



RESEARCH ARTICLE

An Efficient Methodology to Identify Technological Needs and Problems of Poultry Farmers

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ABSTRACT

Poultry farming is playing an important role in boosting economy of India. Tamil Nadu state ranked second in commercial egg production in India. Hence it is essential to determine the needs and problems of poultry farmers of India to improvise the egg production. There is no methodology to scientifically estimate the needs and problems of poultry farmers in developing countries. Keeping this point in mind, a methodology has been developed by empirical research. This methodology include 11 steps that includes activity listing, inventory preparation, finding out the degree to which the available technologies meet the technological needs, estimating awareness and adoption, extent of participation in each activity, listing of technological needs/problems, ranking of problems and technological needs, Rank Based Estimation, estimation of loss due to the problem / needs, magnitude value estimation, and classifying the technological need into research need and extension need. This would result in identifying research needs and extension problems in poultry farming which would boost poultry production. This study would pave way for estimating the technological needs of farmers in different parts of the country. When such estimated needs are discussed with concerned authorities, this might help to pave an efficient way to develop viable technologies and implement extension programmes.

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INTRODUCTION

Identification of technological needs and problems of farmers is the first step either in developing sophistications in commercial poultry industry or in developing extension programmes in poultry farming. No systematic methodology is available especially for poultry farming except a Ph.D thesis carried out by Mathialagan (1998) throughout the world especially for poultry farmers. Hence, an attempt was made to develop a methodology to identify technological needs and problems of poultry farmers.

Research institutes and universities should design and implement policies and programmes aimed at encouraging and motivating researchers in using Participatory Poultry production Research (Apantaku, 2006). The level of farmers' involvement in agricultural problems identification and prioritization was low, farmers were very willing to be involved in their agricultural problem identification and prioritization (Apantaku, 2003)

Non involvement of farmers in problem identification resulted in inapplicability of most of the research findings (Getahun *et al.*, 1977). Researchers aimed at farmers

problems has used top down approaches (Crawford and Barclay, 1982). Most of the research, extension programmes if examined carefully, will be found not usually relevant to farmers needs (Carena *et al.*, 1985). Existing programmes not delivering results should be restructured (Anonymous, 2011).

First, a thorough literature search was made to identify a methodology to find out technological needs and problems of poultry Farmers. No method is available for poultry farmers except a single method developed by Sabarathnam (1988) which is based on Rank Based Quotient for crop production.

Sabarathnam and Vennila (1996) estimated technological needs and identification problems of farmers for entomological problems through RBQ calculation and magnitude value estimation. As there is no available methodology to estimate the technological needs and problems of poultry farmers, the current study was performed to estimate the same. This could be used to identify the technological needs in any geographical area which would ultimately result in formulating user-oriented research projects and needs-based extension programmes for poultry farmers.

MATERIALS AND METHODS

In this study, technological needs were estimated in the following manner: Farmers, extension personnel and technology developers were taken as respondents for this study and they were asked to indicate individually the difficulties faced by the poultry farmer in using the available technology. This is referred as technological need or problem. The technological needs could be estimated by adopting the following steps:

Step 1: Activity listing

In order to identify the genuine respondents for the study, we had to list the various activities related to poultry farming by using observation technique in the actual layer poultry farms of Namakkal district (Fig.1). In this way, 130 activities were identified. For example, the activities related to input purchase is presented in Table 1.

Table 1: Input purchase activities of poultry farming

S. No	Activities
1.	Decision regarding type of poultry strain
2	Purchase of chicks
3	Purchase of brooder
4	Purchase of feeders and waterers
5	Purchase of electric bulbs
6	Purchase of medicines
7	Purchase of litter materials

Step 2: Inventory preparation

An inventory for available technologies on poultry farming was developed keeping the poultry technology inventory developed by Mathialagan (2010) as a base by going through various literature, discussion with poultry scientists and extension officials and interacting with the poultry farmers engaged in poultry farming and on the spot observation made by the researcher. This resulted in identification of 129 technologies. The inventory regarding input purchase of poultry farming is shown in the table 2.

Step 3: Finding out the degree to which the available technologies meet the technological needs to carry out the different activities identified by the poultry farmer.

Finding out the degree to which the available technologies meet the technological needs to carry out the different activities identified by the poultry farmer indicates the farm activities and the technological availabilities as per the perception of the technology users (poultry farmers), technology developers (scientists) and Extension personnel as indicated in column 3 of table 2. For example as for the purchase of chicks, only 19 per cent of the farmers perceived that the technology available meets their requirement. This indicates that there is technological need.

Step 4: Estimating awareness and adoption

The extent of awareness of the technologies and also the rate of adoption were worked out. When there is significant variation between awareness (obtained by word of mouth) and adoption with regard to a specific technology, it could be inferred that the technology does not meet the requirement and it indicates the technological problem / need. Here again the example regarding input purchase in poultry farming is shown in table3.

For instance, purchase of chicks in this case, awareness is 67 per cent whereas adoption is only 19 per cent. This indicates that there is a technological need.

Step 5: Extent of participation in each activity

The information regarding extent of participations of the farmer and family members was collected through interview and observation. The family members who were intensively involved in the specific activity were alone selected as respondent for listing out the need / problem for the specific activity concerned and is shown in table 4.

Step 6: Listing of technological needs / problems

The activities and the concerned available technologies were tabulated. The farmers were asked to list the needs / problems for the activities and asked them to rank. An example with regard to activity regarding input purchase is shown in the table-5.

Step 7: Ranking of problems / technological needs

The farmers were asked to rank the different problems based on importance, urgency and magnitude by requesting them to place pellets (dried dropping) of goat or sheep against each problem. The ranking of the farmers' perception was done on the floor (Fig.1). Even seeds of Neem, Castor and Tamarind were used as suggested by Venkataramaya (1990). Based on the number of pellets / seeds found, each problem was ranked as first second, third etc as shown in the table-6. For the Extension personnel and Technology developers ranking was done on papers.

Step 8: Rank Based Quotient (RBQ) estimation

RBQ was estimated using the RBQ formula developed by Sabarathnam and Vennila (1996). An example is shown below:

$$RBQ = \frac{\sum_{i=1} (Fi) (n+1-i)}{Nn} \times 100$$

Fi = Frequency of farmers for the ith rank of the technological need

N = Number of farmers

N = Number of ranks Σ = it directs to sum the multiplication factor

i = 1; F = 42; N = 5

Problem A First rank = 4

So, Fi (n+1-i) = 4 (5 + (1 - 1))
= 4 X 5 = 20

$$RBQ = \frac{\sum_{i=1} (Fi) (n+1-i)}{Nn} \times 100$$

$$= \frac{20}{42 \times 5} \times 100 = 9.5$$

$$= \Sigma (Fi) (n+1-i) = 20$$

F = 42: N = 5

Table 2: Technology inventory of poultry farming regarding input purchase and perception regarding the degree to which the technology meets the requirement

S. No	Activity and Technology	Meets the requirements as perceived by					
		Farmers N= 42		Extension Personnel N = 30		Technology developers N = 32	
		No	%	No	%	No	%
1	Decision regarding type of poultry strain: Choose of poultry strain based on published reports, enquiry with experienced farmers and extension officials	38	90.5	23	76.67	27	89.99
2	Purchase of chicks Chick – Purchase by observing the attributes like 35 g body weight, closed abdomen, discarding weakling, vent pasting and avoiding chicks having diseased symptoms	8	19	29	96.67	26	86.67
3	Purchase of Brooder for deep litter house Purchase of Readymade brooder for deep litter	12	28.6	24	79.92	30	100
4	Purchase of feeders and waterers Purchase of automatic feeders and nipple waterers	41	97.6	23	76.67	30	100
5	Purchase of electric bulb Purchase of standard electric bulbs @ 1 tube / 400birds	34	80.9	23	76.67	29	96.67
6	Purchase of medicines Purchase of standard Medicines in consultation with vets	39	92.8	26	86.67	27	89.99
7	Purchase of litter materials Purchase of well dried litter materials	42	100	25	83.33	23	76.67

Table 3: Technology inventory of poultry farming regarding input purchase

S. No	Technology	Awareness		Adoption	
		No.	%	No.	%
1	Choose of poultry strain based on published reports, enquiry with experienced farmers and extension officials	27	64.3	38	90.5
2	Chick - Purchase by observing the attributes like 35 gm body weight, closed abdomen, discarding weaklings, vent pasting and avoiding chicks having diseased symptoms	28	66.6	8	19
3	Purchase of readymade brooders	19	45.2	12	28.6
4	Purchase of automatic feeders and nipple waterers	42	100	21	50
5	Purchase of standard electric bulbs	42	100	34	80.9
6	Purchase of standard medicines	42	100	39	92.8
7	Purchase of well dried litter materials	42	100	42	100

Table 4: Extent of participation of poultry farmers and their families in the input purchase activities of poultry farming

S. No	Activity	Head	Wife	Others				Total	H- Value
				C*	B*	M*	L*		
1.	Decision regarding type of poultry strain	71	2	10	4	-	-	14	
2	Purchase of chicks	71	2	10	4	-	-		
3	Purchase of brooder for deep litter house	77	1	10	3	-	-	13	14
4	Purchase of feeders and waterers	77	1	9	3	-	-	12	18.29**
5	Purchase of electric bulbs	77	1	9	3	-	-	12	
6	Purchase of medicines	77	2	4	2	-	-	6	
7	Purchase of litter materials	77	2	4	2	-	-	6	

Significant at 1 % level (Table value at 1 % level: 9:1): *C: children; B: brother; M: Mother; L: Labour

In the same way the RBQ was calculated for the other two categories of respondents' viz., technology developers and extension personal and shown in Table-1.

For example, item 5 of table7, (Ready- made brooder is costly was felt by farmers, but not by Extension personnel and Technology Developers)

Step 9: Estimation of loss due to the problem / needs

The respondents, who were asked to list the technological needs / problems, were also asked to indicate the loss met by them due to the problem in terms of percentage. Then the Average Extent of Damage (AEOD) was calculated for the specific problem by adding the percentage damage listed by the different farmers and dividing it by the number of farmers who reported the damage.

For example in one case 6 farmers reported damage as below: 60%, 70%, 40%, 80% and 65%.

$$\text{Then the AEOD} = \frac{60+70+40+45+80+65}{6} = \frac{360}{6} = 60\%$$

For instance, if the number of eggs has gone down from 100 to 80, then the percentage of loss is equal to 20%.

$$100 - 80 = 20\%$$

$$\frac{20}{100} \times 100 = 20\%$$

Step 10: Magnitude value estimation

As the magnitude value of farmers, extension personnel and technology developers varied extensively

Table 5: List of different technological needs and problems identified regarding input purchase

S. No	Technological Needs / problems
<i>I Research needs</i>	
1.	Cost of chicks is high
2.	lack of monitoring The quality of chicks
3.	Cost of medicine is high
4.	Monopoly of poultry strain
S. No	Technological Needs / problems
5.	Ready – made brooder is costly
6.	Delay in supply of chicks
7.	Lack of veterinary service
8.	Quality of medicine is poor
9.	Quality of chicks is spoor
10.	Pushing off poor quality medicine
11.	Direct approaches of reps-compromising quality
12.	Advance payment for chicks
13.	Misguidance of medicine sellers
14.	Replacement of prescription by sellers
15.	Artificial demand created by hatcheries
16.	Crazy of some poultry strain & traders influence
17.	No lab facility to assess medicine quality
18.	No fair price shop for medicine
<i>II Extension needs (Problems)</i>	
1.	Misguidance by traders in medicine purchase
2.	Purchasing incorrect medicine, misguidance by Neighbours,non-honouring of vets advice
3.	Cheating and exploiting by supplying expired medicine

with regard to technology needs, there is a need to develop the technology for each category separately. Most of the technological needs to be developed, as per study were from the following disciplines viz., Pathology, Microbiology, Poultry Science, Parasitology, Pharmacology and Extension Education. The magnitude value was calculated by using the formula and tabulated in the Table 8:

Table 7: RBQ and Average loss for different technological needs and problems as per different categories of respondents regarding input purchase

S. No	Technological Needs	Average loss %	No.of Birds (Lakhs)	Farmers RBQ N=42	Extension Personnel RBQ N=30	Technology developers RBQ N= 30
<i>I. Research needs</i>						
1.	Cost of chicks is high	0.5	23.68	44.97	40.00	59.05
2.	lack of monitoring the quality of chicks	3	23.68	-	6.67	-
3.	Cost of medicine is high	0.5	23.68	42.33	28.89	-
4.	Monopoly of poultry strain	0.5	23.68	-	10.37	-
5.	Ready – made brooder is costly	0.83	23.68	1.59	-	-
6.	Delay in supply of chicks	10.8	23.68	-	43.7	83.33
7.	Lack of veterinary service	1.5	23.68	-	-	18.57
8.	Quality of medicine is poor	7	23.68	42.59	3.7	26.19
9.	Quality of chick is poor	3	23.68	63.23	24.41	40.00
10.	Pushing off poor quality medicine	3	23.68	2.65	21.11	-
11.	Direct approaches of reps-compromising quality	3	23.68	-	12.22	-
12.	Advance payment for chicks	0.66	23.68	28.57	20.37	23.81
13.	Misguidance of medicine sellers	8	23.68	1.85	-	-
14.	Replacement of prescription by sellers	8	23.68	1.85	-	-
15.	Artificial demand created by hatcheries	1	23.68	-	8.52	-
16.	Crazy of some poultry strain & traders influence	0.5	23.68	-	-	-
17.	No lab facility to assess medicine quality	1	23.68	3.17	-	-
18.	No fair price shop for medicine	0.5	23.68	0.53	-	-
<i>II. Extension needs (Problems)</i>						
1.	Misguidance by traders in medicine purchase	8	23.68	-	-	28.10
2.	Purchasing incorrect medicine due to misguidance by neighbors non honoring of vets advise	8	23.68	-	18.15	16.67
3.	Cheating and exploiting supplying expired medicine	0.5	23.68	1.59	-	-

MV = RBQ X AEOD or AYLP X NB affected.

Where,

MV	=	Magnitude Value
RBQ	=	Rank Based Quotient
AEOD	=	Average Extent of Damage
AYLP	=	Average Yield Loss Percentage
NB affected	=	Number of birds affected

An example of the magnitude value table is given in table 8.

Table 6: Preferential ranking of the identified problems of the farmers

S. No. of Respondents	Problems / Difficulties rank				
	A	B	C	D	E
1	1 (16)	2 (10)	5 (2)	3 (7)	4 (6)
2	1 (20)	1 (25)	5 (4)	4 (10)	3 (15)
3	1 (30)	2 (20)	5 (7)	3 (18)	4 (15)
4	1 (24)	2 (15)	0 (0)	3 (10)	4 (6)
..
..
N	1 (29)	2 (20)	4 (10)	3 (15)	0 (0)

(Figures in the bracket indicate the number of pellets used)

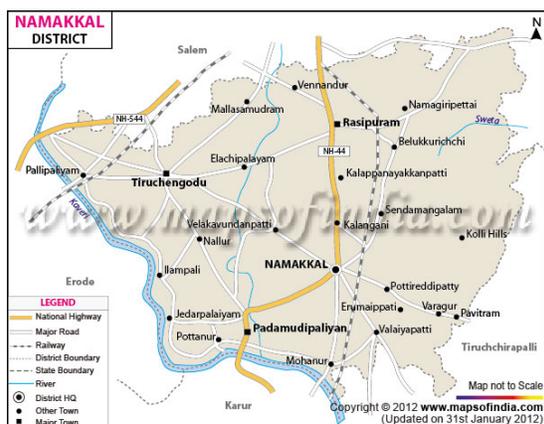
Step 11: Classifying the technological need into research need and extension need

A need is considered as a research need when there is no technology as perceived by the respondent. A need is considered as an extension need when the technology is available, but it is not known by the poultry farmer. The technological needs identified were classified as Research needs and Extension needs as shown in table 8. The research needs were to be sent for conducting research by concerned scientist. The extension needs were to be sent to concerned development department to formulate suitable development programme.

Table 8: Technological needs and problems of poultry farmers based on magnitude values regarding input purchase

S. No	Technological	Research Discipline	Estimated block magnitude value for the technological Needs as perceived by			
			Farmers (Lakhs) n=42	Extension personnel (Lakhs) n=30	Technology developers (Lakhs) n=30	Average (Lakhs)
<i>I Research Needs</i>						
1.	Delay in supply of chicks	Psc	23364.89	10348.16	21311.15	17341.40
2.	Quality of medicine is poor	Phram	7059.72	43.81	4341.25	3814.92
3.	Quality of chicks is poor	Psc	4491.86	3368.01	2841.60	3567.16
4.	Direct approaches of reps-compromising quality	Ext	-	868.11	2841.60	3567.16
5.	Pushing off poor quality medicine	Phram	188.26	1499.65	-	843.96
6.	Cost of chicks is high	Psc	532.45	473.60	699.15	568.40
7.	Quality of chicks is not monitored by any body	Psc	-	473.84	-	473.84
8.	Cost of medicine is high	Phram	501.19	342.06	-	421.62
9.	Advance payment for chicks	Psc	446.56	318.36	372.13	378.99
10.	Misguidance of medicine sellers	Ext	350.46	-	-	350.46
11.	Replacement of prescription by sellers	Ext	147.17	263.09	439.74	283.33
12.	Artificial demand created by hatcheries	Psc	-	201.75	-	20.752
13.	Monopoly of poultry strain	Psc	-	122.78	-	122.78
14.	Crazy of some poultry strain and traders influence	Psc	-	-	78.93	78.93
15.	No lab facility to assess medicine quality	Pharm	75.07	-	-	75.07
16.	Ready – made brooder is costly	Engg	31.26	-	-	31.25
17.	No fair price shop for medicine	Govt	6.28	-	-	6.28
<i>II Extension Needs (Problems)</i>						
1.	Misguidance by traders in medicine purchase	Ext	-	-	5323.26	5323.26
2.	Purchasing incorrect medicine, misguidance by neighbors and non honouring of vets advise	Ext	-	3438.34	1184.24	2311.29
3.	Cheating and exploiting by supplying expired medicine	Ext	100.29	-	-	100.29
4.	Lack of veterinary service	Govt	-	-	659.61	659.61

Ext: Extension, Govt.: Government, PSc: Poultry Science, Pharm: Pharmacology, Engg: Bio Engineering

**Fig. 1:** Study Area

Conclusion

The detailed methodology to estimate the technological needs/problems of poultry farmers consisting of 11 steps has been identified. So, H_0 is rejected and H_1 is accepted. This would pave way for estimating the technological needs of farmers in different parts of the country. When such needs are estimated and sent to the concerned scientist and to the development departments, to develop viable technologies and implemental extension programmes would emerge, which in turn boost the poultry farming.

Recommendations

This study recommends that effort must be made to draw similar methodology for different branches (Dairy, Sheep and goat) of veterinary sciences by conducting specific studies.

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