



Mahakal Blessed My Crop: Community Dynamics and Religious Beliefs Influence Efficacy of a Wildlife Compensation Program

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Conservation conflicts or human-wildlife conflicts present one of the foremost challenges to wildlife conservation globally. The challenges of reconciling human safety and food security with the conservation of large-bodied wildlife are further compounded in the developing nations with a high spatial overlap of wildlife with people. Therefore, conservation models are required to offset losses faced by affected communities while at the same time ensuring the long-term conservation of wildlife species in shared spaces. Ex-gratia payment is one such widely used conflict mitigation instrument that aims to reduce losses and increase tolerance toward damage-causing wildlife species. However, the efficacy of such programs is rarely investigated and the complex interplay of local beliefs, traditions, and community dynamics are rarely incorporated in the compensation programs. This paper aimed to study an ex-gratia payment program for crop losses in India using ecological, economic, and social lenses. In this study, we used 119 interview surveys across 30 villages. Linear models and thematic analysis were used to understand the sources of crop losses, the propensity to claim ex-gratia payments, and the reasons for claiming or not claiming. We find that even though wildlife is the major cause of crop loss in the region, especially to elephants, the majority of the respondents (53%) did not claim compensation for the losses. The reasons varied from procedural failures to a negative evaluation of the process or the agency involved but the most recurrent reason for not claiming was a deep religious belief in certain communities on the elephant God, “Mahakal.” Our work indicates that the cultural reverence toward the species is enabling the acceptance of losses. We propose that such complex cultural beliefs and local traditions should be considered when designing schemes that aim to garner conservation support toward damage-causing wildlife species.

Keywords: human-wildlife interaction, compensation (damage), crop damage, Asian elephant (*Elephas maximus*), conflict mitigation

INTRODUCTION

Humans and wild ungulates have been sharing space and competing for resources since the advent of agriculture (Edgerton, 1931). The highly nutritious and palatable nature of crops have resulted in many herbivore species favoring these crops thereby creating conservation conflicts (Linnell et al., 2020). Globally, crop damage by wild herbivores is a major economic pressure on farming communities, leading to losses worth millions of dollars each year (Woodroffe et al., 2005). Such damages affect local lives and livelihoods of people and are most severe at the interface of wildlife and human ranges and most often impact the already marginalized communities living in these interface areas (Karanth and Kudalkar, 2017; Karanth et al., 2018). Furthermore, such losses bear direct adverse effects on wildlife conservation, especially native herbivores due to retaliation and persecution (Woodroffe et al., 2005). Several approaches have been used worldwide to offset such losses and reconcile wildlife conservation with the food security and local livelihoods. The common methods adopted globally range from eradication of problem animals, regular harvest and hunting to fences and deterrents, *ex-gratia* compassionate payments, compensation payments, and crop insurance (Fernando et al., 2008; Hoare, 2012).

Eradication and wildlife population management is a widely practiced method in the global north and relies on the removal of the problem animals and yearly harvest to control populations of damage causing wildlife (Wagner et al., 1997). Trophy hunting is also practiced in certain areas to control carnivore populations and thereby reducing the risk of damage to livestock; however, such measures are rarely effective for herbivores (Anthony et al., 2010; Teichman et al., 2016). Separation of wildlife ranges and production areas continues to be a widely advocated means of reducing damage. Fences, deterrents, translocation, and resettlement are used in varying degrees and have also met with varying success rates (Fernando et al., 2008; Hoare, 2012; Branco et al., 2019).

The cost-benefit analyses and applicability of all kinds of instruments to mitigate conservation conflicts with regard to wild herbivores have been explored at length and the shortcomings of each method has also been studied extensively (Baruch-Mordo et al., 2011; Redpath et al., 2013; Kissui et al., 2019; Linnell et al., 2020). Compensation payments or *ex-gratia* payments or compassionate payments are the most widely used instruments used to offset losses and garner support for the conservation of damage causing species (Hoare, 2012; Ravenelle and Nyhus, 2017; Karanth et al., 2018). In India, 27 out of 29 states have policies for such *ex-gratia* compensation (Karanth et al., 2018). However, the efficacy of such compensation/*ex-gratia*/compassionate payments are rarely studied (Nyhus et al., 2003; Nyhus and Tilson, 2004; Ravenelle and Nyhus, 2017). Scientific studies have also argued that the compensation/*ex-gratia* schemes may not always attain their motive of wildlife conservation but may also be detrimental in nature if not implemented well (Bulte and Rondeau, 2005a, 2007). Further, the factors which affect the success or failure of these schemes have received scant focus in academic literature. Therefore, there is

a lacuna in understanding the efficacy of such programs which are widely implemented as a conflict mitigation tool, especially in India where such conservation conflicts are on the rise. Furthermore, the accessibility and acceptability of these schemes have received no focus in the conservation literature in India.

As ensuring protection for crops at all times is not possible, schemes like *ex-gratia* relief and monetary compensation become crucial. There have been studies looking at the broad differences in the compensation practices and the difficulties in implementation across India (Karanth et al., 2013, 2018; Watve et al., 2016). It is seen from these studies that the compensation practices are often shaped by cultural and political complexities. Problems like disproportionate *ex-gratia* payments, assessment of damage being left to the personal judgment of a single individual, or damage by less charismatic species, such as smaller herbivores have received inadequate attention. Underlying belief systems that predict the propensity to claim compensation has received even less attention in the conservation literature (Saif et al., 2020). Attention to social and psychological variables of conservation behavior may help policymakers design effective interventions for the long term (Clayton and Brook, 2005).

In this paper, we examined *ex-gratia* payments for crop loss and the psycho-social and economic factors that affect the implementation and efficacy of the program in West Bengal state, India. This paper looks at attitudes, emotions, norms, beliefs, and administrative processes involved as antecedents to the behavior of applying or not applying for *ex-gratia* relief. Attitudes are important as they precede and direct behavior. The short-term behavior change usually does not become permanent until the constructs causing the behavior have been changed, such as underlying attitudes (Vaske and Manfredi, 2012). Norms can influence the behavior, especially in cases where people are less informed about the procedures to claim relief. The influence of local beliefs on the behavior and intentions has been seen in several studies and hence, we addressed the issue of compensation from varied theoretical perspectives (Castelfranchi and Paglieri, 2007).

Theoretical Framework

Theory of Reasoned Action and Theory of Planned Behavior

The theory of planned behavior (TPB) is an extension of the theory of reasoned action (TRA) (Ajzen, 1985). The theory posits as a central idea that behavioral intention is the best predictor of actual behavior performed. Behavioral intention is determined by the attitudinal component (attitude toward the behavior), normative component (subjective norm), and the perceived behavioral control over performing the behavior (Ajzen, 1985). It says that beliefs about the consequences of a behavior are assumed to determine attitudes toward the behavior, beliefs about the expectations and behaviors of others (normative beliefs) are assumed to determine the subjective norms, and beliefs about potential facilitating or inhibiting factors (control beliefs) are assumed to determine perceived behavioral control (Ajzen, 2011). This theory distinguishes among the three types of beliefs—behavioral, normative, and control—and among the related constructs of attitude, subjective norm, and perceived

behavioral control. The control beliefs may be based on the past experience with the behavior, but will also be influenced by second-hand information about the behavior, such as by friends and acquaintances (Ajzen, 2011).

This framework was deemed suitable for the present study as it offers several advantages in terms of looking at antecedents of behavior, which has made it a popular theoretical framework over the years used in research conducted on the social aspects of conservation (Rossi and Armstrong, 1999; St. John et al., 2010; Jhamvar-Shingote and Schuett, 2013). This framework has been previously used to study the conservation-related behaviors of farmers (Beedell and Rehman, 1999). A systematic review has shown that two-third of the case studies where intervention was planned around TRA showed a behavioral change in the desired direction after the intervention (St. John et al., 2010). This framework has previously been applied to study the support of people for wolf reintroduction in Colorado as well (Manfredo and Dayer, 2004). The TRA has also been used to predict behavior toward leopards in Maharashtra, India (Jhamvar-Shingote and Schuett, 2013) in a study that demonstrated that attitudes contributed the most (19%) in predicting the behavioral intentions toward leopards and their conservation. This model has also been applied to study the factors driving the poaching of bears in China (Liu et al., 2011).

METHODS

Study Area

The study was conducted in Jalpaiguri district of West Bengal state, India (Figure 1). The landscape is a mosaic of different land use and land cover types, such as tea estates, protected forests, settlements, agricultural fields, river beds, and fallow areas (Kshetry et al., 2017). The forests include the Protected Areas of Gorumara National Park and Chapramari Wildlife Sanctuary and the Reserve Forests of Jalpaiguri Forest Division that are part of the East Himalayan biodiversity hotspot (Myers et al., 2000). The major forest types are Northern Tropical Semi-Evergreen and Tropical Moist Deciduous with Sal being the predominant species (Champion and Seth, 1968).

The region has a rich biodiversity of mammals, reptiles, birds, amphibians, and insects that include charismatic and threatened fauna, such as the Asian elephant (*Elephas maximus*), Greater one-horned rhino (*Rhinoceros unicornis*), and Indian leopard (*Panthera pardus*) (Kshetry et al., 2020). The present Asian elephant (*Elephas maximus*) population in North Bengal is ~500 individuals spread across an area of 1,933 km² of forest area (Project Elephant, 2017). The annual temperature ranges between 37.9 and 7.8°C and annual rainfall is 3,500 mm (Kshetry et al., 2020).

The district has a population density of 701 persons per km², according to the 2011 census (<http://jalpaiguri.gov.in/district-profile>, accessed July 2021). Agriculture related income supports ~17% of the population with 4.75% cultivators, 5.10% marginal farmers, 1.15% small farmers, 5.93% agricultural laborers, and 0.41% involved in allied agro-activities (<http://jalpaiguri.gov.in/district-profile>, accessed July 2021). The major communities inhabiting this area are tribal (Adivasi) from Chotanagpur

plateau and the erstwhile Santhal Pargana, such as Oraon, Munda, Minj, Kheria, and Murmu. Other communities are Rajbangshi, Mohammedan, Nepali, Bhutia, Bengali, Marwari, and Mech. This area was originally inhabited by the Mechs who practiced shifting agriculture but were soon outnumbered by the Rajbangshis who were the first permanent settlers and the actual tillers (Xaxa, 1980). The agrarian structure in Jalpaiguri developed perfectly on the pyramidal model that was mainly due to the increasing pressure on land and the absence of alternative economic resources and primarily has a subsistence setting (Xaxa, 1980). Although paddy is the staple food of the district, there has been a steady switch over to crops, such as maize, barley, wheat, jute, mustard, and tobacco (Xaxa, 1980). However, the acreage for each of these crops indicates fluctuating trends over the years (Xaxa, 1980; Nagendra et al., 2009). In spite of irrigation through the canals and wells being present (<http://jalpaiguri.gov.in/district-profile>, accessed March 2021), agriculture is highly dependent on the south-west monsoon.

Elephants are found to be distributed well beyond the protected areas in this region thereby leading to considerable interactions with people (Kshetry et al., 2020). Between 2009 and 2013, ~269 acres of crops were damaged by elephants as per the official records of the West Bengal Forest Department along with 1,180 cases of building damage by elephants to access stored food (Roy et al., 2017). In the same period, 108 people lost their lives due to the encounters with elephants. Hence, we predict that a majority of the crop losses in the region may be attributed to the elephants.

Data Collection and Analysis

A semi-structured questionnaire was used to understand the extent of crop losses due to all possible sources. The questionnaire contained categorical and open ended questions that enabled quantitative as well as qualitative analysis of the responses. The leading questions regarding the damages caused by elephants or any particular species were avoided to prevent any bias in reported losses. There were 10 questions in the survey and some basic information about the respondent, such as name, household members, and earning members. The questionnaire was tested with two members of the local community who were known personally to the research team and then was finalized for the entire survey.

The villages within the study area were digitized using the district map and each village was numbered uniquely, a random number generator was used in Program R to select 30 villages from the list. The households (3–4 in each village) were opportunistically selected within these villages and approached for an interview. The purpose of the survey was explained to the respondents and the questionnaire was administered after obtaining verbal consent from them. It was explained to the respondents that the purpose of the survey was to identify all sorts of challenges faced in agriculture especially crop losses from all the sources. The data were analyzed using mixed methods (qualitatively and quantitatively), the quantitative analyses were carried out in Program R (Venables and Smith, 2008).

For the subset of respondents who reported the crop losses due to wildlife, we investigated the reasons for claiming or not

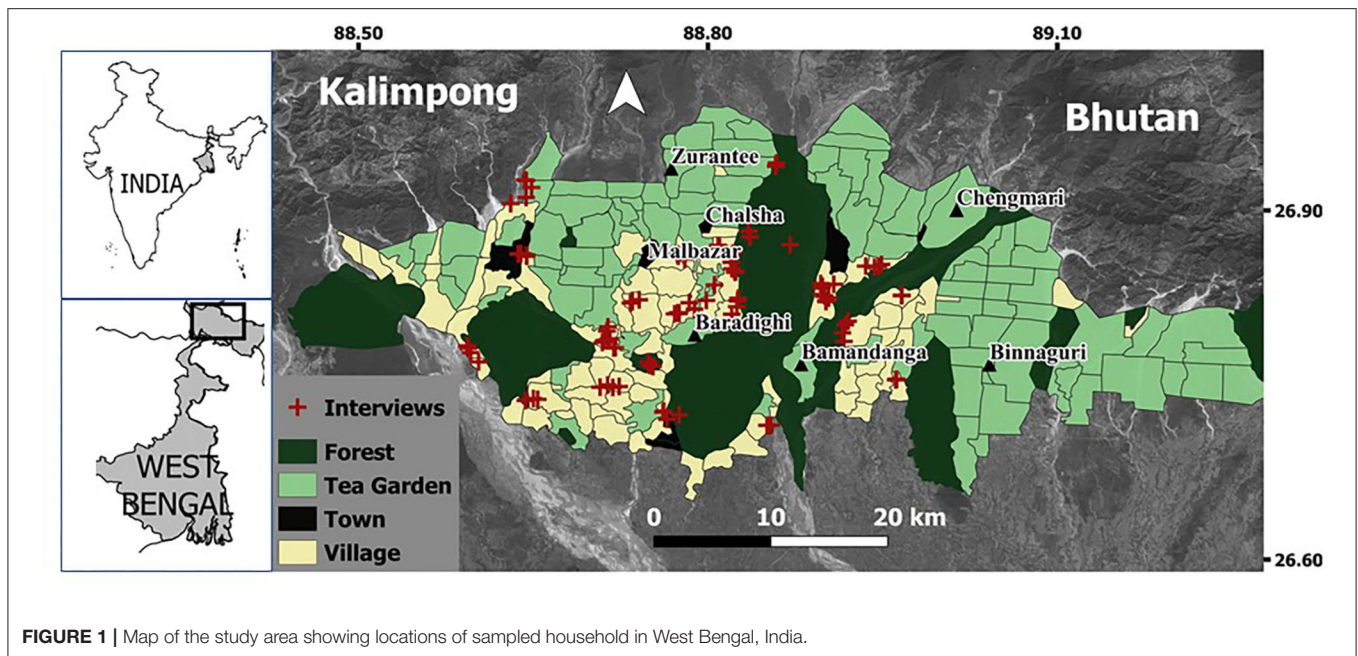


FIGURE 1 | Map of the study area showing locations of sampled household in West Bengal, India.

claiming any *ex-gratia* relief for the loss. We built the generalized linear models (GLMs) with a binomial error distribution. The response variable was binary, “0” in case of not claiming *ex-gratia* relief and “1” in case of claiming relief. We used a set of categorical and continuous predictors to assess the underlying economic and psycho-social factors that affect the motivation of an individual to seek *ex-gratia* relief. The predictors, such as ethnicity of the respondents, area under agriculture, number of earning members, distance of the field from forest, and the religious belief of the respondents regarding the God “*Mahakal*” were used in the models. The reasons for not claiming *ex-gratia* relief according to the respondents were further analyzed using thematic analyses to explore the overall efficacy of the *ex-gratia* scheme.

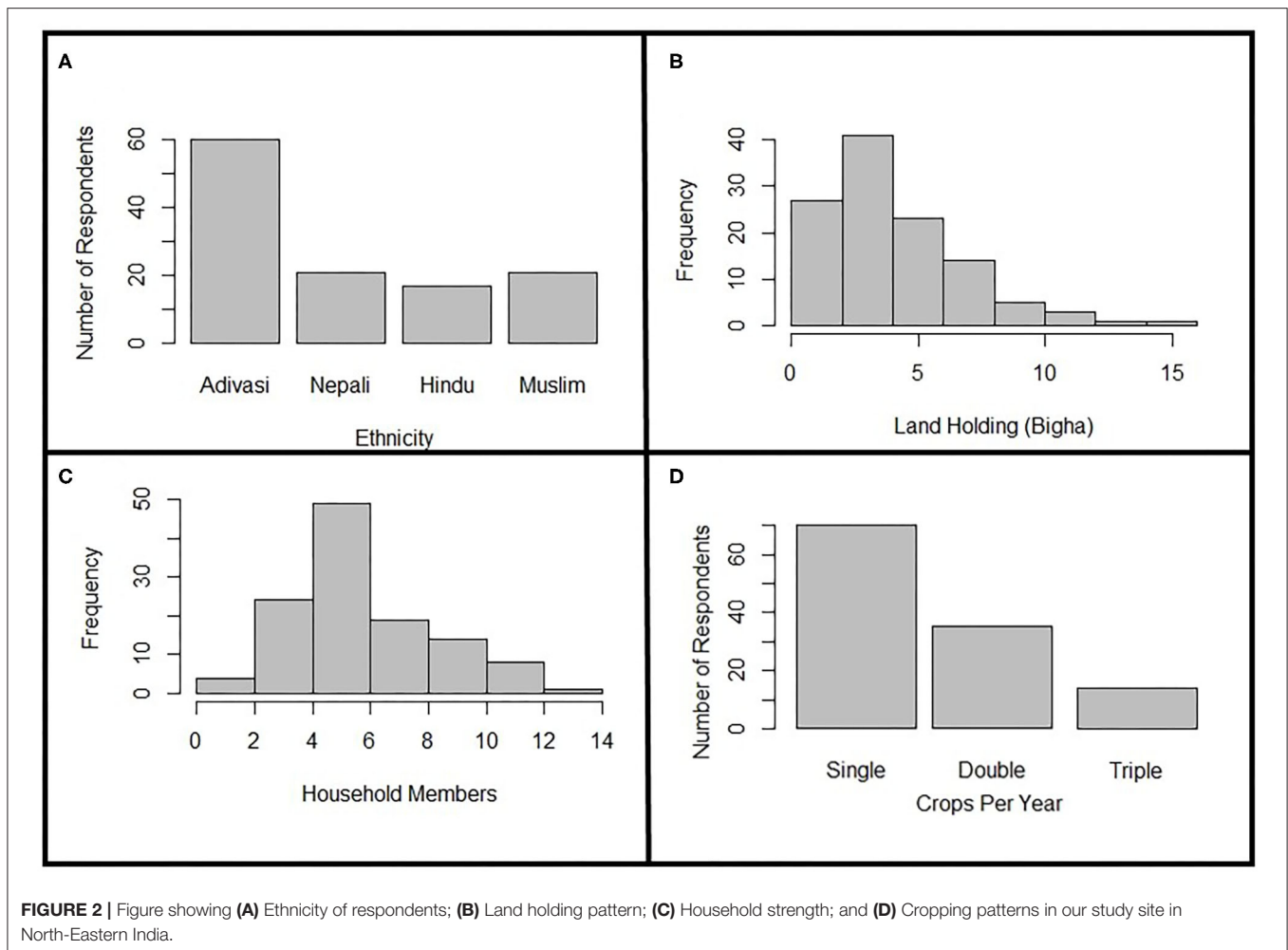
The qualitative analysis was carried out using the thematic analysis method. A thematic analysis is a method for identifying, analyzing, and reporting patterns (themes) within data (Braun and Clarke, 2006). A thematic analysis can be used to address most types of research questions, from questions about the practices, views, and opinions of people to questions about the representation and construction of particular social and psychological objects and subjects in particular contexts (Braun and Clarke, 2014). An inductive thematic analysis was conducted, which is a data driven bottom-up approach (Braun and Clarke, 2006; Joffe, 2012; Vaismoradi et al., 2013; Willig et al., 2013). Line-by-line coding of the responses was carried out at both semantic (explicit) and latent (implicit) levels. “The latent level goes beyond the semantic content of the data, and starts to identify or examine the underlying ideas, assumptions, and conceptualizations—and ideologies—that are theorized as shaping or informing the semantic content of the data” (Braun and Clarke, 2006). This approach was suited to the study since it allows the analysis to take into account

the context in which the data are collected (Vaismoradi et al., 2013).

RESULTS

A total of 119 interviews were conducted across the 30 villages in Jalpaiguri district. The response rate was 100% as all the individuals approached for the interview consented to be part of the survey. Approximately 40% of the respondents were women and the rest were men, all respondents were adults. The respondents were from all communities in the region. Since the region is dominated by tribal populace, ~50% of our respondents were from the Adivasi community, 17% from non-tribal, non-Nepali Hindu, 14% of the respondents were from the Muslim community, and 17% of the respondents were from Nepali community (https://censusindia.gov.in/2011census/dchb/1902_PART_B_DCHB_JALPAIGURI.pdf, accessed on August 2019). Majority of the respondents practiced subsistence farming (98 out of 119 respondents) and the average land holding was 4.5 bigha (1.35 acre) (range: 0.5–15 bigha). The crops grown included were paddy, maize, mustard, and vegetables with paddy being the most dominant crop followed by maize. A single crop per year was the most common cropping pattern (58%, $n = 119$), more than one crop per year was grown by 29% of the respondents whereas only 11% of the respondents grew more than two crops per year (Figure 2).

The wildlife caused damages were found to be the most important cause of crops loss in the region since 50.42% of the respondents listed wildlife as the most important reason for crop loss. Water shortage was the next most important reason for crop failure as listed by 25.21% of the respondents as the cause of crop loss followed by damage due to livestock grazing (11.76%), floods (6.72%), invertebrate pests (5.04%), and labor shortage (0.8%, one



respondent). Among wildlife, elephant was the prime cause of crop damage with 52.9% of the respondents identifying elephants as the key damage causing wildlife species. Other wildlife species involved in crop damage are peafowl (*Pavo cristatus*), monkeys (*Macaca mullata*), and wild pig (*Sus scrofa*). The respondents living closer to forests (0–2 km) were more likely to face losses due to wildlife while pest infestation was attributed as the major cause of loss by respondents living further away from the forests (2–5 km) (Figure 3). In addition, we found that increasing distance to forests reduced the propensity to claim compensation, this was due to information asymmetry as communities staying away from forests, but facing crop damage due to wildlife were unaware of *ex-gratia* relief schemes and procedures (Figure 4). Among the 119 respondents, 105 respondents faced crop losses due to wildlife in some form and analysis on *ex-gratia* claims was carried out using this subset of the respondents.

When the respondents were asked if they ever claimed any sort of *ex-gratia* relief from any agency due to crop losses, 53.3% of the respondents (56 out of 105) who faced losses due to wildlife never claimed any *ex-gratia* relief for the loss. Furthermore, 54% of all the Adivasi respondents, 80% of non-Nepali Hindu, 58% of Muslim, and 2% of Nepali respondents did not claim *ex-gratia*.

We investigated this subset of respondents (105 out of 119) who faced losses due to wildlife to understand the reasons for not claiming *ex-gratia* relief and to evaluate the perception toward the government relief program. We investigated the reasons for not claiming relief using a two-step analytical framework. First, we regressed claiming (or not claiming) against a set of psycho-social, economic, and cultural variables and then corroborated our quantitative results with the thematic analyses of reasons for not claiming relief. The variables that were seen to explain the probability of claiming relief were the ethnicity of the respondent, distance from forest, area under cultivation, and cropping pattern. It was found that non-Nepali Hindu community was less likely ($\beta = -1.16$, $SE = \pm 0.67$) to claim *ex-gratia* relief while the Nepali Hindu community was more likely ($\beta = 1.04$, $SE = \pm 0.69$) to claim *ex-gratia* relief. The respondents living closer to forests were more likely to claim ($\beta = -0.28$, $SE = \pm 0.22$). The effects of land holding ($\beta = 0.07$, $SE = \pm 0.08$) and cropping pattern ($\beta = 0.68$, $SE = \pm 0.88$) had negligible beta estimates but improved the overall fit of the model. Our model explained 15% of the variation in the probability of claiming *ex-gratia* relief (pseudo $R^2 = 0.149$). Each of these quantitative findings is explained using the qualitative findings from the data.

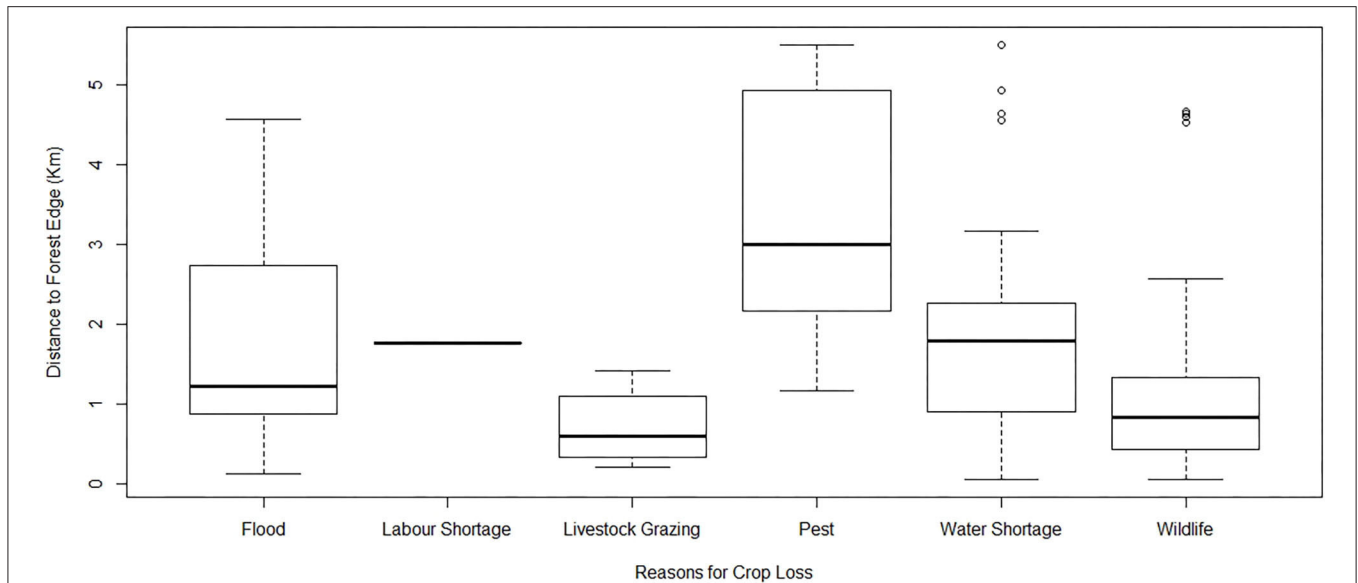


FIGURE 3 | The box-plot showing the effect of distance to forests on the reasons for crop loss as reported by respondents. Distance to forest is plotted on the y-axis in kilometer.

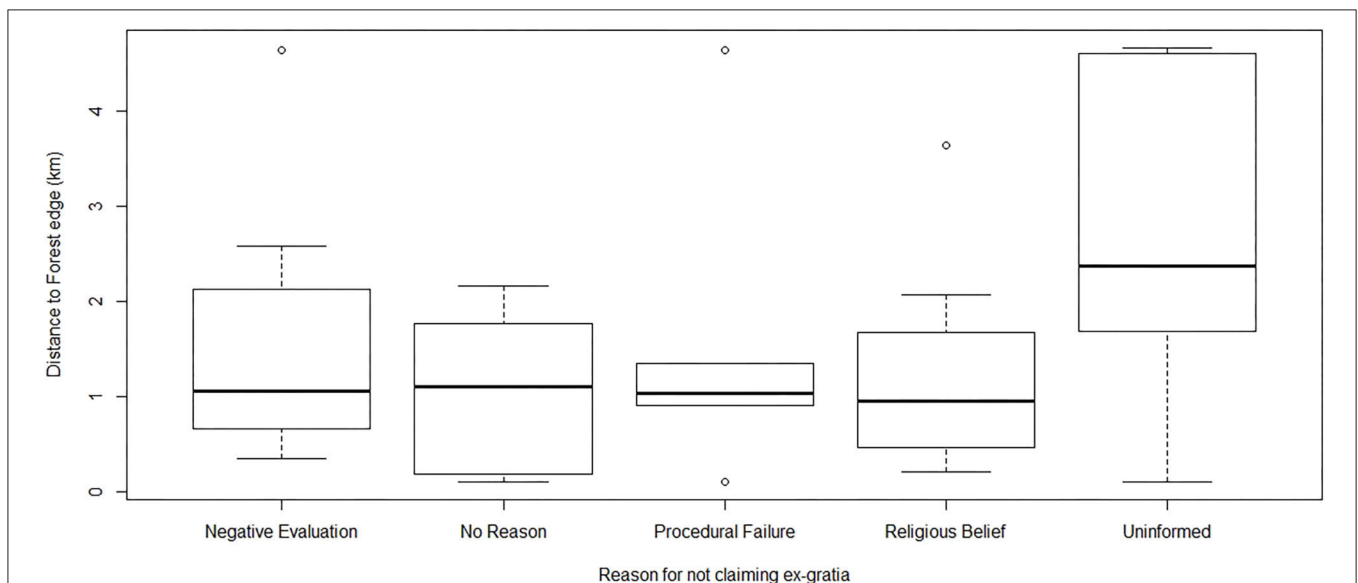


FIGURE 4 | The box-plot showing the effect of distance to forest on reasons for not-claiming relief, distance is in kilometers.

The qualitative analysis was done using the thematic analysis method. The major themes that emerged were corroborated with the variables that were found to be significant in the quantitative results. The behaviors of claiming and not claiming compensation were further looked at and analyzed through the TPB and reasoned action.

The major themes were procedural hurdles, lack of access to reliable information, lack of communication between the agency

and locals, and a negative attitude toward the compensation procedure (Table 1). A strong need for compensation (be it monetary or future reward) emerged from the responses. A belief in the elephant God also emerged as a recurrent and important theme in the overall analysis. It was seen to be an important part of the popular narrative of reasons determining the behavior of applying for compensation, especially for Hindu respondents who constituted 17% of all the respondents (Figure 2).

TABLE 1 | Table defining the key themes that emerged from reasons given for not claiming ex-gratia relief.

Theme	Definition
Procedural failures	Unsuccessful attempts at applying due to loopholes or hurdles in the application procedure
Negative evaluation of the compensation procedure	Respondents who did not apply due to a negative prior experience, or reports of negative experiences by other people.
Religious and belief related reasons	Beliefs that were associated with considering the elephant as an embodiment of God and cultural significance of the elephant.
Being uninformed	Respondents who did not apply due to being unaware of the procedure, documents required, or being unaware about when the concerned beat officer visits the village for a compensation related survey of damage.

Reasons for Not Claiming ex-gratia Relief

Procedural Failures

This theme describes responses of not applying for ex-gratia relief due to previous unsuccessful attempts. Some respondents (8%, $n = 56$) reported having made one or more attempts to apply for the compensation. However, there were hurdles that the respondents had not been able to surpass, or loopholes in the procedure due to which they had stopped applying. For example, they submitted the required documents but never heard back in spite of follow-up; or informed the concerned beat officer about the loss but received no response. Another reason cited was that they had applied for compensation several years (ranging from 5 to 15 years) before the survey was conducted but had not received any compensation and hence had stopped applying. The compensation amount was reported to be highly inadequate and the process for applying was tedious and unreliable. Thus, the costs of applying were greater than and out-weighed the benefits received due to unreliable procedure. A negative attitude toward any assistance that the department might provide in this matter was expressed due to the unreliability in the assistance, and the procedure. Some of the responses include (after translation) are

Respondent 1: I had applied 10 years ago. I got the form, wrote the area of land that had suffered damage and submitted it along with the legal documents for the land. We never received any compensation in spite of going and complaining several times to the range office. I will not apply anymore, as it is simply a waste of time and money.

Respondent 2: We got the required form from the gram panchayat and filled it out and submitted it to the secretary of the EDC (Eco Development Committee), but he never did anything about it. The EDC never came for any enquiry.

Negative Evaluation of the Procedure and Forest Department

A strong negative evaluation of the compensation procedure as presently carried out by the forest department was seen in several reports (24%, $n = 56$). This negative evaluation had resulted from either first-hand prior experience, or indirect reports of negative experiences by other people. The process was often described as “*harassing*.” According to one respondent (translated),

R3: We used to inform the forest department about our loss 5 years ago, but did not get any form. Hence, we

stopped informing them. We have lost faith in the forest department now.

Dissatisfaction, helplessness, and resignation were important underlying emotions in reports about the compensation procedure. This was clear through responses which stated that they did not apply as they knew the forest department would not give them any money, and that it was a completely futile exercise. Along with unsuccessful attempts at applying for the compensation, other reasons that resulted in dissatisfaction were that the amount received was inadequate and was paid after a delay of several months, and a lack of redressal for any complaints they might have about the process. The process for applying for compensation was done directly through the concerned forest official, or through a mediator, such as the EDC or some other member of the community who was more informed than the claimant. There was a lack of common understanding seen about the particulars of the application procedure as well as the process that went behind the distribution of the compensation amount. A negative attitude toward the associated department officials was expressed and they were described as being neglectful of the problems of the villagers along with some instances where the people said they have to pay money to get the ex-gratia payment released. The respondents also mentioned that the lack of communication between the department officials and the villagers furthered this negative attitude.

Religious and Belief Related Reasons

Reasons under this theme were cited most frequently (42%, $n = 56$). The religious belief reasons reported can be divided into two sub-themes. One set of beliefs revolved around and spoke about the belief in “*Mahakal*” or the elephant god. The second set of belief reported directly revolved around the elephant itself (not as an embodiment of God), and the consequences of those beliefs. Among all the respondents who did not claim compensation, religious belief was cited as the reason by 38% of the Adivasi respondents, 53% of the non-Nepali Hindu respondents cited religious reasons especially the “*Mahakal*” God, whereas 1 respondent from the Muslim community and 3 respondents from the Nepali community cited religious beliefs. All of the Hindu respondents who reported reasons under this theme, mentioned a belief in “*Mahakal*.” Sixty-five percent of the non-Nepali Hindu respondents, who mentioned religious

and belief related reasons, cited their belief in *Mahakal* to be the primary reason that refrained them from applying for ex-gratia. While belief related reasons were mentioned as a part of the narrative for all communities, this belief was seen to be more salient for the non-Nepali Hindu and Adivasi communities.

One respondent from the Adivasi community who cited damage by elephant as the most important reason for crop loss reported “We have applied but not received any compensation for the last 5 years. We are not going to apply anymore. We are angry at the forest department. Nobody should hold a grudge against the elephant as it is our God. If one holds a grudge, something bad befalls them.”

Another respondent from the non-Nepali Hindu community said “We don’t apply for compensation, if we do so the elephant will cause greater damage. We do Mahakal puja.”

Some of the common beliefs related to *Mahakal* were that if *Mahakal* was worshipped regularly, the elephant would not do much harm. As the elephant symbolizes *Mahakal* and thus, what it eats is considered an offering to *the elephant God*. Thus, letting it eat without applying for compensation for the loss would lead to an increase in yield the following year. Asking for a monetary benefit for an offering that was made to Mahakal would anger the Elephant God. There were similar beliefs directly related to the elephant, but spoken about without the mention of *Mahakal* such as applying for the compensation would in-turn lead to an increase in loss. Thus, it can be seen that the beliefs associated with not applying due to Mahakal or the elephant directly were of two types. One was that applying for compensation would lead to an associated negative consequence (increase in loss), or a positive consequence as a reward (better yield next year) was expected.

Being Uninformed

There were other reports of simply being uninformed (8.7%, $n = 56$) about the procedure, documents required, or being unaware about when the concerned beat officer visits the village for a compensation related survey of damage. When asked to describe the process of applying for compensation, some respondents reported not being aware at all, or they had written an application but were unaware of the associated authority who could take it forward, or had started the process but did not know how or where the follow-up was to be done. This is underscored by the following responses:

R6 (Adivasi respondent): We just go and inform the range officer. We have not filled out any form and have never received any compensation.

R7: We don’t apply as we never get to know when the range officer visits the village.

No dialog was reported between the department officials and villagers regarding the compensation process or any clarity that might be needed about the details of the process. Thus, the exchange of information by word-of-mouth or from people who were better informed about the process, as well as relying on them for the application were the only methods of approaching the compensation process. This was once again illustrative of there

being a lack of a reliable communication channel, leading to lack of access to information about accurate process for applying.

Perceived Solutions and Attitude Toward the Administration

The respondents were also asked to give any suggestions or solutions for reducing the reported crop loss. Among the solutions given for damage caused by wildlife, almost all involved in the survey mentioned the different roles of the forest department. Some responses have been translated below:

R8: The department must arrange for food for the elephants inside the forests.

R9: The elephant is not at fault. It comes to fill its stomach as the forests have become empty. The department should construct more watchtowers.

R9: The forest department should put an electric fence around our field and provide the villagers with a torch and firecrackers.

R10: The forest department should employ a team to guard at night, especially during paddy and maize season.

R11: We have sent an application to the forest department for a trench to be made around the field.

The solutions ranged from getting forest guards to guard the fields at night or coming in to chase the elephants away, to the department providing watch towers, fences, torches, and crackers. The respondents also did not blame the damage causing animal (elephants in this case) nor gave it responsibility for the damage. The responsibility for animals coming into the fields, the damage caused and responsibility to provide solutions (including due ex-gratia) were directly attributed to the forest department.

The process for applying for ex-gratia was evaluated negatively and the amount was reported to be inadequate. The process involved notifying the forest department beat office after any loss due to wildlife and inspection would be carried out within 30 days, after verification, the application would be passed on to the Range officer and then, to the Divisional Forest Officer and then, to the Treasury Department office [G.O. No. 195-For/11M-95/2011(Pt-I) date 30.01.2015]. The entire process is lengthy and takes up to 6 months and requires constant follow-up which adds to the transaction costs. The amount of ex-gratia payment as per the State guidelines is approximately INR 6,000 per acre (80.68 USD, 1 USD = 75.36 INR), this amount is irrespective of the type of crop that has been damaged.

The negative attitude toward the department was seen to stem from a lack of communication and reliable channel of information exchange, perception of the department as neglectful, attribution of complete responsibility for wildlife caused damage, and the negative evaluation of the ex-gratia claim procedure and associated negative emotions.

DISCUSSION

Mitigation of conservation conflicts has emerged as one of the most critical aspects of wildlife conservation worldwide and may hold the key to safer shared spaces between people and

wildlife. Losses faced by the communities due to damage-causing wildlife can severely erode tolerance toward these species and may lead to their extirpation (Treves and Karanth, 2003; Frank et al., 2005). Compensation payment or *ex-gratia* relief is a widely used policy to offset losses by people and garner local support for conservation of damage causing wildlife (Ravenelle and Nyhus, 2017). However, the efficacy of such schemes is rarely evaluated thereby raising uncertainties regarding the success or failure of the program (Bulte and Rondeau, 2005b). Limited studies testing the efficacy of such programs deal with the economics of the schemes but rarely touch upon the social and cultural factors (Nyhus et al., 2003; Ravenelle and Nyhus, 2017; Karanth et al., 2018). Furthermore, *ex-gratia* schemes do not always lead to increased tolerance, especially when non-monetary costs outweigh the monetary costs and in some cases such schemes have a deteriorating effect on local attitude (Saif et al., 2020).

In the study area, elephants are the most predominant cause for crop loss due to wildlife in the region. This finding is supported by the previous studies in the region which looked at the distribution of elephants as well as crop losses due to elephants (Roy et al., 2017; Kshetry et al., 2020; Naha et al., 2020). However, this study for the first time compared losses due to wildlife with all reasons for crop damage in the region. Water shortage and damage by livestock were the other key reasons for crop damage in the region. Proximity to forests had an effect on the crop damage with villages within 1.5 km of forests reporting wildlife as the main cause for damage whereas villages further away reported insect pests as the main source of crop damage (Figure 3). A previous study conducted in the landscape has also found crop damage due to elephants was high within a 1.5 km buffer of forested areas (Naha et al., 2020). We also found that the wildlife species apart from elephants were also responsible for crop damage, albeit at low proportions including species, such as peafowl, wild pig, and macaque. However, despite the high losses due to wildlife and the presence of *ex-gratia* payment program, these findings indicate that a majority of the respondents (53.3%) who faced losses did not claim any *ex-gratia* relief.

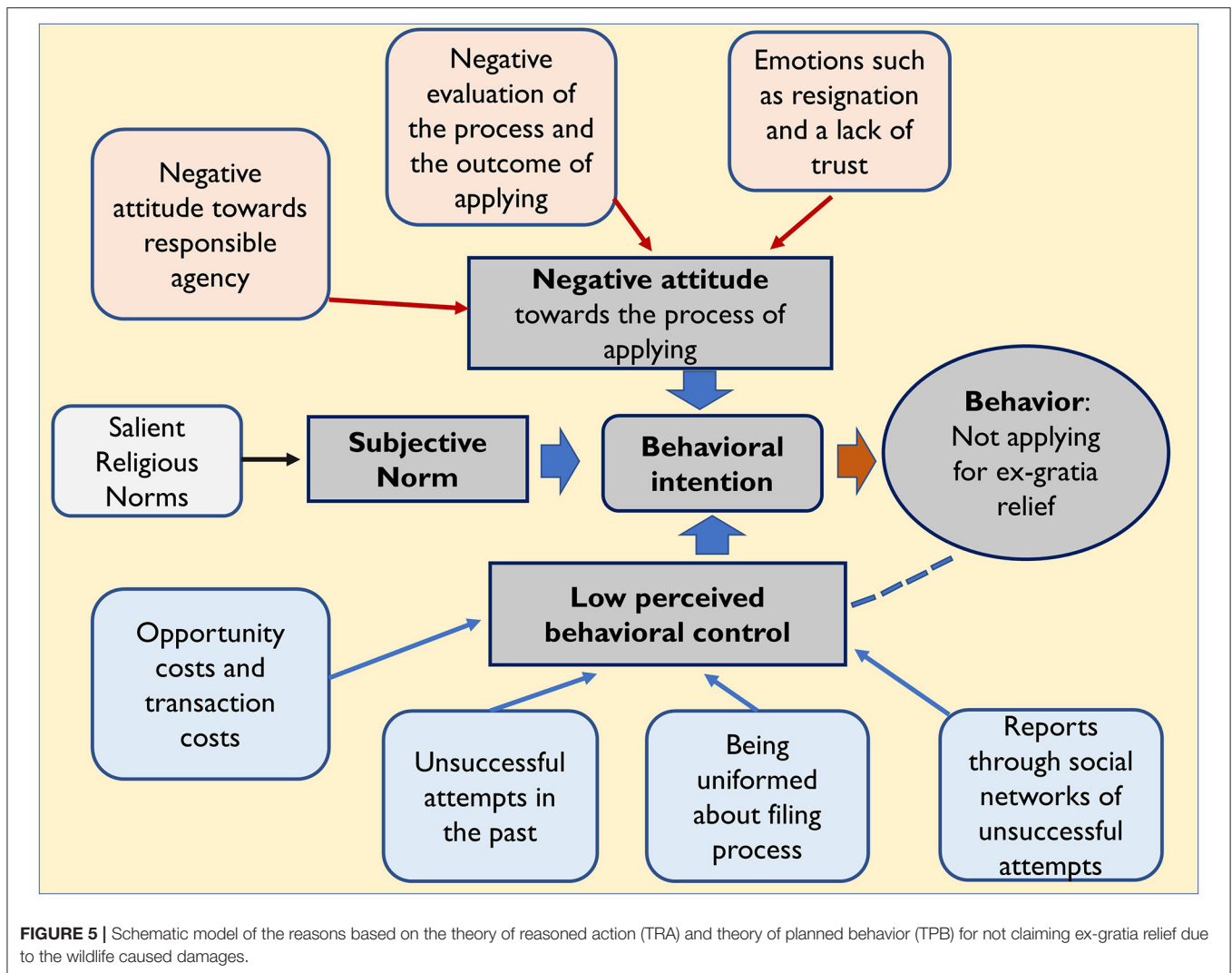
The probability of claiming *ex-gratia* was influenced by the community of the respondent which in turn influenced the religious beliefs around the Elephant God “Mahakal.” The Rajbangshis who were originally animists are worshippers of “Mahakal.” An idol of the Hindu God “Shiva” sitting on an elephant carriage embodies “Mahakal” and they are worshiped in community temples in the villages around the month of March. The Rajbangshis refer to “Mahakal” as “Baba” (father) or “Thakur” (God). The Adivasis who arrived in this landscape around a century back, borrowed the belief of “Mahakal” but worshiped it in the form of an oval stone, mostly placed inside a forest with rituals that are passed from one generation to the next. Both the communities believe elephants to be a God residing in the forests and hills protecting the forest and everything within it. Moreover, they believe that not worshiping or enraging this elephant God will bring forth great doom (Maha: great, kal: doom) upon them. The Nepali and Muslim communities do not have such beliefs but do venerate elephants in general

and also apply for *ex-gratia* when faced with any loss. Such religious beliefs and other non-monetary safety net like close family units providing support and diversification of income have been known to influence the behavior in some cases and there may be a possibility of fostering these ontological relationships that people in a region have with wildlife while devising conflict mitigation and management plans (Dickman and Hazzah, 2015; Bhatia et al., 2020; Saif et al., 2020). For instance, not claiming financial compensation for the loss that was caused by *Mahakal*, was expected to result in positive outcomes, such as a reward of increased yield from the elephant God or avoid negative outcomes for enraging the elephant God like decreased crop loss in the following year. Thus, not applying for financial compensation was done in expectation of the present loss being compensated by an increase in yield or to avoid the punishment of further loss and can be viewed as a perceived compensation that is bestowed upon them by Mahakal. Similar positive influence of religious beliefs (about elephants) has been found in other studies as well from nearby regions of Assam and Bangladesh (Gogoi, 2018; Saif et al., 2020). Furthermore, such beliefs which increase acceptance toward even large carnivores have also been reported in the studies from several parts of India (Jalais, 2011; Ghosh et al., 2015; Aiyadurai, 2016; Dhee et al., 2019; Nair et al., 2021). The religious sentiments of communities sharing space with large bodied wildlife could be an important aspect to consider on conservation planning and yet, remains largely unexplored. However, while designing *ex-gratia* schemes to reduce the impact of losses faced due to wildlife, religious beliefs and norms could be one of many local socio-economic factors that need to be considered.

The inter-relationships among the major themes and factors that were seen to be drivers of not applying for *ex-gratia* were analyzed to create a causal model (Figure 5). TBP was used as a framework to map and understand the inter-relationships that emerged between the themes during the analysis. The inter-relationships among the themes were analyzed based on TPB and TRA. TBP posits that any behavior is likely to continue depending on the attitudinal component, perceived behavioral control toward the behavior, and the subjective norm regarding that behavior. The behavior analyzed was not applying for *ex-gratia* compensation. The three components for the behaviors of claiming and not claiming *ex-gratia* compensation emerged as follows.

Attitudinal Component

A negative attitude was expressed toward the process of applying for *ex-gratia*. The process of applying was evaluated negatively due to prior negative experiences with applying, as well as due to the negative information received through the social information exchange. The forest department was attributed the entire responsibility of *ex-gratia* and human-elephant conflict mitigation. A negative attitude toward the forest department was expressed, which furthered the negative evaluation of the compensation process. A near lack of dialog between the forest department and the villagers furthered the negative attitude toward the department and the process. The negative emotions, such as helplessness and resignation toward *ex-gratia* were



expressed. The consequence of applying was not evaluated positively as the process was reported to be a great hassle with repeated visits to the department office, without any guarantee of receiving the amount. Additionally, the amount was reported to be inadequate and the process, not transparent.

Perceived Behavioral Control

Previous unsuccessful attempts at applying for compensation were seen to reduce the perception of control over the behavior of applying. Procedural hurdles that the respondents had been unable to surpass were reported. Additionally, there seemed to be no easily accessible reliable source of information regarding the process for applying. Low behavioral control toward successfully applying and receiving ex-gratia was seen.

Among the Adivasi respondents, other than the reasons, such as belief in Mahakal and procedural hurdles, an opportunity cost was also reported. As most Adivasi respondents were involved in

daily wage labor other than agriculture, going to the beat office repeatedly meant giving up on the wages for the day.

Normative Component

The respondents were seen to base the decision of whether to apply based on the social information they got regarding the process. Information about negative experiences of applying and inadequate compensation received through social networks discouraged people from applying for the compensation.

A belief in Mahakal being a part of the popular narrative, it was seen to be the norm in the non-Nepali Hindu community to not apply for ex-gratia payment due to beliefs associated with Mahakal. Religious and belief related reasons were a part of the popular narrative across all the communities studied. However, these beliefs seem to be relatively more salient in the Hindu community, as it was predominantly (65%) reported as the primary reason for not applying to ex-gratia. Among the respondents who reported they currently applied for ex-gratia compensation and plan to continue doing so, it was

seen that the respondents with higher land holding were more likely to apply. The reasons were that a high behavioral control was likely to be perceived due to better access to the reliable information or means to get reliable information through social networks and fewer procedural hurdles. The attitude toward the act of applying was seen to be favorable. The reasons that emerged were that the evaluation of the consequence of applying was favorable, that is, they had successfully received the amount. As many of the respondents were subsistence farmers, this amount even if small, could prove important. Belief related to the elephant though reported, were not seen to be of salience while determining whether to apply for the Muslim and Nepali communities.

Although only a limited number of variables were measured and analyzed in the present study, we believe that the findings have important indications to help in making the government relief program of monetary compensation effective for farmers. Analyzing the drivers of the behaviors of applying and not applying, provides a direction for intervention. The religious beliefs related to the elephant were seen to play a role, mainly among the Hindu community, as a basis to refrain them from applying. Among all the social groups, a strong need for *ex-gratia* relief was expressed. As seen above, a negative attitude toward the procedure of applying due to a lack of information, lack of dialog with the department, and procedural loopholes were seen. Hence, we propose that by reducing the procedural hurdles and facilitating structured communication both within the village and through ties with the department officials would increase in *ex-gratia* claims.

As seen from the study, the ways that the procedural hurdles can be reduced are as follows. Increase in interaction and dialog between the farmers and the forest department officials. People were often seen to prefer to take assistance from the other villagers who are better informed. Thus, there could be specific people from all social groups in the village who are well-informed about the procedure of applying. Locals from all social groups and communities who have been employed with the department can facilitate the constructive communication between the department and the locals. This will help increase the perceived behavioral control over applying and reduce the negative evaluation of the procedure made due to lack of access to reliable information. Increased awareness and information about the procedure leading to the perception of better access and transparency, increased dialog with the department would help reduce the sense of unfairness and injustice relating to the forest department about providing *ex-gratia* and in turn reduce the negative attitude.

Cooperation with the local bodies or people that are respected and trusted can be gained before communicating any cooperative venture. This will add trust and credibility toward the communication of the department. It would also help increase trust and a sense of participation, thus also increasing a sense of justice and reducing the feeling of helplessness. Research shows that a perceived sense of justice toward an agency, makes it more likely that people would want to work with that agency in the future (Kruglanski et al., 2007). It was seen that

the responsibility of *ex-gratia* and the losses by elephants was attributed entirely to the forest department with little contempt toward elephants, due to the religious beliefs and norms. Hence, these religious beliefs could also be taken into consideration while designing conservation interventions that aim to reduce the negative impacts of human–wildlife coexistence (Gogoi, 2018). Furthermore, a regularization of the process of verification of loss via mobile application/online based filing of claims and awareness of this would also be important. This would reduce the pressure on the department officials and keep the spread of mis-information in check. To help the right information from reaching, announcements could be made or meetings could be conducted by non-governmental organizations (NGOs) or the department informing people of the process. The above findings become relevant in the context of rising human-animal conflict in India. In a country with high human density in and around forest areas, there is dire need for the communities and administrative bodies to work together. As it can also be seen in the recent policy developments, community-based conservation along with the administration is the way forward for effective conservation.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Human Study Ethics Committee, Wildlife Conservation Society-India. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

AK and VA designed the study. AK and PD carried out the field work for the study. AK, VA, and NB analyzed the data. AK, PD, NB, and VA drafted the manuscript. AK raised the funding for the study. All authors contributed to the article and approved the submitted version.

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