



Wildlife Conflict and Prevention Strategies Adopted by Farmers and Forest Officials

Deepak Chand Meena¹, B. S. Meena^{2*}, Gopal Sankhala³, Sanchita Garai⁴, H. R. Meena⁵, Madhu Latha C.⁶

¹Assistant Professor, Department of Agricultural Economics and Extension, School of Agriculture, Lovely Professional University, Phagwara-144001, Punjab, India

⁶Ph.D. Scholar, ^{2,3&5}Principal Scientist, ⁴Senior Scientist, ICAR-NDRI, Karnal-132001, Haryana, India

*Corresponding author email id: bmeena65@gmail.com

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ABSTRACT

Human-wildlife conflict is unfavorable interactions between people and wild animals that hurt both people and their resources as well as wildlife and their habitats. The study was conducted in the year 2021-2022 in the surrounding villages of Ranthambore Tiger Reserve to understand the type of conflict and strategies adopted to prevent conflict. Garret ranking method was used to assess degree of vulnerability of crops and livestock towards wild animals and vice versa and strategies to prevent conflict. Farmers have grown 10 types of crops among them maize and among livestock goat was highly preferred by wild animals. Farmers mostly followed seven strategies to prevent conflict out of seven, fencing around the field and guarding crops and livestock by humans was found most effective strategies and eight practices were followed by forest officials to prevent conflict out of eight, boundary wall around the reserve area was most effective practice.

INTRODUCTION

Global conservation efforts face significant obstacles as a result of human-wildlife interactions that cause damage to property, loss of crops and livestock, injuries to people, and even death. Human activity has increased, fragmenting shared spaces, which has increased these conflicts between people and wildlife (Karanth et al., 2013). One of the most essential natural and renewable resources for human survival, particularly for people who live in or near forests, is the forest (Bhat, 2018). Programme like Joint Forest Management programme works for the development of forests but it's also not effective due to problems like lack of fund and delay in planting time (Iqbal et al., 2020). An estimated 200 million people reside in or near woods and are entirely dependent on these areas' natural resources for their survival (Iqbal et al., 2021). A large portion of this human-carnivore conflict happens within the boundaries of protected areas where people, livestock, and carnivores coexist (Nyhus & Tilson, 2004). There are numerous non-lethal methods available to help reduce livestock and livelihood losses, such as physical deterrents, and financial incentives for

communities (Shivik, 2006). And Organizations like Tripura Forest Development & Plantation Corporation Limited also work for uplifting the life of tribes in a state like Tripura (Uchoi & Singh, 2020). This paper aims to provide a brief and their ranking, about type of crops and livestock highly preferred by wild animals and vice versa and strategies adopted by farmers and forest officials to prevent human-wildlife conflict.

METHODOLOGY

The present study was carried out during December 2021 to May 2022 in the surrounding villages of Ranthambore Tiger Reserve, India. RTR was selected purposively due to the highest crop raiding by wild animals and the highest 304 villages with one million population in the vicinity of RTR. The Ranthambore Tiger Reserve is divided into two zones namely the Core also known as critical tiger habitat and Buffer zone, both zone were selected for the study. Out of 304 villages, 30 villages (18 villages from the core zone and 12 villages from the buffer zone) were selected randomly, from each village 12 farmers were selected randomly from each village, so total 360 farmers, Further 30 forest officials

belonging to RTR have been selected, so, the total sample size was 390 for the study. An exploratory research design was used to identify wildlife conflict and strategies adopted by the farmers and forest officials. Data were collected in two phases. In the first phase of data collection, a survey and focus group discussion was conducted to identify the type of wildlife conflict and strategies adopted by the farmers and forest officials to prevent conflict. Then, all the types of conflict were categorized into different heads like most vulnerable crop, and type of livestock, wild animals mostly dangerous for the crops, livestock, and humans, and strategies adopted by the farmers and forest officials to prevent Conflict. In the second phase, asked farmers and forest officials to put rank on the particular items then it was quantified by using the garret ranking as suggested by Garret (1981) which is as follows:

$$\text{Per cent position} = \frac{[100(R_{ij} - 0.50)]}{N_j}$$

Whereas, R_{ij} , Rank given for the i th service by j^{th} respondent; N_j , Number of services ranked by j th respondent.

RESULTS AND DISCUSSION

Crops and livestock's vulnerable to the wild animals

Since it was clear in the earlier focus group discussions with the farmers of the vicinity of the RTR that there is intense HWC in the village and their crops as well as livestock. HWC happened in crops in the form of destroying the standing crop, crop raided, eating, uproots whole plants, etc. by the wild animal. So, the farmers were then asked to list different crops they grow and rank them in terms of their vulnerability to damage by wild animals. The details of the crop type that farmers are cultivating and their rank is presented in Table 1. The study explored that farmers were mostly cultivating 10 types of agriculture crops and found that maize crop was highly vulnerable to raiding by the wild animal and most desirable crops of the wild animal like Nilgai, monkey, etc. so, farmers have kept rank

Table 1. Ranking of crops and livestock vulnerable towards the wild animal

S.No.	Crops	Garret mean score	Rank
Vulnerability of crops toward the wild animals			
1	Wheat	56.84	V
2	Mustard	46.08	VII
3	Gram	49.73	VI
4	Barley	36.23	VIII
5	Sorghum	34.28	IX
6	Pearl Millet	57.66	III
7	Maize	74.85	I
8	Black Gram	23.43	X
9	Vegetable	57.61	IV
10	Guava	62.31	II
Vulnerability of livestock to wild animals			
1	Buffalo	35.29	IV
2	Cow	30.88	V
3	Calves of Buffalo and Cow	49.42	III
4	Goat	68.83	I
5	Sheep	65.58	II

I of the maize crop. Chauhan, (2011) reported that nilgai is a major cause of crop-raiding and trampling of crops like wheat, gram, millet, etc. The majority of the farmers used to cultivate horticulture crops like guava and guava farming is very much prevalent in the study area and this crop is highly vulnerable to wild animals like wild boar, which used to destroy whole the plant of guava and entered in guava field despite having fencing around the field due to this reason farmers have kept it II rank.

Farmers surrounding the vicinity of RTR used to keep livestock like buffalo, sheep, goats, and cows for their livelihood but due to HWC, these animals were killed and injured by the wild animal in the reserve area. The data presented in the Table 1 revealed that goat was most vulnerable for the wild animals followed by sheep and calves of buffalo and cow.

Wild animals toward vulnerable crops and livestock

The result of the rank of wild animals destroying crops and livestock depredation has been given in detail in Table 2. Their study explored that wild boar (Garret mean score: 72.18) was a major cause of crop damage, wild boar destroyed all types of crops including horticulture crops such as guava, and uprooted whole the plant of guava due to this reason farmers have given rank first. Nilgai was used to destroy standing crops in form of crop-raiding and foraging the crop and given II rank by the farmers. Chhangani et al., (2008) also found a similar result in their study and reported that most crops were raided by the blue bull (nilgai) followed by wild boar. Wild animals like big cats leopards and tigers are used to harm livestock as well as human in form of lifting and killing livestock as well as making injured the livestock and humans.

Strategies adopted by the farmers and forest officials

Farmers followed various strategies to prevent HWC and tried to reduce their losses as much as they can reduce losses by these practices. Details of the strategies have been given in Table 3. Fencing of wire with the help of poles (Pole made by stone or Cement) around the agriculture field was ranked first with a Garret mean score of 74.07. Similar findings also reported by Huygens and Hayashi (1999). And guarding the crops and livestock in the daytime as well as the night time by the human along with some of the farmers keeping dogs while they were guarding crops and livestock were ranked second. Karanth & Kudalkar (2017) reported

Table 2. Ranking of wild animals toward vulnerable crops and livestock

S.No.	Type of Wild animal	Garret mean score	Rank
Ranking of the wild animal towards destroying crops			
1	Nilgai (<i>Boselaphus tragocamelus</i>)	67.69	II
2	Wild Boar (<i>Sus scrofa</i>)	72.18	I
3	Chital (<i>Axis axis</i>)	46.40	IV
4	Sambar (<i>Rusa unicolor</i>)	52.64	III
5	Common langur (<i>Semnopithecus</i>)	30.44	VI
6	Rhesus monkey (<i>Macaca mulatta</i>)	31.60	V
Ranking of Wild animals towards depredation of livestock			
1	Tiger (<i>Panthera tigris</i>)	58.52	I
2	Leopard (<i>Panthera pardus</i>)	41.48	II

Table 3. Strategies and their rank towards effectiveness to prevent Human-Wildlife Conflict

S.No.	Strategies	Garret mean score	Ranking
Ranking of effectiveness of strategies adopted by the farmers to prevent Conflict			
1	Guarding the crops and livestock	69.22	II
2	Fencing around the agriculture field	74.07	I
3	Use of crackers	50.37	IV
4	Spreading hair around the border of the field	42.77	V
5	Using rope, bottle, banging tin to make sound	57.24	III
6	Temporal changing of cropping pattern	30.02	VI
7	Insurance	29.33	VII

Table 4. Ranking of effectiveness of strategies adopted by the forest officials to prevent Conflict

S.No.	Strategies	Garret mean score	Ranking
1	Boundary walls around the Tiger Reserve	74.58	I
2	Technical financial support to the farmers by the Forest officials	68.33	III
3	Guarding the Reserve area by the forest guard	70.75	II
4	Training program related to preventing attack by the wild animal	44.03	V
5	Awareness Programme	51.33	IV
6	Resettlement of the villages and farmers	36.42	VI
7	Transfer the more aggressive wild animal to the safe zone	32.72	VII
8	Eco-Development activities	28.00	VIII

that watching crops and livestock and using scare devices were good mitigation practices for wild animals.

Forest officials followed various strategies to prevent HWC and restricted entering humans and their livestock inside the premises of RTR by some strategies. So forest officials were asked to give a ranking based on effective strategies to prevent HWC. The result of strategies adopted by the forest official is presented in Table 4. A study revealed that Boundary walls around the Tiger Reserve were most effective and given rank first. Guarding the Reserve area by the forest guard to restrict the entry of humans and livestock were given ranked II. If any livestock and human has been countered by wild animals on the premises of human settlement area forest officials used to give Technical financial support to the farmers were ranked III with the garret means score of 68.33.

CONCLUSION

The primary finding of this study emphasizes the need for ongoing development of direct mitigation techniques to promote harmonious cohabitation between people and wildlife. Conflicts frequently result in local communities losing their main sources of income due to the destruction of crops and livestock losses which frequently causes hunger and poverty. Through preventive, mitigation, and indirect strategies, coping strategies aim to reduce human-wildlife conflicts and increase local community tolerance. They also promote more sustainable practices that will not only help decrease human-wildlife conflicts but also strengthen local communities' resilience. We found that some outdated tactics require revision to have a meaningful impact, but even more crucially, these techniques require revision to lessen habitat devastation. Therefore, in order to create more effective mitigation policies that will aid populations in better coexisting with wildlife, policymakers must give weight to these important elements.

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