



A study to find the Relation between Knowledge Index, Adoption Index and Awareness Index of Selected Animal Husbandry Practices with the Exogenous Variables

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Abstract

Barua village of Midnapur Sadar Block in Paschim Midnapore district of west Bengal was purposively selected to fulfill the objectives of the researcher's study. In the present study livestock owners' adoption, knowledge and awareness behavior about selected animal husbandry practices were the dependent variables. The selected independent variables were - socio-economic, socio-psychological and communication variables. Path analysis adopting the multivariate path model as suggested by Land was used to isolate the direct as well as indirect effects of exogenous variables on endogenous variable. The result of path analysis for the respondents represent the direct and indirect effects for 21 selected exogenous variables on overall knowledge score (knowledge index) about selected animal husbandry practices. It was revealed that the communication skill had the largest direct effect (0.398) on knowledge of improved animal husbandry practices. The residual effect had been found to be 0.3456 or, in a way 34.56 percent of the total variability have been left unexplained. The family size had the largest direct effect on adoption of improved animal husbandry practices. Communication skills, mass media, education of the respondent and material possession were the key elements which directly and indirectly promote adoption of improved animal husbandry practices. Land had the largest direct effect on awareness level about improved animal husbandry practices.

Keywords: Knowledge, adoption, awareness, exogenous.

Introduction

The Animal Husbandry plays significant role in accelerating the growth of rural economy in the developing countries like India. In spite of low productivity of Indian indigenous livestock, this sector contributes 27% of the total agricultural output of the country. 70% of livestock population belongs to rural poor, *i. e.* small, marginal and landless agricultural workers. The present study was concerned with the change of behaviour of the stake holders involved in the programme. This behavioral change may be due to adoption, knowledge, and awareness. These were the determinants to be used for the study of impact of any programme objectively. Therefore, the present study was aimed at finding out the level of different attributes like adoption, knowledge and awareness of respondents involved in relation to livestock production system in the study area.

Material and methods

Barua village of 5 No. Siromoni Grampanchayat under Midnapur Sadar Block was selected purposively to fulfill the objectives of the researcher's study. The present study was confined to only 8 interventions related to livestock. 20% of the Institute Village Linkage Programme beneficiaries covered under

each intervention and thus 139 of respondents were taken as respondents for this study.

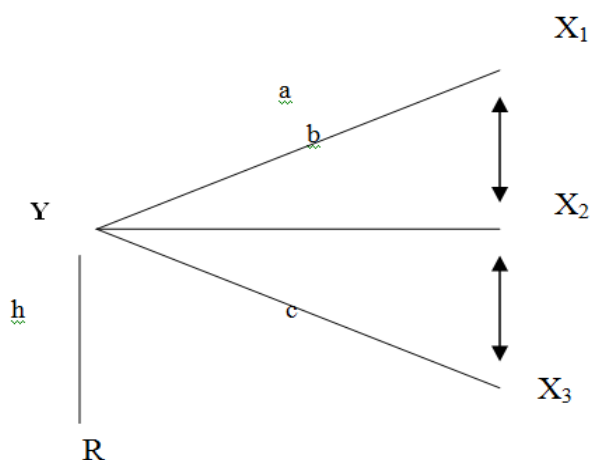
In the present study livestock owners' adoption, knowledge and awareness behavior about selected animal husbandry practices were the dependent variables. The selected independent variables were - socio-economic, socio-psychological and communication variables. In the present investigation path analysis, on the basis of relationship between overall knowledge score (knowledge index), overall adoption score (adoption index) and overall awareness score (awareness index) of selected animal husbandry practices respectively with the exogenous variables was used. Path analysis adopting the multivariate Path Model as suggested by Land was used to isolate the direct as well as indirect effects of exogenous variables on endogenous variable¹. Obviously, the general principles of path analysis are more attuned to construction of unidimensional causal theories, but there are ample evidences where it has proved its efficiency in handling reciprocal relationship as well. From the epistemological and scientific logic perspective, we concur that path analysis is a better tool of analysis than simple correlation and regression models.

The techniques of path coefficient analysis involves a method of partitioning the total correlation between the dependent variable

and the independent variable into direct effect of independent variable and its indirect effect via third variable on dependent variable.

Path coefficient can be defined as the ratio of the standard deviation of the effect, i.e., if Y is the effect and X₁ is the cause, the path coefficient for the path from cause X₁ to affect Y is σ_{x_1} / σ_y .

If the cause and effect relationship is well defined, it is possible to represent the whole system of variable in the form of a diagram, known as path diagram. Let us consider that the yield 'Y' is the function (effect) of various components (causal factors) like number of years etc.



From this figure it is obvious that yield is the result of X₁, X₂ and X₃ and some other undefined factors designated by 'R'. Further X₁, X₂ and X₃ in turn are correlated. In the figure a, b, c and h are the path co-efficient due to respective variables.

The advantages of path diagram, is that a set of simultaneous equations can be written directly from a diagram and a solution of these questions provides information on the direct and indirect contributions of these causal factors to the effect.

Results and Discussions

Path analysis on the basis of relationship between overall knowledge score (knowledge index) of selected animal husbandry practices and the exogenous variables:

The result of path analysis as depicted in table1 for the respondents represented the direct and indirect effects for 21 selected exogenous variables on overall knowledge score (knowledge index) about selected animal husbandry practices.

From the perusal of table 1, it was revealed that the communication skill has the largest direct effect (0.398) on knowledge of improved animal husbandry practices followed in descending order by utilization of innovation proneness (0.331), mass media (0.319), material possession (0.268), education of the respondent (0.188), family size (0.175), farm power (0.0970), attitude(0.083), risk orientation (0.007), economic motivation (-0.013), age (-0.016), social participation (-0.019), family type (-0.031), urban contact (-0.047), number of family members (-0.057), land (-0.066), house (-0.079), personal localite (-0.093), occupation (-0.123), personal cosmopolite (-0.124) and family education score (-0.125).

It was evident from table-1 that the residual effect had been found to be 0.3456 or, in a way 34.56 percent of the total variability had been left unexplained.

Further processing of the data revealed that out of 21 exogenous variables, 15 had their larger indirect effect through communication skill which were occupation, education of the respondent, family education score, land, house, material possession, urban contact, economic motivation, innovation proneness, attitude, risk orientation, social participation, mass media, personal localite and personal cosmopolite. On the other hand, 15 namely, age, occupation, education of the respondent, family type, family size, number of family members, house, farm power, material possession, urban contact, economic motivation, risk orientation, communication skill, social participation, mass media and communication skill had their larger indirect effects through innovation proneness. Similarly 12 had their higher indirect effects through material possession.

Table-1

Path co-efficient showing the direct and indirect effects of selected independent variables on overall knowledge score (knowledge index) of animal husbandry practices

Independent Variables	Direct Effect	Indirect Effect through other independent variables	
(X ₁) Age	-0016	X ₁₁	0.035
		X ₁₄	0.030
		X ₃	0.017
(X ₂) Occupation	-0.123	X ₂₁	0.177
		X ₁₈	0.092
		X ₁₄	0.091
(X ₃) Education of the respondent	0.188	X ₂₁	0.119
		X ₁₄	0.104
		X ₁₈	0.082

(X ₄) Family Type	-0.031	X ₅ X ₁₄ X ₃	0.132 0.053 0.031
(X ₅) Family Size	0.175	X ₁₄ X ₃ X ₁₀	0.059 0.047 0.025
(X ₆) Number of Family members	-0.057	X ₅ X ₃ X ₁₄	0.149 0.063 0.046
(X ₇) Family Education Score	-0.125	X ₂₁ X ₃ X ₁₈	0.152 0.144 0.166
(X ₈) Land	-0.066	X ₁₁ X ₂₁ X ₁₈	0.095 0.089 0.071
(X ₉) House	-0.079	X ₁₁ X ₁₄ X ₂₁	0.173 0.145 0.140
(X ₁₀) Farm Power	0.097	X ₁₁ X ₁₄ X ₃	0.129 0.099 0.053
(X ₁₁) Material possession	0.268	X ₁₄ X ₂₁ X ₁₈	0.175 0.132 0.086
(X ₁₂) Urban Contact	-0.047	X ₁₄ X ₂₁ X ₁₁	0.124 0.108 0.102
(X ₁₃) Economic Motivation	-0.013	X ₁₄ X ₂₁ X ₁₁	0.131 0.115 0.069
(X ₁₄) Innovation Proneness	0.331	X ₁₁ X ₂₁ X ₁₈	0.142 0.122 0.070
(X ₁₅) Attitude	0.083	X ₂₁ X ₁₈ X ₁₁	0.090 0.086 0.058
(X ₁₆) Risk Orientation	0.007	X ₂₁ X ₃ X ₁₄	0.098 0.036 0.025
(X ₁₇) Social Participation	-0.019	X ₂₁ X ₁₄ X ₁₁	0.189 0.098 0.097
(X ₁₈) Mass Media	0.319	X ₂₁ X ₁₁ X ₁₄	0.284 0.073 0.072
(X ₁₉) Personal Cosmopolite	-0.124	X ₂₁ X ₁₈ X ₁₁	0.234 0.219 0.087
(X ₂₀) Personal Localite	-0.093	X ₂₁ X ₁₈ X ₁₁	0.217 0.196 0.077
(X ₂₁) Communication Skill	0.398	X ₁₈ X ₁₄ X ₁₁	0.228 0.102 0.089

These were land, house, farm power, urban contact, economic motivation, innovation proneness, attitude, social participation, mass media, personal cosmopolite, personal localite and communication skill. Mass media influences indirectly through occupation, education of the respondent, family education score, land, material possession, innovation proneness, attitude, personal cosmopolite, personal localite and communication skill on knowledge index. On the other hand 7 namely age, family type, family size, number of family members, family education score, house, farm power and risk orientation had their larger indirect effects through education of the respondent.

So communication skill, innovation proneness, material possession, mass media and education of the respondent, were the key elements which directly and indirectly promoted knowledge of improved animal husbandry practices. Islam also stated that mass media was one of the key elements directly and indirectly promote knowledge of selected animal husbandry practices².

path analysis on the basis of relationship between overall adoption score (adoption index) of selected animal husbandry practices and the exogenous variables:

The result of path analysis as in table2 for the respondents represented the direct and indirect effects for 21 selected exogenous variables on overall adoption score (adoption index) about selected animal husbandry practices.

From the table 2, it was manifested that the family size had the largest direct effect (0.229) on adoption of improved animal husbandry practices followed in descending order by mass media (0.0.216), material possession (0.178), communication skill (0.165), education of the respondent (0.160),urban contact (0.151), farm power (0.125), social participation (0.095), land (0.071), innovation proneness (0.064), house (-0.008), attitude (-0.014), age (-0.027), personal cosmopolite (-0.031), economic motivation (-0.083), personal localite (-0.089), risk orientation (-0.105), occupation (-0.123), number of family members (-0.171), family type (-0.267) and family education score (-0.474).

The critical perusal of table- 2 shows that the residual effect had been found to be 0.7006 or, in a way 70.06 percent of the total variability had been left unexplained.

Further processing of the data depicted that out of 21 exogenous variables,16 had their larger indirect effect through material possession which were age, occupation, education of the respondent, family education score, land, house, farm power, urban contact, economic motivation, innovation proneness, attitude, social participation, mass media, personal localite, personal cosmopolite, communication skill. On the other hand,12 namely, occupation, family type, family size, number of family members, family education score, house, material possession, urban contact, economic motivation, risk orientation, mass media and communication skill had their larger indirect effects through education of the respondents. Similarly 10 had their higher indirect effects through mass media. These were education, family education score, material possession, economic motivation, attitude, risk orientation, social participation, personal cosmopolite, personal localite and communication skill. 8 exogenous variables had their higher indirect effects through communication skill which were occupation, urban contact, economic motivation, innovation proneness, risk orientation, social participation, personal cosmopolite, and personal localite. So communication skill, mass media, education of the respondent and material possession were the key elements which directly and indirectly promote adoption of improved animal husbandry practices. These findings were in line with the Ghosh who reported that communication source has come out to be the key element which directly and indirectly promoted the adoption of improved animal husbandry practices in case of dairy farmer of Member Co-operative Society³. Similar kind of findings were found by Sarkar and Dutta for path analysis on the basis of relationship between overall adoption score (Adoption Index) of selected animal husbandry practices and the exogenous variables^{4, 5}.

Path analysis on the basis of relationship between overall awareness score (awareness index) of selected animal husbandry practices and the exogenous variables:

The result of path analysis as depicted in table-3 for the respondents represented the direct and indirect effects for 21 selected exogenous variables on overall awareness score (awareness index) about selected animal husbandry practices.

Table-2
Path co-efficient showing the direct and indirect effects of selected independent variables on overall adoption score (adoption index)

Independent Variables	Direct Effect	Indirect Effect through other independent variables	
(X ₁) Age	-0.027	X ₄	0.028
		X ₁₁	0.023
		X ₁₂	0.019
(X ₂) Occupation	-0.123	X ₃	0.094
		X ₂₁	0.074
		X ₁₁	0.068
(X ₃) Education of the respondent	0.160	X ₁₁	0.072
		X ₅	0.057
		X ₁₈	0.056

(X ₄) Family Type	-0.267	X ₅ X ₁₀ X ₃	0.173 0.033 0.027
(X ₅) Family Size	0.229	X ₃ X ₁₀ X ₈	0.040 0.033 0.020
(X ₆) Number of Family Members	-0.171	X ₅ X ₃ X ₁₀	0.195 0.054 0.029
(X ₇) Family Education Score	-0.474	X ₃ X ₁₁ X ₁₈	0.123 0.090 0.079
(X ₈) Land	0.071	X ₁₀ X ₁₁ X ₅	0.079 0.063 0.063
(X ₉) House	-0.008	X ₁₁ X ₃ X ₁₂	0.115 0.089 0.078
(X ₁₀) Farm Power	0.125	X ₁₁ X ₅ X _{3,8}	0.085 0.060 0.045
(X ₁₁) Material Possession	0.178	X ₃ X ₁₀ X ₁₈	0.065 0.060 0.059
(X ₁₂) Urban Contact	0.151	X ₁₁ X ₂₁ X _{3,4}	0.068 0.045 0.040
(X ₁₃) Economic Motivation	-0.083	X ₂₁ X _{11,3} X ₁₈	0.048 0.046 0.045
(X ₁₄) Innovation Proneness	0.064	X ₁₁ X ₁₂ X ₂₁	0.094 0.057 0.051
(X ₁₅) Attitude	-0.014	X ₁₈ X ₁₂ X ₁₁	0.058 0.041 0.038
(X ₁₆) Risk Orientation	-0.105	X ₁₈ X ₂₁ X ₃	0.068 0.041 0.030
(X ₁₇) Social Participation	0.095	X ₂₁ X ₁₁ X ₁₈	0.079 0.064 0.063
(X ₁₈) Mass Media	0.216	X ₁₁ X ₃ X ₁₇	0.048 0.041 0.028
(X ₁₉) Personal Cosmopolite	-0.031	X ₁₈ X ₂₁ X ₁₁	0.148 0.097 0.058
(X ₂₀) Personal Localite	-0.089	X ₁₈ X ₂₁ X ₁₁	0.133 0.090 0.051
(X ₂₁) Communication Skill	0.165	X ₁₈ X ₁₁ X ₃	0.155 0.059 0.048

Table-3
Path co-efficient showing the direct and indirect effects of selected independent variables on overall awareness score (awareness index) of animal husbandry practices

Independent Variables	Direct Effect	Indirect Effect through other independent variables	
(X ₁) Age	0.041	X ₇	0.015
		X ₄	0.010
		X ₁₂	0.009
(X ₂) Occupation	-0.104	X ₈	0.161
		X ₂₀	0.083
		X ₇	0.075
(X ₃) Education of the respondent	-0.297	X ₈	0.121
		X ₇	0.108
		X ₁₉	0.043
(X ₄) Family Type	-0.100	X ₈	0.099
		X ₂₀	0.057
		X ₇	0.026
(X ₅) Family Size	-0.060	X ₈	0.102
		X ₇	0.047
		X ₂₀	0.043
(X ₆) Number of Family members	-0.064	X ₈	0.094
		X ₇	0.061
		X ₂₀	0.049
(X ₇) Family Education Score	0.141	X ₈	0.129
		X ₂₀	0.115
		X ₁₉	0.085
(X ₈) Land	0.367	X ₂₀	0.104
		X ₁₉	0.055
		X ₇	0.049
(X ₉) House	0.004	X ₇	0.091
		X ₈	0.064
		X ₁₉	0.058
(X ₁₀) Farm Power	-0.394	X ₈	0.231
		X ₇	0.048
		X ₂₀	0.014
(X ₁₁) Material possession	-0.119	X ₈	0.175
		X ₂₀	0.132
		X _{7,19}	0.086
(X ₁₂) Urban Contact	0.070	X ₁₉	0.046
		X ₇	0.038
		X ₄	0.015
(X ₁₃) Economic Motivation	0.014	X ₁₉	0.063
		X ₂₀	0.058
		X ₈	0.055
(X ₁₄) Innovation Proneness	-0.018	X ₂₀	0.059
		X ₈	0.051
		X ₁₉	0.047
(X ₁₅) Attitude	0.022	X ₁₉	0.067
		X ₂₀	0.045
		X ₈	0.033
(X ₁₆) Risk Orientation	0.014	X ₂₀	0.101
		X ₈	0.080
		X ₁₉	0.078
(X ₁₇) Social Participation	-0.040	X ₂₀	0.109
		X ₈	0.089
		X ₁₉	0.088

(X ₁₈) Mass Media	-0.230	X ₂₀	0.188
		X ₁₉	0.151
		X ₈	0.089
(X ₁₉) Personal Cosmopolite	0.219	X ₂₀	0.221
		X ₈	0.093
		X ₇	0.054
(X ₂₀) Personal Localite	0.306	X ₁₉	0.158
		X ₈	0.125
		X ₇	0.053

The data revealed that land had the largest direct effect (0.0.367) on awareness level about improved animal husbandry practices followed in descending order by personal localite (0.306), personal cosmopolite (0.219), family education score (0.141), urban contact (0.070), age (0.041), attitude (0.022), economic motivation (0.014), risk orientation (0.014), house (0.004), innovation proneness (-0.018), communication skill (-0.021), social participation (-0.040) family size (-0.060), number of family members (-0.064), family type (-0.100), occupation (-0.104), material possession (-0.119), mass media (-0.230), education of the respondent (-0.297), and farm power (-0.394).

The residual effect had been found to be 0.7006 or, in a way 70.06 percent of the total variability had been left unexplained.

Further processing of the data revealed that out of 21 exogenous variables, 18 had their larger indirect effect through land, which were occupation, education of the respondent, family type, family size, number of family members, family education score, house, farm power, material possession, economic motivation, innovation proneness, attitude, risk orientation, social participation, mass media, personal cosmopolite, personal localite and communication skill. On the other hand, 16 namely occupation, family type, family size, , number of family members, family education score, land, farm power, material possession, economic motivation, innovation proneness, attitude, risk orientation, social participation, mass media, personal cosmopolite, personal localite and communication skill had their higher indirect effects through personal localite. Similarly 14 had their higher indirect effects through personal cosmopolite. These are education of the respondent, family education score, land, house, material possession, urban contact, economic motivation, innovation proneness, attitude, risk orientation, social participation, mass media, personal localite and communication skill. 13 exogenous variables had their higher indirect effect through family education score which were age, occupation, education of the respondent, family type, family size, number of family members, land, house, farm power, material possession, urban contact, , personal cosmopolite, personal localite.

So personal cosmopolite, personal localite, land, and family education score of the livestock farmers were the key elements

which directly and indirectly promoted awareness of improved animal husbandry practices.

Conclusion

The study concludes that selected socio-economic, socio-psychological and communication variables had exerted direct and indirect effect on overall knowledge score (knowledge index), overall adoption score (adoption index) and overall awareness score (awareness index) of selected animal husbandry practices respectively. Communication skill, innovation proneness, material possession, mass media and education of the respondent, were the main determinants which directly and indirectly promoted knowledge of improved animal husbandry practices whereas communication skill, mass media, education of the respondent and material possession played pivotal role for adoption of improved animal husbandry practices. For awareness personal cosmopolite, personal localite, land, and family education score of the respondents were the most vital factors.

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