Adoption of improved technologies by farmers

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Adoption of improved technologies by the pig farmers of Aizawl district of Mizoram, India

find out the extent of adoption of improved pig production technology and identify the factors that influences adoption of pig production technology in pig farmers

Abstract

Introduction

Animal agriculture has a specialized significance as it can play an important role in improving the socio-economic status of a sizable section of the weaker and tribal population. It gives safeguard to the crop failures in the event of natural calamities. Most cases livestock is the source of cash income for the subsistence farmers as well as endurance of family purchasing power in the event of unprofitable agriculture due to unforeseen reasons. This immense potential is limited by the traditional and tenure system and subsistence farming practices (traditional technologies) that unfortunately seldom assure , or generate adequate returns which can promote the development of more commercially oriented livestock production systems. If agricultural technologies developed for farmers in developing countries are not transferred in correct (appropriate) manner and adopted accordingly, all the efforts by the researchers who developed new technologies would have been in vain. This is probably why transfer and adoption of new technologies is perhaps one of the most popular written about and controversial topics in developing agriculture (Nell et al 1998). Technology transfer and development is not a new concept, it has been around since mankind discovered things that they did not know before (Finlayson 1995). A farmer is a rational decision maker who normally strives for a better standard of living and seeks ways of adopting new technologies to accomplish this goal (Nell et al 1998).

Among the commonly available meat producing animals of Mizoram state, pig occupies a unique place, as pig rearing is considered to be the most encouraging and appropriate livestock enterprise to narrow down the gap between the availability and requirement of animal meat in the state. Pigs are reared by each and every family as a backyard venture in Mizoram, India. The backyard production system of pigs in the state is characterized by low input; traditional management system suited to the local condition. There is a need to identify the factors that contribute positively to the adoption of new livestock technologies as well as those that represent main constraints for the diffusion /adoption process. (Nell et al 1998). Reimund et al (1981) reported that with respect to hog industry the adoption of technology has led to increase in farm size, specialization and associated risk, transaction cost and asset specificity. This type of research is essential for policy formulation to develop the livestock sector and alleviate poverty in rural areas of the state. This, as well as the fact that no research was previously done on adoption of technologies by the pig farmers in Aizawl District, the study was under taken with the following objectives:

- To find out the extent of adoption of improved pig production technology and
- To identify the factors that influences adoption of pig production technology in pig farmers.

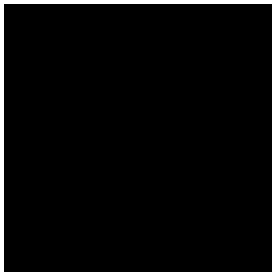
Materials and method

The study was carried out in Aizawl district of the Mizoram state of India during March 2005 to September 2005. In Aizawl district, there were five blocks and from these five blocks two blocks namely Aibawk and Tlangnuam were randomly selected. From each selected block 5 villages were selected randomly i.e. 10 villages were selected for the study. From each selected villages, ten pig farmers were selected randomly to make a sample size of 100 respondents. The Interview Schedule was developed to obtain relevant information covering all the objectives of the study. Before going to final data collection, the interview Schedule was pre-tested on 20 non-respondents farmers of Aizawl and accordingly appropriate changes in the construction and sequence of interview schedule were made. Interviews were conducted by means of Interview Schedule with 100 pig farmers; the interview with farmers who were not fluent in English was done with the help of translator in order to preserve the accuracy of the information. In order to ascertain extent of adoption of improved technology, the responses of respondents were collected on five selected practices, namely Housing, Breeding, Feeding, Health Care, and General Care and Management. The score was assigned for the adoption of each of the practices in the following way:

Adoption Pattern	**Score**
Non-adoption	
Partial adoption	1
Complete adoption	2

The total score for a respondent is obtained by summing up the score obtained on each practices. The minimum score one could score was 0 and maximum score was 90.

The adoption level of the respondents was measured by making use of adoption index developed by Karthikeyan (1994).



Depending upon the extent of adoption of improved technologies the respondents were categorized as follows:

1) Low adopters (up to 33%),

2) Partial adopters (34-66%) and

3) High adopters (67-100%).

The study was carried out with 15 independent characteristics (Socio-personal, economic and communication characteristics) and one dependent variable (Y=Adoption of improved technologies on piggery practices) of the pig farmers. The following independent variables were selected for the study:

- Age (X1)
- Education level(X2)
- Family size(X3)
- Occupation(X4)
- Operational land holding(X5)

- Farm size (Herd Size)(X6)
- Income from piggery(X7)
- Social participation(X8)
- Extension contact(X9)
- Farming experience(X10)
- Farm education exposure(X11)
- Scientific orientation(12)
- Knowledge(X13)
- Training received(X14)
- Financial help received (X15)

Statistical analysis was done with the help of SPSS 10.0 package. The following statistical analyses were performed in the study:

- Pearson Product Moment Correlation Test: Correlation coefficient was computed to know the relationship between selected Independent variables of pig farmers with dependent variable i.e. adoption of improved technology on piggery practices.

- Multiple Regression Analysis: It was employed to find out the effect and extent of influence of each Independent variable contributing significantly towards the dependent variable i.e. adoption of improved technologies on piggery practices.Results and discussion

Results and discussion

Extent of adoption of improved technology

The data in the Table 1 shows majority of the farmers i.e. 81% and 63% adopted improved technology on breeding and heath care practices at higher level in their farms and the average adoption score was found to be 79.85 and 73.83, respectively. It is observed that 62% and 63% of the respondents were low adopters in respect of housing and feeding practices respectively. Half of the respondents (50%) had adopted general care and management practices partially. The mean was calculated at 64.54, which indicated that though adoption was partial, there is drift towards high adoption level.

Table 1.

Practice-wise distribution of respondents according to extent of adoption

Sl.No.	**Level of adoption**	**Score index**	**Frequency and percentage (N=100)**	**Mean**
A	*Housing*			

	1	Low adopter	Up to 33%	62	31.83
	2	Partial adopter	34-66%	31	
	3	High adopter	67-100%	7	
B		*Breeding*			
	1	Low adopter	Up to 33%	4	79.85
	2	Partial adopter	34-66%	15	
	3	High adopter	67-100%	81	
C		*Feeding*			
	1	Low adopter	Up to 33%	63	29.67
	2	Partial adopter	34-66%	22	
	3	High adopter	67-100%	15	
D		*Health care*			
	1	Low adopter	Up to 33%	8	73.83
	2	Partial adopter	34-66%	29	
	3	High adopter	67-100%	63	
E		*General care and Management*			
	1	Low adopter	Up to 33%	7	64.54
	2	Partial adopter	34-66%	50	
	3	High adopter	67-100%	43	

A perusal of the data in Table 2 reveals that the overall adoption was partial (Average score was 55.87). Majority of the respondents (51%) adopted the improved technology on pig rearing partially, whereas 34% and 15% adopted improved technology on pig rearing at higher and lower level, respectively.

Table 2.

Overall adoption level of pig farmers

Sl.No.	Level of adoption	Score index	Frequency and percentage (N=100)	Mean
1	Low adopter	Up to 33%	15	55.87
2	Partial adopter	34-66%	51	
3	High adopter	67-100%	34	

Correlates of adoption behaviour

Assuming that adoption is influenced by various socio-personal and economic characteristics of the farmers, correlation coefficient was computed to know the relationship between 15 selected variables of pig farmers with adoption behaviour. The results were shown in Table 3.

Table 3.

Correlations of adoption of improved pig rearing practices with fifteen selected independent variables

Sl.no.	Independent variables	Coefficient of correlation (r)
1	Age (X1)	-0.804**
2	Education Level(X2)	0.841**
3	Family size(X3)	0.106
4	Occupation(X4)	0.164
5	Operational land holding(X5)	0.472**
6	Farm Size (Herd Size)(X6)	0.694**
7	Income from Piggery(X7)	0.783**
8	Social Participation(X8)	0.686**
9	Extension contact(X9)	0.831**
10	Farming experience(X10)	0.370**

11	Farm education exposure(X11)	0.892**
12	Scientific Orientation(12)	0.659**
13	Knowledge(X13)	0.908**
14	Training received(X14)	0.412**
15	Financial Help received(X15)	0.237*

Age

It was observed that age had a negative and significant relationship with adoption level. It might be because the aged persons were less change prone and reluctant to adopt new technologies in their farms. It was also observed by Motamed and Singh (2003) on sericulture farmers of Dehradun.

Education

Table 3 reveals that education was positively and significantly associated with adoption level. It indicates that as the education level increases the adoption level also increases. The finding was similar with the findings of Motamed and Singh (2003) and Haque and Ray (1983).

Land holding

A positive and significant correlation was found between adoption of technologies by the farmers and their land holdings. More operational land holding leads to more application of modern technologies in the farms.

Farm size

It exhibited a positive and significant relationship with adoption level. It indicates that farmers having large number of pigs in their farms adopted improved technologies in their farms.

Knowledge

Knowledge of the farmers was positively correlated with adoption of improved pig production technologies. It shows that farmers having better knowledge on pig farming influenced to adopt

improved technologies in their farms.

Scientific orientation

It is found to be significantly and positively correlated with adoption. Farmers with high scientific orientation tended to adopt improved technologies in their farms for better productivity and profitability.

Social participation

It exhibited a positive and significant relationship with adoption level of farmers. Social participation helped the farmers in gaining more information and adoption on improved technologies in their farms.

Extension contact

It is found to be positively and significantly associated with the adoption level of farmers. Contact with extension personnel/veterinarians influenced the farmers to adopt improved pig production practices in their farms.

Farming experience

Farming experience showed a positive and significant relationship with the adoption of improved technologies by the farmers. Experience helps an individual to think in a better way and makes a person more mature to take right decision.

Farm education exposure

It had shown a positive and significant relationship with adoption level of the farmers. A farmer with high farm education exposure became more change prone, look into the innovative practices to be adopted at the farm level.

Training received

It was found to have a positive and significant correlation with the adoption level of the respondents. Training might have inculcated technical competency, more exposure to the subject

matter and convinced to adopt the improved technologies in the farms.

Financial help received

Financial help received was positively and significantly associated with adoption level. It indicated that those who received financial help either from government or financial institution adopted new technologies in their farms.

The regression analysis (multiple regressions)

The multiple regression analysis was performed to find out the effect and extent of influence of 15 independent variables to levels of adoption of improved technologies in pig farming. The results of analysis involving 15 variables are presented in Table 4.

Table 4.

Multiple regression analysis of adoption of improved technologies with fifteen selected independent variables

Independent Variable	**Unstandardized Coefficients B**	**Standard Error**	**Standardized Coefficients Beta**	**T Value**	**Sig.**
(Constant)	13.772	7.415		1.857	.067
Age (X1)	-.209	.106	-.115	-1.966	.053
Education Level(X2)	1.315	1.076	.077	1.222	.225
Family size(X3)	-.240	.265	-.029	-.909	.366
Occupation(X4)	-.591	1.015	-.020	-.582	.562
Operational Land holding(X5)	-.217	.687	-.012	-.316	.753
Farm Size (Herd Size)(X6)	-7.161E-02	.166	-.022	-.431	.668
Income from Piggery(X7)	1.333E-04	.000	.145	2.533	.013*
Social Participation(X8)	2.410	1.406	.075	1.714	.090
Extension contact(X9)	1.839	.707	.148	2.600	.011*

Farming experience(X10)	.242	.173	.048	1.395	.167
Farm education exposure(X11)	.815	.401	.159	2.030	.045*
Scientific Orientation(12)	.416	.118	.145	3.510	.001**
Knowledge(X13)	.297	.096	.253	3.089	.003**
Training received(X14)	2.501	1.463	.059	1.710	.091
Financial help received(X15)	-1.581	.1.668	-.033	-.948	.346

*** Significant at the 0.01 level*

** Significant at the 0.05 level*

R2 = 0.92

A perusal of Table 4 shows that out of 15 variables taken for analysis of regression, 2 variables i.e. Knowledge and Scientific Orientation were found to have significant contribution at one percent level, 3 variables i.e. Extension contact, Income from piggery, and Farm Education Exposure had significant contribution at five percent level of significance.

The coefficient of determination (R2 value) was 0.92, which indicates that 92.00% variation in the adoption gain in improved technologies in pig farming was explained by these 15 independent variables selected for the study.

Conclusions

From the above findings it can be concluded that:

- Knowledge about improved technologies is essential for adoption of technologies. To increase the level of adoption of improved technologies knowledge about the new technology has to be improved by undertaking various extension approaches.

- Farmers scientific orientation and scientific insight is found to be an important factor in determining the adoption of improved technologies. Emphasis should be given in developing scientific mind and attitude to the adoption of these technologies.
- Extension contact has positive effect on adoption level. Therefore efforts should be made to increase the extension contacts of the farmers with extension workers/veterinarians to increase their level of adoption.
- To increase the level of adoption of improved technologies in pig farming, farmers are required to be exposed to as many as cosmopolite sources of information as possible, to make them aware of these technologies.
- As training found to influence the level of adoption in a positive way, frequent training should be arranged for the farmers. Training should be more intensive and farmers' problem and need oriented.
- Financial institute like Bank should provide credits to the farmers at soft rate so that they can afford it. This will encourage the farmers to do commercial farming and to implement innovative practices in their farms.
- Social participation showed a positive and significant association with adoption level. Extension Worker/Veterinarians should form some informal groups or forum of the farmers and should encourage the group members to discuss the farm problem amongst themselves at their convenience.

References

Citation of this paper

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