

## Original Research Article

# Path Analysis of Personal, Socio-Economical and Psychological Characteristics of the Deoni and Non-Descriptive Cattle Rearers on Their Extent of Adoption of Management Practices

B. L. Pisure<sup>1\*</sup>, P. R. Deshmukh<sup>2</sup> and P. S. Kapse<sup>2</sup>

<sup>1</sup>Department of Extension Education, NSB College of Agriculture, Markhel, (M.S), India

<sup>2</sup>Department of Extension Education, College of Agriculture, VNMKV, Parbhani (M.S) India

*\*Corresponding author*

## ABSTRACT

The present study was conducted purposively in Latur district of the Marathwada region of Maharashtra state. From this district six tahsils were selected. Four villages from each taluka were selected purposively. The total villages for the study were 24. Ten respondents from each village were selected purposively for the study. Comprising 120 respondents of Deoni cattle and 120 respondents of Non-descriptive cattle from Latur district were selected. Thus, there were a total of 240 respondents selected for the research study. Ex-post facto research design was adopted in this study. The data were collected with the help of pretested interview schedule. The statistical methods and tests such as frequency, percentage, mean, standard deviation, co-efficient of correlation, multiple regressions, Z test and path analysis were used for the analysis of data. In relation to the deoni cattle rearers, it is observed from that the independents variables namely education, occupation, land holding, annual income, experience in cattle rearing, herd size, social participation, use of sources of information, extension contact, market orientation, risk orientation and knowledge were positively and significantly related with extent of adoption of cattle management practices by deoni cattle rearers. Whereas, age, family size and experience in cattle rearing did not show any relationship with adoption of cattle management practices by non-descriptive cattle rearers.

### Keywords

Relationship  
Socio-personal,  
economical  
characteristics,  
Adoption, Deoni  
cattle rearers,  
Non-descriptive  
cattle rearers,  
management  
practices

## Introduction

Cattles are considered to have been one of the first animals domesticated by man for agricultural purposes. They were tamed to provide milk, meat and hides and for draft purposes. Cattle are an important source of livelihood for the rural people particularly for women, landless labour and marginal farmers living in the interior areas, who do not have the other means of survivals. The number of milch animals (in milk and dry) in cows and buffaloes has increased from 111.09 million to 118.59 million, an

increase of 06.75 per cent. The female cattle (Cows) population has increased by 06.52 per cent over the previous census (2007) and the total number of female cattle in 2012 is 122.90 million numbers. The total livestock population of Maharashtra state according to 19<sup>th</sup> Livestock Census (2012) is 3,24,88,652. Total exotic/crossbred cattle female in Maharashtra is 3105627 (in milk – 1396402, dry – 576882, not calved once – 73426). Total indigenous cattle in Maharashtra are 11559938 (total female – 4897507, in milk –

1648173, dry – 1308876, not calved once – 181239). (Anonymous, 2012). A cattle rearing is very important subsidiary business for the farmers. Cattle rearing provide farmers regular cash income throughout the year. To make the cattle rearing more profitable and well managed, it is necessary for the cattle rearers to adopt different recommended and improved cattle management practices than old cattle management practices. The socio-economic attributes of the cattle rearers may have influence on their knowledge and adoption of different cattle management practices. Therefore these different personal, socio-economic, and psychological characteristics needs to be studied for better policy making and for motivating the cattle rearers to adopt different recommended management practices. Considering all these factors this study was conducted with a specific objective of to study the relationship between personal, socio-economical and psychological characteristics of deoni cattle rearers and non-descriptive cattle rearers with extent of adoption of management practices

### **Materials and Methods**

The present study was conducted in Latur district of the Marathwada region of Maharashtra state which was purposively selected for the research study. From this district six tahsils were selected for the study. Four villages from each taluka were selected purposively for the study. The total villages for the study were 24. Ten respondents from each village (Five respondents of Deoni cattle and five respondents of Non-descriptive cattle) were selected purposively for the study. Comprising 120 respondents of Deoni cattle and 120 respondents of Non-descriptive cattle from Latur district were selected for the study. Thus, there were a total of 240

respondents selected for the research study. Ex-post facto research design was adopted in this study. The data were collected with the help of pretested interview schedule from the respondents as per their convenience at their home or farms. One of the objectives of present study was to study the personal, socio-economic and psychological characteristics of the deoni cattle rearers and non-descriptive cattle rearers. The study of personal, socio-economical and psychological characteristics of deoni cattle rearers and non-descriptive cattle rearers were made with reference to age, education, family size, occupation, land holding, annual income, experience in cattle rearing, herd size, social participation, use of sources of information, extension contact, market orientation, risk orientation and knowledge. This was used to identify the direct, total indirect and substantial indirect effect of independent variables on dependent variable. Path analysis adopting multivariate path model suggested by Land (1969) was used to isolate direct, indirect and substantial effect of independent variable on dependent variables of the respondents.

The formula used was as follows:

$$Z_{12} = P_{12.1} Z_1 + P_{12.2} Z_2 + \dots + P_{12.n} Z_n + P_{12.Za}$$

Where,

$Z_{12}$  = Dependent variable

$Z_1$  to  $Z_n$  = Independent variables

$Z_a$  = Residual factor

### **Results and Discussion**

#### **Path analysis**

The relationship exhibited by correlation study may undergo change in different

situations, where some of the independent variables may not exist in the environment or they may be concealed. In order to know the influence of independent variables both directly, as well as, through other variables, the correlation coefficient values indicated earlier were attempted for path analysis.

### **Path analysis showing the effects of personal, socio-economical and psychological characteristics of deoni cattle rearers on their extent of adoption of management practices**

#### **Total effect**

It was observed from Table 1 that among the personnel, socio-economical and psychological characteristics of deoni cattle rearers the highest positive total effect on extent of adoption of management practices was exerted by social participation (0.7451), followed by land holding (0.6906), risk orientation (0.6109), occupation (0.6038), herd size (0.5443), knowledge (0.5304), annual income (0.5215), education (0.5047), extension contact (0.5028), market orientation (0.4815), experience in cattle rearing (0.4412) and use of source of information (0.4121), whereas age (0.1140) exerting low positive total effect on overall adoption of cattle management practices.

#### **Direct effect**

It is noticed from Table 1 that, the highest direct positive influence on extent of adoption of management practices was exerted by knowledge (0.7882), followed by land holding (0.7421), market orientation (0.6565), social participation (0.5473). A considerable direct positive effect was also exerted by education (0.1072), occupation (0.0786), risk orientation (0.0586), herd size (0.0302) and age (0.0225) on extent of adoption of management practices.

#### **Total indirect effect**

It is further seen from Table 1 that, the highest positive total indirect effect on extent of adoption of management practices was exerted by extension contact (1.4862), followed by annual income (1.0780), experience in cattle rearing (0.7273), risk orientation (0.5523) followed by use of source of information (0.5439), herd size (0.5141) and occupation (0.5252).

Other variables exercising total indirect positive effect on extent of adoption of management practices were in the following order: education (0.3975), social participation (0.1978), age (0.0915) and family size (0.0866).

#### **Substantial indirect effect**

As regards the substantial indirect effects Table 1 shows that the first substantial indirect effect on extent of adoption of management practices was exerted by extension contact (0.7275) through knowledge, followed by market orientation (0.6837) through knowledge, education (0.6678) through knowledge, occupation (0.5944) through land holding, herd size (0.5910) through land holding, annual income (0.5705) through knowledge, knowledge (0.5695) through market orientation, experience in cattle rearing (0.5635) through knowledge.

The other first substantial indirect effect was exerted by social participation (0.5496) through land holding, risk orientation (0.5291) through land holding, use of source of information (0.4593) through knowledge, land holding (0.4053) through social participation, family size (0.2168) through land holding and age (0.1234) through land holding on extent of adoption of management practices.

**Table.1** Path analysis showing the effects of personal, socio-economical and psychological characteristics of deoni cattle rearers on their extent of adoption of management practices

Sr. No.	Independent variables	Total effect	Direct effect	Total indirect effect	Substantial indirect effect	
					1	2
X1	Age	0.1140	0.0225	0.0915	0.1234 (X5)	0.0762 (X14)
X2	Education	0.5047	0.1072	0.3975	0.6678 (X14)	0.5329 (X12)
X3	Family size	-0.0127	-0.0993	0.0866	0.2168 (X5)	0.1224 (X12)
X4	Occupation	0.6038	0.0786	0.5252	0.5944 (X5)	0.4262 (X9)
X5	Land holding	0.6906	0.7421	-0.0515	0.4053 (X9)	0.3240 (X14)
X6	Annual income	0.5215	-0.5565	1.0780	0.5705 (X14)	0.5103 (X5)
X7	Experience in cattle rearing	0.4412	-0.2861	0.7273	0.5635 (X14)	0.4465 (X5)
X8	Herd size	0.5443	0.0302	0.5141	0.5910 (X5)	0.4859 (X14)
X9	Social participation	0.7451	0.5473	0.1978	0.5496 (X5)	0.4222 (X14)
X10	Use of source of information	0.4121	-0.1318	0.5439	0.4593 (X14)	0.4192 (X5)
X11	Extension contact	0.5028	-0.9834	1.4862	0.7275 (X14)	0.5543 (X12)
X12	Market orientation	0.4815	0.6565	-0.1750	0.6837 (X14)	0.2829 (X5)
X13	Risk orientation	0.6109	0.0586	0.5523	0.5291 (X5)	0.4114 (X14)
X14	Knowledge	0.5304	0.7882	-0.2578	0.5695 (X12)	0.3050 (X5)

**Table.2** Path analysis showing the effects of personal, socio-economical and psychological characteristics of non-descriptive cattle rearers on their extent of adoption of management practices

Sr. No.	Independent variables	Total effect	Direct effect	Total indirect effect	Substantial indirect effect	
					1	2
X1	Age	-0.0224	0.1032	-0.1256	0.0950 (X10)	0.0282 (X6)
X2	Education	0.5278	-0.0097	0.5375	0.4001 (X13)	0.3370 (X8)
X3	Family size	0.1187	0.0060	0.1127	0.1586 (X8)	0.1436 (X10)
X4	Occupation	0.4357	-0.0413	0.4770	0.4196 (X13)	0.3770 (X8)
X5	Land holding	0.2445	-0.4028	0.6473	0.2941 (X13)	0.2694 (X10)
X6	Annual income	0.2060	0.0578	0.1482	0.2368 (X10)	0.2300 (X8)
X7	Experience in cattle rearing	0.1308	-0.1649	0.2957	0.2493 (X10)	0.2337 (X8)
X8	Herd size	0.6765	0.4796	0.1969	0.4715 (X13)	0.2673 (X9)
X9	Social participation	0.6335	0.3128	0.3207	0.4623 (X13)	0.4099 (X8)
X10	Use of source of information	0.4446	0.3575	0.0871	0.3273 (X13)	0.2850 (X8)
X11	Extension contact	0.5469	-0.2134	0.7603	0.4377 (X13)	0.4273 (X8)
X12	Market orientation	0.4559	-0.2173	0.6732	0.3971 (X13)	0.2872 (X8)
X13	Risk orientation	0.8019	0.7289	0.0730	0.3103 (X8)	0.1984 (X9)
X14	Knowledge	0.5676	0.1462	0.4214	0.4331 (X13)	0.3677 (X8)

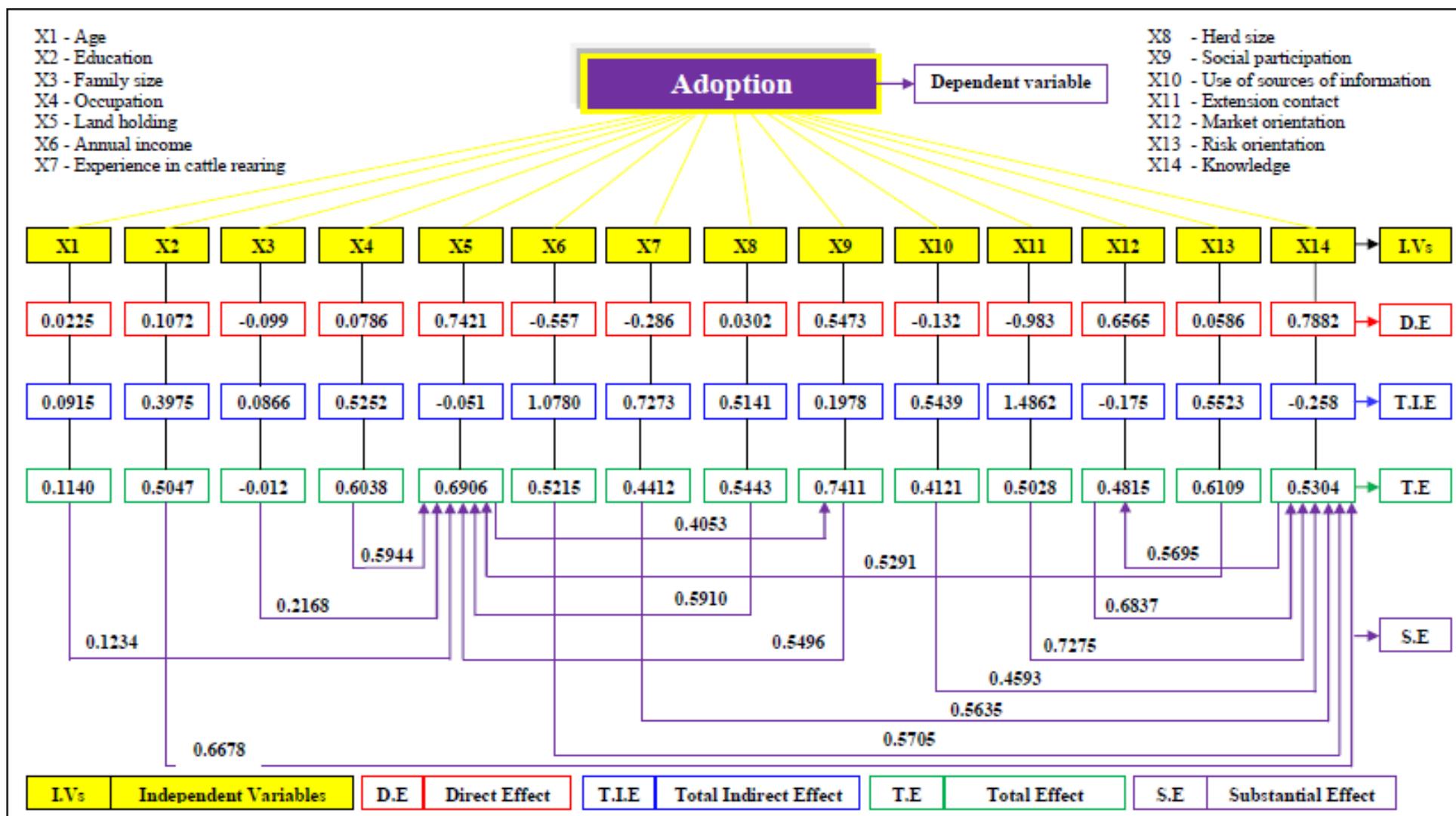


Fig. 1. Path analysis showing the effects of personal, socio-economical and psychological characteristics of deoni cattle rearers on their extent of adoption of management practices

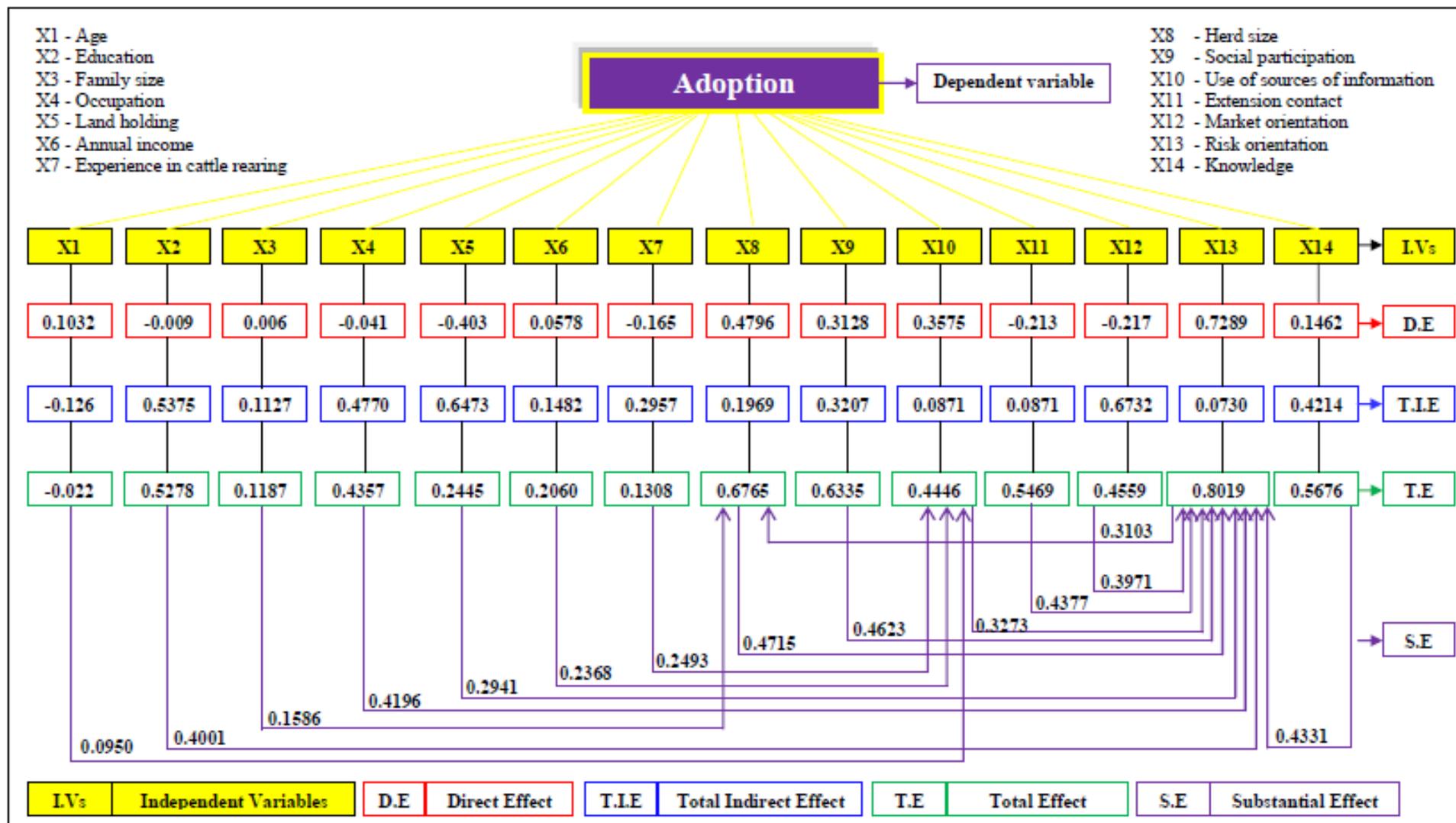


Fig. 2. Path analysis showing the effects of personal, socio-economical and psychological characteristics of non-descriptive cattle rearers on their extent of adoption of management practices

The data in the Table 1 further showed that highest second substantial indirect effect on extent of adoption of management practices was exerted by extension contact (0.5543) through market orientation, followed by education (0.5329) through market orientation, annual income (0.5103) through land holding, herd size (0.4859) through knowledge, experience in cattle rearing (0.4465) through land holding, occupation (0.4262) through social participation, social participation (0.4222) through knowledge, use of source of information (0.4192) through land holding and risk orientation (0.4114) through knowledge. The other second substantial indirect effect was exerted by land holding (0.3240) through knowledge, knowledge (0.3050) through land holding, market orientation (0.2829) through land holding, family size (0.1224) through market orientation and age (0.0762) through knowledge on extent of adoption of management practices. Thus, it is observed that knowledge, land holding, market orientation and social participation were the important variables in absence of which, independent variables are not able to influence the extent of adoption of management practices by deoni cattle rearers. The diagrammed representation showing the effects of personal, socio-economical and psychological characteristics of deoni cattle rearers on their extent of adoption of management practices is given in Fig.1.

**Path analysis showing the effects of personal, socio-economical and psychological characteristics of non-descriptive cattle rearers on their extent of adoption of management practices.**

**Total effect**

It was observed from Table 2 that the highest positive total effect on extent of

adoption of management practices was exerted by risk orientation (0.8019) followed by herd size (0.6765), social participation (0.6335), knowledge (0.5676), extension contact (0.5469), education (0.5278), market orientation (0.4559), use of source of information (0.4446), occupation (0.4357), land holding (0.2445), annual income (0.2060), experience in cattle rearing (0.1308) and family size (0.1187).

**Direct effect**

It is noticed from Table 2 that, the highest direct positive influence on extent of adoption of management practices was exerted by risk orientation (0.7289), followed by herd size (0.4796), use of source of information (0.3575), social participation (0.3128), knowledge (0.1462) and age (0.1032).

A considerable direct positive effect was also exerted by annual income (0.0578) and family size (0.0060) on extent of adoption of management practices.

**Total indirect effect**

It is further seen from Table 2 that, the highest positive total indirect effect on extent of adoption of management practices was exerted by extension contact (0.7603), followed by market orientation (0.6732), land holding (0.6473), education (0.5375), followed by occupation (0.4770), knowledge (0.4214), social participation (0.3207), experience in cattle rearing (0.2957), herd size (0.1969). Other variables exerting total indirect positive effect on extent of adoption of management practices were annual income (0.1482), family size (0.1127), use of source of information (0.0871) and risk orientation (0.0730) on extent of adoption of management practices.

### **Substantial indirect effect**

In relation to the substantial indirect effects, Table 2 shows that the first substantial indirect effect on extent of adoption of management practices was exerted by herd size (0.4715) through knowledge, followed by social participation (0.4623) through risk orientation, extension contact (0.4377) through risk orientation, knowledge (0.4331) through risk orientation, occupation (0.4196) through risk orientation and education (0.4001) through risk orientation. The other first substantial indirect effect was exerted by market orientation (0.3971) through risk orientation, use of source of information (0.3273) through risk orientation risk orientation (0.3103) through herd size, experience in cattle rearing (0.2493) through use of source of information, land holding (0.2941) through risk orientation, annual income (0.2368) through use of source of information, family size (0.1586) through herd size and age (0.0950) through use of source of information on extent of adoption of management practices.

In context with the substantial indirect effect, the data in the Table 2 also shows that, the highest second substantial effect on extent of adoption of management practices was exerted by extension contact (0.4273) through herd size, followed by social participation (0.4099) through herd size, occupation (0.3770) through herd size, knowledge (0.3677) through herd size, education (0.3370) through herd size, market orientation (0.2872) through herd size, use of source of information (0.2850) through herd size, land holding (0.2694) through use of source of information, herd size (0.2673) through social participation, experience in cattle rearing (0.2337) through herd size, annual income (0.2300) through herd size, risk orientation (0.1984) through social participation, family size (0.1436)

through use of source of information and age (0.0282) through annual income. Thus, it is revealed that risk orientation, herd size, use of sources of information, social participation and annual income were the important variables in absence of which, independent variables are not able to influence the extent of adoption of management practices by non-descriptive cattle rearers. The diagrammed representation showing the effects of personal, socio-economical and psychological characteristics of deoni cattle rearers on their extent of adoption of management practices is given in Fig.1.

It is observed that knowledge, land holding, market orientation and social participation were the important variables in absence of which, independent variables are not able to influence the extent of adoption of management practices by deoni cattle rearers. Further it is found that risk orientation, herd size, use of sources of information, social participation and annual income were the important variables in absence of which, independent variables are not able to influence the extent of adoption of management practices by non-descriptive cattle rearers.

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