Factor analysis related to production constraints with special reference to rabbit breeding farmers in Tirunelveli District

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Abstract

Animal husbandry contributes significantly in supplementing the income of small, marginal farmers and landless labourers many of whom are women who play a major role in the care and management of livestock. , the researcher selected 480 farmers as sample size in the study area. The data are analyzed by using appropriate statistical techniques such as, Percentage analysis, Chi-square test, ANOVA Techniques, Factor analysis and likert scale . The analysis showed that 295 (61.0 %) belonged to the age group between 30 and 40 years. It also shows that out of 34 females, 76.47 per cent of the female respondents (26) are married. This implies that more married people 417 male respondents (93.5 %) are engaged in rabbit's farming.

Keywords : *rabbit, factor analysis , socio economic , farmers*

Introduction

Our state being an agricultural based economy with more than 60% of the people engaged in animal husbandry, agriculture and allied activities; it forms the backbone of the rural economy. Animal husbandry contributes significantly in supplementing the income of small, marginal farmers and landless labourers many of whom are women who play a major role in the care and management of livestock. Livestock is not only an important source of income to the rural poor but also helps them sustain their livelihood in times of drought and famine. Livestock provides a diverse range of output varying from draught power and organic manure for agriculture, self-employment throughout the year especially for women as well as direct production of milk, meat and eggs for human food consumption as preferred items of food. In the early times, rabbits used to dwell in natural places like forests, hilly areas or uncultivated land masses.

Statement of the problem

Rabbit keeping is commercial base started in last century. The scarcity of food following first and Second World War pave the way for extensive rabbit rearing. Meat became popular due to its excellent quality. During those time rabbits flesh was denoted as "Underground mutton" and served as a source of food for rural families. Later on, F.A.O (Food and Agricultural Organizations) through different package programmed encouraged the farmers for rabbit farming. Thus, rabbit farming gradually spread to other countries.

Rabbit farming is another livestock activity with great scope as it is relatively easy, rewarding and takes little space compared to other livestock activities. Rabbit farming can also provide a very valuable additional source of income in the hilly areas where opportunities of employment are very limited. Another important consideration is food production cycle, which shows that rabbit need not be in competition with man for its food. For producing high quality woolens, blending with other fine quality fibers is essential, which are produced in limited quantity in our country. Therefore, currently we are importing the fine wool. The wool from Angora rabbits is of very high quality and it's blending with carpet wool of sheep and silk improves the quality of woolens to a great extent.

The importance of the domestic rabbit as a source of meat for human consumption is widely recognized throughout the world. The popularity of rabbit in India also is on the increase. The domestication of the major livestock species like cattle, sheep, pigs and poultry is lost in the dawn of prehistory, but rabbit domestication is of more recent origin. The wild areas of Southern Europe and North Africa are believed to be the original places for rabbit. However, rabbit is not found widely in the wild state in India, but the domesticated breeds are common in all parts. Various races of rabbit have been produced by breeders. They may be pure white, pure black or white with brown or black patches. Besides being highly prolific, rabbits are also herbivores with efficient feed conversion. They can turn 20 % of the protein they eat into edible meat. Rabbit meat is more economical in terms of feed energy than beef. Rabbits can also easily convert the available proteins in cellulose rich plants better than chicken and turkeys. The traditional grains and soya cakes fed to these domestic poultry put them in direct competition with man for food. In India, with no cereal surpluses, rabbit meat production is, thus, of special importance. In this industry also faced many problems like production, financing and marketing. In this area low research studies had been carried out in India. So, the researcher selected this topic "A study on animal husbandry farm with special reference to rabbit breeding farmers in Tirunelveli district" for research study.

Objectives of the study

- To study the socio economic profile of rabbit breeding farmers in Tirunelveli district.
- To identify the constraints faced by rabbit breeding farmers in production.
- To analyze the satisfaction level of rabbit breeding farmers in production
- To offer suitable suggestions and recommendations based on the findings of the study

Hypotheses of the study

- There is no significant relationship between the nature of occupation and socio economic profile of rabbit breeding farmers in Tirunelveli District.
- There is no significant relationship between socio economic condition and level of opinion related to production constraints

Sampling Design and tools

There are totally 2401 rabbit breeders available in Tirunelveli district. It is not possible to collect the data for the entire population. Non –probability sampling technique and convenient sampling methods are applied**.** A pre tested interview schedule is used by the researcher for collecting primary data from 50 respondents. Convenience sampling method was adopted for the selection of respondents in the 12 taluks of Tirunelveli District. Thus, the researcher selected 480 farmers as sample size in the study area. The data are analyzed by using appropriate statistical techniques such as, Percentage analysis, Chi-square test, ANOVA Techniques, Factor analysis and likert scale .

Association between socio economic conditions and nature of occupation: Application of Chi-square test

In order to test the relationship between socio economic conditions and nature of occupation of the respondents the following null hypothesis is formulated.

Ho: "There is no significant relationship between socio economic conditions and nature of occupation of rabbit breeding farmers".

The Chi square test has been used at 5 per cent level of significance computed results are given below.

Table 1

Socio economic conditions and nature of occupation of rabbit breeding farmers

S. No	Variables		Nature of occupation		Total	Chi-square value	P Value	Remarks
			Main	Subsidiary				
1.	Gender	Male	79 (16.4)	367 (76.5)	446 (92.9)	2.863	0.091	Not Significant
		Female	10 (2.1)	24 (5.0)	34 (7.1)			
		Total	89 (18.5)	391 (81.5)	480 (100)			

2.	Age	20-30	11 (2.3)	42 (8.8)	53 (11.0)	1.421	0.491	Not Significant
		30-40	58 (12.1)	237 (49.4)	295 (61.5)			
		Above 40	20 (4.2	112 (23.3)	132 (27.5)			
3.	Marital Status	Married	85 (17.7)	358 (74.6)	443 (92.3)	11.586	0.208	Not Significant
		Unmarried	4 (0.08)	33 (6.9)	37 (7.7)			
4.	Educational qualification	Illiterate	8 (1.7)	62 (12.9)	70 (14.6)	3.072	0.215	Not Significant
		HSC	45 (9.4)	194 (40.4)	239 (49.8)			
		Degree	36 (7.5)	135 (28.1)	171 (35.6)			
5.	Region	Rural	50 (10.4)	155 (32.3)	205 (42.7)	8.995	0.011	Significant
		Semi urban	25 (5.2)	130 (27.1)	155 (32.3)			
		Urban	14 (2.1)	106 (22.9)	120 (25.0)			
6.	Family	Joint Family	69 (14.4)	267 (55.6)	336 (70.0)	2.949	0.086	Not Significant
		Nuclear family	20 (4.2)	124 (25.8)	144 (30.0)			
7.	Experience	Less than 3 years	48 (10.0)	214 (44.6)	262 (54.6)	0.186	0.911	Not Significant
		3-5 years	31 (6.5)	139 (29.0)	170 (35.5)			
		Above 5 years	10 (2.1)	38 (7.9)	48 (10.0)			

Source: Primary data (Figures in parenthesis are percentages)

With regard to the socio economic conditions and nature of occupation of the respondents, the P values of Chi-square for all socio economic conditions are more than 0.05 except one variable is region. Therefore, it is concluded that out of seven variables, six variables are found to be there is no relationship between gender, age, marital status, educational qualification, family and experience between natures of occupation. Only one variable is relationship between region and nature of occupation and its significant value is 0.011 less than 0.05.

Factors influencing rabbit production

There are so many constraints faced by the rabbit breeding farmers in connection with rabbit production. The researcher has observed all the constraints and identified 20 variables and they are grouped into seven constraints and each constraint consists of different variables. They are presented in the table below.

Table. 2

Factors influencing Rabbit Production

S.No.	Factors	Name of the constraints	No of variables
1.	Factor I	Economic Constraints	4
2.	Factor II	Labour Constraints	3
3.	Factor III	Health Constraints	4
4.	Factor IV	Infrastructure constraints	3
5.	Factor V	Training Constraints	2
6.	Factor VI	Cost Constraints	2
7.	Factor VII	Risk Constraints	2

Source: Compiled Primary Data

The total of 20 variables is grouped into seven factors. Each variable comes under one group by using factor analysis.

The following are the important factors which describe the constraints faced by the rabbit breeding farmers in production.

Table 3
Factor Analysis

S. No.	Name of the Variables	Factor	Factor Loading	Percentage of variance	Eigen Value
1.	Lower income	Factor I Economic constraints	0.961	**27.627**	**5.525**
2.	High cost of fodder Seed		0.959		
3.	Lack of government assistance		0.958		
4.	Lack of time due to domestic/agricultural work		0.929		
5.	High wages	Factor II Labour constraints	0.821	**11.940**	**2.388**
6.	Heavy work		0.736		
7.	Labour scarcity		0.689		
8.	Inadequate facilities in veterinary hospital	Factor III Health constraints	0.820	**10.109**	**2.022**
9.	Disease affected in rainy season		0.718		
10.	Inadequate space		0.584		
11.	Cages, feeders and waters are not available at right time		0.561		
12.	Shortage of quality feed	Factor IV Feed constraints	**0.787**	**8.094**	**1.619**
13.	Irregular and inadequate supply of cattle feed		**0.600**		
14.	Inadequate Water supply for animal		**0.552**		
15.	Lack of training facility	Factor V Training constraints	**0.770**	**7.710**	**1.542**
16.	Lack of technical guidance		**0.750**		
17.	High cost of medical expenses	Factor VI Cost constraints	**0.776**	**5.769**	**1.154**
18.	High charges for cattle insurance		**0.679**		
19.	High mortality rate	Factor VII Risk constraints	**0.791**	**5.213**	**1.043**
20.	Weather conditions affect the growth of rabbits		**0.566**		

Source: Computed Data

The Eigen value of factor I is 5.525 which are related to economic constraints. It has very high significant loading on the variables, Lower income (0.961), high cost of fodder seed (0.959), lack of government assistance (0.958) and lack of time due to domestic & Social work (0.929).The percentage of variance is of 27.627.

The second factor denotes the labour constraints and the Eigen Value is 2.388. It has very high significant loading on 'high wages' (0.821), 'labour scarcity' (0.689), and 'heavy work' (0.736). The percentage of variance is 11.940.

Factor III has named as health constraints. It has the highest loading on the variables 'inadequate facilities in veterinary hospital' (0.820), disease affected in rainy season (0.718), Inadequate space (0.584), cages, feeders and waters are not available at right time (0.561). The Eigen value of this factor is 2.022. The percentage of variance is 10.109.

Factor IV has very high significant loading on the variables 'Shortage of quality feed' (0.787), irregular and inadequate supply of cattle feed (0.600) and inadequate water supply for animal (0.552). The percentage of variance is 8.094. The Eigen value of factor IV is 1.619 and named as feed constraints.

Factor V has the highest loading on the variable 'lack of training facility' (0.770) and lack of technical guidance (0.750). The percentage of variance is 7.710. The eigenvalue of factor V is 1.542 and named as training constraints.

Cost constraints are VI factor and Eigen value is 1.154. It has very high significant loading on the variables high cost of medical expenses (0.776) and high charges for cattle insurance (0.679). The percentage of variance is 5.769.

The eigenvalue of factor VII is 1.043 and it denotes the risk constraints. It has very high significant loading on the variable 'high mortality rate' (0.791) and weather conditions affect the growth of rabbits (0.566). The percentage of variance is 1.043.

Level of opinion related to production constraints

The farmers were classified into three categories namely those who had high level opinion, medium level opinion and low level opinion on production constraints. Accordingly, the minimum score will be fifty one and the maximum score will be sixty seven.Mean ($\bar{X}$) and standard deviation (σ) of the total opinion scores of 480 respondents were computed. Scores above $\bar{X} + \sigma$ were considered to be of high level opinion. Scores below $\bar{X} - \sigma$ were considered to be of low level opinion. Scores between $\bar{X} + \sigma$ and $\bar{X} - \sigma$ were considered to be of medium level opinion. Mean score was 59.97 and standard deviation score was 1.03.

Respondents whose opinion scores were above 61 were considered as having high level opinion and those with opinion scores below 58.94 were considered as having low level opinion and the respondents whose opinion scores were in between 58.94 and 61.00 were considered as having medium level opinion.

Association between socio economic condition and level of opinion related to production constraints faced by the respondents

In this section an attempt is made to analyze the relationship between the level of opinion of respondents and their socio economic condition. The following null hypothesis was formulated.

Testing of hypothesis II

There is no significant relationship between socio economic condition and level of opinion related to production constraints.

Table .4

Association between socio economic condition and level of opinion related to production constraints faced by the respondents

Variables		Level of opinion			Total	Chi-square value	P Value	Result
		High	Medium	Low				
Gender	Male	123 (94.6)	210 (91.7)	113 (93.4)	446 (92.9)	1.123	0.570	Not Significant
	Female	7 (5.4)	19 (8.3)	8 (6.6)	34 (7.1)			
	Total	130 (100)	229 (100)	121 (100)	480 (100)			
Age (Years)	20-30	16 (12.3)	25 (10.9)	12 (9.9)	53 (11.0)	4.780	0.311	Not Significant
	30-40	83 (63.8)	131 (57.2)	81 (67.0)	295 (61.5)			
	Above 40	31 (23.9)	73 (31.9)	28 (23.1)	132 (27.5)			
Marital status	Married	120 (92.3)	216 (94.3)	107 (88.4)	443 (92.3)	3.865	0.145	Not Significant
	Unmarried	10 (7.7)	13 (5.7)	14 (11.6)	37 (7.7)			
Educational qualifications	Illiterate	22 (16.9)	38 (16.6)	10 (8.3)	70 (14.6)	6.184	0.186	Not Significant
	HSC	61 (46.9)	109 (47.6)	69 (57.0)	239 (49.8)			
	Degree	47 (36.2)	82 (35.8)	42 (34.7)	171 (35.6)			
Region	Rural	65 (53.7)	78 (34.1)	62 (51.2)	205 (42.7)			

	Semi urban	40 (33.1)	82 (35.8)	33 (27.3)	155 (32.3)	12.489	0.014	Significant
	Urban	25 (19.2)	69 (30.1)	26 (21.5)	120 (25.0)			
Family	Joint family	81 (62.3)	167 (72.9)	88 (72.7)	336 (70.0)	8.105	0.017	Significant
	Nuclear family	49 (37.7)	62 (27.1)	33 (27.3)	144 (30.0)			
Nature of occupation	Main	22 (16.9)	41 (17.9)	26 (21.5)	89 (18.5)	0.982	0.612	Not Significant
	Subsidiary	108 (83.1)	188 (82.1)	95 (78.5)	391 (81.5)			

Source: Primary data (Figures in parenthesis are percentages)

It could be observed from that out of the 130 respondents with high level opinion, one hundred and twenty three respondents were male and 7 respondents are female. Following that, the Table shows that out of the 229 respondents with medium level opinion, 131 respondents are belonged to between 30 and 40 years. Out of 121 respondents with low level opinion, 107 respondents are married and 14 respondents are unmarried. 109 respondents have completed higher secondary and having medium level opinion.

In order to test the hypothesis chi-square test is applied at 5 per cent level of significance. The result shows that socio economic conditions and level of opinion on production constraints faced by the respondents, the P values of Chi-square for all socio economic conditions are more than 0.05 except two variables is region and family system. Therefore, it is concluded that out of seven variables, five variables are found to be there is no relationship between gender, age, marital status, educational qualification and nature of occupation between levels of opinion related to production. Only two variables is significant value is 0.014 and 0.016 less than 0.05.

Findings of the study

- The result shows that out of 480 respondents 446 are male farmers and 34 female farmers who involved in the rearing of rabbits. The number of male farmers was higher than female farmers.
- The analysis showed that 295 (61.0 %) belonged to the age group between 30 and 40 years.
- It also shows that out of 34 females, 76.47 per cent of the female respondents (26) are married. This implies that more married people 417 male respondents (93.5 %) are engaged in rabbit's farming.
- Regarding the literacy level of the sample farmers, 410 (85.4 %) were literates and 70 (14.6 %) respondents are illiterates. Literacy rate was more or less equal among both male and female sample farmers (85.65 % and 82.35 %). The rabbit farming does not require any special skill for running the business. The result also inferred that the dominance of higher secondary level procured by 219 male respondents (49.1 %) is high.
- It is observed that 205 (42.7 %) respondents are doing their business in rural areas and 155 (32. 3%) respondents are doing their business in semi urban areas.
- It portrays that is out of 446 male respondents, 313 (70%) are adopting and living in joint family system.
- It is understood that, 386 (80.4 %) respondent's family consists of below 4 members in their families and 19.6 per cent (94) of respondents' family member numbering above 4 members in their family.
- Out of 480, only 89 (18.54%) respondents are conducting the rabbit breeding as their main business and 367 male respondents (82.29%) are conducting the rabbit breeding as their subsidiary business.
- It reveals that 262 respondents (54.6%) have less than 3 years experience and 170 (35.4%) respondents having experience between 3and 5 years.
- It was found that 391 subsidiary business respondents, 60.9 per cent of the respondents (280) have own land, 22.5 per cent respondents (20) doing main activities of business used leased agriculture land and 17.08 per cent of the respondents (82) used both agriculture land.
- The result of this study proved 69 main respondents 56 (81 %) respondents are holding the land upto 3 acres, 113 subsidiary respondents (38.5%) holding land between 3 acres and 5 acres. There are 84 respondents (23.2%) holding the agricultural land above 5 acres.
- It elaborates 241 respondent's (50.2%) monthly income is less than Rs.10, 000, whereas 204 respondents (42.5 %) monthly income lies between Rs.10, 000 and Rs.20, 000 , thirty three respondents earned income between Rs.20, 000 and Rs. 30, 000 per month and only 2 respondents earned monthly income is above Rs.40, 000.

- Association between socio economic conditions and nature of occupation: Application of Chi-square test used. It is concluded that out of seven variables, six variables are found to be there is no relationship between gender, age, marital status, educational qualification, family and experience between natures of occupation. Only one variable is relationship between region and nature of occupation and its significant value is 0.011 less than 0.05.

Suggestions of the study

The government must organize the seminars, conference, training and workshop to the farmers in others to create the awareness among the farmers related to the latest technology in production. It will help them to increase the rabbit meat production in India and export it at global level. To avoid the marketing problems the government appoints the agent and determines the price of the rabbits like milk and silk. The farmers also face the feed problems of rabbits and disease during the rainy season. To reduce the insurance premium and also bring the changes in insurance policy is need. The insurance cover the age period three months to 3 years of rabbits. The death arise below three months is high due to feed and climate condition. It will create a cost of production of rabbit. So the government change the policy related to rabbit insurance is necessary.

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