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Development of Perception Test for Human-Wildlife Conflict

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ABSTRACT

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The present study was conducted in two districts namely, Erode and Coimbatore districts of Tamil Nadu State with sample size of 60 farmers to develop a perception test for Human-wildlife conflict (HWC). Eight components of Human-wildlife conflict perception of affected farmers, Socio-cultural Impact, economic impact, reasons for HWC, responsibility in reducing HWC, efforts of villagers after HWC, eco centrisim, antropocentrism and environmental apathy were selected based on relevancy weightage and scale value. The perception test was developed by following the standard procedure given by Edwards (1969) to frame statements, farmer's response on items, item analysis, validity and reliability. A total number of 10 items which had p value of 21 to 75, discrimination index of 0.21 to 0.75 and significant rp bis were selected for the final perception test.

Introduction

Human-wildlife conflict (HWC) is an emerging problem among the people at the buffer zones of protected areas. The commonly occurring conflicts include crop-raiding events, property damage and human casualties, among other forms (Dickman, 2010). The common wildlife encountering with humans are elephant, wild boar, and primates. Overabundant wild boar and feral pigs are associated with disease transmission and negative impacts on agriculture, native

Wildlife and, particularly where they occur around urban areas, public safety (Quy *et al.*, 2014). Crop raiding was found to be predominantly directed at maize and perceived at least to be carried out solely by primates (Mc Guinness and Taylor, 2014). The peoples are managing the HWC in different ways, which include solar/wire messed fencing, frightening, and trenching. The need of the hour is community-based management by placing fences around risk-

prone villages and managing abandoned farmlands in a village. The costs of HWC included decreased food security, changes to workload, decreased physical and psychological wellbeing, economic hardship, and at times an increase in illegal or dangerous activities (Ogra, 2008).

Sometimes people lost their patience and tried to kill the wild animals as a final resort to get rid of HWC. Some authors have studied the people's perception towards human-wildlife conflict. Thompson and Barton (1994) developed a scale to study the eco centric and anthropocentric attitudes towards environment. Hence a psychological test was developed to study the people's perception about HWC because perception is a psychological object and procedures are available to develop standard psychological tests.

Materials and Methods

Based on the review of literature and discussion with experts, items for the test were collected. The statements were edited and revised based on the suggestion of judges. A total number of 56 items (Annexure- I) was administered to 60 farmers of HWC area in Erode and Coimbatore districts of Tamil Nadu, India. An interview schedule was prepared with these 56 items and the response was personally collected from the farmers.

Scoring of responses

The responses obtained from the 60 farmers were subject to item analysis. To analyse 56 items, each one of the 60 respondents to whom the test was administered, was scored on the basis of the score allotted. *i.e.* '1' for correct response and '0' for incorrect responses for each item. Thus, score could range from 0 to 56.

These 60 respondents were then divided into three groups *i.e.* 20, 20, 20 for the purpose of analysis of 'discrimination index', the middle group was eliminated as suggested by Sabarathnam (1987). The scores of these groups ranged as follows:

G1 = 49 to 38

G2 = 37 to 35

G3 = 34 to 25

Results and Discussion

Selection of items for final test

The selection of items for the perception test of Human-wildlife conflict was done based on the following criteria (Table 1).

Item difficulty index

The item-difficulty index was worked out as the percentage of the respondents answering an item correctly. The assumption in this item statistic of difficulty was that the difficulty is linearly related to the level of perception of the respondent about human-wildlife conflict. For selection of items based on difficulty indices, normal curve was taken. That is the items with difficulty indices (p value) ranging from 0.21 to 0.75 were considered for final selection as followed by Parishad (1981).

To rule out answers, which are likely to be a mere guesswork, correcting difficulty indices for chance success were worked as suggested by Garret (2011) using the following formula

$$P_c = \frac{R - \frac{W}{(k-1)}}{(N - HR)}$$

Where,

Pc - The per cent who actually know the right answer

R -The number who get right answer
W-The number who get wrong answer
N-The number of examinees in the sample
HR-The number of examinees who do not reach the item (Hence, do not try it)
K-The number of options or choices

Item discrimination index

The next criterion for selecting the items to incorporate in the final scale/test was item discrimination index, which is symbolized by $\Sigma I/3$. The method suggested by Sabarathnam (1987) was adopted to find out the item discrimination index. The discrimination indices for all items were calculated using the following formula:

$$\Sigma I/3 = \frac{G1 - G3}{N/3}$$

Where,

G1 - Frequency of correct answers for an item in the group 1
G3 - Frequency of correct answers for item in the group 3.
N - Total number of respondents in the sample selected for item analysis *i.e.*, 60.

The item discrimination index was found out for all the items and those with discrimination index between 0.21 and 0.75 were selected for the final test. Since the discrimination index varies between 0 and 1, it was considered necessary to select item with at least 0.21 discrimination indexes to be the lowest discrimination index point in order to have a wider continuum of discrimination of the items.

Table.1 Perception of villagers on Human-Wildlife Conflict (HWC)

S. No.	Statements	Agree (Score - 1)	Disagree (Score – 0)
I.	Economic Impact		
1.	HWC results in less damage to crops		
2.	Sudden attack of wild animals on public property like ration shop, temporarily stored harvested sugarcane and paddy bags result in heavy loss		
II.	Reasons for HWC		
3.	Even animal feed inadequacy in a forest area lead wild animals remain in the same area instead of moving to the buffer zones of forest		
III.	Efforts of the villagers after HWC		
4.	Pressurizing the forest officials to know HWC in their area, but not informing about HWC		
5.	Self-effort for protection against HWC		
IV.	Eco-centrism		
6.	One cannot enjoy spending time in natural settings for the sake of being out in nature		
7.	I need time in nature to be happy		
V.	Anthropocentrism		
8.	Nature is important as it contributes for pleasure and human welfare		
9.	Main reason to conserve is to maintain high standard of living		
VI.	Environmental apathy		
10.	It is too much for anybody to get concerned about environmental issues		

Table.2 Selection of test items of the human-wildlife conflict perception test

Sl. No.	Item No.	Item-Description	Key A/DA ¹	Difficulty Index (p)	Difficulty Index for chance success (p)	Discrimination Index E 1/3	Point biserial rpbis
1	11	HWC results in less damage to crops	DA	0.73	0.47	0.25	0.3*
2	15	Sudden attack of wild animals on public property like ration shop, temporarily stored harvested sugarcane and paddy bags result in heavy loss.	A	0.73	0.7	0.25	0.34*
3	16	Large scale deforestation forces wild animals do move out and cause HWC.	A	0.45	0.36	0.3	0.15 ^{NS}
4	19	Even animal feed inadequacy in a forest area lead wild animals remain in the same area instead of moving to the buffer zones of forest	DA	0.50	0.49	0.35	0.33*
5	29	Pressurizing the forest officials to know HWC in their area, but not informing about HWC.	DA	0.73	0.46	0.25	0.55**
6	31	Self-effort for protection against HWC	A	0.5	0.49	0.35	0.33**
7	33	One cannot enjoy spending time in natural settings for the sake of being out in nature.	DA	0.8	0.6	0.25	0.36*
8	36	I need time in nature to be happy	A	0.8	0.6	0.25	0.38*
9	48	Nature is important as it contributes for pleasure and human welfare	A	0.41	0.4	0.4	0.43*
10	50	Main reason to conserve is to maintain high standard of living	A	0.86	0.73	0.4	0.63*
11	53	It is too much for anybody to get concerned about environmental issues	DA	0.52	0.5	0.45	0.48*

1- A-Agree; DA-Disagree

*- significant at rpbis=0.237 at 5 percent level

** -significant at rpbis=0.354 at 1 percent level

NS- Not significant and hence not selected for final perception test (Item 16)

Table.3 Statements for studying the perception of farmers towards Human-Wildlife Conflict (HWC)

Statements		Agree (1)	Disagree (0)
I. Socio-cultural Impact			
1.	People are afraid to go out in the night rarely		
2.	Because of wildlife problem, villagers rarely conduct function during night		
3.	Wild animals (Elephant/Wild pig/gaur/monkey) attack people		
4.	The Human-wildlife conflict can be avoided		
5.	Community activities cannot be a reason for mitigating HWC		
6.	One of the reasons for food shortage and poverty in an area can be a wild animal		
7.	Villagers can live without wildlife in their surroundings		
8.	It is difficult to stop wild animals visiting villages		
9.	Unable to conduct village dramas during local-temple festival days.		
10.	Wild animals taking away babies kept side by during home chores in villages is a routine incident		
II. Economic Impact			
11.	HWC results in less damage to crops		
12.	Chasing and scaring wild animals including gesturing, mimicking, or impersonating do more harm than good		
13.	Night attack of domestic animals by wild animals is fatal		
14.	Attack of wild animals on villagers results in unbearable financial loss		
15.	Sudden attack of wild animals on public property like ration shop, temporarily stored harvested sugarcane and paddy bags result in heavy loss.		
III. Reasons for HWC			
16.	Large scale deforestation forces wild animals do move out and cause HWC.		
17.	There is no relationship between HWC and Introduction of exotic forest species.		
18.	Wild animal may change their behaviour result in HWC		
19.	Even animal feed inadequacy in a forest area lead wild animals remain in the same area instead of moving to the buffer zones of forest		
20.	Improper and inefficient protection measures result in HWC		
21.	HWC is not influenced by population increase of wild animals		
22.	Easy availability of preferred crops like sugarcane can lead to HWC		
23.	Water scarcity in forest results in HWC		
IV. Responsibility in Reducing HWC			
24.	It is the duty of the villagers to reduce HWC as they are the first target of HWC		
25.	Wildlife Authorities (Forest officials) are concerned with wildlife protection and HWC reduction.		
26.	NGO's are concerned with society welfare rather than bothering about HWC.		
27.	Revenue officials (Including Deputy Collector) are the custodian of jurisdiction and hence it is their responsibility to allay HWC		
V. Efforts of the Villagers after HWC			
28.	Meeting the elected representatives narrating the incident and pleading for compensation		
29.	Informing the forest officials about the incident for further action		
30.	Requesting the forest officials for compensation		
31.	Self-effort for protection against HWC		
VI. Eco-Centrism			
32.	One of the worst things about over population is that many natural areas are getting destroyed for development		
33.	I can enjoy spending time in natural settings just for the sake of being out in nature		
34.	Sometimes, it makes me sad to see forests cleared for agriculture		
35.	I prefer wildlife reserves to zoos		

36.	I need time in nature to be happy		
37.	Sometimes when I am unhappy I find comfort in nature		
38.	It makes me sad to see natural environments destroyed		
39.	Being out in nature is a great stress reducer for me		
40.	One of the most important reasons to conserve is to preserve wild areas		
41.	Sometimes, animals seem almost human to me		
VII. Anthropocentrism			
42.	The worst thing about the loss of the rain forest is that it will restrict the development of new medicines		
43.	The best thing about camping is that it is a cheap vacation		
44.	The thing that concerns me most about deforestation is that there will not be enough lumber for future generations		
45.	One of the most important reasons to keep lakes and rivers clean is so that people have a place to enjoy water sports		
46.	The most important reason for conservation is human survival		
47.	One of the best things about recycling is that it saves money		
48.	Nature is important because of what it can contribute to the pleasure and welfare of humans		
49.	We need to preserve resources to maintain a high quality of life		
50.	One of the most important reasons to conserve is to ensure a continued high standard of living		
51.	Continued land development is a good idea as long as a high quality of life can be preserved		
VIII. Environmental Apathy			
52.	It seems to me that most conservationists are pessimistic and somewhat paranoid.		
53.	I find it hard to get too concerned about environmental issues		
54.	I don't care about environmental problems		
55.	I'm opposed to programs to preserve wilderness, reduce pollution and conserve resources		
56.	Too much emphasis has been placed on conservation		

***Ecocentrism** - A philosophy or perspective that places intrinsic value on all living organisms and their natural environment, regardless of their perceived usefulness or importance to human beings.

****Anthropocentrism** - The belief that human beings are the central or most significant species on the planet (in the sense that they are considered to have a moral status or value higher than that of other animals), or the assessment of reality through an exclusively human perspective

*****Environmental Apathy**- people do not seem to care or be moved to action in the face of urgent ecological threats

Item Validity Index

To validate the test, point-biserial (rp bis) was estimated. Point-biserial correlation (rp bis) is the test of item validation in which the criterion of validity is considered to be internally consistent. That is, the relationship of total score to be a dichotomized response to any given item. Since the items were scored simply as '1' if correct and '0' if incorrect the assumption of normality in the distribution of right-wrong responses was considered as unwarranted, by Garrett (2011). In such cases, he considers point-biserial 'r' rather than biserial 'r' as appropriate. Point biserial r assumes that the variable which has been classified into two categories can be

thought of as concentrated at two distinct points along a graduated scale or continuum. The formula for the point biserial 'r' is:

$$rp\ bis = \frac{Mp - Mq}{S.D} \times PQ$$

Where,

rp bis - Point biserial correlation coefficient

Mp - Mean score on continuous variable for successful group on dichotomous variable

Mq - Mean score on continuous variable for unsuccessful group on dichotomous variable

S.D. - Standard deviation of the test score on continuous variable

P - The proportion of the group answering a test item correctly

Q - Proportion of the group answering a test item wrongly

Point biserial correlation was worked out for those items, which had discrimination index between 0.21 and 0.75. All the point biserial r values were found out with the aid of the table 51 of Garrett (2011) with $n-2 = 58$ degrees of freedom where n was the number of respondents. The r value for 58 (60-2) d.f. as per table at 5 per cent level is 0.237 and 1 per cent level is 0.354. Hence all the items having point bilateral r of 0.237 and above were selected for inclusion in the final test of perception of human-wildlife conflict.

The process of elimination of statements

The p value *i.e.*, item difficulty index was worked out for all 56 items. Those items which got p value other than the range of 21 to 75 were dropped from further analysis. The item discrimination index was worked out for the statements having p value of 21 to 75. The items which showed item discrimination other than the range of 0.21 to 0.75 were dropped from further analysis. In this process, only 11 statements were eligible for the point biserial correlation analysis.

Final selection of statements

Out of eleven statements subject to point biserial correlation analysis, 6 statements were significant at 0.01 level, 2 statements were significant at 0.05 level and one statement was not significant. Finally 10 items which had p value of 21 to 75 discrimination index of 0.21 to 0.75 and significant rp bis were selected for the final perception test. The item which was not significant rp bis analysis was dropped. The p

value, discrimination index and rp bis value of these 10 statements are shown in table 3.

Scoring technique for perception test on Human-Wildlife Conflict

The tool/test consisting of 10 statements was applied to the respondent to study their perception on Human-wildlife conflict (Table 2). They were asked to indicate their opinion/perception about the items freely. A score of 'one' was given to the correct response and 'zero' for incorrect response with regard to conservation.

The reliability and validity of the test indicated the precision and consistency of the results. Therefore, this test can be used by all persons and organisations to observe the perception of the farmers towards HWC in any area with suitable modification.

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