



Information Sources, their Utilization Pattern *vis-à-vis* Mithun (*Bos frontalis*) Husbandry in Arunachal Pradesh

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ABSTRACT

The study was designed to assess the utilization pattern of mithun husbandry information sources by the mithun farmers in the state of Arunachal Pradesh during 2019-20. Using multi-stage stratified random sampling a total of 120 farmers who owned and reared mithuns was selected. The study compared the utilization pattern of different sources and channels used by the farmers. Overall, the major source of channel of the mithun for any information on mithun management and production was their fellow mithun friends, followed by television and internet. The indigenous knowledge played a prime source for mithun husbandry information. Multiple regression analysis was employed to find out the independent variables that simultaneously contributed the information utilization pattern. Age of the household head, years of formal education, annual income from mithun and annual income significantly contributed in influencing the information utilization pattern. The mithun farmers of Arunachal Pradesh used both the traditional as well as modern tools to access the mithun management and production information.

INTRODUCTION

Mithun (*Bos frontalis*) the unique and elegant bovine species of North East India, is being reared in four states only, viz. Arunachal Pradesh, Manipur, Mizoram and Nagaland with Arunachal Pradesh accounting for almost 90 per cent of the population (Biam et al., 2021). Mithuns are free ranging bovines inhabiting deeply within the community forests and jungles. In most case, the mithun owners are resource poor and have low purchasing power as a result they mostly use their locally acquired traditional knowledge and information on mithun management and production from their forefathers and fellow mithun which at times is not accurate and sufficient. Still the personal sources dominate the agricultural information system and the dearth of extension personnel and their poor linkages with farmers and amongst themselves have enough indication for the development planners (Bhagat et al., 2004; Nain et al., 2015). Information and Communication Technology (ICT) tools are mostly used to get

benefit of general communication and entertainment purpose and less for marketing and other productive purpose (Panda et al., 2019), although social media have the potential to promote the creation of social wealth in the form of discussion forums for learning exchange (Nain et al., 2019). The changing environment of the food and agricultural industry, particularly in the livestock-based high-value agriculture segment, has made information and knowledge become an increasingly crucial aspect in production for successful decision-making (Birkhaeuser et al., 1991; Cash, 2001; Galloway & Mochrie, 2005; Adhiguru et al., 2009). In developing countries, centralized extension services rarely prioritize the dissemination of livestock production knowledge (Morton & Matthewman, 1996). Though the government of India provides veterinary services, funding constraints have made it impossible for most state governments to expand livestock services and improve service quality (Ahuja et al., 2003; Bardhan, 2010). Farmers, as food producers, must have access to know-how and do-how in order to realize the full

potential of contemporary agricultural and its allied sectors technology, and they must be empowered to take initiatives and make decisions that will only help shape the future of the farmer's economy (Madhuri et al., 2021).

To mobilize the convergence of up to date information on mithun husbandry through different sources and channels, there is a need to investigate various researchable issues to delineate the pre-requisites of a sound strategy so that quality and effective information reaches the farmers. Agriculture is becoming less remunerative due to the lack of a proper information and communication network infrastructure, a need-based information dissemination center, and increased technical distribution to farmers (Jena et al., 2019). Hence, it becomes important to know the information utilization pattern of farmers with regard to the different information sources and channel for overcoming the challenges faced by the farmers. The utilization of relevant, accurate and up-to-date information on mithun husbandry by the key stakeholders would ensure increased productivity. With this in mind, the present study was conducted with the following objectives to study the sources of information and information utilization pattern of the mithun farmers' vis-à-vis mithun husbandry and to analyze the association and relationship of identified variables towards the information utilization pattern.

METHODOLOGY

The study was conducted in the state of Arunachal Pradesh located in the extreme northeastern part of India during 2019-2020. Using a multi-stage stratified random method the state's districts were divided into three quartiles depending on the mithun population. The districts with the highest mithun population in each quartile, namely Papum Pare (44,286), Upper Siang (20,463) and East Siang (9,758) (19th Quinquennial Livestock Census, 2012) were then purposely selected. A total of four villages from each of the districts were selected at random with ten respondents from each village. Thus a total of 120 mithun household heads was surveyed for the study. A pre-tested interview schedule that contained both closed-ended and open-ended questions was used to collect the primary data.

The information utilization pattern of the mithun farmers was operationalized as the dependent variable and was conceptualized as the process through which the mithun farmers gather information related to mithun husbandry and further utilize the same from different sources viz. impersonal cosmopolite, personal cosmopolite and personal localite. It was assessed with the help of respondents' responses to Likert-type scale (Mukherjee et al., 2018; Kumar & Meena, 2021) with slight modifications on 3 point continuum employing an ordinal level of measurement i.e. Frequently (F), Sometimes (S), and Never (N) with corresponding weightage scores of 2, 1, and 0. The weighted mean score (WMS) with respect to the frequency of the sources of information used was calculated to assess the information utilization pattern of the mithun farmers. Independent variables likely to influence the information utilization pattern of the farmers like age, years of formal education, family size, land holding, operational land, farming as primary occupation, number of mithun owned, years of mithun rearing experience, annual income from mithun and annual income were selected.

Multiple regression analysis was employed to find out the number of independent variables that simultaneously contribute or influence the information utilization pattern of the mithun farmers (Ray & Mondal, 2016). Statistical Package for the Social Sciences v22.0 (SPSS) of IBM was used for analyzing the data.

RESULTS AND DISCUSSIONS

Information utilization pattern of the mithun farmers

Information is an integral part of any change and development. For the extension functionaries, the communication gap is an alarming challenge (Kundal et al., 2018). The mithun farmers due to their location in far flung village use various types of sources for obtaining information on mithun husbandry. The findings revealed that out of all the different impersonal cosmopolite sources, television was ranked first as their main source of information about mithun husbandry, with a WMS of 1.51 and 82.50 per cent of the farmers reporting frequent usage, followed by internet (WMS 1.51) and radio (WMS 0.74). Similar findings were reported by Banmeke and Ajayi (2007). This could be because the mithun villages' remote location makes internet connection impossible, thus they rely heavily on the television and sometimes the radio. Radio being a cheap source of dissemination of information was widely used by the farmers when they visit the jungles to feed the mithun salt every fortnightly. Further perusal of Table 1, divulges that the National Research Centre on Mithun, Medziphema, Nagaland, was the most widely used personal cosmopolite sources (WMS 0.97). This can be attributed to the fact that the center being the only research organization in the world working exclusively for the conservation and preservation of mithun is a ready to access information repository on mithun husbandry for the farmers. This is followed by the specialist from the line department viz. state veterinary officers (WMS 0.86). Overall 99.17 per cent of the respondents were contacting fellow mithun/livestock farmers frequently (WMS 1.65) followed by bank personnel (WMS 0.08). Similar findings were reported by Kundal et al., (2018). This could be because most farmers have an average of 32.99 years of mithun rearing experience, making them more knowledgeable about numerous indigenous mithun husbandry techniques. Overall, the major source of any information on mithun management and production was their fellow mithun friends as is evident from the highest WMS of 1.65. They would first consult their fellow mithun/livestock farmers or else use the television, contact the National Research on Mithun or search the internet for any information pertaining to mithun husbandry. It is important to use ICT in combination with the more traditional extension methods such as mass media, group meetings, field days, demonstrations and exchange visits with the objective to make the information available to all the stakeholders very effectively, efficiently and quickly (Raina et al., 2011; Chander & Rathod, 2020).

Relationship between the information utilization pattern and the independent variables

The mithun farmers because of their low purchasing power and inaccessibility to quick information use different types of sources for acquiring information on mithun husbandry. A perusal

Table 1. Mithun farmers sources of information and their utilization pattern vis-à-vis mithun husbandry

Source of information	Utilization Pattern (%)			WMS	Rank
	Frequently	Sometimes	Never		
Impersonal cosmopolite					
Radio	25.83	37.50	36.67	0.74	III
Television	82.50	15.83	1.67	1.51	I
Internet	50.12	25.13	24.75	1.04	II
Newspaper	16.67	18.33	65.00	0.43	V
Educational Films	10.83	12.50	76.67	0.28	VI
Printed Farm publications	4.17	9.17	86.67	0.15	VII
Agri-fair/Exhibitions	4.17	22.50	73.33	0.26	VI
Kisan Melas/Mithun Melas	2.50	69.17	28.33	0.62	IV
Agriculture magazines	5.00	8.33	86.67	0.15	VII
Personal cosmopolites					
Training/Demonstrations	3.33	15.83	80.83	0.19	III
ICAR-NRC on Mithun	40.83	34.17	25.00	0.97	I
Specialist from State Veterinary Department	32.50	38.33	29.17	0.86	II
Personal localite					
Bank Personnel	0.83	7.50	91.67	0.08	II
Agricultural/veterinary input dealers	0.00	0.83	99.17	0.01	III
Mithun/livestock farmers	99.17	0.83	0.00	1.65	I

WMS: Weighted mean score

of the Table 2, reveals that age ($r = -0.181$) and annual income from mithun ($r = 0.430$) had a negative and significant correlation with the information utilization pattern of the mithun farmers. However, there was a positive and significant relationship between farmers'

Table 2. Relationship between information utility pattern (y) and selected independent variables

Independent variables	r value	Remarks
Age of household head (x_1)	-0.181	*
Formal years of education (x_2)	0.353	**
Family size (x_3)	-0.173	
Land holding (acre) (x_4)	-0.078	
Operational land holding (acre) (x_5)	0.068	
Farming as primary occupation (x_6)	-0.020	
Number of mithun owned (x_7)	0.126	
Years of mithun rearing experience (x_8)	0.195	*
Annual income from mithun (x_9)	-0.181	*
Annual income (x_{10})	0.237	**

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

information utilization pattern and their years of formal education ($r = 0.353$), annual income ($r = 0.237$) at 0.01 level of probability and years of mithun rearing experience ($r = 0.195$) at 0.05 level of probability. The findings are in line with Anbarasan & Bhardwaj (2017), wherein they reported that age, formal years of education and farming experience had a significant relationship with the information utilization pattern.

The regression analysis of the information utilization pattern with ten independent variables is presented in Table 3 by B-values (un-standardized partial regression coefficients), standard errors of unstandardized partial regression coefficients, β values (standardized partial regression coefficients), the coefficients of multiple regression determination (R^2) and the corresponding p -values. The farmers information utilization pattern was strongly influenced by the variables; formal years of education ($p < 0.05$), annual income from mithun ($p < 0.05$) and annual income ($p < 0.01$). These three variables' standard coefficient beta values explain why one unit changes in these variables contribute 0.200, -0.224, and 0.270 unit changes in information utilization pattern of the mithun

Table 3. Regression analysis in predicting information utility pattern using selected independent variables

Variables	Unstandardized Coefficients		Standardized Coefficients	t value	Sig.
	Reg. Coeff. B	S.E. B	Beta		
(Constant)	8.274	2.273		3.641	0.000
Age of household head (x_1)	-0.050	0.030	-0.143	-1.697	0.093
Formal years of education (x_2)	0.103	0.047	0.200	2.178	0.032
Family size (x_3)	-0.068	0.073	-0.085	-0.932	0.354
Land holding (acre) (x_4)	-0.047	0.034	-0.148	-1.392	0.167
Operational land holding (acre) (x_5)	0.015	0.011	0.133	1.409	0.162
Farming as primary occupation (x_6)	0.129	1.251	0.009	0.103	0.918
Number of mithun owned (x_7)	0.027	0.048	0.052	0.564	0.574
Years of mithun rearing experience (x_8)	0.067	0.045	0.129	1.503	0.136
Annual income from mithun (x_9)	0.000	0.000	-0.224	-2.613	0.010
Annual income (x_{10})	0.000	0.000	0.270	2.800	0.006

R Square = 0.609 & Adjusted R Square = 0.521, Standard error of the estimate = 2.426

farmers. The fitted regression model with ten independent variables could explain 60 per cent of the variability in comprehending the dependent variable (R square = 0.609).

On the basis of this regression analysis the linear relationship of the information utilization pattern with the independent variables is as per the following model:

$$Y = 8.274 - 0.143X_1 + 0.200X_2 - 0.085X_3 - 0.148X_4 + 0.133X_5 + 0.009X_6 + 0.052X_7 + 0.129X_8 - 0.224X_9 + 0.270X_{10}$$

Where, $X_1, X_2, X_3, \dots, X_{10}$ (independent variables) and Y (dependent variable)

CONCLUSION

Despite the revolution in information technology, the mithun farmers in the study areas have not taken use of its benefits. Due to limited internet connectivity, television and radio, which are both inexpensive and popular ways of gathering information, are commonly used. The ICAR-NRC on Mithun and the relevant State Veterinary Department should work together to develop need-based and time-based mithun husbandry programmes so that farmers can maximize the benefits of television. Mithun being a rare and unique bovine species requires that the farmers must be able to have information supplied to them at their convenience, so that they can benefit from increased output as a result of the adoption of new scientific rearing practices, actions to mitigate any losses and their conservation.

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