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HUMAN TOLERANCE OF LARGE CARNIVORES: A CASE STUDY ON HUMAN-CARNIVORE RELATIONSHIPS FROM THE MULTIPLE-USE BUFFER ZONE OF PANNA TIGER RESERVE, INDIA

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INTRODUCTION

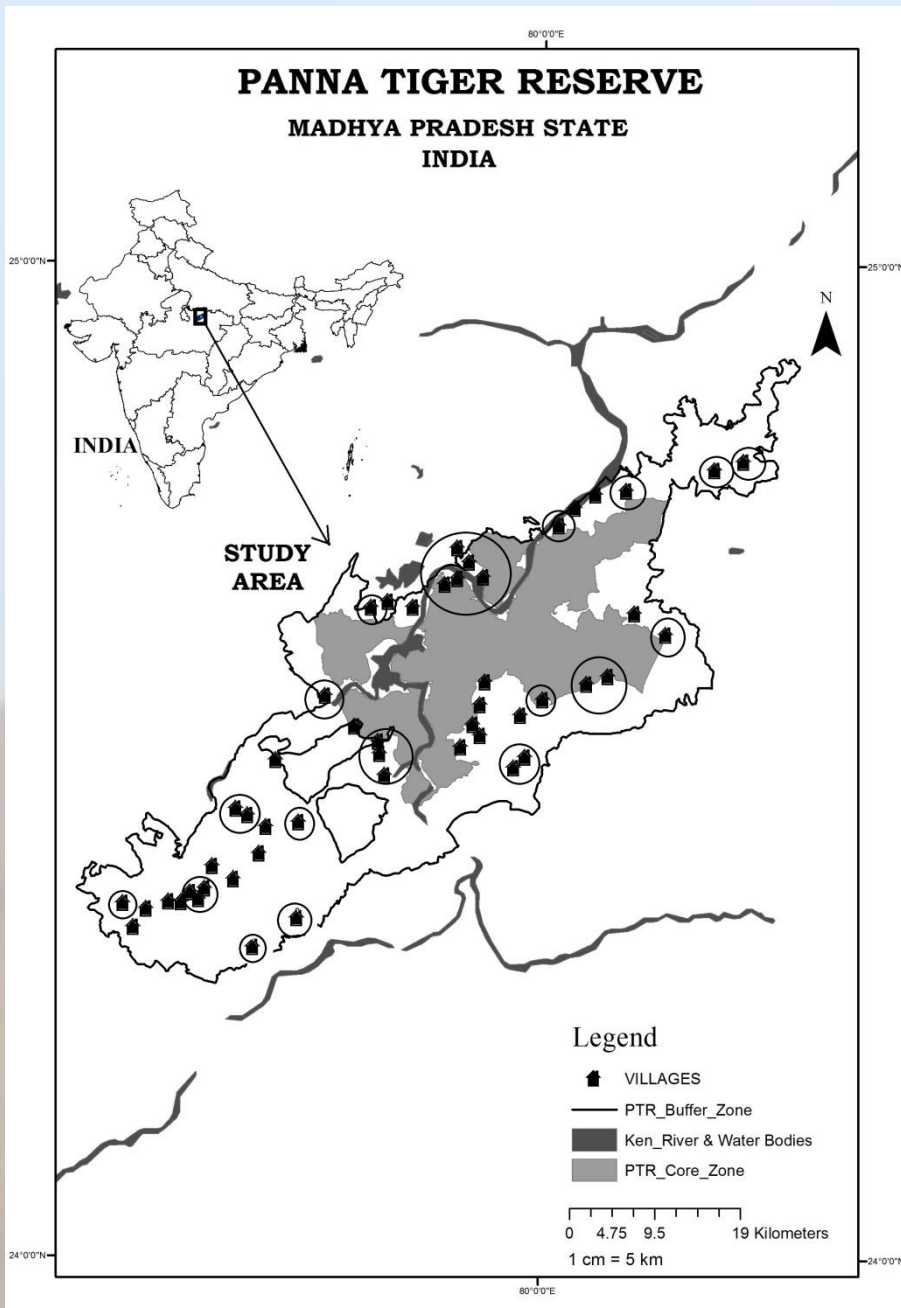
The case presented in this paper is a unique situation of livestock pastoralists, living in the buffer zone of Panna Tiger Reserve in M.P. State of India, displaying unusually high tolerance towards large carnivores in spite of frequent predation incidents and absence of monetary compensations for losses.

This unique situation raises several questions on non-monetary motivators for tolerating potentially dangerous wildlife and offers an opportunity to examine a positive case of human tolerance of carnivore species.

- Why are economically underprivileged livestock herders tolerating losses?
- What factors may be influencing their behaviour?
- Is the observed tolerance sustainable?
- Can the findings be modelled into conservation plans?

STUDY AREA

The study was conducted in the buffer zone of Panna Tiger Reserve, Madhya Pradesh, India. Forty two (42) villages are located inside the multiple use buffer zone. Livestock keeping is a Common practice amongst people in the buffer zone and over 45,000 cattle (cows, buffalos and goats) graze in the buffer zone areas.



Map: Panna Tiger Reserve including Core and Buffer zone. Data for this study are collected from the villages with circle around them.

OBJECTIVES OF THE STUDY

- To examine and describe local livestock management practices drawing attention to factors influencing these practices.
- Describe qualitatively the relationship between the factors and pastoralists tolerance of carnivores.
- To analyze the sustainability of those factors exerting influence.

METHOD

Information (Table 1) from livestock owners living in 29 villagers in the buffer zone was collected.

Table 1: Summary of methods

S. No.	Methods	Source	Sample	Period
1	Observations	Livestock pastoralists ¹	20	2013
2	Semi-structured Interviews	Households owning livestock	82	2013-14
3	Pre-structured Questionnaire Survey	Spirit mediums	6	2013-14
		Households owning livestock	255	
4	Counts of Livestock Kills	Panna Tiger Reserve records	8 radio collared tigers	2010-14
5	Carcass Counts	Villages- forest fringe areas	29 sites	2013-14
6	Presence/ Absence Surveys	Buffer zone	N.A	2012-14

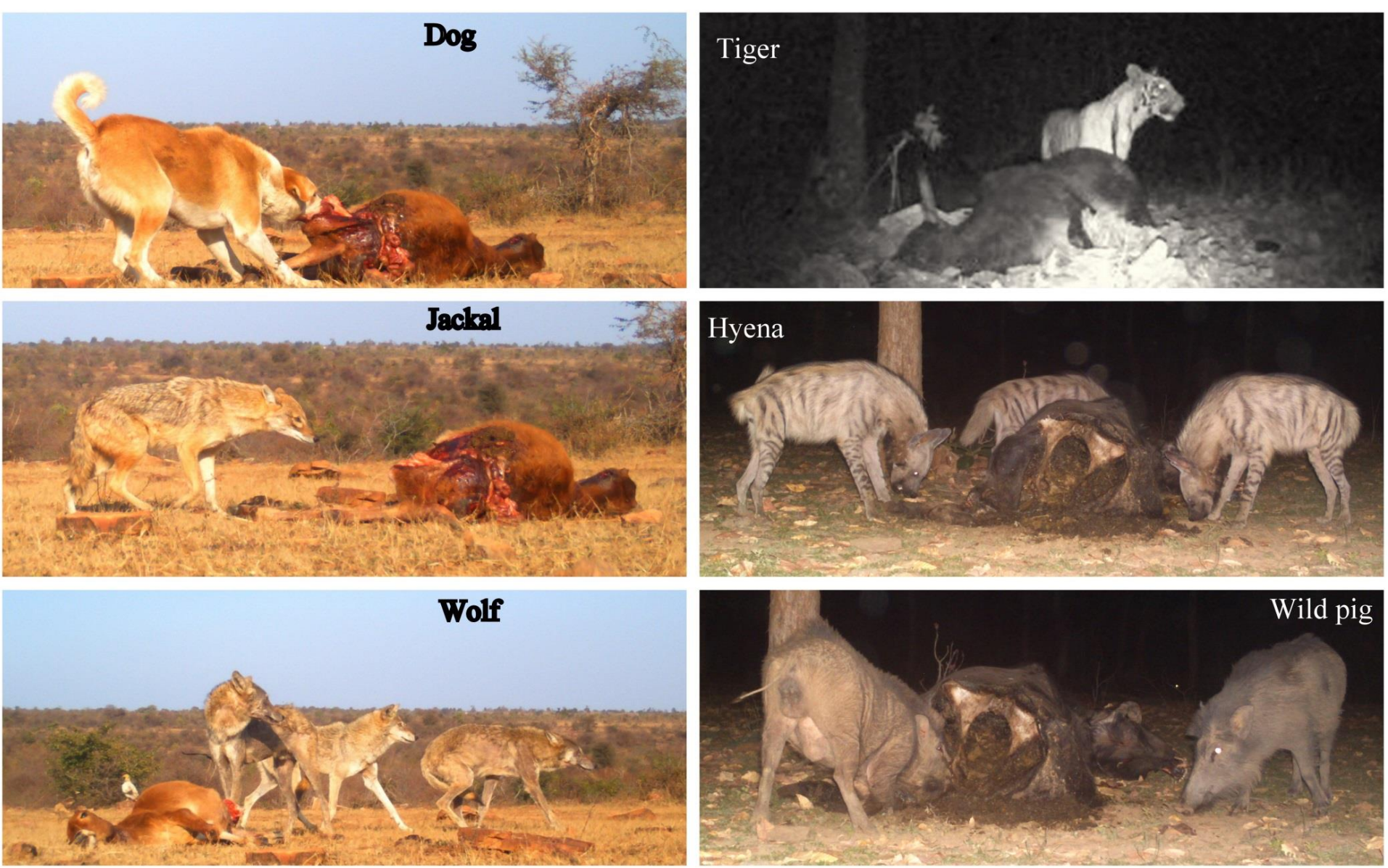
(1) Livestock pastoralists are those villagers who earn their livelihood from rearing livestock

DATA ANALYSIS

- Qualitative data and quantitative data were separately analyzed but combined to interpret and support arguments made in the discussion.
- Thematic Content Analysis as explained by Bernard (2006) was used to analyze the qualitative interviews. The informants' responses such as their views and perceptions on the core topics were placed into predefined themes under each of the core topics. This ensured that the focus stayed on the core topics (practices, religious beliefs, cultural norms, and adherence). This also helped keep focus on the research objectives. Individual statements were given codes and some of them were quoted directly in the papers' text. Themes were linked and suitable quotes were selected to suit the thematic structure of the paper and explained.
- Quantitative information from carnivore data was analyzed using a Microsoft Excel 2013 spreadsheet.

RESULT AND DISCUSSION

➤ **Local Livestock Management Practices** (1 and 2) are contributing towards abundant and regular supply of food from human sources to large carnivores.



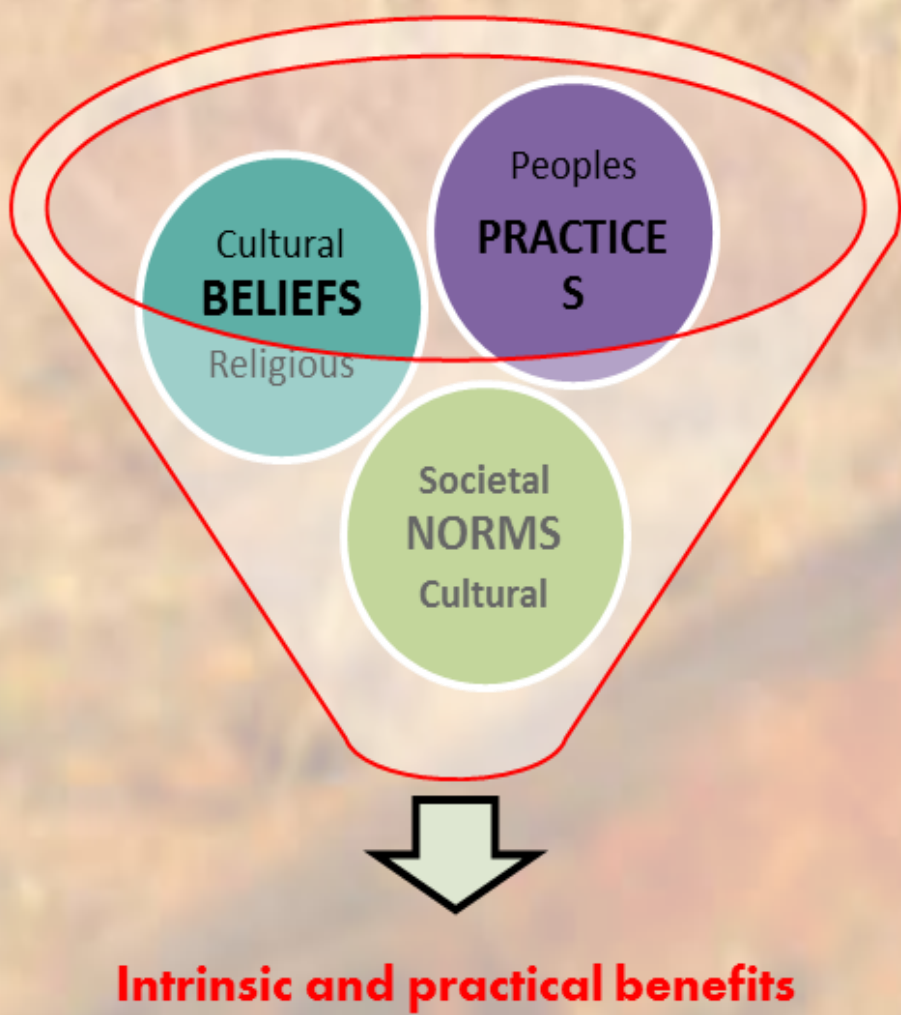
(Pic 1: All large carnivores (except sloth bears) were photographed feeding on dead cattle carcasses in the multiple use forests of PTR.

Practice 1: The Disposing of Dead Cattle Carcasses Near Village-Forest Fringes (Our study reports nearly 2100 cattle carcasses in Buffer zone in 2013 alone).

Practice 2: Villager's abandon or stop caring for Cattle that are unproductive, sick, unwanted male calves and nearly 15000 such cattle, mostly cows, roam feral in PTR. According to our interviews nearly 1455 cows, buffalos and goats were predated by carnivores in 2013).

➤ **Social Factors** (Fig. 1) such as beliefs and norms and age old practices are all interrelated.

Fig. 1: Social Factors provide intrinsic and practical benefits to local people and such benefits are valued highly by local people.



Enforcement of practices:

Enforcement is through self-regulation and local institutions. Influenced by strong faith people feared supernatural retribution and loss of benefits if they violated norms. Violating social norms like trading in cows to slaughter houses or killing of animals sacred to the spirits were also punishable through social sanctions and fines. People adhere to these norms fearing loss of wellbeing, Social isolation, fines etc. Similar cases of adherence are also reported by many authors (Horne 2003; Johnson 2005; Botero et al. 2014).



Pic 2: Rituals at spirit sites and ceremonies evoking spirits ensured a feeling of wellbeing amongst villagers.

Perceptions about Risks from Carnivores:

Practical and Intrinsic Benefits from Social factors + Good Knowledge on Local Wildlife + Convenience + Very low human fatalities = Contributing to a perception of low threat from large carnivores

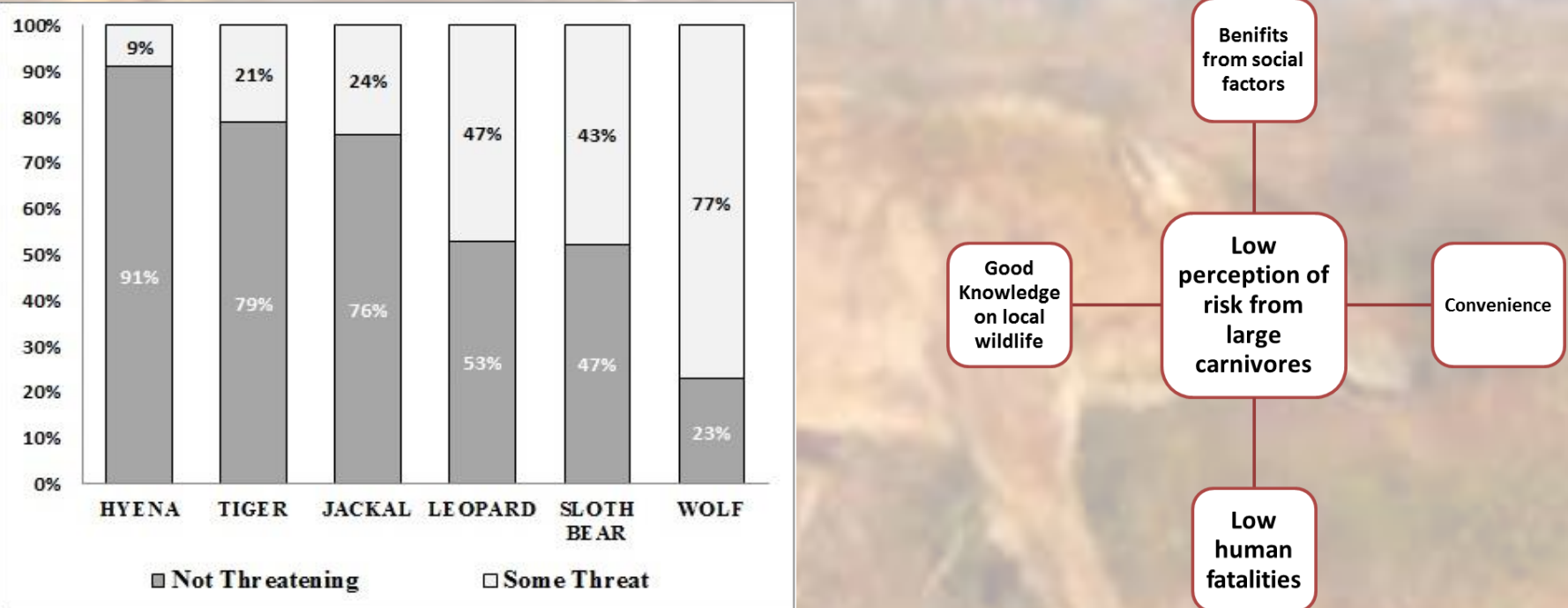


Fig. 2: The bar graph showing varying perceptions of threat for different species. Dark grey areas represents people who do not view carnivores in the study as a threat. The areas in white represent interviewed people who see a degree of threat from the species.

Fig. 3: Factors influencing perception of risk from large carnivores.

Sustainability of Practices:

Existing practices and beliefs systems recorded in the Study area are actively being transferred to the next generations. Adherence is also very wide and increasing. This means practices are likely to stay in use at least for the medium term (10-20 years) in spite of all the modernization taking place in India.



Pic 3: The young generation actively participate in local cultural practices and religious beliefs and are consciously involved by parents.

CONCLUSIONS AND RECOMMENDATIONS

- Assessing people's practices are important for conservation success outside PA's. As observed in this study peoples practices have significant consequences for carnivores and these need not necessarily be conscious acts of people to safeguard wildlife but their practices have ancillary effects with positive (sometimes negative) outcomes for carnivore conservation.
- Social Motivators for conserving carnivores are very important. For example, in this study we discovered the usefulness of spirit sites for conservation. These conservation units are smaller and different than sacred groves but the wide prevalence and high local acceptance of the sites and the norms against killing animals around them cannot be overlooked for conservation.
- Strong presence of self-regulation and involvement of local institutions to regulate people's positive behaviours towards wildlife means park authorities have lesser work on the enforcement of law front.
- Tolerance as observed in this study is as a result several, interconnected and dynamic factors. In this case tolerance is fuelled majorly by social factors. Since these factors are ground in sensitive subjects like religion and culture they can have socio-political repercussions leading to conflicts amongst humans. Therefore, if managers do not have the means or expertise to attempt change, sometimes just being aware of the situation is better than actually trying to do something that could have counterproductive out-comes.
- The research highlights that the observed social forces that influence peoples beliefs and behaviours towards wildlife are sustainable and likely to stay in practice. It would be futile to attempt change in local practices without considering the underlying mechanisms in which the practices are grounded.
- If policymakers in India were to take this study seriously, they might want to look at ways to collaborate with local level institutions and also involve local villagers and religious leaders in conservation projects.

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