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Study of anthropogenic impacts on snow leopards in district Neelum, Azad Jammu and Kashmir-Pakistan

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ABSTRACT

The *Panthera uncia* is recorded from mountains region of central Asia and a flagship species. It is noted that world snow leopard population is 4000 to 6500 individuals. While 200 to 420 snow leopards present in northern mountains region of Gilgit-Baltistan, Khyber Pakhtunkhwa and Azad Jammu and Kashmir. *P. uncia* is assessed as Vulnerable (VU) because the global population is noted as more than 2,500 individuals. Pakistan has the global third largest population of *P. uncia*; Gilgit Baltistan has two largest National Park as; Central Karakoram National Park and Khunjerab National Park. Both National Parks have habitats for the snow leopards. Snow leopard has wide range of upto 1000 km^2. It is assumed that the Karakoram Mountain is important to conserve the genetic diversity of the snow leopard. The main objective of the study was to know the anthropogenic impacts on the snow leopard in Neelum Valley, Azad Jammu and Kashmir-Pakistan. According to the Majority of respondents population of snow leopard was small in study area. Because snow leopard has low temperature tolerance, and temperature influence was noted in the study area. Due to this reason snow leopard migration was noted by majority of respondent in study area. Majority of the respondents told that this species has large geographic range, low reproductive rate, high dispersal ability and habitat specialization.

Key words: Snow leopard, Kashmir, Anthropogenic impacts, climate.

INTRODUCTION

The *Panthera uncia* (Schreber, 1775) is flagship species and recorded from mountains region of the central Asia. It is noted that world snow leopard population is between four thousand to sixty five thousand individuals (McCarthy and Chapron, 2003). While 200 to 420 snow leopards present in northern mountains region of Gilgit-Baltistan (abbreviated as GB), Khyber Pakhtunkhwa (abbreviated as KPK) and Azad Jammu and Kashmir (abbreviated as AJK). According to (McCarthy *et al.*, 2017) *P. uncia* is assessed as Vulnerable (abbreviated as VU) because the global population is noted as more than 2,500 individuals. Pakistan has the global third largest population of *P. uncia*; while in Pakistan largest population is present in Gilgit Baltistan (Hussain, 2003); Gilgit Baltistan has two largest National Park as Central Karakoram National Park (CKNP) and Khunjerab National Park (KNP). Both National Parks have habitats for the snow leopards. Snow leopard has wide range of up to 1,000 km^2 (McCarthy, 2000). It is assumed that the Karakoram mountain is important to conserve the genetic diversity of the snow leopard (Fox, 1989).

The mountain ecosystems are important for both human and wildlife. The significant plants present in *P. uncia* habitat include *Betulautilis, Cedrusdeodara, Juniperus communis, Picea smithiana, Pinus wallichiana, Quercus ballot and Taxus baccata*. Almost 78 medicinal palnt species are present. Almost 80% inhabitants are involved in agriculture; important cultivated crops are as; fruits, cereals, vegetables, and fodders play an important function in financial system of Gilgit Baltistan. Livestock is basic requirement for local agricultural economy and plays a significant role. It is noted that livestock population is 4.56 million; which is dependent on alpine pastures in GB (PCD, 2013).

Snow Leopards were lived in sub-alpine and alpine zones, favoring ridges, gullies, cliffs and rocky outcrops. However, *P. uncia* was recorded comparatively rolling terrain or flat as long as there is enough hiding cover in Tibet and Mongolia, and *P. uncia* occupy in open coniferous forest, but habitually avoid dense forest in Russia and China. *P. uncia* was observed at elevations of 3000m to 4500m, except for at their northern range boundary, where snow leopard were observed at lower elevations (900m to 2500m) (McCarthy and Chapron, 2003).

The main threat to *P. uncia* is illegal trade of body parts, conflict with native citizens, as well as lack of conservation rule, capability and knowledge (Li and Lu, 2014). Other threats include habitat loss, fragmentation, not have of effective law enforcement, decrease of prey cause of poaching, exponential human population growth rate, poverty, mining, road construction and hydroelectricity development (Forrest *et al.*, 2012; Advani, 2014). The main objective of the study was to know the anthropogenic impacts on the snow leopard in Neelum Valley, Azad Jammu and Kashmir-Pakistan.

MATERIALS AND METHODS

Study area: District Neelum is situated northernmost (NW) of Azad Jammu and Kashmir, Pakistan. Taking up the maximum part of Neelum Valley, District Neelum has a 191,000 population. This river flows down from the Gurez valley and joins river Jhelum at district Muzaffarabad. The valley is wooded area with an elevation ranging from 4,000 feet to 7,500 feet, the peaks on either side reaching 17,000 feet. Neelum Valley is 144 kilometers long (AJKBS-PDD, 2015; Faruqi, 2018; DP, 2019) (Figure 1).

Methodology: The data were collected (From March 2017 to February 2018) through questionnaires (n=100) and it was consist of the following questions as; migration, dispersal, habitats, reproduction and climate change impacts.

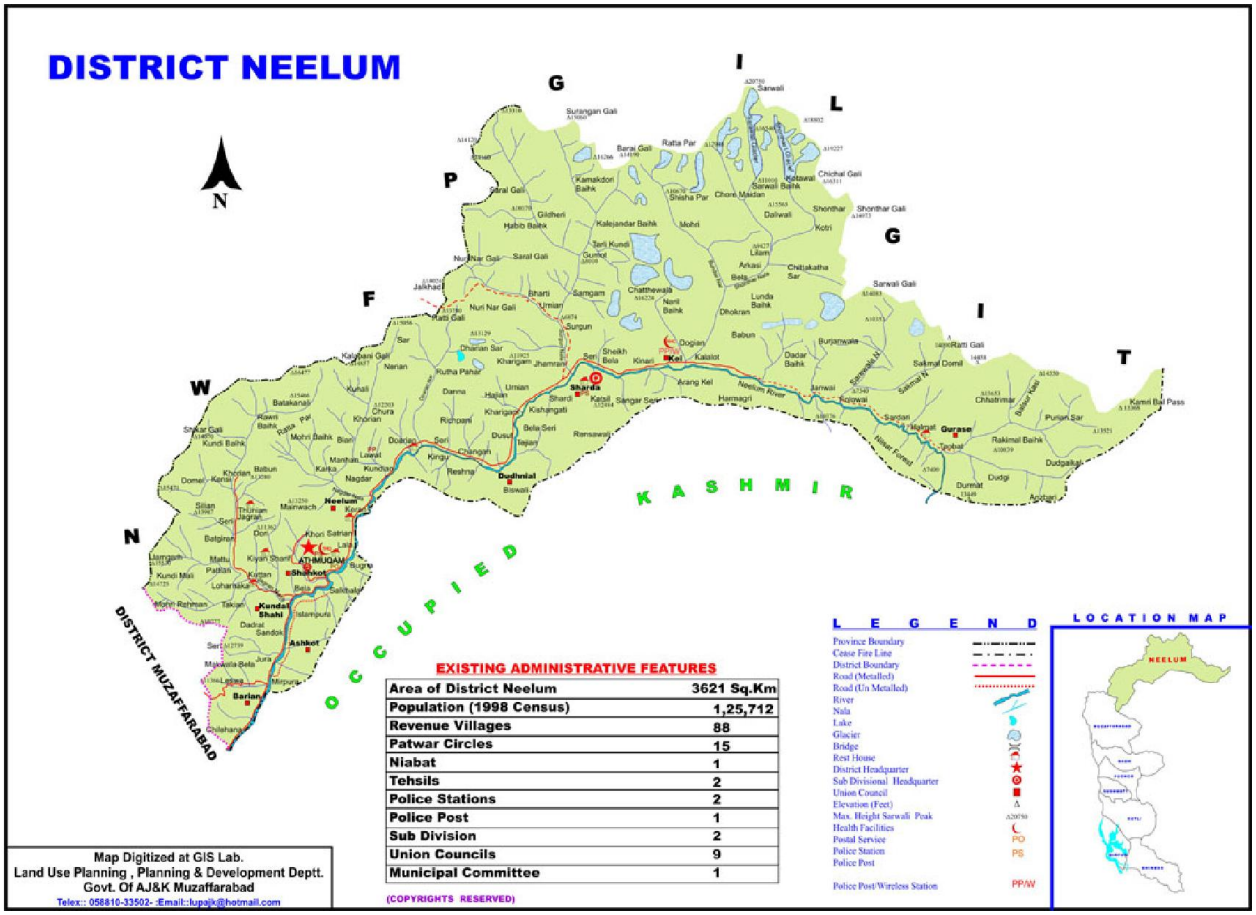

Figure 1: Map of the study area.

RESULTS AND DISCUSSION

The data were collected from all Muslims male (89%) and female (11%) respondents of the district Neelum. They have different occupations as; Shepherd (33%), Labrorer (24%), Farmer (21%), Teacher (12%), Shopkeeper (8%) and Drivers (2%). They belong to different ethnic groups, education and different age groups from 25 to above 60 years (Figure 2).

According to the Majority of respondents (64%) population of snow leopard was small in study area (Figure 3). Because snow leopard has low temperature tolerance (82%) (Figure 4), and temperature influence (67%) was noted in the study area (Figure 5). Due to this reason snow leopard migration was noted by majority of respondent (60%) in study area (Figure 6). Majority of the respondents told that this species has large geographic range (67%) (Figure 7), low reproductive rate (46%) (Figure 8), high dispersal ability (82%) (Figure 9) and habitat specialization (88%) (Figur 10).

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Authors' contributions: Fatima has designed project, collected data and written this article; Altaf is supervised; while Nazer and Abbasi critically analysis this article and approved as final.

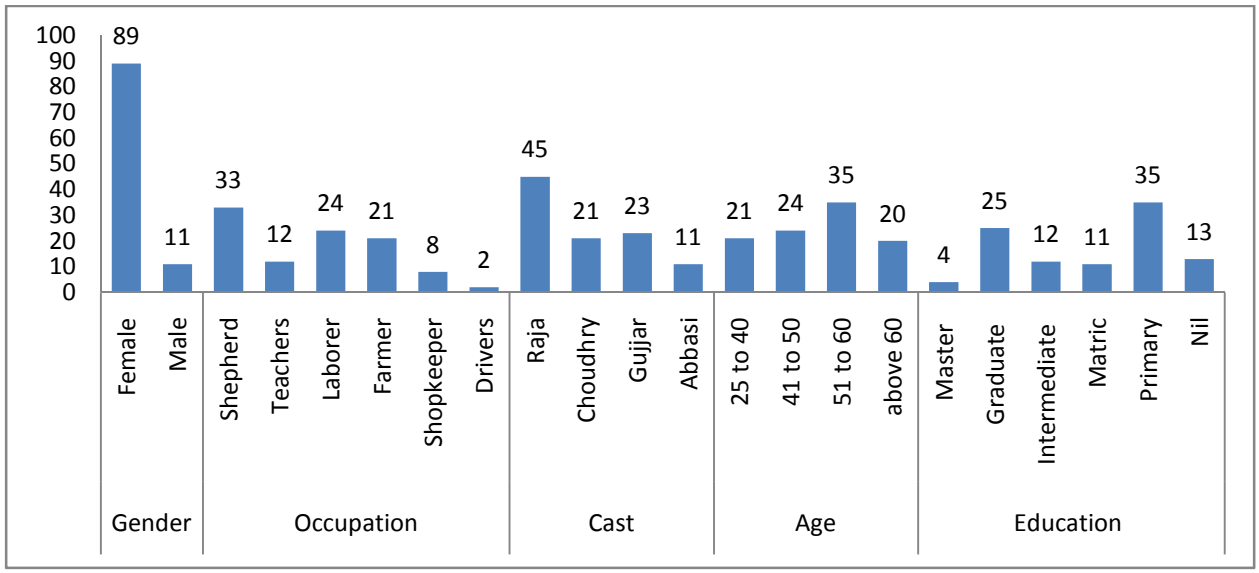

Figure 2: The respondents Profile.

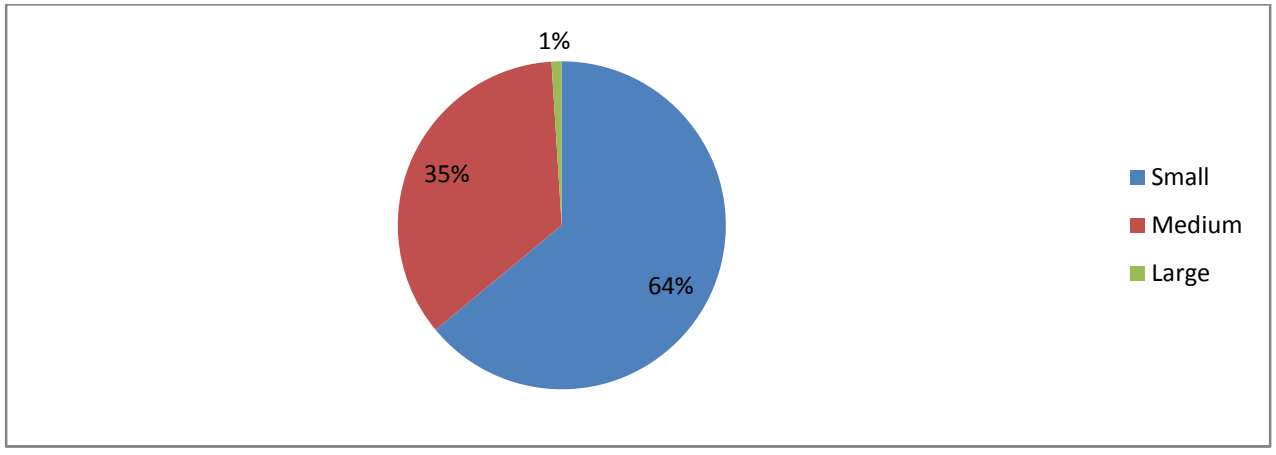

Figure 3: Local people perception about the Population size of snow leopard.

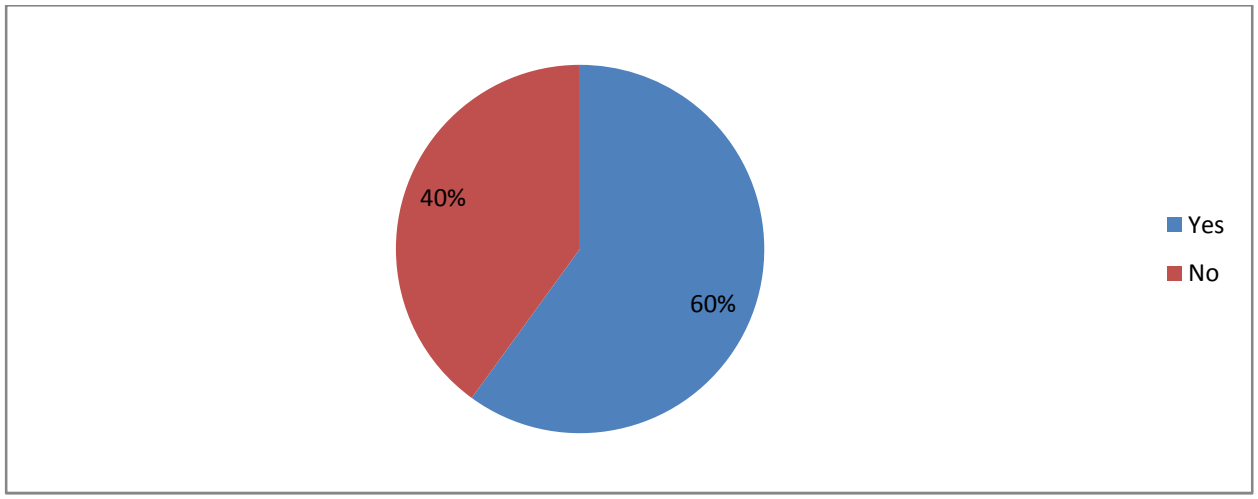

Figure 4: Local people perception about the migration of snow leopard.

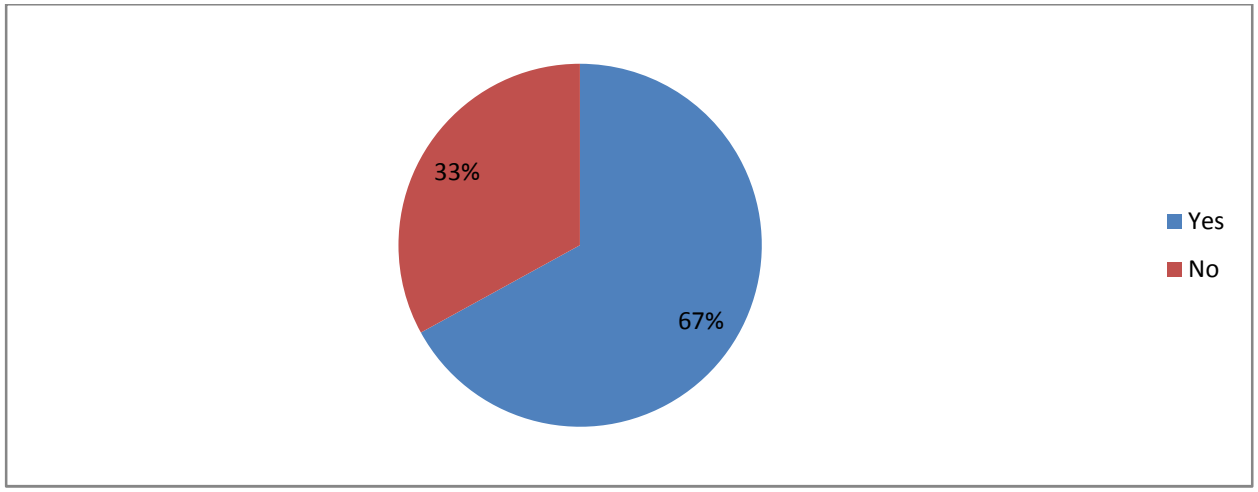

Figure 5: Local people perception about the temperature influence of snow leopard.

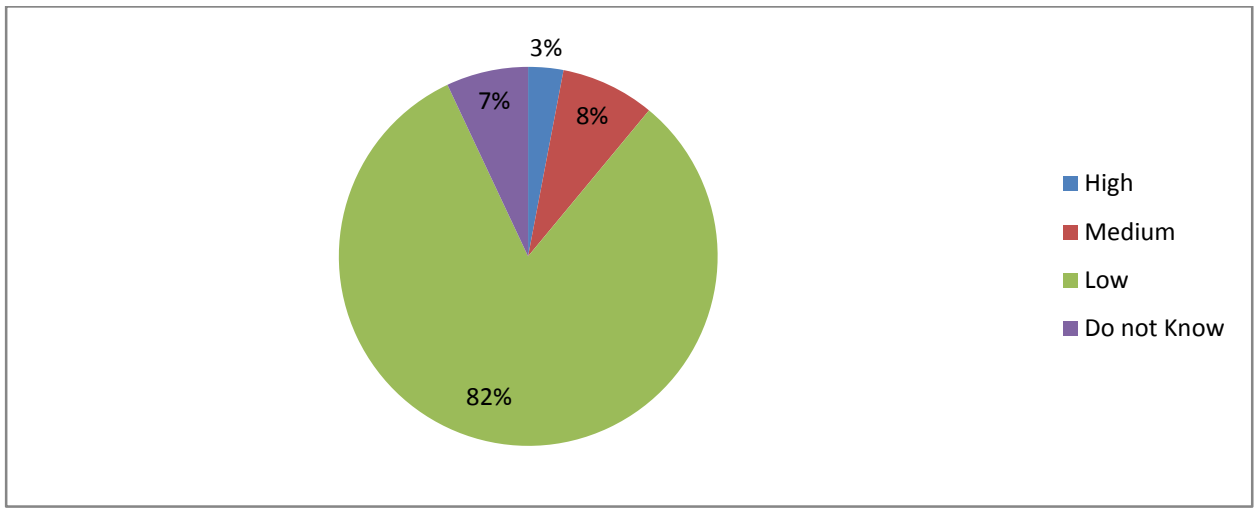

Figure 6: Local people perception about the temperature tolerance of snow leopard.

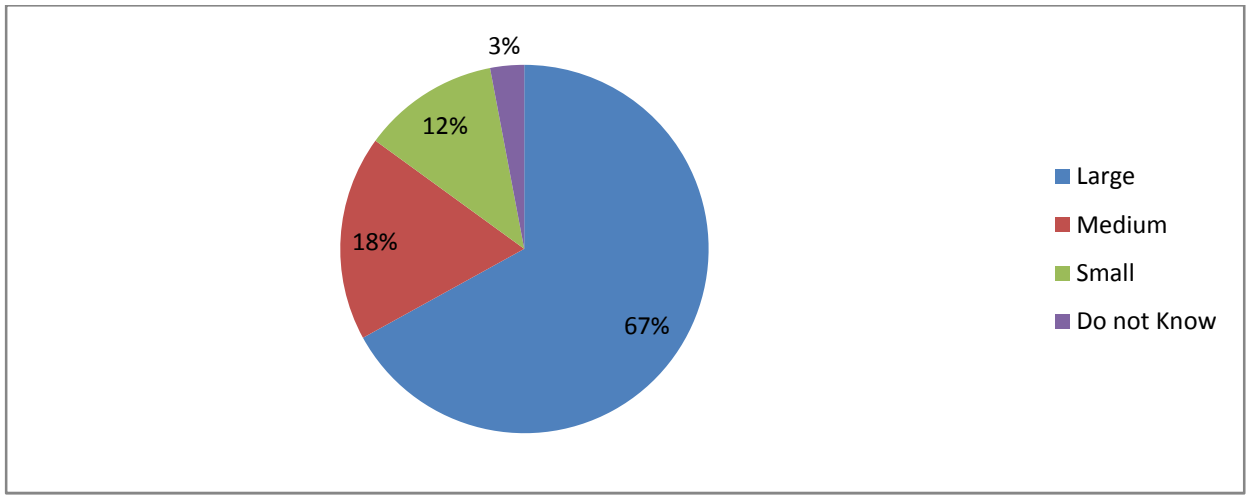

Figure 7: Local people perception about the geographic range of snow leopard.

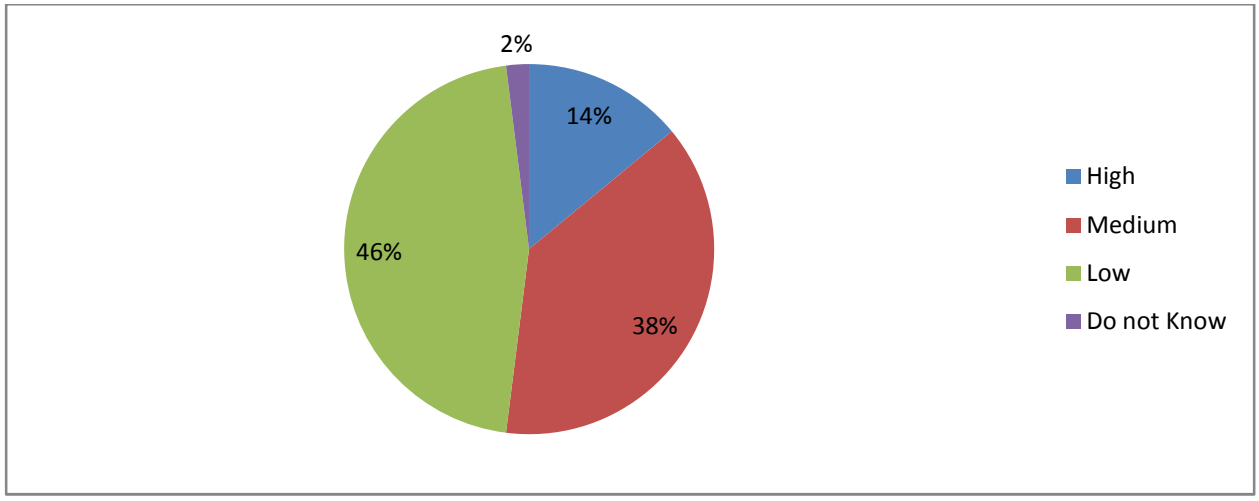

Figure 8: Local people perception about the reproductive rate of snow leopard.

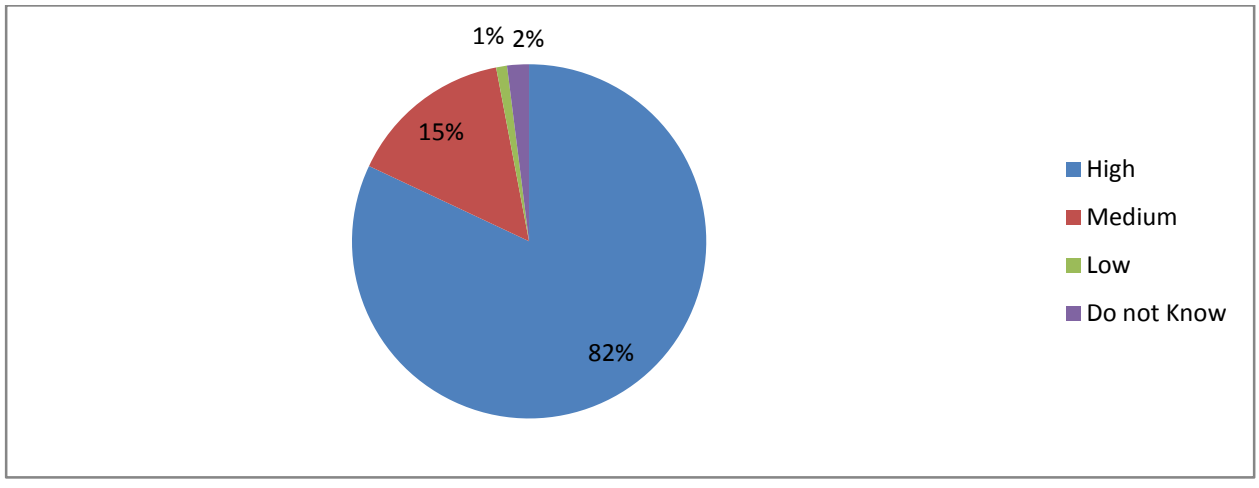

Figure 9: Local people perception about the dispersal ability of snow leopard.

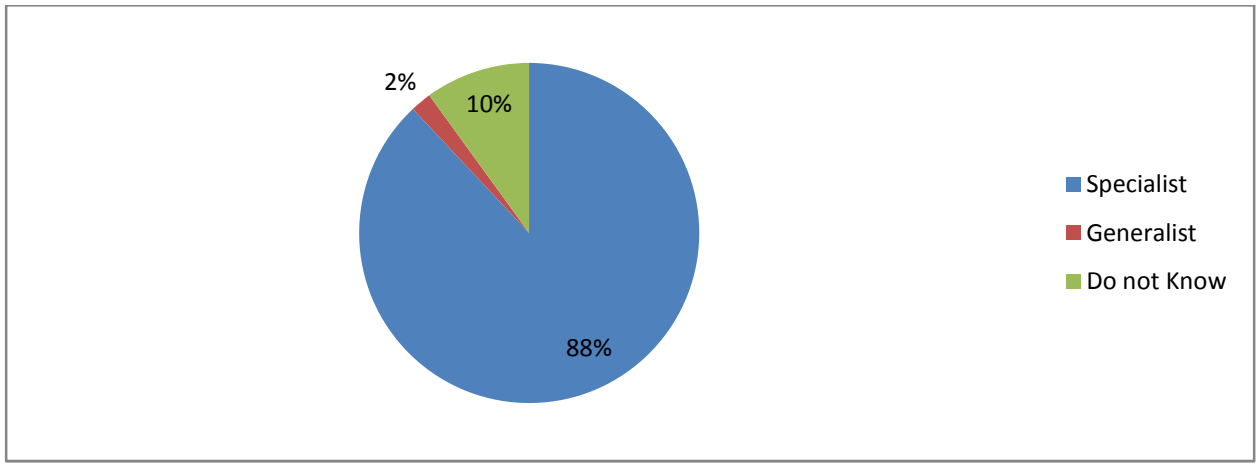

Figure 10: Local people perception about the habitat specialization of snow leopard.

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