Journal of Wildlife and Ecology. (2018). 2(2):01-12

Research Paper **Open Access**

Assessment of human-Indian crested porcupine (*Hystrix indica)* conflict in district Bagh, Azad Jammu and Kashmir

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Peer Reviewed

Citation: Safeer, B., Z. Rasheed, M. Altaf, I. Manzoor, S. Yasrub. 2018. Assessment of human-Indian crested porcupine (Hystrix indica) conflict in district Bagh, Azad Jammu and Kashmir. Journal of Wildlife and Ecology. 2: 1-12.

Received: 10, 12, 2017
Accepted: 11, 02, 2018
Published: 01, 06, 2018

Competing interests: The authors have declared that no competing interests exist.

Funding: Authors have no source of funding for this work.

ABSTRACT

Introduction: The Indian crested porcupine is a big rodent herbivore and since measured to be a severe financial pest of forest farms and crops. Indian crested porcupine has been noted as a severe pest of crops (maize, rice, wheat etc.), fruit, vegetables (pumpkin, okra, bitter, carrot, onion etc.) and flowering plants. The present study has been designed to collect detailed about human-porcupine conflict and interaction in the selected sites of the district Bagh.

Materials and methods: Data collected through questionnaire (n=100) that is consist of respondent profile, loss of porcupine (%), sign of porcupine, human sharing land with porcupine, agriculture management and effective methods to control porcupine.

Results: During the study noted that people of the area have one to five hectare (ha) land size, maximum respondents (80%) told that Indian crested porcupines are the major reason of agriculture damage and the respondents are feel very unhappy. It is noted that most of the respondents used poison, dog and fence to remove the Indian crested porcupine. Informant said that if the level is reduced to tolerable level, then it would be beneficial for them.

Conclusion: Human-porcupine conflict is present; many respondents killed to Indian crested porcupine and used the preventive measures to protect the crops.

Key words: *H. Indica*, Pests, Spines, Conflict, Agriculture management

INTRODUCTION

This specie is native in following countries i.e. Yemen, Turkmenistan, Turkey, Sri Lanka, Saudi Arabia, Pakistan, Nepal, Kazakhstan, Jordan, Israel, Iraq, Iran, India, Georgia, China, Azerbaijan, Armenia, Afghanistan (Gurung and Singh 1996).

This species population is stable, common, and widespread in Pakistan. This species is extant in Kirthar Range, Las Bela, Panjgur, Kalat, Sibi, Murree Mountains and Kohistan forests, Shogran, valley of Swat, lower Chitral, Kurakram, Bannu (Roberts, 1997), Himalayan Mountains up to 2,400 meters (Gurung and Singh 1996), Jehlum and Neelum valleys and Machiara National Park at a height of 3,200 m above sea level the peak point so far noted of its spreading (Awan *et al*., 2004). This species has a wide area tolerance; live in stony hillsides, temperate and tropical shrubland, plantations, arable land, grasslands, gardens and forests. Indian crested Porcupines are documented as agricultural pests use as food (Qumsiyeh, 1996).

The Indian crested porcupine is a big rodent as well as herbivore and since measured to be a severe financial pest of forest farms and crops (Roberts, 1997). Indian crested porcupine belongs to class Mammalia, order Rodentia, and has 2 families of porcupines i.e. i) Erethizontidae and ii) Hystricidae. The Old World porcupines include 4 types namely, *Atherurus Trichys, Thecurus and Hystrix*. Of these, genus *Hystrix* is categorized by its big sizes quelled fur and bald sole and small appendages with 5 tough toes. The head is huge with distinct infra-orbital foramen wide chisel-shaped and light yellow incisors all with hypsodont tooth. Digestive area is lengthened having a cecum. The superior lip is cleft, with smooth S-shaped nostrils, protected with soft hair on their top. This genus contains 12 species; shared variety spreads over the whole Europe Southern, South Eastern and Africa Asia, with Pakistan (Prakash and Rana, 1970). Out of these only 2 namely, *H. hodgsoni* (Gray) and *Hystrix indica* (Kerr), are usually

seen within the Indo-Pak subcontinents. *H. indica* is commonly spread in Pakistan (Roberts,1997).

In Asia, *H. indica*, as a vertebrate pest and source damage to fruits (i.e. *Mangifera indica, morus alba*), grasses (i.e. *Cenchrus ciliaris, Sorghum helpenese, Cymbopogon jwarancusa and Eliomurus hirsutus*), vegetables (i.e. potato, *Eremurs aurantiacus*), flowering plants, crops (i.e. maize, rice and wheat) and plants (i.e. *Acacia* specie, *A. catechu, A. indica, A. leucophloea, Butea monosperma, Eucalyptus* species, and up-rooting of new coconut plants) (Roberts, 1997; Hafeez, 2011). The present study has been designed to collect detailed about human-porcupine conflict and interaction in the selected sites of the district Bagh.

MATERIALS AND METHODS

Study area: Bagh is located 80 Kilometers from Muzaffarabad, the capital city of Azad Jammu and Kashmir. It is 160 Kilometers from Islamabad, the capital of Pakistan. The all district Bagh is a mountainous landscape and falls in the lesser Himalayas zone, sloping from the northeast to the south-west (Figure 1). The elevation is between 1500 to 2500 meters (m) above sea level. Bagh has the two main streams. However, many rivulets flow in Bagh district (Bibi *et al.*, 2013).

Methodology: In the study area I asked the following questions from the respondents;

- Having agriculture?
- What is the size of agriculture?
- Are you owner or leasehold?
- How long is your agriculture experience?
- How often are you on the agriculture?
- How often porcupine loss your agriculture?
- How often you see signs of porcupine on your agriculture?

- How do you feel about sharing the land with porcupine?
- Which of the following agriculture management techniques you currently used?
- Have you used poison?
- Have you guarding animals?
- Are you used Fence?

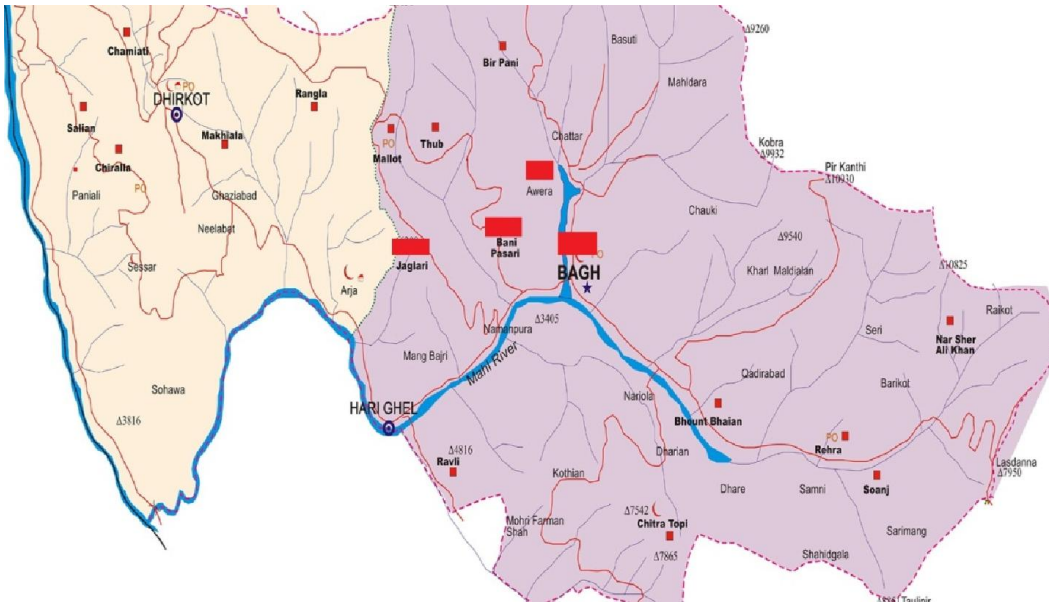

Figure 1: Study area of the District Bagh.

RESULTS AND DISCUSSION

Data collected from Male (97%), Female (3%) respondents all are Muslim and during the survey noted that selected respondents having education as, Matric (22%), did not complete secondary school (12%), secondary school graduate (34%), post graduate degree (10%), L.L.B (1%), uneducated (21%), while the age of the respondents as, 25 to 40 (32% respondents), 41 to 50 (22% respondents), 51 to 60 (25% respondents), 60 and above (21%), and the cast of the respondents as, Mughal (31%), Khawaja (13%), Batla (13%), Raja (19%), Zai (7%), Syed (2%),

Kayani (2%), Quresh (2%), Lohar (1%), Sodden (1%), Kashmiri (1%), Norma (30%), Sheik (3%) and Turk (2%) (Figure 2).

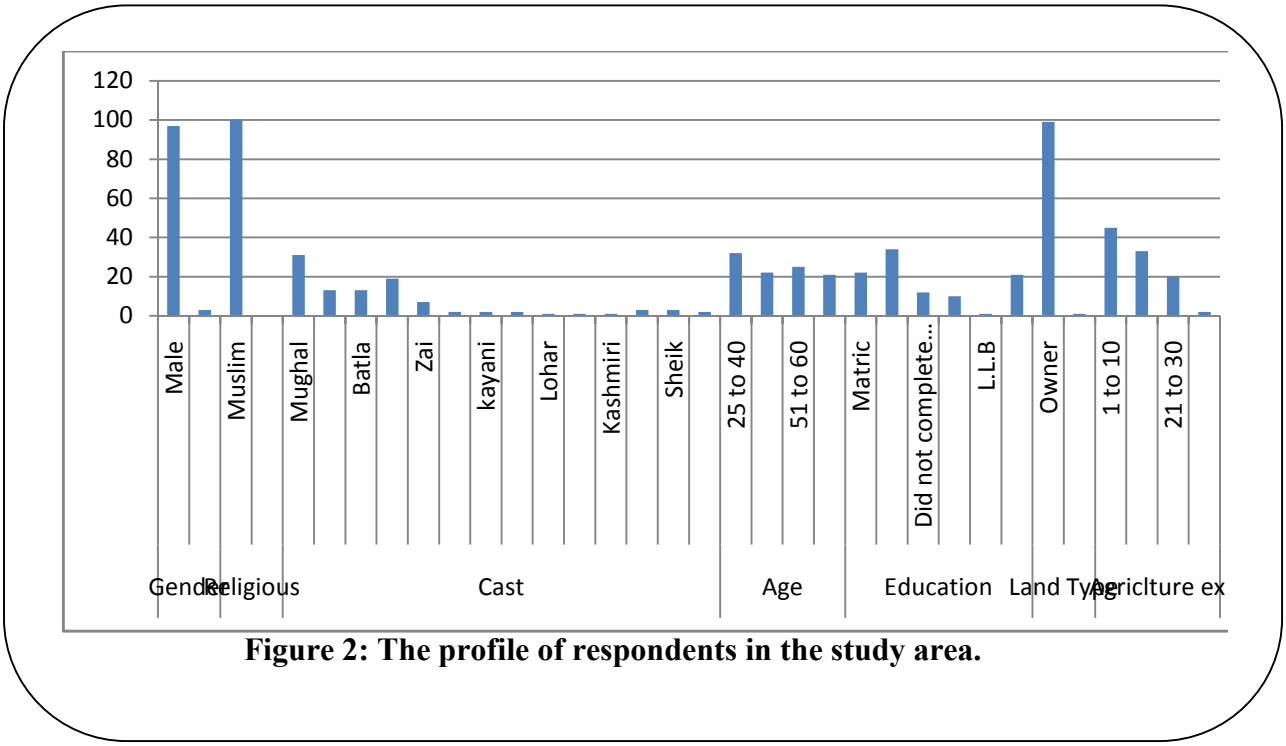

Figure 2: The profile of respondents in the study area.

During the study noted that people of the area have one to five hectare (ha) land size, and maximum people have 0.1 to 1 ha land size (Figure 3). During the study noted that maximum respondents (80%) visit to agriculture daily; while other weekly (11%) and monthly (9%) (Figure 4). Maximum respondents (80%) told that Indian crested porcupines are the major reason of agriculture damage and some (20%) said that they are damaged to crops but in lower ratio (Figure 5). Most of the respondents (70%) said that Indian crested porcupine are visited in agriculture annually; while other said that they visited monthly (15%), weekly (10%) and daily (5%) (Figure 6) and the respondents are feel very unhappy (88%) and unhappy (12%) (Figure 7). It is noted that most of the respondents (45%) used poison to remove the Indian crested porcupine; while other used in past (25%) and other would be used in future (8%) and some

never used (Figure 8). During the study recorded that local people used dog to protect livestock as, never use (15%), used in past (79%), currently use (5) and plan to use in future (1) (Figure 9). It is noted that most respondents (72%) used fence in past, only few (22%) people used in present; and have planned to use in future (2%) (Figure 10). During the study recorded that if reduced the porcupine number to tolerable level for agriculture then it would be effective (48), ineffective (4) and do not know (48) (Figure 11). Woods and Zeglen (2003) reported North American porcupine (*Erethizon dorsatum*) damage to Sitka spruce forests of north-costal British Columbia, Canada. Roberts (1997) and Hafeez (2011) *H. indica* is a vertebrate pest and damage to *Acacia* species and *Eucalyptus* species.

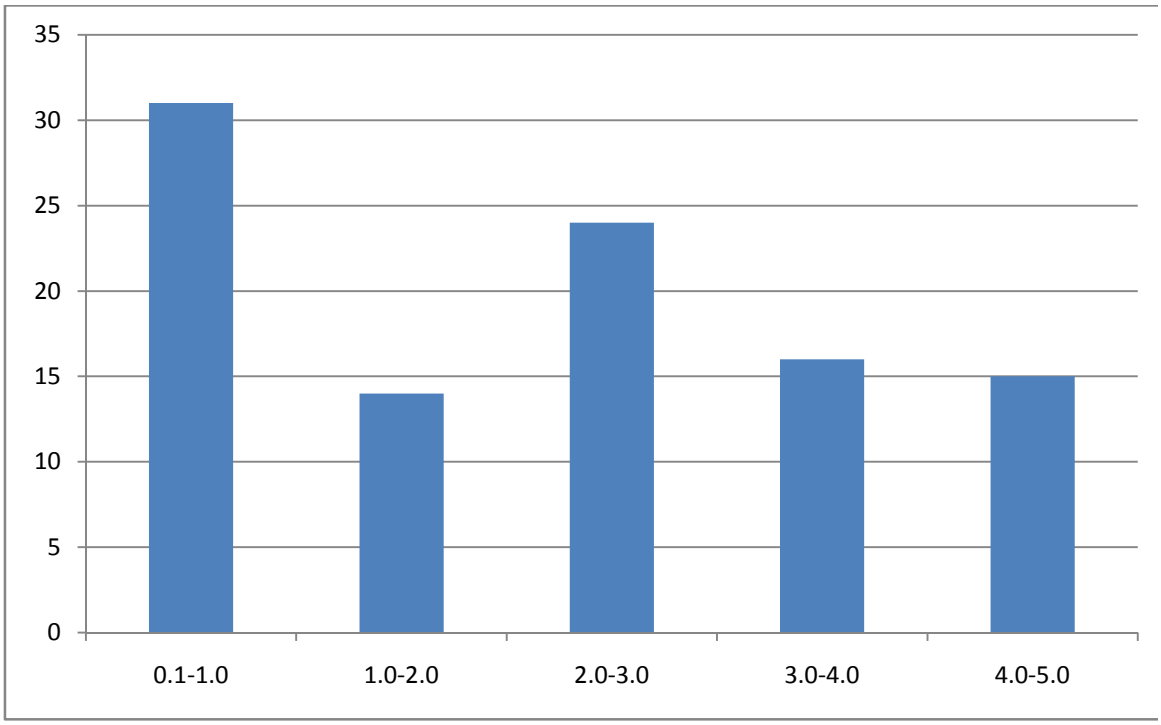

Figure 3: Agriculture size in the study area.

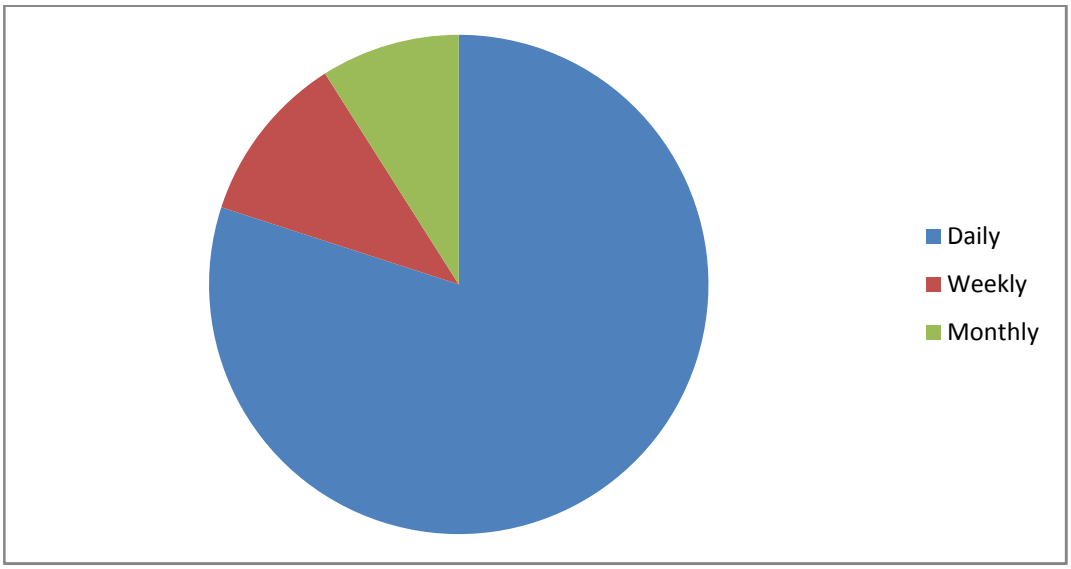

Figure 4: Respondent visit to agriculture area

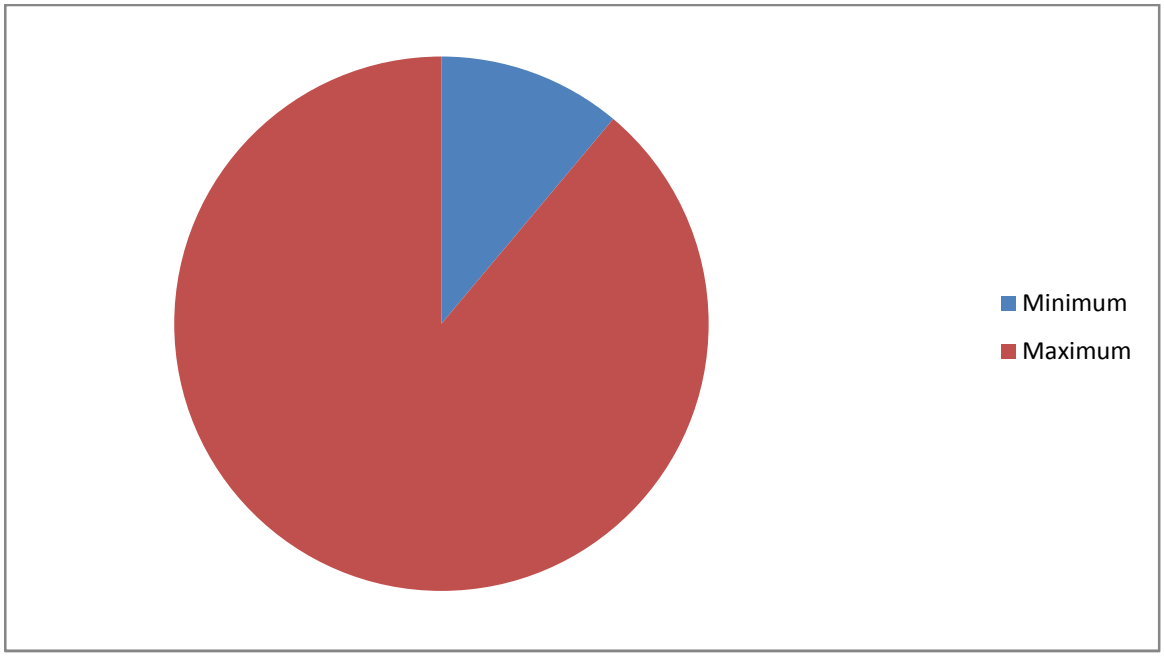

Figure 5: Respondents response about Indian crested porcupine.

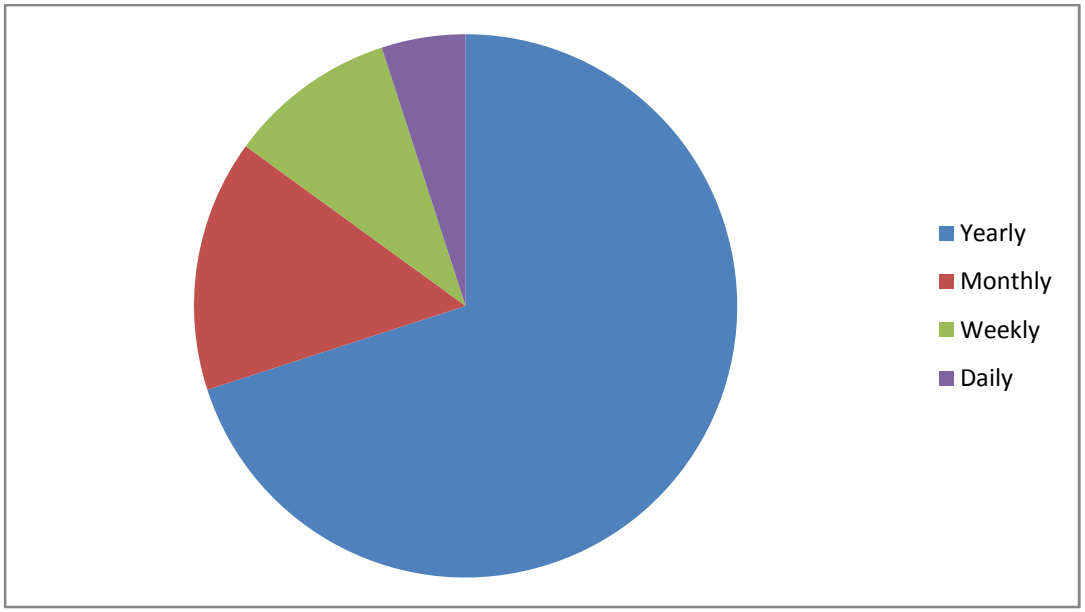

Figure 6: Sign of the Indian crested porcupine in the study area.

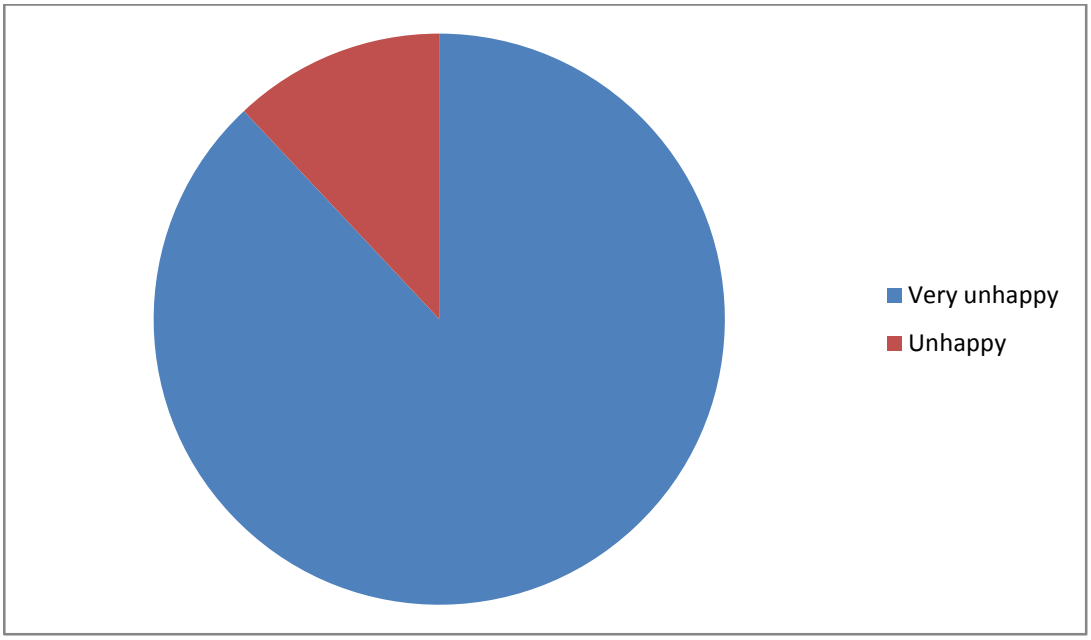

Figure 7: Respondents response about sharing of the land in the study area.

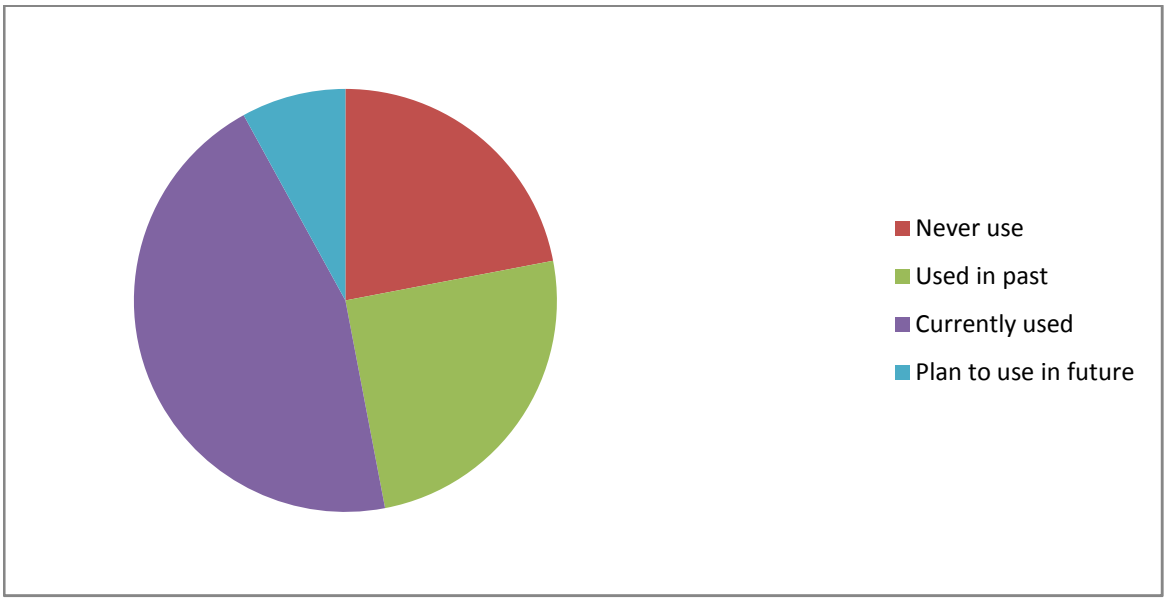

Figure 8: Poison used to remove the Indian crested porcupine.

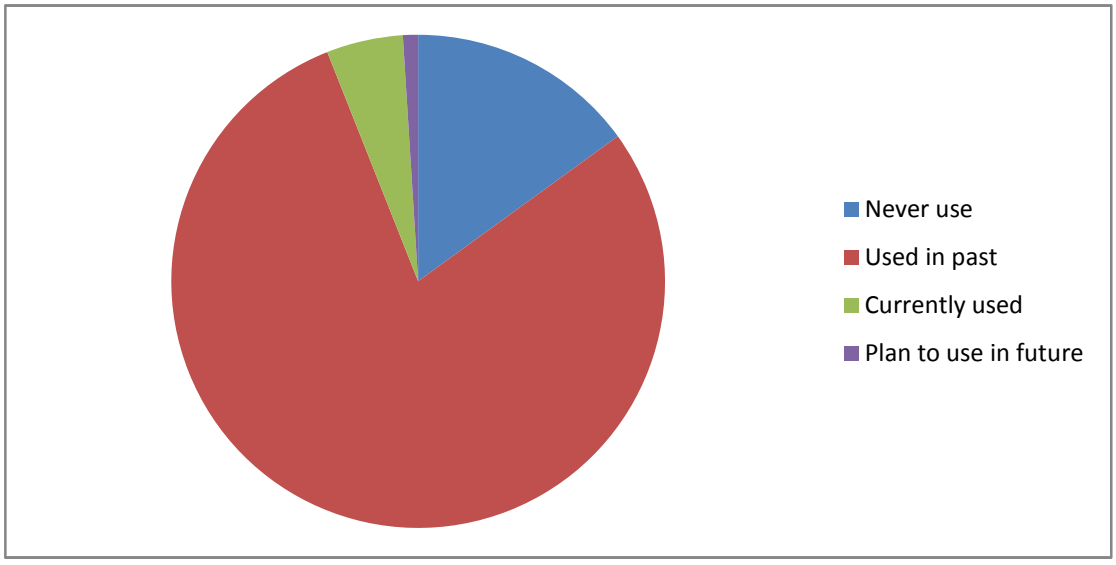

Figure 9: Guarding animal used to save the livestock.

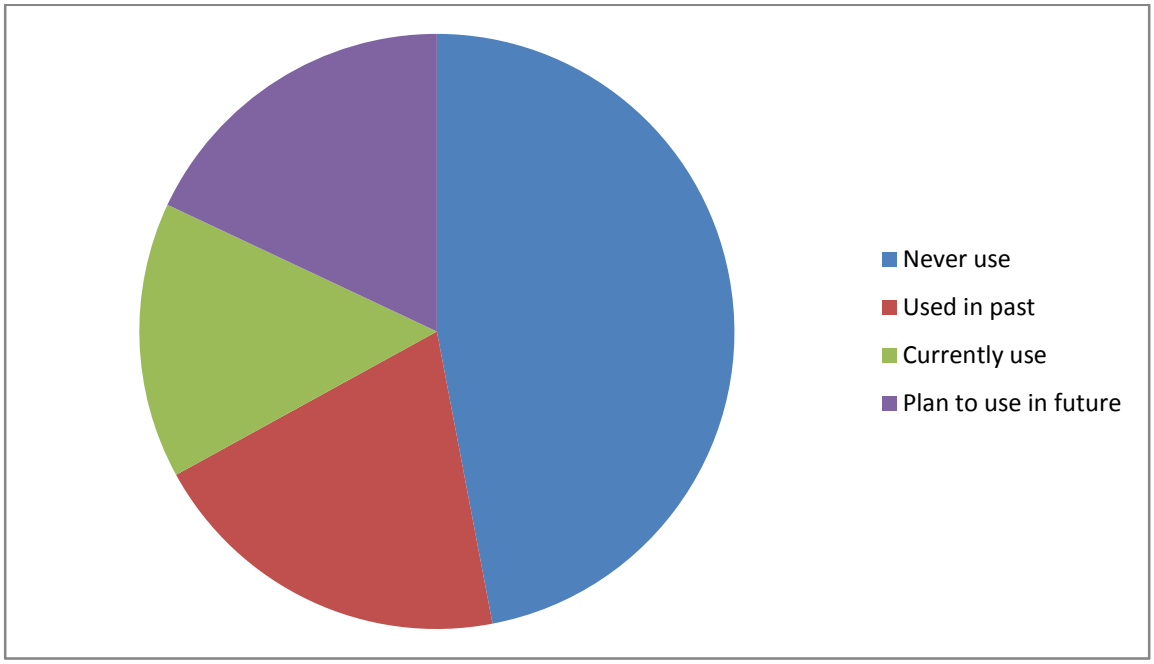

Figure 10: Fence used to save the livestock.

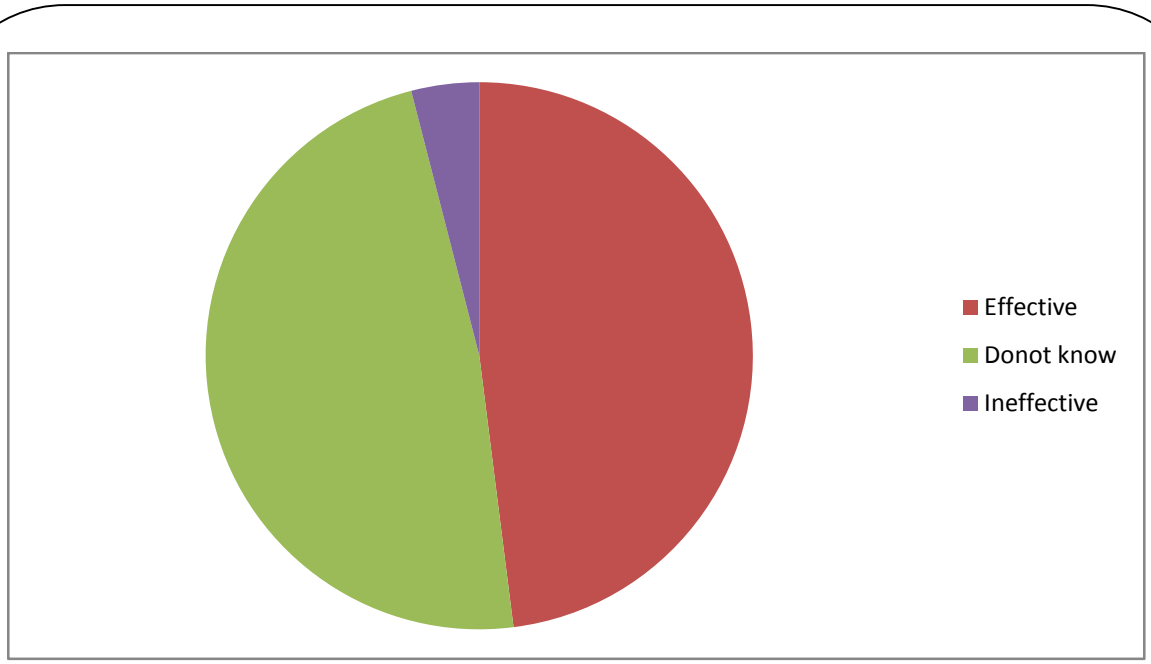

Figure 11: Respondents response about reduction of Indian crested porcupine number to tolerable range.

Conclusion: It is concluded that human-porcupine conflict is present; Indian crested porcupine was damaged to crops and in response local people were used preventive measures to protect the crops.

Acknowledgements: Authors are thankful to local people for sharing data about human-wild boar conflict.

Availability of data: We have included all relevant data in the manuscript that were collected during the field survey.

Authors' contributions: Safeer designed this study and also performed the research; Rasheed and Altaf helped in data write up. Manzoor and Yasrub were analyzed article and approved as final manuscript.

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