Does the contemplation of forest field staff about wildlife differ than a common man?

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Introduction:

A field-based training was organized by Vadodara wildlife division, Gujarat forest department and WCB Research Lab of Hemchandracharya North Gujarat University from September 17th to 19th, 2020 with the aim to enhance the capacity of forest field staff for monitoring and rescue of sloth bear and associated fauna. The training was organized at Jambughoda wildlife sanctuary, Central Gujarat. Along with the awareness about sloth bear, a small survey was carried out to understand how the field staff envisages the wildlife that is found in their work place. Total 18 frontline forest staff of different cadre such as beat guards and round foresters from different forest ranges of central Gujarat has participated in this survey.

Figure 1: Forest frontline staff organizing photos on Q Board © Nishith Dharaiya

This study provides an insight on how forest staff's perception differs in different animals. As Q method provides qualitative and quantitative data which helps identifying people's perception in detail. As participants have to provide justification of their answers, it reveals some underlying conflicts or reasons. These justifications of participants can help identify the gaps and can be better used for conservation planning as well as capacity building of forest field staff.

Methodology:

We used Q methodology for this study; this method is designed and developed by William Stephenson in 1930s (McKeown & Thomas, 1988)and allows to disclose underlying reasons. This method is widely used in social sciences studies. In this method, photos were used instead of statements to know respondent's perception allowing them to justify their answer in detail without any restriction. This method allows both qualitative and quantitative data on perception of the person being interviewed.

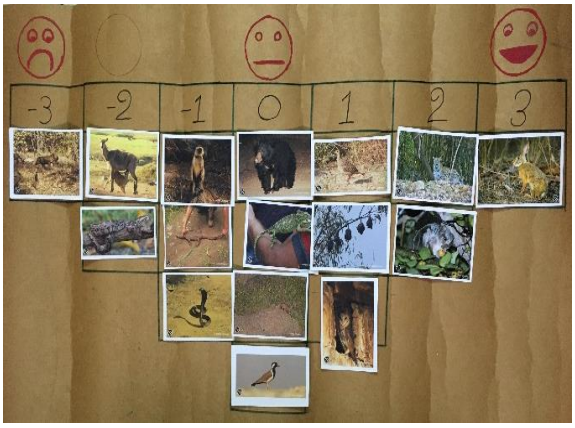

Figure 1(a): Representative sort of organized Q-board by a participant

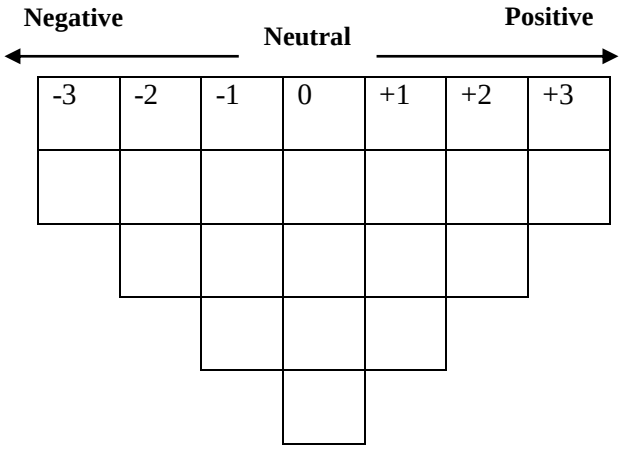

Figure 1(b): A Q-board on which the respondents organize the photos

We categorised the Q Method into two parts, first, organising 16 photos of locally found animals on a Q-board (figure 1(b)) followed by explanation for each photo which are placed on Q-board by the respondent. As shown in the figure 1(a), the participants were asked to organise photos in Q- board as per their liking and disliking towards the animals and to provide reasons which were recorded in mobile phone devise. A list of all the wildlife photos used for this survey is provided in table 1.

Table 1: Photos of wildlife used for this study

Photo ID	Common name	Scientific name
1	Wild boar	*Sus scrofa*
2	Hanuman langur	*Semnopithecus entellus*
3	Indian cobra	*Najanaja*
4	Indian giant flying squirrel	*Petauristaphilippensis*
5	Small Indian civet	*Viverricula indica*
6	Sloth bear	*Melursus ursinus*
7	Indian hare	*Lepus nigricollis*
8	Indian python	*Python molursus*
9	Barn owl	*Tyto alba*
10	Grey francolin	*Francolinuspondicerianus*
11	Red-wattled lapwing	*Vanellus indicus*
12	Rhesus macaque	*Macaca mulatta*
13	Black kite	*Milvus migrans*
14	Common krait	*Bungarus caeruleus*
15	Indian crested porcupine	*Hystrix indica*
16	Blue bull	*Boselaphustragocamelus*

Q sort analysis:

In this study, three factors were derived based on participant'sjustification which is explained in detail in the result section. A factor in this study is a category representingthe group of people who have similar perspective(Brown, 1980). The higher the factor loading, the more highly that sorts are correlated with that factor (Ramlo, 2008**,** Ramlo & Newman, 2011).The sorts refer to the photos assembled by participants on Q-board (figure 1(b)).In order to analyse the data, a software, PQMethod(http://schmolck.org/qmethod/)was used which is specially designed for Q-analysis. Q sorts are the number of participants that took part in the survey. All the data were entered manually in this software and correlation was calculated among each sort. The correlation matrix for the extracted factor was analysed through a principal component factor analysis with varimax rotationfor which options are provided in the software (figure 2).

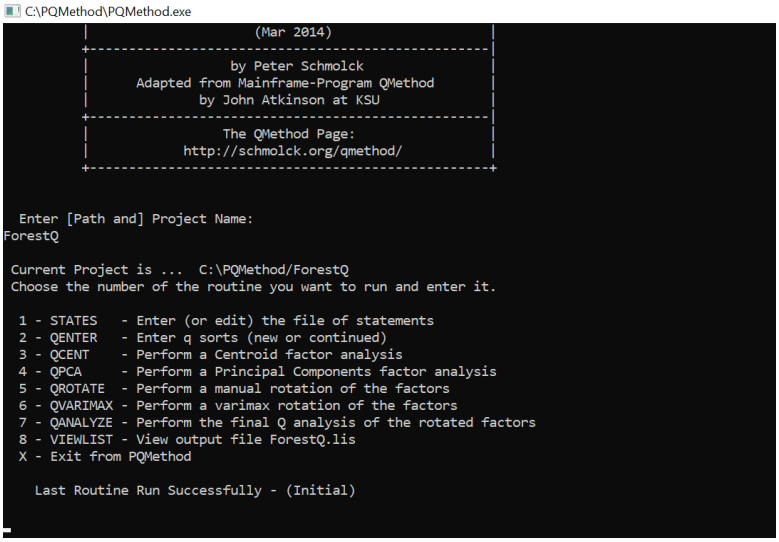

Figure 2: Screenshot of analytical option available in PQM method Software

Results and Discussion:

The three factors that emerged are shown in Table 2 with automatic pre-flagging. Participants having similar perceptions are put together in their respective factors and marked in bold and have "X" next to their score. Out of 18 sorts, 17 sorts were found complete by the software and were further analysed. Each of three factors represents a different perspective towards the photos provided to them. Participants were named as PART001, PART002 and so on to keep their identity unrevealed.

In table 2, there are 8 participants belonging to factor 1 with 29% of the variance explained followed by 7 participants in factor 2 having 26% explained variance and 2 participants belonging to factor 3 with 14% explained variance.Once factor score calculated by the software, distinguishing tables were developed in this analysis for each factor which differ from each other that is explained further in this section. The distinguishing tables for each factor explains differences between factors(Brown, 1971**,** Ramlo & Newman, 2011, Brown, 1993)**.**In order to determine distinguishing statements, average Z-score of respondent's factor score was calculated by the software.

Table 2: Extracted factor score from Q-sorts

Q-Sorts	ID	Factor 1	Factor 2	Factor 3
1	PART001	**0.8530X**	0.1248	-0.1223
2	PART002	0.0414	**0.8084X**	0.1708
3	PART003	**0.6945X**	0.0471	0.3983
4	PART004	**0.7683X**	0.1839	-0.0156
5	PART005	**0.5450X**	0.0166	0.2332
6	PART006	0.4208	**0.7241X**	0.4006
7	PART007	0.1728	0.1377	**0.9013X**
8	PART008	**0.6930X**	0.5214	0.3237
9	PART009	**0.6516X**	0.4289	0.4265
10	PART010	0.5119	**0.6142X**	0.0921
11	PART011	**0.8475X**	-0.0072	-0.2626
12	PART012	0.3742	-0.5333	0.4456
13	PART013	0.0481	**0.8292X**	0.3240
14	PART014	-0.0002	**0.6395X**	-0.3574
15	PART015	**0.6577X**	0.2179	0.1940
16	PART016	-0.0614	0.1991	**0.6372X**
17	PART017	0.4469	**0.7611X**	0.1835
18	PART018	0.5679	**0.7564X**	0.1465
%	**Explained variance**	**29**	**26**	**14**

Note: number in bold shows respondents belong to those respective factors.

Table 3 shows different factor score for each animal photo and depending on statistical significance the photo load to a specific factor. The above table contains 16 photos and their grid position for all three factors (perception, table 2). For example, Indian python was disliked by participants therefore it is scored at -2 for respondents grouped under factor 1, +1 for factor 2 andfor factor 3 it was scored at +2. For factor 1 the most liked species by participants is Indian hare and most disliked species is wild boar. Most liked species for factor 2 is Indian leopard and most disliked animal is fruit bat. For factor 3, most liked species is Indian hare scored at +3 and most disliked species is wild boar scored at -3 by the participants.

Table 3: Aggregate factor values of each 16 photos

		Aggregate values		
No.	**Photos**	**Factor 1**	**Factor 2**	**Factor 3**
1	Indian python	-2	1	2
2	Hanuman langur	0	0	2
3	Monitor lizard	-1	-2	-1
4	Red-wattled lapwing	1	-1	1
5	Sloth bear	2	2	0
6	Indian hare	3	1	3
7	Leopard	2	3	0
8	Grey francolin	1	-1	-1
9	Indian giant flying squirrel	1	1	-2
10	Blue bull	0	0	0
11	Small Indian civet	0	0	-1
12	Fruit bat (Flying fox)	-1	-3	-2
13	Indian cobra	-2	2	1
14	Barn owl	0	0	0
15	Indian chameleon	-1	-1	0
16	Wild boar	-3	-2	-3

Factor 1: Economic impact

This factor was described by 8 participants mainly concerning economic impact. Animals that cause harm economically by destroying crops and threat to human life and livestock. Participants of factor 1 thinks fruit bat, Indian python and Indian cobra causes high level of economic harm. Grey francolin is scored +1 due to its contribution to reduce impact by eating pest insects from agricultural field. Though the most disliked animal is wild boar for factor 1 as shown in table 3.

Table 4: Distinguishing photos for factor 1

Photo ID	Photos	Grid position for Factor 1	Z-score of Factor 1	Grid position for Factor 2	Z-score of Factor 2	Grid position for Factor 3	Z-score of Factor 3
8	Grey francolin	1	0.95	-1	-0.46	-1	-0.67
12	Fruit bat (Flying	-1	-0.2	-3	-1.82	-2	-1.1
1	Indian python	-2	-1.03	1	0.34	2	1.22
13	Indian cobra	-2	-1.19	2	1.27	1	0.37

Factor 2: Aesthetic, spiritual values and conservation aspects

This factor explains aesthetic, spiritual values and conservation aspects which includes appearance, tourist attraction, rehabilitation and religious belief. There are 7 responses in this factor (table 2). Respondents are observed to have negative opinions towards animals which play major role in economic loss but positive towards animal's beauty and its natural charisma. Table 5 shows how score of animals for factor 2 is different from the score of factor 1 and factor 3. For example, Indian cobra is scored at +2 in factor 2 as it is attractive to participants but it is scored -2 for factor 1 as it threatens human life.

Table5: Distinguishing photos for factor 2

Photo ID	Photos	Grid position for Factor 1	Z-score of Factor 1	Grid position for Factor 2	Z-score of Factor 2	Grid position for Factor 3	Z-score of Factor 3
13	Indian cobra	-2	-1.19	2	1.27	1	0.37
6	Indian hare	3	1.48	1	0.67	3	1.89
1	Indian python	-2	-1.03	1	0.34	2	1.22
4	Red-wattled lapwing	1	0.14	-1	-0.65	1	0.79
16	Wild boar	-3	-1.89	-2	-1.25	-3	-2.01

Factor 3: Lack of awareness

This factor describes lack of awareness which includes lack of interest compared to other animals and species. This factor mainly concerns individuals who lacks knowledge, proper information and are not aware about the species. For example, in table 6, the score of Indian giant flying squirrel differs from factor 3 to factor 1 and 2 as it is scored at -2, +1 and +1 respectively. The justification for negative score given by the participants is that they are not aware about the presence of the species therefore they do not have any information on the species.

Table 6: Distinguishing photos for factor 3

Photo ID	Photos	Grid position for Factor 1	Z-score of Factor 1	Grid position for Factor 2	Z-score of Factor 2	Grid position for Factor 3	Z-score of Factor 3
1	Indian python	-2	-1.03	1	0.34	2	1.22
2	Hanuman langur	0	-0.2	0	-0.45	2	1.10
13	Indian cobra	-2	-1.19	2	1.27	1	0.37
5	Sloth bear	2	1.38	2	1.35	0	-0.00
7	Leopard	2	1.33	3	1.81	0	-0.00
9	Indian giant flying squirrel	1	0.96	1	0.62	-2	-1.22

Conclusion:

The perception of forest field staff was better understood using Q method analysis considering various aspects. It is seen that participants tend to like animals such as Indian leopard, sloth bear, Hanuman langur and Indian hare as they are scored positive or neutral. The animals that are not given negative score in any factor due to their appearance, are seen frequently and does not lack awareness. It is observed from the data that frontline forest staff lacks knowledge about animals that are not seen or present in their forest range/beat. As frontline forest staff, they should be aware about existence of animal species that are found in Gujarat state along with their ecological importance, threats and conservation values. Some participants were not even aware about the existence of the species in the wild such as Indian giant flying squirrel. Although, being frontline forest staff, their perception is biased towards animals such as wild boar, monitor lizard and flying fox bat due to the economic loss they

may cause and weird appearance. Their perception becomes the same as a common man when every animal should be equal to frontline forest staff as it is their job to protect forest and its animals. Some participants believe in superstitions of bad luck of barn owl and monitor lizard which shows their common man perception and lack of right information.

Recommendations:

A separate training or workshops should be organised by forest department focused on animal species found in Gujarat. This will help them enhancing their existing knowledge and it will provide them with some scientific insights. Having basic scientific knowledge will help remove some barriers like superstitions and other beliefs. Field trips should be organised in different part of state to gain practical experience. Team building activities should be conducted between staff of different forest divisions.

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