nourishment on one side and gives income assistance, employment and possibilities on the other side (Ravikumar and Mahesh, 2006; Borah and Halim, 2014) [18, 4]. India's public extension system forms a small portion of farmers' information sources, while informal communication among farmers is still supreme for accessing information, knowledge and innovations (Anonymous, 2005) [3].

Traditionally, various aspects of production, marketing, finance, traders, consultants, input dealers, farm service organisations, government extension services, other farmers, and relatives have been potential information sources for farmers. However, this traditional method of service delivery has marked limitations like time-consuming in the service delivery system (Mittal and Kumar, 2000; NSSO, 2005 and Saravanan, 2011) [15, 16, 22].

Information and Communication Technology (ICT) advancements have recently presented an enormous opportunity to streamline the delivery of information and technology services, particularly to farmers (Maningas, 2006) [13]. The economy of livestock, agriculture and rural artisans in India could be altered due to the use of ICT tools (Sasidhar and Sharma, 2006) [23]. More productivity and profitability result from providing farmers with information and expertise at the proper time and in the appropriate manner. Therefore, the information dissemination system technology should be used to give the livestock farmers the information, knowledge and expertise. Hence, these ICT tools are thus in high demand right now.

ICT refers to all information and communication technologies, including radio, cable, wireless television, video, cellular phones and print media-like technologies, and interfaces with digital forms like the internet or World Wide Web (WWW) (Hazelman and Flor, 2004) [10]. Computers, the internet, mobile phones, televisions, and radios are just a few of the gadgets integrated with ICTs. There are three types of ICTs, as per Elijah and Ogunlade (2006) [8], Advance ICTs (mobile phone, computer and internet), conventional ICTs (TV, radio, landline telephone and telegraph) and really old ICTs (books or libraries and newspaper).

The least expensive input to create marked change in the livestock sector is adequate access to knowledge and information. ICT tools can be utilised to disseminate information and knowledge, inspiring people to act and improve the livestock industry through mobilisation and action. ICTs have contributed significantly to the growth of agricultural and related industries as well as the decision-making of farmer communities across the globe (Cash, 2001; Galloway and Mochrie, 2005; Opara, 2008 and Taragola & Van Lierde, 2010) [5, 9, 17, 24].

ICT-based information delivery has the potential to be timelier and directly reach more farmers (Richardson, 1996) [19]. Access to ICTs may lower the expenses associated with information search transaction costs and knowledge and information asymmetries, particularly about market price information (De Silva and Ratnadiwakara, 2008) [7]. Information can encourage people to embrace technologies for healthy livestock when rewarded with success stories. ICTs, for instance, can be used to spread knowledge on immunisation, calf mortality, maternal mortality, sanitation, nutritional awareness and the causes, prevention, and treatment of disease. The availability of information enables the underprivileged to seize chances and lessens their susceptibility (Kiplang'at 1999) [11]. Farmers really ought to receive information at the appropriate time and location (De Silva and Ratnadiwakara, 2008) [7]. ICT is becoming more widely acknowledged as being crucial for acquiring access to necessary knowledge and information (Richardson 1997; Chapman *et al.*, 2004; Anandajayasekaram *et al.*, 2008; Mcnamara 2009; Aker 2010) [20, 6, 2, 14, 1]. Improved and seamless communication contributes to the country's livestock sector's overall growth (Saravanan, 2010) [21].

In order to improve the existing system and develop a more sophisticated information delivery system in India's livestock sector, this study focused on the farmers' attitudes toward ICT-based systems for providing livestock services, their current attitudes and levels of knowledge about ICT-based information delivery systems and the difficulties they encountered using these systems.

## Material and Methods

To better understand the barriers livestock farmers face when using ICTs, an exploratory research design was used in Rajasthan in North-East India. Rajasthan's wealth in livestock and its residents' use of various ICT tools in daily life to adopt improved lifestyles led to the state being purposefully chosen. Additionally, Jaipur district was purposefully selected from other districts in Rajasthan based on the rate of information accessibility, availability, utilisation, good informational network and livestock wealth status.

A total of 120 respondents who used ICT tools were randomly chosen from the Sanganer and Shahpura tehsils in the Jaipur district. Six villages were randomly selected from each identified tehsils for the subsequent sampling stage. From Sanganer Tehsil, the following villages were chosen: Chhitroli, Bhankrota Khurd, Manohariya Wala, Watika, Vidhani and Goner. From Shahpura Tehsil, the following villages were chosen: Chimanpura, Amarpura, Govindpura Dhabai, Markhi, Neejhar and Chhapra Kalan. Twelve villages in total were chosen for the study as a result. An extensive list of livestock farmers who use ICT tools for livestock information from each village was compiled. Ten respondents were arbitrarily chosen among them. As a result, a total of 120 respondents were chosen for the study. The inferences

were made using a variety of statistical techniques including frequency, percentage, regression and correlation.

## Attitude of livestock farmers towards ICTs

An organised predisposition to think, feel, perceive and act in a certain way toward a cognitive object is known as attitude. Attitude is the degree of positive or negative impact coupled with a psychological object.

The attitude of livestock farmers towards ICT-based livestock extension services was assessed using the Modified scale of Kumar and Ratnakar (2011) [12]. Twenty-two statements made up the scale (twelve positives and ten negatives). The replies were scored on a five-point scale, with strongly agree, agree, undecided, disagree and strongly disagree receiving a score of 5, 4, 3, 2 and 1 for positive statements and vice versa for negative opinions. The two possible maximum and minimum scores were 110 and 22, respectively.

Each respondent's overall attitude score was obtained, and they were then divided into three groups as follows:

Less favourable attitude - Less than (Mean-S.D.).

Favourable attitude - Between (Mean  $\pm$  S.D.).

More favourable attitude - More than (Mean + S.D.).

## Result & Discussion

### Attitude of livestock farmers towards ICTs

Table 1 analyses the livestock farmers' attitudes toward the use of ICTs to disseminate livestock information. According to this table, a large majority of livestock farmers agreed with statements that information sharing through ICTs is beneficial. For example, ICT-based disease outbreak warning systems help farmers take preventive measures (92.50 per cent), ICTs offer potential solutions to the current animal husbandry situation (86.67 per cent), ICT-based extension services help farmers plan and make decisions related to animal husbandry (85.83 per cent), ICTs has potential tools to reach needy farmers and ICTs-based extension services provide new opportunities to build a skilled and knowledgeable community (83.33 per cent each).

The majority of them also agreed with the other positive statements, including that the farming community benefits from having access to information centres at the village level (76.67%), live over the phone with scientists provides first-hand information & knowledge about doubts (74.17%), weather forecasting helps farmers make timely decisions (72.50%), feedback from farmers via ICTs is quicker than traditional methods (71.67%), expert advice encourages farmers to be entrepreneurial and benefited (69.17 percent) and Through ICT-based market intelligence, farmers can secure fair pricing for their produce (65.83 percent).

A large percentage of those surveyed expressed no opinion regarding the negative assertions such as that ICTs cannot give personalized information (75.83%), ICT-based extension services prevent personal extension interaction (45.83%) and ICTs cannot address the location-specific demands of livestock farmers (43.33 per cent). The majority of livestock farmers disagreed with the other negative claims, including that ICT-based extension services are an alternative to the current extension system (81.67 per cent), ICTs alone would solve farmers' problems (50.83 per cent), ICTs are a valuable tool, but it will never affect farmers' own decision-making (49.17 per cent) and that ICTs can only be used effectively by farmers who are resourceful (45.83 per cent). ICT services are a far-off dream for resource-poor farmers, according to 45.83 per cent of respondents who disagreed strongly with the assertion.

According to the data in Table 2, most livestock farmers (73.33%) had a favourable and positive attitude toward the distribution of information using various ICT methods in the livestock sector, followed by 15.83% with more favourable and 10.83% with less favourable attitudes.

This conclusion suggests that livestock farmers in the study area were eager to use and consider various ICT methods to obtain the needed information. This could result from livestock farmers receiving fast and precise information about livestock and services catered to their requirements and preferences. The advantages of various ICT technologies and their function in information distribution for livestock farming are known to livestock farmers.

**Correlation between chosen independent variables and livestock farmers' attitudes toward ICTs**

Table 3 revealed that experience in livestock farming had a negative and non-significant relationship with attitude toward ICTs. In contrast, age, family size, herd size, land ownership, social participation and extension contact had positive and non-significant relationships. The attitudes of livestock farmers toward ICTs were positively and significantly correlated with education, exposure to the media, and annual gross income.

The fact that there is a positive and significant correlation between education and attitude toward ICTs among livestock farmers can be explained by the fact that educated people are aware of the value of ICTs and how they might increase animal productivity via this.

**Table 1:** Distribution of livestock farmers on the basis of their attitude towards ICTs

| S. No. | Statements  | SA |       | A   |       | UD |       | DA |       | SDA |       |
|--------|---|----|-------|-----|-------|----|-------|----|-------|-----|-------|
|        |   | f  | %     | f   | %     | f  | %     | f  | %     | f   | %     |
| 1.     | ICTs provide possible solutions to the present animal husbandry situation.                                  | 3  | 2.50  | 104 | 86.67 | 10 | 8.33  | 3  | 2.50  | 0   | 0.00  |
| 2.     | ICTs cannot meet location specific needs of the livestock farmers.  | 0  | 0.00  | 18  | 15.00 | 52 | 43.33 | 41 | 34.17 | 9   | 7.50  |
| 3.     | ICTs are potential tools to reach the needy farmers.  | 6  | 5.00  | 100 | 83.33 | 9  | 7.50  | 5  | 4.17  | 0   | 0.00  |
| 4.     | Farmers feedback is fast through ICTs than traditional methods.   | 33 | 27.50 | 86  | 71.67 | 1  | 0.83  | 0  | 0.00  | 0   | 0.00  |
| 5.     | Illiteracy will not deter farmers in availing ICT services.   | 20 | 16.67 | 82  | 68.33 | 10 | 8.33  | 5  | 4.17  | 3   | 2.50  |
| 6.     | ICTs cannot deliver personalized information.   | 0  | 0.00  | 10  | 8.33  | 91 | 75.83 | 19 | 15.83 | 0   | 0.00  |
| 7.     | ICT based extension services assist the farmer in planning and decision-making aspects in animal husbandry. | 6  | 5.00  | 103 | 85.83 | 5  | 4.17  | 6  | 5.00  | 0   | 0.00  |
| 8.     | ICT services are a distant dream for resource poor farmers.   | 0  | 0.00  | 6   | 5.00  | 4  | 3.33  | 55 | 45.83 | 55  | 45.83 |
| 9.     | Farmers can get remunerative prices to their produce through ICT based market intelligence.                 | 36 | 30.00 | 79  | 65.83 | 3  | 2.50  | 2  | 1.67  | 0   | 0.00  |
| 10.    | Expert advice makes the farmers enterprise/activities productive.   | 33 | 27.50 | 83  | 69.17 | 2  | 1.67  | 1  | 0.83  | 1   | 0.83  |
| 11.    | All kinds of information exchange are possible only through ICTs.   | 3  | 2.50  | 2   | 1.67  | 12 | 10.00 | 84 | 70.00 | 19  | 15.84 |
| 12.    | Existing infrastructure of ICTs is not enough to meet the needs of the farming community.                   | 13 | 10.83 | 53  | 44.17 | 41 | 34.17 | 8  | 6.67  | 5   | 4.17  |
| 13.    | Only resourceful farmers can get the benefit of the ICTs.   | 3  | 2.50  | 15  | 12.50 | 12 | 10.00 | 55 | 45.83 | 35  | 29.17 |
| 14.    | Access to information centre at village level is boon to the farming community.                             | 13 | 10.83 | 92  | 76.67 | 11 | 9.17  | 3  | 2.50  | 1   | 0.83  |
| 15.    | Phone-in-live with scientists gives first-hand information about queries.                                   | 29 | 24.17 | 89  | 74.17 | 0  | 0.00  | 1  | 0.83  | 1   | 0.83  |
| 16.    | ICTs alone would solve the problems of farmers.   | 1  | 0.83  | 22  | 18.33 | 15 | 12.50 | 61 | 50.83 | 21  | 17.50 |
| 17.    | ICT based disease outbreak warning system facilitate farmers to take preventive measures.                   | 1  | 0.83  | 111 | 92.50 | 4  | 3.33  | 3  | 2.50  | 1   | 0.83  |
| 18.    | ICT based extension services avoid the personal extension contact.  | 0  | 0.00  | 10  | 8.33  | 55 | 45.83 | 53 | 44.17 | 2   | 1.67  |
| 19.    | ICTs based extension services provide new opportunities to build a skilled and knowledgeable community.     | 10 | 8.33  | 100 | 83.33 | 8  | 6.67  | 2  | 1.67  | 0   | 0.00  |
| 20.    | ICT is a valuable tool, but it will never influence farmers' own decision making.                           | 0  | 0.00  | 12  | 10.00 | 44 | 36.67 | 59 | 49.17 | 5   | 4.17  |
| 21.    | Weather forecasting through ICTs assists farmers in timely decisions.                                       | 32 | 26.67 | 87  | 72.50 | 1  | 0.83  | 0  | 0.00  | 0   | 0.00  |
| 22.    | ICT based extension services are alternative to the present extension system.                               | 0  | 0.00  | 0   | 0.00  | 10 | 8.33  | 98 | 81.67 | 12  | 10.00 |

SA: Strongly agree, A: Agree, UD: Undecided, DA: Disagree and SDA: Strongly disagree \*Negative Statements.

**Table 2:** Overall attitude of livestock farmers towards ICTs (n=120)

| S. No. | Attitude                            | f  | %     |
|--------|-------------------------------------|----|-------|
| 1.     | Less favourable (up to 71.43 score) | 19 | 15.83 |
| 2.     | Favourable (71.44 to 79 score)      | 88 | 73.33 |
| 3.     | More favourable (Above 79 score)    | 13 | 10.83 |

**Table 3:** Pearson's correlation for attitude of livestock farmers towards ICTs with independent variables

| S. No. | Independent variables           | Pearson's Correlation Coefficient (r <sub>p</sub> ) |
|--------|---------------------------------|---|
| 1.     | Age                             | 0.101   |
| 2.     | Education                       | 0.186*  |
| 3.     | Family size                     | 0.122   |
| 4.     | Land holding                    | 0.023   |
| 5.     | Herd size                       | 0.014   |
| 6.     | Annual gross income             | 0.242**   |
| 7.     | Experience in livestock farming | -0.024  |

|     |                      |        |
|-----|----------------------|--------|
| 8.  | Extension contacts   | 0.014  |
| 9.  | Mass media exposure  | 0.219* |
| 10. | Social participation | 0.093  |

\*\*Significant at 1 per cent level; \*Significant at 5 per cent level.

**Table 4:** Linear regression analysis for attitude of livestock farmers towards ICTs with independent variables

| S. No. | Independent variables           | $\beta$ | t- value |
|--------|---------------------------------|---------|----------|
| 1.     | Age                             | .295    | 2.111*   |
| 2.     | Education                       | .237    | 1.984    |
| 3.     | Family size                     | .074    | .802     |
| 4.     | Land holding                    | -.142   | -1.396   |
| 5.     | Herd size                       | .059    | .620     |
| 6.     | Annual gross income             | .130    | 1.199    |
| 7.     | Experience in livestock farming | -.134   | -.952    |
| 8.     | Extension contacts              | .039    | .404     |
| 9.     | Mass media exposure             | .202    | 2.163*   |
| 10.    | Social participation            | .124    | 1.349    |

\*Significant at 5 per cent level.

Further, the study revealed a significant and positive correlation between annual gross income and mass media exposure with livestock farmers' attitudes toward ICTs. This suggests that as gross yearly income rises, so does their capacity to buy ICTs and increased media exposure increases their awareness of the advantages of ICTs.

Table 4 shows that only two factors, age and exposure to the mass media, had a favourable and significant impact on livestock farmers' attitudes toward ICTs. Landholding and livestock farming experience made a negative but non-significant contribution to the attitude of livestock farmers toward ICTs. In contrast, education, family size, herd size, annual gross income, extension contact and social participation made a positive and non-significant contribution.

### Conclusion

Based on the study and data analysis, it was concluded that most of the livestock farmers had a positive attitude toward information distribution in the livestock sector using various ICT methods, with nearly 16% of livestock farmers having a more favourable attitude and nearly 11% having a less favourable attitude.

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