

Interaction Pattern of Buffalo Farmers with Information Providing Stakeholders in Haryana

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Authors' contributions

This work was carried out in collaboration among all authors. Author KK designed the study, conducted field works, wrote the first draft of the manuscript and wrote the protocol. Authors MC, VBD and HT managed the literature searches, performed the statistical analysis, analyses of the study. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2020/v39i4231124

Editor(s):

(1) Dr. Orlando Manuel da Costa Gomes, Lisbon Accounting and Business School (ISCAL), Lisbon Polytechnic Institute, Portugal.

Reviewers:

(1) I Nengah Muliarta, Mahendradatta University, Indonesia.

(2) K.Sesha Saikrishna, NTR College of Veterinary Science, India.

(3) Eric Parala, Philippines.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/64058>

Original Research Article

Received 15 October 2020

Accepted 20 December 2020

Published 26 December 2020

ABSTRACT

The present study was carried out in two agro-climatic zones of Haryana. A total of six blocks were studied from which a total of twelve villages constituted the study area. Ten farmers from each village were selected randomly. A total of 120 buffalo farmers constituted the sample for the present study. An ex-post facto research design was used for the study. The research was planned to study the interaction pattern of the buffalo farmers in Haryana. The study mainly concerns with 'symbolic interaction' i.e., reactions on the basis of behavior and giving meaning to it. It was hypothesized that farmers' antecedent variables affect their interaction pattern. The existing and desired level of interaction of farmers amongst themselves and with different stakeholders was determined by eliciting their response on a four-point continuum. Modes used by farmers for interaction with various stakeholders were milk cooperative meetings, panchayat meetings, training, buffalo melas, clinical camps, milk recordings, demonstrations, infertility camps, vaccination campaigns and a visit to university. The results thus suggested that there was a significant difference in existing and desired level of interaction of farmers amongst themselves and with different stakeholders. Farmers had the highest existing interaction amongst themselves while they desired maximum interaction with input agencies. Interaction between the farmers and

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stakeholders needs to be increased through their desired modes to benefit the buffalo farming community, by enhancing their technical knowledge as well as guiding them towards augmenting the animals' productivity.

Keywords: Buffalo farmers; Haryana; mode; frequency; interaction; stakeholders; input agencies.

1. INTRODUCTION

Buffalo plays a vital role in rural livelihood, food security and agricultural economy of India. The buffalo is "black gold" and rightly occupies a central role in the dairy sector, meat industry and animal draught power. Besides, the Buffaloes are heralded as key contributors for ensuring nutritional security to the masses in the Asian region, which harbors 97.04 percent of the world buffalo population out of 199.8 million heads. India is home to 57.80 percent of the world buffalo population. The species contributes 12.92 percent of the total milk produced in the world. However, 97.07 percent of the buffalo milk is produced in the Asian region, with a predominant contribution of 67.75 percent by India alone [1].

Though less in population as compared to cattle (190.9 million), buffaloes produced 81.18 million tonnes of milk contributing 49.20 per cent to the total milk. Besides milk, 1.467 million tonnes of meat is produced from buffaloes which account for 19.83 per cent of the total meat produced in the country [2]. Buffalo draught power also accounts for roughly 10.00 per cent of the total draught power contributed by the work animals in the country. In addition to milk, meat and draft, buffaloes also produce 0.52 million tonnes of skin and hides and its dung helps in improving soil fertility as well as ends up as domestic fuel in rural households. Thus, buffalo has great significance for the country, especially for the village community.

Livestock development in general and buffalo development in particular, is a function of a number of factors viz., buffalo breeds, health cover, livestock management, feeding management, marketing price, and livestock information. Buffalo development is not the sole mandate of a single organization. The development of buffalo is the shared effort of all actors that explicitly and implicitly participate in the different activities of livestock development. Thus, research, extension, and other actors play a vital role to drive the buffalo development of the country [3]. It necessitates the integrated action

of various stakeholders' viz., scientists, extensionist, subject matter specialists, input suppliers, marketing agency, livestock agency, cooperatives, and farmers.

The state department of animal husbandry (SDAH) is implementing several dairy development programs by expanding huge resources in order to enhance the income of the dairy farmers. In addition, other organizations like the National Dairy Development Board, dairy cooperatives, agricultural and veterinary universities, ICAR institutions, financial institutions, input agencies, and non-governmental organizations are also working for dairy farmers. But most of these agencies are working in isolation. At present, the level of interaction between these agencies is very less which is to be strengthened to improve the livestock development system [4]. The supply and demand for improved technologies involve a multifaceted interaction among all the stakeholders to trigger innovation, adoption, and diffusion [5,6].

All the agencies of livestock development like research institutions, development departments, veterinary personnel, dairy cooperatives, progressive farmers, non-governmental organizations and financial institutions are engaged in performing one or the other task. In this process, it becomes imperative for these agencies to interact within and with different agencies through some modes in the formal setting. Any agency working in isolation would not be helpful in enhancing the milk production of the state. These must move in a coordinated manner and for which their basic pre-requisite is their close interaction amongst themselves and with other stakeholders [4].

So, to analyze the interaction of the buffalo farmers with information providing stakeholders, this study was done. The pattern of interaction was presumed to be influenced by the personal, social, economic characteristics of farmers. The outcome of the present study may serve as a guideline for stakeholders in modifying approaches for future strategic development.

2. METHODOLOGY

The present study was carried out in two agro-climatic zones of Haryana. A total of six blocks were studied from which a total of twelve villages constituted the study area. Ten farmers from each village were selected randomly to arrive at a total sample size of 120 farmers. An ex- post facto research design was used in the present study.

According to Webster's Dictionary interaction means 'to act upon one another' whereas the Chamber's Dictionary described the word interaction as mutual action. The Oxford dictionary defines interaction as 'reciprocal action' or 'influence of persons on one another'.

The International Encyclopedia of Social Sciences (1968) did not explain the term interaction but explained 'social interaction' which occurs whenever one social actor affects the thoughts or actions of another social actor in some manner. To differentiate between the interactions that involve communication and those that don't, the sociologists sometimes speak of the former as 'symbolic interaction' and later as 'behavioral interaction'.

The study mainly concerns with 'symbolic interaction' *i.e.*, reactions on the basis of behavior and giving meaning to it and not only on the mechanical overt basis. In the present investigation, the concern was to study the interaction of farmers with different stakeholders. The interaction is mainly oral by the physical presence of two or more persons, but it may be written also such as through correspondence. However, it is seen that interaction through correspondence between two organizations or among the members of the same organization is a routine and general phenomenon. In fact, it is more of communication rather than the interaction in real terms. Hence, in the present study, the interaction has been operationalized as 'oral interaction' having the physical presence of two or more than two persons in a formal setting.

In interaction pattern, the modes, frequency of interaction and level of satisfaction as perceived by the farmers were studied. A schedule was developed to study the interaction pattern of the buffalo farmers with information providing stakeholders

3. RESULTS AND DISCUSSION

3.1 Interaction Pattern of the Buffalo Farmers

3.1.1 Modes of interaction

Existing and desired modes of interaction of farmers with different information providing stakeholders were identified with the help of extensive review of literature. Studies of Sharma [7] and Dixit et al. [4] opined that important modes of interaction which were panchayat meetings, cooperative meetings, buffalo *melas*, vaccination campaigns, milk recordings, demonstrations, infertility camps and training programs. The respondents were asked to rank the existing and desired modes of interaction. The findings of the same are discussed as under:

As evident from Table 1, the farmers interacted among themselves and with other information providing stakeholders through different modes regarding improved buffalo husbandry practices. Modes used by farmers for interaction with various stakeholders were milk cooperative meetings, panchayat meetings, trainings, buffalo *melas*, clinical camps, milk recordings, demonstrations, infertility camps, vaccination campaigns and a visit to university. The existing and desired ranks of the modes of interaction were identified. In order to find out whether there was any association between existing and desired mode of interaction, Spearman's rank correlation was applied between existing and desired modes of interaction. The rank order coefficient of correlation ($r = -0.103$) was found to be negative between existing and desired modes of interaction which suggested that farmer's desired modes of interaction were different from their existing modes of interaction. The data revealed that the major desired modes of interaction were training, panchayat meetings, clinical camps, milk recordings, and demonstrations. The observations were in concurrence with the findings of Dixit et al. [8], who conducted a study on interactions among different subsystems of dairy development in Haryana, reported that major modes of interaction were training, panchayat meetings, clinical camps and demonstrations. The results were also supported by Jha and Chauhan [9], Prasad [10], Burman et al. [11] and Singh et al. [12].

3.2 Existing and Desired Level of Interaction of Farmers with Stakeholders

The existing and desired level of interaction of farmers amongst themselves and with different stakeholders was determined by eliciting their response on a four-point continuum. The findings of their level of interaction are presented in Table 2. It is obvious from the Table 2 that the farmers had the highest existing interaction among themselves (2.51), but they desired maximum interaction with input agencies (5.11). Existing interaction with input agencies (2.11) was next to farmers interaction among themselves, followed by interaction with field functionaries (0.89), scientists (0.68) and non-government organizations (0.63). The lowest frequency of interaction of farmers was with administrators and planners (0.51) and farmers wanted to increase it by almost three times (1.50). The results of the study suggested that action should be taken by various stakeholders to strengthen their interaction with the farmers. Similar results were also reported by Dixit et al. [8], who found that dairy farmers desired maximum interaction with input agencies. The similar results were also reported by Nataraju and Channegowda [13], Thombre et al. [14], Mabuku [15], Kumar et al. [16].

3.3 Difference in the Interaction Levels

To find out a significant difference in farmers interaction amongst themselves and with different stakeholders the data was subjected to z-test. The z-values are presented in Table 3 which indicated a significant difference between existing and desired level of interaction of farmers amongst themselves and with different information providing stakeholders. The findings were in accordance with the observation of Dixit et al. [8], who reported that there was a significant difference in the existing and desired level of interaction of farmers among themselves and with different stakeholders.

3.4 Distribution of Respondents According to Their Level of Interaction

On the basis of their selected antecedent variables, the farmers were classified into different categories and the existing as well as desired interaction of each category was worked out. Analysis of Variance (ANOVA) was applied to determine significant difference between them, if any. The values are presented in Table 4 and the results are discussed in the following paragraph aspect wise.

Table 1. Ranking of existing and desired modes of interaction

Modes of interaction	Existing mean	Rank	Desired mean	Rank
Milk cooperative meetings	6.03	VI	9.67	X
Trainings	7.77	IX	1.87	I
Buffalo <i>melas</i>	6.88	VII	5.67	VI
Clinical camps	4.25	IV	4.08	III
Panchayat meetings	4.92	V	2.08	II
Visit to university	8.22	X	7.75	IX
Demonstrations	7.03	VIII	5.33	V
Infertility camps	3.50	II	6.08	VII
Vaccination campaign	3.58	III	7.27	VIII
Milk recordings	2.82	I	4.32	IV

Table 2. Existing and desired level of interaction of farmers

Stakeholders	Existing mean	Desired mean
Farmers	2.51	3.00
Scientists	0.68	1.68
SDAH field functionaries	0.89	1.89
Input agencies	2.11	5.11
NGOs	0.63	1.63
Administrators and planners	0.51	1.50

3.5 Total Gross Annual Income

As indicated in Table 4, desired interaction scores of all the three income groups of respondents is more than the existing scores. Since all the F-values (7.386 and 5.871) were significant, it showed a significant variation in the interaction level of the respondents of different categories. Mean total score of existing as well as desired interaction was more for high income group respondents than the lower and medium income group respondents, respectively. This might be due to their more access to information providing stakeholders because of better economic condition. Similar results were also reported by Dixit et al. [8], who conducted a study on interactions among different subsystems of dairy development in Haryana, revealed that farmers with high socio-economic status had more interaction.

3.6 Caste

It is obvious from Table 4 that the desired interaction scores of respondents in all the three categories of caste of respondents were more than the existing scores. The F-values (12.249 and 11.294) were highly significant, it is clear from these findings that there was significant variation in the interaction level of the respondents of different categories. There was variation in existing as well as desired interaction of different categories of castes. Similarly Dixit et al. [8] observed that respondents who belonged to general caste were having higher interaction compared to respondents belonged to other categories of caste.

3.7 Education

The desired interaction scores of farmers of different education levels were more than their existing levels of interaction (Table 4). Since all the F-values (2.445 and 2.477) were highly significant, it indicates a significant variation in the interaction level of the respondents. The mean total score of existing as well as desired interaction was more for the farmers possessing high education level than the farmers possessing medium and low education level. Thus, the farmers with better education interacted more with information providing stakeholders. Results were in line with Dixit et al. [8] who recorded that farmers with high education status had more interaction.

3.8 Landholding

It is evident from Table 4 that respondents having different levels of landholding sizes had different level of existing and desired interaction. Since all the F-values (8.028 and 7.801) were highly significant, it implies a significant variation in the interaction level of the respondents possessing different landholding sizes. Large and medium farmers had almost similar interaction, but it was more than the small farmers. It might be due to the reason that large and medium farmers wanted to make buffalo farming as a more remunerative enterprise, because they were having better resources. The observation were in concurrence with the finding of Dixit et al. [8], who reported that farmers with large landholding sizes were having more interaction.

3.9 Mass Media Exposure

It is apparent from Table 4 that desired interaction scores of all the categories of respondents possessing different level of mass media exposure was more than the scores of existing interaction. The F-values (71.50 and 54.63) were highly significant in all the cases implying variation in the interaction level of respondents. The mean score of existing and desired interaction was more for the farmers having high level of mass media exposure in comparison to those farmers having low and medium level of mass media exposure. The difference in interaction might be due to their level of exposure to mass media sources. Similar results were also reported by Dixit et al. [8], who observed that respondents with high mass media exposure were having more interaction than their counterparts.

3.10 Association and Contribution of Farmers' Antecedent Variables to the Total Existing and Desired Interaction

To determine the association and contribution of the antecedent variables on their existing and desired interaction, the data were subjected to correlation and stepwise regression analysis. It is apparent from Table 5 that caste, herd size, landholding, mass media exposure, experience in buffalo rearing, social participation, livestock gross income, localite extension agency contact and cosmopolite extension agency contact were positively and significantly associated with the existing interaction. It is also seen that all the

antecedent variables selected for this study were also significantly and positively associated with the desired frequency of interaction except herd size.

As indicated in Table 6 the stepwise regression analysis of the data revealed that the existing frequency of farmers is explained by four antecedent variables *i.e.*, localite and cosmopolite extension agency contact, mass

media exposure and caste to the tune of 67.90 per cent, while desired frequency was explained by five antecedent variables *i.e.*, cosmopolite extension agency contact, mass media exposure, experience in buffalo rearing, income and caste to the extent of 64.40 per cent. The calculated F-values in both the cases were also found to be significant which indicates that these variables contributed significantly towards existing and desired frequency of interaction.

Table 3. Differential interaction of information providing stakeholders with the farmers

Interaction (desired vs. existing)	z value
Farmers	9.291**
Scientists	84.499**
SDAH field functionaries	84.499**
Cooperatives	84.499**
Government agencies	84.499**
Private agencies	84.499**
NGOs	119**

** Significant at 0.01 per cent

Table 4. Distribution of respondents according to their antecedent variables and frequency of interaction

	Frequency n = 120	Mean total score of existing frequency	SD	Frequency n = 120	Mean total score of desired frequency	SD
Total income						
Low	73 (60.84)	6.10	3.40	73 (60.84)	13.73	3.07
Medium	41 (34.16)	9.14	1.76	41 (34.16)	16.39	1.49
High	6 (5.00)	9.66	1.36	6 (5.00)	17.00	1.09
		F = 7.386			F=5.871	
Caste						
General	73 (60.84)	7.85	2.87	73 (60.84)	15.33	2.58
OBC	39 (32.50)	7.36	3.38	39 (32.50)	14.69	3.00
SC	8 (6.66)	2.38	0.518	8 (6.66)	10.63	0.916
		F = 12.249**			F = 11.294**	
Education						
Low	32 (26.67)	6.84	3.14	32 (26.67)	14.50	2.88
Medium	71 (59.16)	7.08	3.22	71 (59.16)	14.59	2.86
High	17 (14.17)	9.23	2.96	17 (14.17)	16.29	2.66
		F = 2.445**			F = 2.477**	
Landholding						
Small (0-2 ha)	73 (60.84)	7.20	3.42	73 (60.84)	14.65	3.03
Medium(2-4 ha)	5 (4.16)	7.60	2.88	5 (4.16)	15.00	2.44
Large (> 4 ha)	42 (35.00)	7.50	2.99	42 (35.00)	15.04	2.69
		F = 8.028**			F = 7.801**	
Mass media						
Low	18 (15.00)	3.50	2.14	18 (15.00)	11.67	2.05
Medium	52 (43.33)	6.12	2.83	52 (43.33)	13.77	2.75
High	50 (41.67)	9.96	1.22	50 (41.67)	17.02	1.04
		F = 71.50**			F = 54.63**	

SD- Standard deviation

Table 5. Correlation of farmers’ antecedent variables with their frequency of interaction

Independent variable	Correlation with existing interaction	Correlation with desired interaction
Caste	0.326**	0.336**
Experience in buffalo rearing	0.151*	0.164*
Herd size	0.154*	0.142 ^{NS}
Landholding	0.289**	0.297**
Livestock gross annual income	0.268**	0.249**
Total gross annual income	0.450**	0.447**
Mass media exposure	0.736**	0.689**
Extension agency contact localite	0.584**	0.542**
Extension agency contact cosmopolite	0.770**	0.746**
Social participation	0.344**	0.327**

** - Significant at 0.01 percent, * - Significant at 0.05 percent, NS - Non significant

Table 6. Stepwise regression analysis of farmers antecedent variables with their total interaction

Antecedent variables (predictors)	Regression coefficient with existing interaction	Antecedent variable (predictors)	Regression coefficient with desired interaction
Extension agency contact cosmopolite	$R^2 = 0.679$ $F = 60.868^{**}$	Extension agency contact cosmopolite	$R^2 = 0.644$ $F = 41.229^{**}$
Mass media exposure		Mass media exposure	
Extension agency contact localite		Caste	
Caste		Experience in buffalo rearing	
		Total income	

** - Significant at 0.01 percent, * - Significant at 0.05 percent

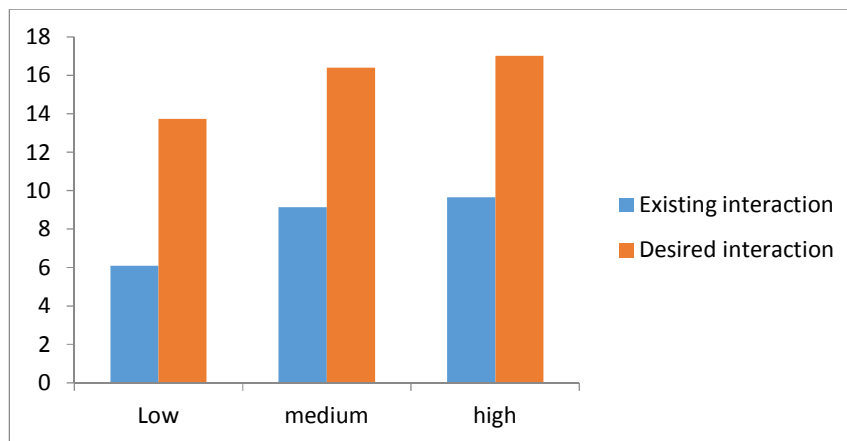


Fig. 1. Distribution of respondents according to their level of income and frequency of interaction

The data revealed that the antecedent variables which contributed positively and significantly towards existing as well as desired interaction were cosmopolite extension agency contact,

mass media exposure, localite extension agency contact. Similar results were reported by Dixit [17], who studied the dairy development in Haryana, reported that contribution of herd size,

extension contact, socio-economic status, in existing and desired frequency of interaction of education and caste was positive and significant respondents.

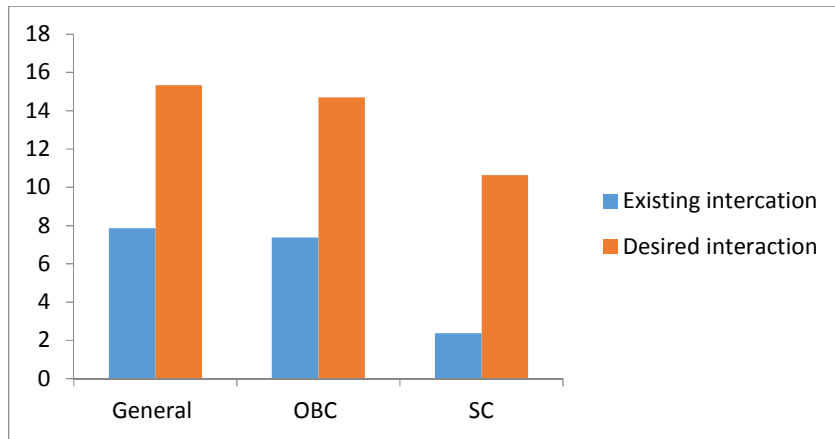


Fig. 2. Distribution of respondents according to their caste and frequency of interaction

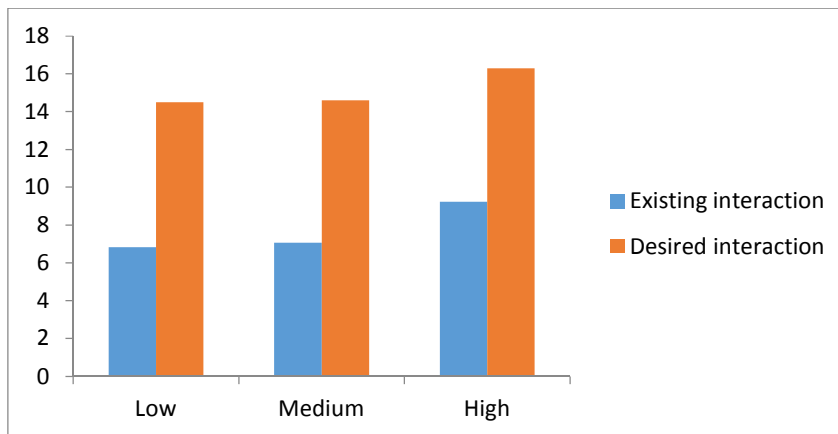


Fig. 3. Distribution of respondents according to their level of education and frequency of interaction

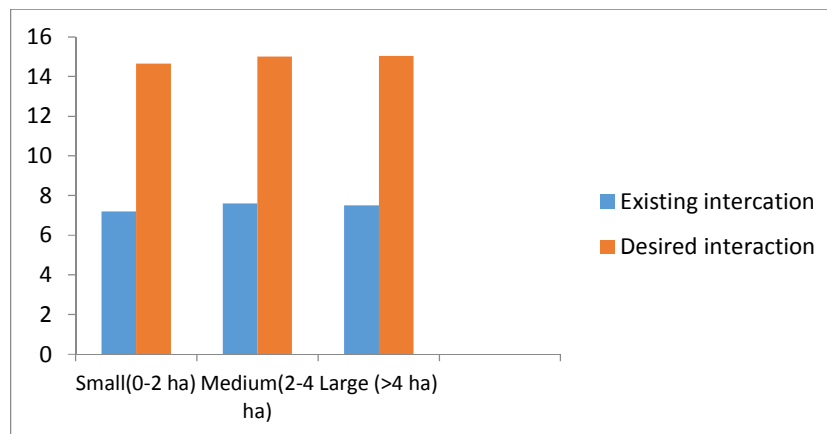


Fig. 4. Distribution of respondents according to their size of landholding and frequency of interaction

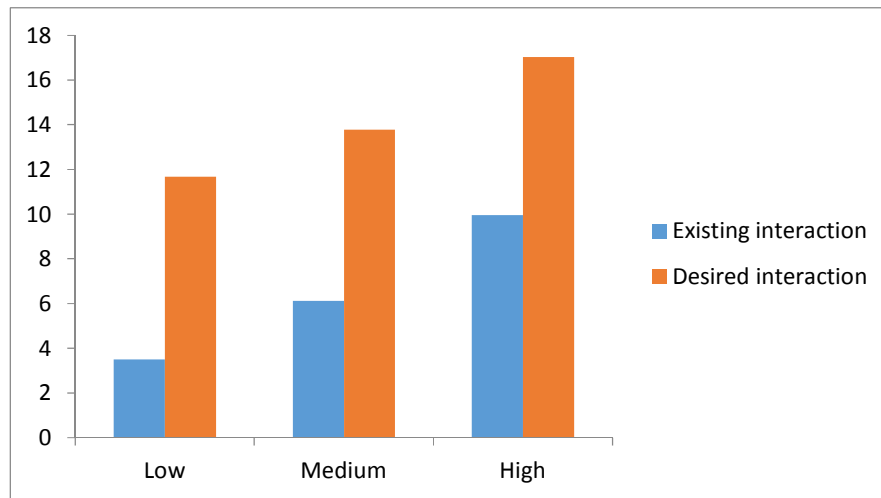


Fig. 5. Distribution of respondents according to their level of mass media exposure and frequency of interaction

4. CONCLUSION

Interaction of farmers belonging to high income group, general caste, high education, medium landholding size and high mass media exposure was significantly more than their counterparts. Hence the hypothesis that antecedent variables of farmers affect their interaction pattern, was found true. The existing interaction of farmers with field functionaries, scientists, administrators, planners and non-government organizations was very less and there was significant difference in existing and desired interaction. Interaction of farmers amongst themselves and with different stakeholders can be increased by organizing more number of on-campus/ off-campus training, demonstrations, loan *melas*, buffalo *melas*, panchayat meetings, milk recordings and clinical camps. Interactions between the farmers stakeholders, through their desired modes, needs to be increased to benefit the farming society, by enhancing their technical knowledge as well as guiding them towards augmenting the animals' productivity. Increased farmers interaction with the stakeholders will be very much beneficial for the adoption of scientific buffalo husbandry practices and thus increasing the milk production and buffalo development in the state.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:

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