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Habitat Analysis and Study on Threats to Chinese Pangolin (*Manis pentadactyla*) in Patletar Patle Community Forest, Bhaktapur

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Abstract

Pangolin is a scaly anteater, nocturnal, elusive, non-aggressive, solitary, burrowing strange mammals found in the different parts of Nepal and is listed as a critically endangered species in IUCN Red List. The research was carried out in the Patletar Patle community forest of Bhaktapur District in Central Nepal to identify the status of burrows, threat analysis and to assess the perception of local people towards pangolin. The direct field observation has been carried out May 27 to June 7, 2019 to know the status of burrows and the semi-structured questionnaire survey has been prepared to access the perception of local people and the threats has been analyzed. Also the secondary data from the literature review were analyzed. Altogether 36 burrows (27 old and 9 new) were recorded during the survey. The distribution of the burrows was found to be uniform throughout the transects. Burrows were mostly present in the elevation range of 1375-1400 m and all the burrows were present in the northeast slope aspect. The burrows were mostly located in the acidic soil type and were located in the slope aspect. The people of the area lack scientific knowledge towards the pangolin but possessed positive perception towards it. Out of 33 respondents only 1 % of respondents have seen the pangolin. The people argued that the none encounter was made by the pangolin towards human, but some of them, argued with rarely encounter and the sometime encounter. The study area lies nearer to the Suryavinayak Community Forest. So, the people thought that the reason behind the presence of Pangolin is due to the migration of pangolin from Suryavinayak Community Forest. However, intensive study is needed in the study area which could be imperative for the conservation of the species.

Keywords: burrow, conservation, distribution, habitat, pangolin, people

Introduction

Pangolins, particularly the Chinese pangolin (*Manis pentadactyla*), are unique, scaly endangered mammals that play a crucial role in ecosystems by controlling insect population, particularly ants and termites which helps maintain soil health and balance in the food chain. Despite their ecological importance, pangolins are among the most trafficked mammals globally, primarily due to high demand for their scales and meat in traditional medicine and culinary practices (Challender et al., 2014; IUCN. 2014) The Chinese pangolin is listed as critically endangered on the IUCN Red List, with populations decling due to habitat loss, paching and illegal trade (Duckworth et al., 2008; Newton et al., 2008).

In Nepal, the Chinese pangolin is found in subtropical forests, but its population status and distribution remain poorly understood. Previous studies in Nepal have focused on pangolin distribution in protected areas and community forests, such as the Nagarjun Forest (Acharya, 2001), Suryabinayak Community Forest (Kaspal, 2008), and Balthali (Suwal, 2011). These studies have highlighted the species preference for specific habitat conditions, such as moderate canopy cover, steep slopes and acidic soils. However, there is a lack of comprehensive research on pangolin ecology and threats in community forests like Patletar Patle Community Forest, which are critical for their conservation.

This study aims to fill this gap by analyzing the habitat preferences, distribution and threats to the Chinese pangolin in the Patletar Patle Community Forest, Bhaktapur. By integrating field observations and local perceptions, this research provides new insights into pangolin ecology and conservation needs in human-dominated landscapes. The findings will contribute to the development of targeted conservation strategies and enhance community-based conservation efforts.

Material and Methods:

Study area

The study was carried out at the Patletar Patle Community Forest, which is situated in Ward No. 4 of Suryabinayak Municipality, Bhaktapur District. The forest is located at a latitude of 27°N, a longitude of 85°E, with an elevation of 1376 m above sea level. It is situated about 5 km from the Araniko Highway, making it accessible yet relatively undisturbed by heavy human activity. The the study area is boardered by the Hanumante River, which separates Suryabinayak Municipality from Madhyapur Thimi Municipality (Figure 1).

The forest is characterized by subtropical vegetation with a mix of broadleaf and coniferous trees. The area experiences a temperate climate with moderate rainfall and temperatures ranging from 10°C to 25°C annually. The soil composition varies across the forest, with brown, red, yellow and black soils being the most common (Figure 4). These soil types are known to influence the distribution of burrows as pangolins prefer specific soil conditions for digging and nesting.

The Patletar Patle Community Forest is managed by a local community forest user group (CFUG), which has implemented strict regulations to protect the forest and its biodiversity. The CFUG restricts grazing and logging activities, which has helped to maintain the forest's ecological integrity. This has likely contributed to the presence of pangolins in the area, as evidenced by the discovery of 36 burrows during the study (Figure 2). The forest's proximity to the Suryavinayak Community Forest, a known habitat for pangolins, further supports the hypothesis that pangolins migrate between these two areas.

The study area's topography is characterized by steep slopes (45–60%) and moderate canopy cover (21–30%), which are ideal conditions for pangolin burrows (Figure 3). The distribution of burrows was found to be uniform across the forest, with the highest concentration observed at elevations between 1375–1400 meters (Figure 3). This elevation range aligns with previous studies that identified subtropical regions as preferred habitats for Chinese pangolins (Dhakal, 2016; Thapa, 2012)

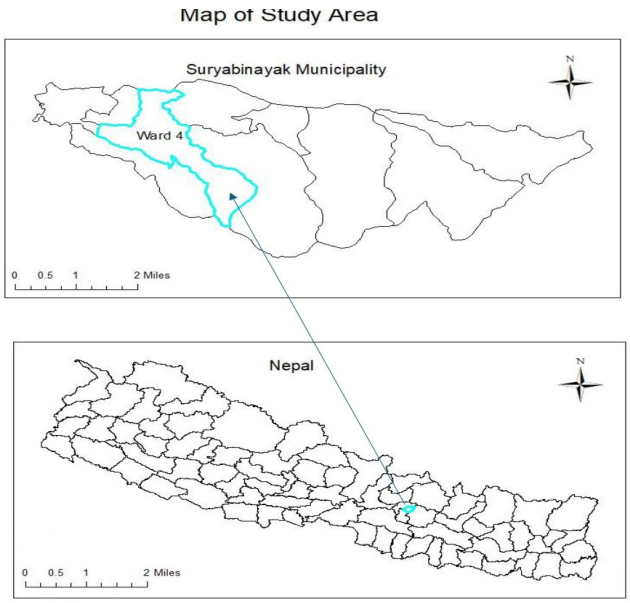

Figure 1: *Map of study area*

Experimental Design

The research design for this study was developed based on established methodologies used in previous pangolin research, ensuring consistency and comparability with existing literature. The study employed a combination of field observations, belt transect surveys and semi-structured questionnaires, which are widely recognized methods for studying elusive and nocturnal species like the Chinese pangolin (*Manis pentadactyla*).

Reconnaissance Survey

A reconnaissance survey was conducted to assess the general status of pangolins and their habitat in the Patletar Patle Community Forest. This preliminary survey helped identify potential areas for detailed data collection, a approach supported by previous studies such as Suwal (2011) and Thapa (2012), who used reconnaissance surveys to map pangolin distribution in community forests of Nepal.

Belt Transect Method

The belt transect method was employed to systematically collect data on pangolin burrows and habitat variables. This method has been widely used in pangolin research, including studies by Acharya (2001) in Nagarjun Forest and Kaspal (2008) in Suryabinayak Community Forest. Five transect blocks were established in the study area, each measuring 500 m in length and 20 m in width, following the methodology described by Wu et al. (2004). Within each transect, data on habitat parameters such as altitude, slope aspect, canopy cover, soil type and presence of ants and termites were recorded. This approach ensures a comprehensive understanding of pangolin habitat preferences, as demonstrated in similar studies (Thapa et al., 2014; Suwal, 2011).

Threat Identification

To identify threats to pangolins, semi-structured questionnaires were administered to 33 members of the local community forest user group (CFUG). This method aligns with the approach used by Newton et al. (2008) and Thapa et al. (2014), who emphasized the importance of integrating local knowledge into pangolin conservation research. The questionnaire focused on local perceptions of pangolins, observed threats, and awareness of conservation measures. This participatory approach not only provides valuable insights into human-pangolin interactions but also fosters community engagement in conservation efforts.

Data Analysis

Data analysis from the field observations and questionnaires were analyzed using descriptive statistics in Microsoft Excel 2010. This method is consistent with previous pangolin studies, such as those by Suwal (2011) and Kaspal (2008), which used similar analytical tools to present habitat data and local perceptions. Qualitative information from open-ended questionnaire responses was manually coded and interpreted, following the approach described by Challender et al. (2014).

Results

General information on Burrows of Pangolin

The presence of burrows, footprints and scratches are the indirect sign for the existence of Pangolin in the study area. A total of 36 burrows were identified of which 7 were active and 29 were inactive. The distribution and characteristics of these burrows were analyzed based on the several environmental factors as described below.

Distribution map and pattern

The distribution of pangolin burrows were mapped across the study area (Figure 2). The burrows were found to be uniformaly distributed, with the highest concentration (9 burrows in Transect D and the lowest i.e. 5 burrows in Transect B. This uniform distribution suggests that the habitat conditions are relatively consistent across the study area, with minimal human disturbance.

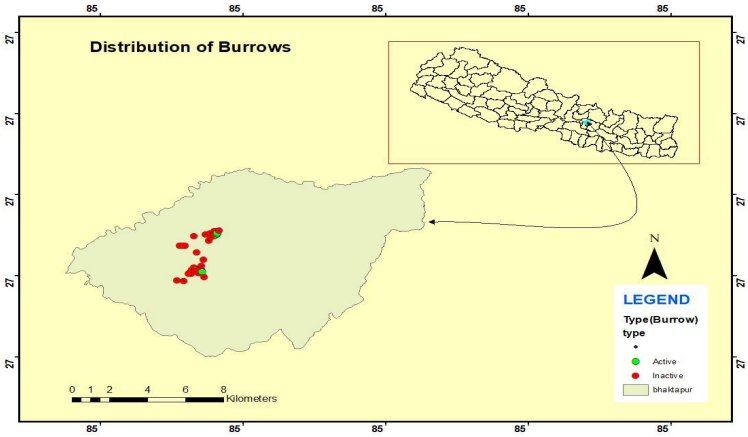

Figure 2: *Distribution map Showing the active and incative burrows*

Distribution based on altitudinal gradient

The majority of burrows (10 burrows) were found at the elevation between 1375-1400 m, with 9 new burrows and 8 old burrows recorded in this range (Figure 3). Fewer burrows were observed at higher elevations, including suitable soil types, moderate canopy cover and abundant food resources i.e ants and termites (Wu et al.,2004; Dhakal, 2016). Additionally, the 1375-1400 m range may offer more favourable microclimates, reduced human disturbance and gentler slopes, which are preferred for burrow construction)Suwal, 2011; Thapa, 2012). This aligns with the findings from previous studies, which report that Chinese pangolins favor elevations below 1550 m fro similar ecological reasons (Chao, 2001; Chakraborty & Chakraborty, 2002).

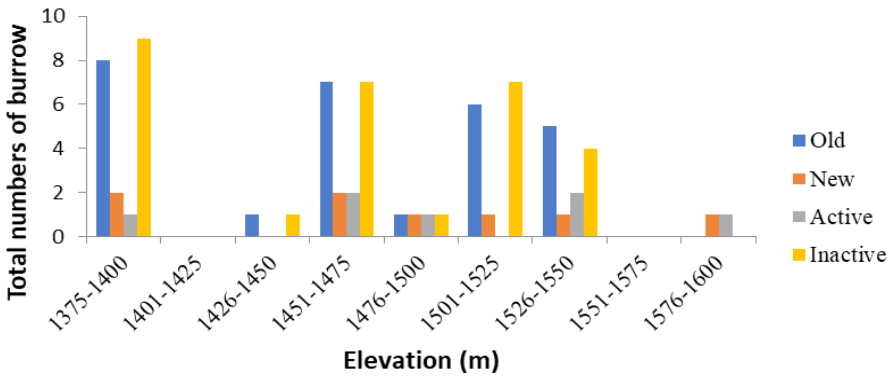

Figure 3: *Burrows distribution based on altitude*

Color based distribution

The soil found around the burrows were predominantly brown (majority), followed by red, yellow and black (Figure 4). This suggesrs that pangolins prefer burrowing in brown soil, possibly due to its texture, drainage properties, or ease of excavation. This findings aligns with studies by Suwal (2011) and Kaspal (2008), who also reported pangolins favouring brown and red soils in similar habitats.

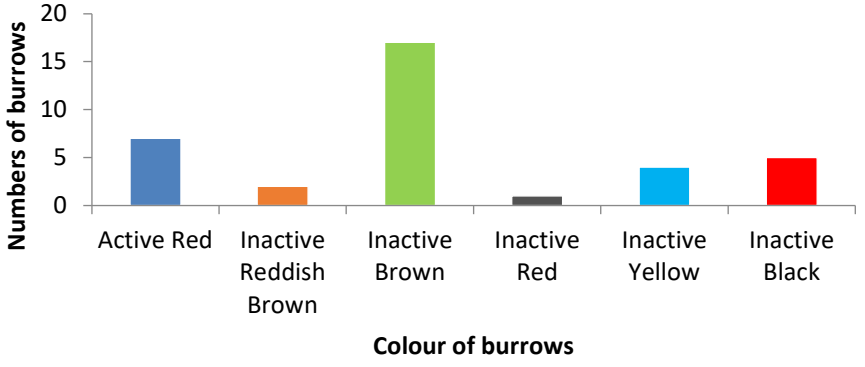

Figure 4: *Burrows distribution based on color*

Distribution of burrows based on canopy coverage

The distribution of burrows was strongly influenced by canopy coverage. The majority of burrows were foun in areas with 21-30% canopy cover, comprising 11 inactive burrows and 1 active burrows (Figure 5) This suggests that pangolins prefer habitats with moderate canopy cover, which likely provides a balance between shelter and foraging opportunities. Similar findings were reported by Wu et al. (2004) who noted that pangolins avoid areas with either very dense pr very sparse vegetation.

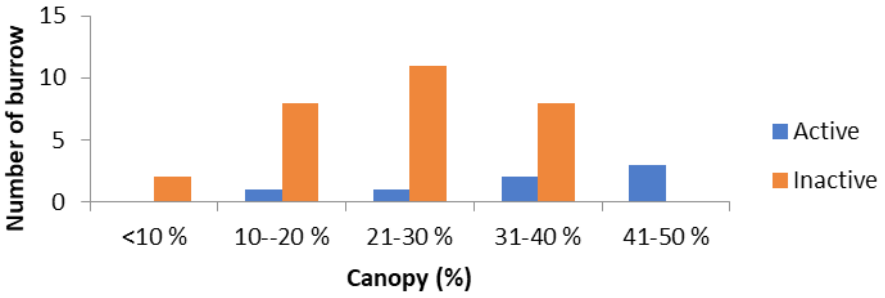

Figure 5: *Burrows distribution based on canopy coverage*

Distribution of burrows along the slope

The distribution of burrows varied significantly with slope gradoients. The majority of burrows were found on the steep slope (45-60%), with 12 active burrows and 2 inactive burrows observed in this range (Figure …). This preference for steep slopes may be due to better drainage, reduced human disturbance and increased protection from predators, as noted in previous studies (Wu et al., 2004; Suwal, 2011)

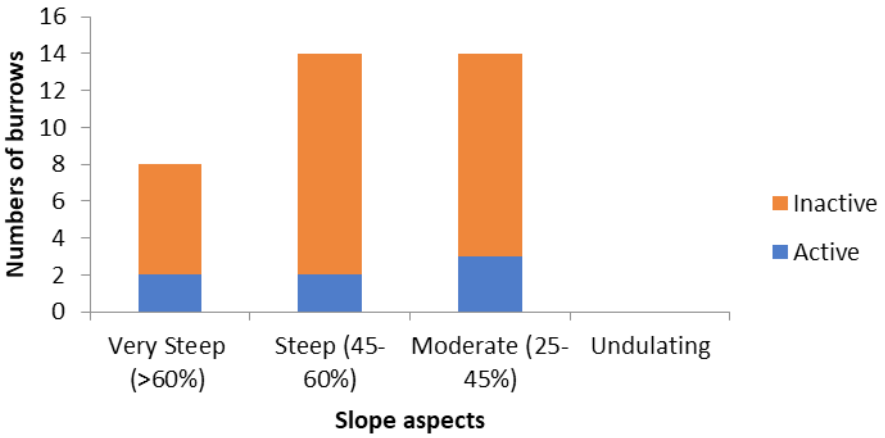

Figure 6: *Burrows distribution based on slope aspect*

Burrow distribution with soil pH

The distribution of burrows was closely associated with the soil pH. The majority of burrows (9 burrows) were found in soils with pH of 4.5, while fewer burrows were observed in soils with pH values of of 4.2, 5.0, 5.1, and 5.3 (Figure) This findings aligns with previous studies such as Acharya (2001) and Suwal (2011) which also reported pangolins favouring acidic soils in their habitats.

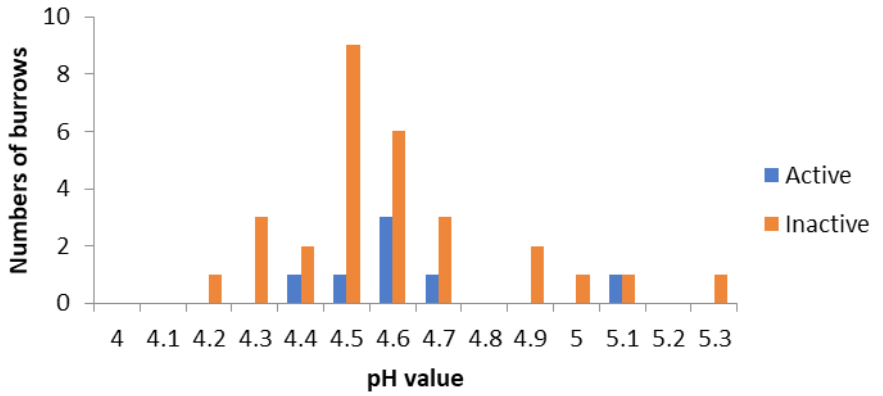

Figure 7: *Burrows distribution based on soil pH*

Presence of ants and termites

Ants and termites were observed near 5 active burrows and 5 inactive burrows (Figure 10). However, no ants or termites were found near the remaining burrows. This indicates that while ants and termites are a key food source for pangolins, their presence is not the only factor influencing burrow activity. This finding aligns with studies by Suwal (2011) and Wu et al. (2004), which suggest that other factors, such as soil type and slope, also play a significant role in burrow selection.

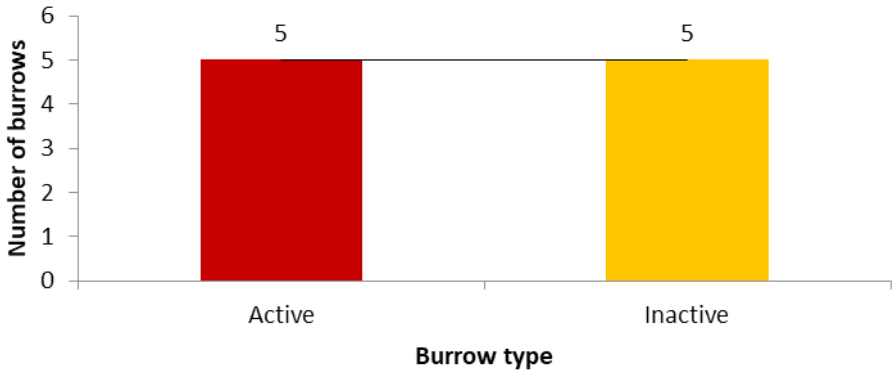

Figure 8: *Presence of ant and termites on burrows type*

Local people perception towards pangolin

A total of 33 respondents, all active members of the community forest user groups, were surveyed to gain insights into local perceptions of pangolins and the challenges they face. The respondents represented a broad spectrum of economic backgrounds, ranging from upper-middle class to economically disadvantaged families ensuring a comprehensive understanding of community perspectives. The survey aimed to assess their awareness, attitudes and knowledge regarding pangolin conservation. The findings, which highlight both the level of understanding and the prevailing threats, are presented in detail below:

Economic characteristic of the respondents

Income sources of the respondents

The primary income sources of the respondents included agriculture (28 respondents), animal husbandry (21 respondents), jobs (7 respondents), business (3 respondents) and labor (1 respondent) (Table 1). Agriculture and animal husbandry, being the dominant livelihoods, indicate a strong dependency on forest resources for fodder, grazing, and other forest products. This dependency can influence land use patterns and habitat availability for pangolins, as agricultural expansion and livestock grazing may alter forest ecosystems.

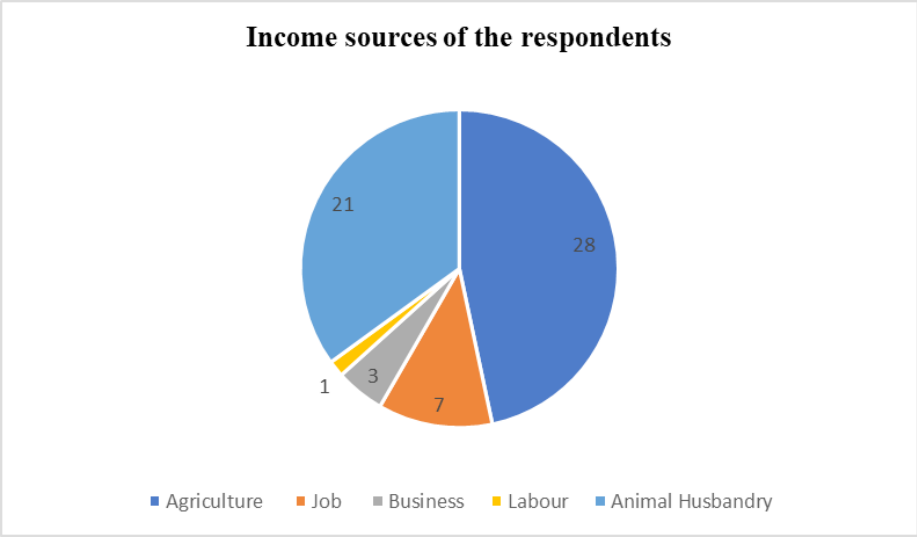

Figure 9: *Income sources of the respondents*

Land holding size

The majority of respondents (52%) owned less than 5 ropani of land, while 45% owned 6–10 ropani (Table 2). Small landholdings often lead to intensive land use, which can fragment habitats and reduce the availability of suitable areas for pangolins. Understanding landholding patterns helps identify potential conflicts between human activities and pangolin habitat requirements.

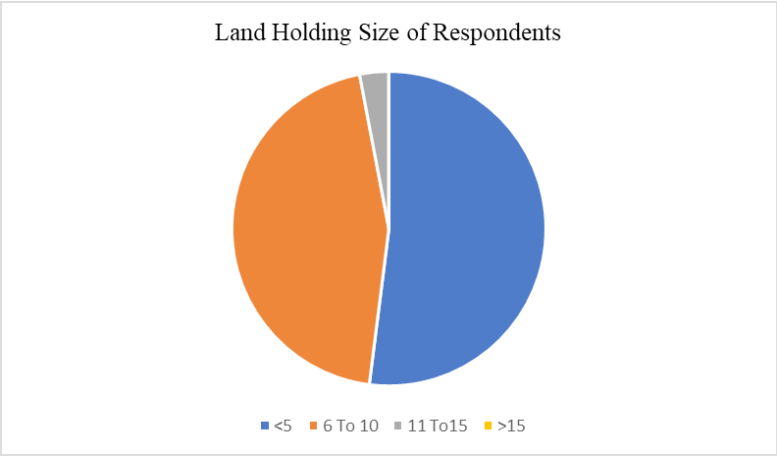

Figure 10: *Land details of the Respondents*

Livestock population and rearing

Of the respondents, 64% owned livestock, primarily cows (75%), buffalo (37%), hens (46%), and goats (23%). Stall feeding was practiced due to grazing restrictions in the community forest. Livestock rearing can indirectly impact pangolin habitats by altering vegetation structure and soil composition. However, the restriction on grazing in the community forest has likely reduced habitat degradation, creating a more favorable environment for pangolins.

Dependency on the Community Forest

A significant majority of respondents (94%) depended on the community forest for resources such as timber and forage, while only 6% did not rely on the forest. This high dependency underscores the importance of integrating pangolin conservation with sustainable forest management practices. Balancing resource use with habitat preservation is essential for the long-term survival of pangolins.

Importance of Community Forest to the respondents

Respondents emphasized the critical role of the community forest in providing cleaner air, reducing landslides, and enhancing aesthetic value. Since its handover to the community in 1995 AD, the forest has undergone significant regeneration, transforming barren land into a thriving ecosystem. This transformation has not only improved local environmental conditions but also created a more favorable habitat for pangolins and other wildlife. The forest's ecological benefits align closely with pangolin habitat requirements, highlighting the importance of sustainable forest management for both biodiversity conservation and community well-being.

Population trend of pangolin for last five years

There has been a less information found regarding the population trend on pangolin for last five years. Regarding the population of pangolin, among 33 respondents maximum i.e 82% of the respondents were don't know about the trend of whether decreasing or increasing. Also the 6% of respondents said that the trend was increasing and that about 9% claimed that the population is decreasing and the 3 % respondents argued with the stable option.

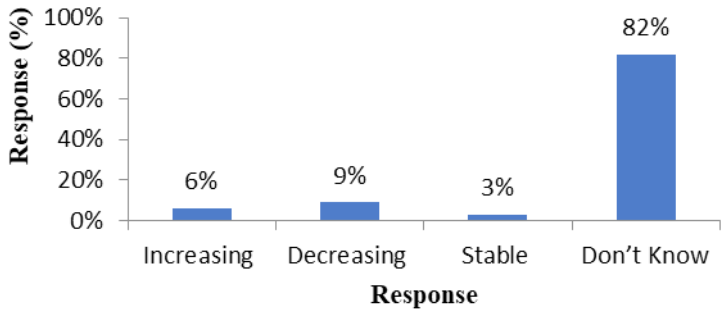

Figure 11: *Population trend of pangolin for last five years*

Reason for continuous threats despite protection

The respondents were asked to identify reasons for the continuous threats to pangolins despite existing protection measures. The findings revealed that 9% of respondents attributed the threats to habitat destruction, 9% cited a shortage of food, and 18% identified hunting/poaching as a significant threat, while none mentioned predation. However, the majority of respondents (64%) argued that no threats were observed in the area and even suggested that the pangolin population might be increasing. This discrepancy highlights a potential gap in awareness about the challenges facing pangolins and underscores the need for targeted education and monitoring efforts to ensure their long-term conservation.

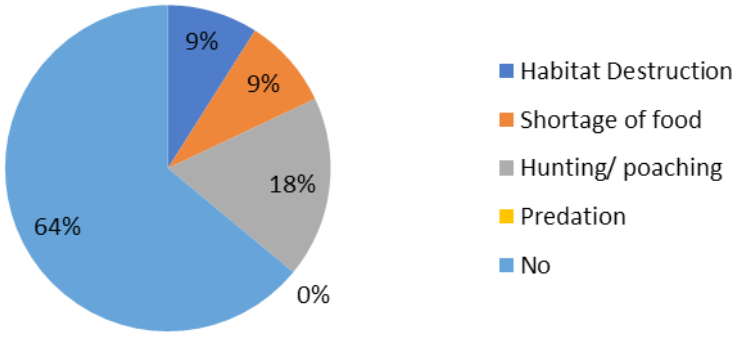

Figure 12: *Reason for continuous threats despite protection*

Reasons behind hunting

The survey identified several reasons behind the hunting of pangolins, which pose significant threats to their conservation. Among the 33 respondents, 28% reported that pangolins are hunted primarily for selling their scales and meat, which are highly valued in illegal wildlife trade. Additionally, 16% indicated that pangolins are hunted for use in traditional medicinal practices, as their scales are believed to have healing properties. Another 5% mentioned that pangolins are hunted for their meat, which is

considered a delicacy in certain cultures. However, 5% of respondents admitted they were unaware of the threats to pangolins or the reasons behind their hunting, highlighting a gap in knowledge about pangolin conservation (Figure 11). These findings underscore the need for stricter enforcement of anti-poaching laws, awareness campaigns to reduce demand for pangolin products, and community education programs to promote conservation efforts.

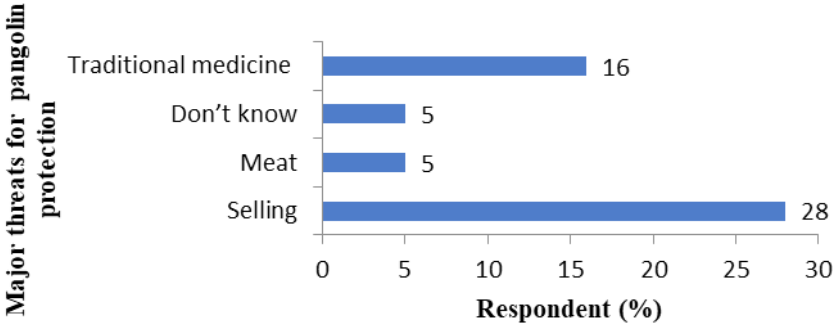

Figure 13: *Major threats for pangolin*

Most valuable parts

The survey findings revealed that 29 respondents (88%) identified scales as the most valuable part of pangolins, while 4 respondents (12%) mentioned skin, and 5 respondents (15%) cited other body parts (Figure 12). Additionally, 3 respondents (9%) reported not knowing which parts were valuable. This indicates that scales are the primary target for exploitation, likely due to their high demand in illegal wildlife trade for traditional medicine and luxury goods. While the local community does not appear to keep or use pangolin parts, the high recognition of scales as valuable highlights the potential risk of illegal trade originating from the area. These findings underscore the need for targeted awareness campaigns and stricter enforcement to prevent the exploitation of pangolins for their parts.

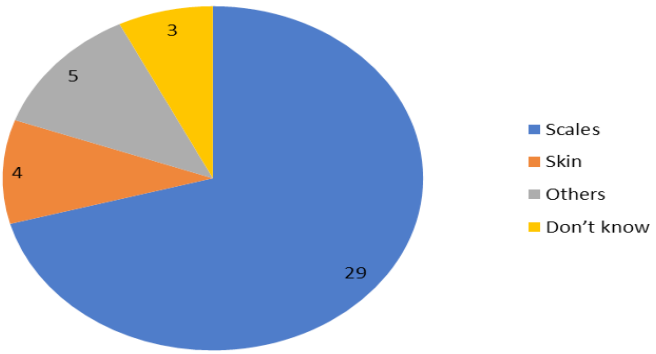

Figure 14: *Most valuable parts of pangolin*

Pangolin meat consumption and use of its scale

The study found that none of the respondents reported consuming pangolin meat or keeping its scales. All respondents claimed they had never consumed pangolin meat or retained its scales for any purpose. However, they were aware that pangolin meat is considered a delicacy and its scales are used in traditional medicine in other countries. The absence of local consumption or use of pangolin parts can be attributed to the lack of direct encounters with pangolins, as most respondents had never seen a pangolin in the area. Despite this, respondents acknowledged the traditional use of pangolin meat and scales in other regions, highlighting the need for continued awareness and enforcement to prevent the potential exploitation of pangolins for these purposes.

Importance of pangolin

During the study, the most of the respondents had not any idea about the importance of Pangolin. As they have sometimes heard about pangolin through the different means of communication, but they were unaware about the importance of pangolin. The few numbers i.e 5% of respondents were confidently disagreed with the importance of Pangolin. Also, very few in numbers of respondents i.e 8% were agreed with the importance of Pangolin in different aspects such as ecological importance, economic importance, etc.

Respondents knowledge on pangolin as a protected species

All the respondents in the study area were not aware that pangolin is a protected animal by Government of Nepal (NPWC Act 2029). Out of 33 respondents questioned, 79% of the respondents knew that pangolins are protected species and hunting of pangolin is illegal and the rest of the respondents were not known about it.

Discussion

Status and Distribution of Burrows

The study revealed that Chinese pangolins (*Manis pentadactyla*) are uniformly distributed across the Patletar Patle Community Forest, as indicated by the presence of burrows in all five transects. This uniform distribution suggests that the forest provides suitable habitat conditions with minimal human disturbance. The availability of food resources (ants and termites), water, and favorable environmental factors likely contribute to this distribution pattern. The presence of burrows, along with indirect signs such as footprints, scratches, and droppings, confirms the existence of pangolins in the area (Kaspal, 2008).

However, the distribution of burrows in this study contrasts with findings from other regions. For example, Suwal (2011) and Thapa (2012) reported non-uniform distribution of pangolin burrows due to variations in elevation, food availability, water resources, and human interference. This discrepancy highlights the influence of local habitat conditions on pangolin distribution and underscores the need for site-specific conservation strategies.

Altitudinal Distribution

The majority of burrows were found at elevations between 1375–1400 meters, with fewer burrows observed at higher elevations (1426–1450 m, 1476–1500 m, and 1578–1600 m). This altitudinal preference aligns with studies by Wu et al. (2004) and Heath and Vanderlip (1988), who reported that Chinese pangolins typically inhabit elevations below 1550 meters. However, other studies, such as

Chao (2001) and Chakraborty and Chakraborty (2002), have recorded pangolins at elevations up to 2000 meters, indicating some variability in altitudinal range across different regions. The preference for lower elevations in this study may be attributed to the availability of suitable habitat conditions, such as moderate slopes, adequate canopy cover, and abundant food resources.

Soil Type and Color

The study found that pangolins in the Patletar Patle Community Forest prefer brown soil, followed by red, yellow, and black soils. This finding is consistent with studies by Suwal (2011) and Kaspal (2008), who also reported pangolins favoring brown and red soils. However, Acharya (2001) observed a preference for red soil in the Nagarjun Forest, suggesting that soil preferences may vary depending on local conditions. The presence of inactive burrows in brown soil may indicate that pangolins have migrated to other areas, possibly due to changes in food availability or habitat conditions.

Canopy Cover

Pangolins in the study area showed a preference for habitats with 21–30% canopy cover, which provides a balance between shelter and foraging opportunities. This finding is supported by Wu et al. (2004), who reported that pangolins avoid areas with either very dense (>75%) or very sparse (<30%) vegetation. Similarly, Akpona et al. (2008) observed that pangolin habitats in the Lama Forest Reserve had vegetation cover ranging from 20–70%. The preference for moderate canopy cover may be due to the need for protection from predators while maintaining access to sunlight and foraging areas.

Soil pH

All burrows in the study area were located in acidic soils, with pH values ranging from 4.0 to 5.3. This preference for acidic soils aligns with findings from previous studies, which suggest that pangolins favor soils with specific chemical properties for burrow construction and stability (Acharya, 2001; Suwal, 2011). The acidic nature of the soil may also influence the availability of ants and termites, which are the primary food source for pangolins.

Ants and Termites

The presence of ants and termites was observed near an equal number of active and inactive burrows, but their abundance was relatively low during the study period. This may be due to seasonal variations or the limited presence of active feeding burrows. The availability of ants and termites is a critical factor influencing pangolin habitat selection, as highlighted by Suwal (2011) and Wu et al. (2004).

Human Interference and Conservation

The study area showed minimal signs of human interference, such as hunting or forest fires, which is a positive indicator for pangolin conservation. The community forest management practices, including restrictions on grazing and logging, have likely contributed to the preservation of pangolin habitat. However, the lack of direct sightings of pangolins suggests that they remain elusive and may be sensitive to human presence. Continued monitoring and community engagement are essential to ensure the long-term conservation of pangolins in the area.

Local people perception towards Pangolin

The study found that while pangolins are present in the Patletar Patle Community Forest, no direct encounters with the species were reported by the local community. The last recorded sighting occurred

several years ago when a deceased pangolin was found in the forest, which some villagers had seen. Since then, no further sightings have been reported. This lack of direct encounters has resulted in limited local knowledge about pangolins and their conservation. Most respondents were unaware of the species' ecological role, economic value, or the threats it faces, such as hunting, poaching, and illegal trade.

This finding contrasts with studies by Thapa et al. (2014) and Suwal (2011), where respondents were more aware of pangolins and their conservation status. For example, Thapa et al. (2014) reported that all respondents in their study area were aware of pangolin presence and recognized their ecological importance. Similarly, Suwal (2011) found that locals in the Balthali area were well-informed about pangolins and their role in the ecosystem. In contrast, this study revealed that only a few individuals in Patletar Patle had basic knowledge about pangolins, highlighting a significant gap in awareness.

The survey data revealed that 82% of respondents were unaware of pangolin population trends, while only 6% believed the population was increasing, and 9% reported a decline (Figure 9). Additionally, 64% of respondents argued that no threats to pangolins exist in the area, despite evidence of habitat destruction and food shortages reported by others (Figure 10). This discrepancy suggests a lack of awareness about the challenges facing pangolins, which is consistent with the limited knowledge observed during the field visits.

The primary reason for the limited awareness among locals is the absence of prior research and conservation initiatives in the area. This study is the first to document pangolin presence and local perceptions in the Patletar Patle Community Forest. The proximity of the study area to the Suryavinayak Community Forest, where pangolins are known to exist, may explain the presence of pangolins in Patletar Patle. Local respondents speculated that pangolins might have migrated from Suryavinayak, but this hypothesis requires further investigation.

Despite the lack of direct threats such as hunting or poaching, some respondents identified habitat destruction, food shortages, and predation as potential risks to pangolins. However, these threats were not widely observed, likely due to the community forest's strict management practices, which restrict human entry and grazing during certain periods (e.g., June 5 to Dec 5). The absence of hunting incidents and forest fires further indicates that the forest is well-managed, providing a relatively safe habitat for pangolins.

The findings highlight the need for community-based awareness programs to educate locals about pangolins and their ecological importance. Engaging the community forest user groups in conservation efforts could help bridge the knowledge gap and foster local support for pangolin protection. Additionally, further research is needed to monitor pangolin populations and understand their movement patterns between the Patletar Patle and Suryavinayak Community Forests.

Conclusion

The study documented a total of 36 pangolin burrows in the Patletar Patle Community Forest, comprising 27 old burrows and 9 new burrows, of which 7 were active and 29 were inactive. The burrows were uniformly distributed across the study area, with their distribution influenced by factors such as altitude, soil type, soil color, and slope. The majority of burrows were found at elevations between 1375–1400 meters, with a preference for northeast-facing slopes. Pangolins showed a strong preference for brown, red, yellow, and black soils with acidic pH values (4.0–5.3). Additionally, burrows were predominantly located in areas with 21–30% canopy cover and on steep slopes (45–60%), which

provide suitable conditions for burrow construction and protection. The presence of ants and termites near some burrows further supports the suitability of the habitat for pangolins.

The local community exhibited a positive perception toward pangolins, but their knowledge about the species' ecological role and conservation status was limited. While the Patletar Patle Community Forest is well-managed, with no signs of hunting or forest fires observed, there are currently no specific conservation measures in place for pangolins. The community forest user groups are aware of the need to protect wildlife but lack scientific knowledge about pangolins, highlighting the need for targeted education and awareness programs. To ensure the long-term conservation of pangolins, it is recommended to implement community engagement initiatives, establish habitat monitoring programs, and promote ecotourism to foster local support for conservation. The absence of hunting and forest fires reflects the successful implementation of community forestry practices, which have contributed to habitat preservation and wildlife conservation. However, continued efforts are needed to address knowledge gaps and ensure the sustainable coexistence of humans and pangolins in the region.

Conflict of Interest

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