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continued on the back inside cover

Cover: A bag worm with its beautiful heap of junk. Acrylics on 300 GSM paper by Dupati Poojitha based on a picture by Sanjay Molur.

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ARTICLE

People perception on use patterns and conservation of Chinese Pangolin in and around Yangoupokpi Lokchao Wildlife Sanctuary, Manipur, India

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Abstract: The current study targeted people's perceptions and knowledge regarding the use patterns of Chinese Pangolins among the communities residing in and around the Yangoupokpi Lokchao Wildlife Sanctuary (YLWS). The sanctuary lies at the Manipur border with Myanmar is in range of Indo-Burma Biodiversity Hotspot. A pre-structured questionnaire survey was conducted between October 2019 and December 2023 to collect information about the use pattern of Chinese Pangolin by consulting 71 local people, particularly traditional hunters from selected villages. The results revealed the use of Chinese Pangolins in bushmeat, medicine (piles, sore throat, asthma, smallpox, allergy), and social beliefs (to keep termites and ants away from wooden houses, gun proof jackets, sighting pangolins as unlucky). Many respondents lack knowledge on medicinal uses and social belief about the species in the study area. In addition, the treatment of sinuses and the excessive control of saliva in nursing babies by using the scales are the two novel findings recorded. Usage of scales to keep ants and termites away from wooden and bamboo house was common in all communities Prior to the COVID-19 pandemic in 2020, there was a rising trend in cost of pangolin body parts like scales. The results of this study indicate that the main threats to the conservation of the Chinese Pangolin species in Manipur, especially in YLWS, are mainly due to the traditional uses of the animal and the trade of its scales for medicinal purposes. As the selected species is Critically Endangered worldwide hence requires immediate conservation and management strategies.

Keywords: Bushmeast, hunting method, illegal hunting, *Manis pentadactyla,* medicine, scales, socio-cultural belief, Tengnoupal, threatened, trade.

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Author contributions: YRZ involved from field work to result discussion, RS and DP involved in data organisation and computation, AK and OPT discussed the result leading to final manuscript.

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INTRODUCTION

Millions of tons of animals are estimated to be hunted throughout tropical forest regions for wild or bushmeat and trade each year (Bahuchet & Loveva 1999; Fargeot & Dieval 2000; Bodmer & Lozano 2001; Bodmer et al. 2004; Newton et al. 2008; Nasi et al. 2011; Katuwal et al. 2013; Zhang et al. 2017). The large quantities of illegal hunting and poaching are leading several animal species towards threatened categories worldwide, with the majority being large and small mammals (Davies 2002; Holland & Bennett 2007; Chalender et al. 2012; Abernethy et al. 2013). The trade amount of pangolin scales was estimated to be in tons, which equals the number of thousands of pangolins (Wu & Ma 2007; Challender & Hywood 2012; Challender et al. 2015; Aisher 2016). Rural tribal people inhabiting in and around the protected area use wild meat and body parts of animals as essential sources of food, medicine, socio-cultural belief, and cash income (Altrichter 2006; Fa & Brown 2009; Challender et al. 2012; Mohapatra et al. 2015; Ingram et al. 2018; Yang et al. 2018; Xing et al. 2020; Sexton et al. 2021). This is especially true for local communities in remote areas, who often depend on natural forest resources for their livelihood. Pangolins are illegally traded in Asia, including Chinese Pangolins (McMurray 2009). Before 1990, the quantity of pangolin consumed for meat, scales, and medicine purposes was relatively small and limited to domestic uses (Van et al. 2009). But, after the early 1990s, the illegal trade of Chinese Pangolin was boosted due to increased demand for meat (Heinrich et al. 2016; Cheng et al. 2017; Zhang et al. 2017; Sharma et al. 2020). In the region of southern and southeastern Asia, the demand for pangolin scales and meat for medical attention has pressured the pangolin populations to decline almost to the level of extinction (Aisher 2016).

The scales of pangolins (around 110- to 150-thousand per year) are used in traditional Chinese medicines (Wu & Ma 2007; Pantel & Chin 2009; Challender et al. 2015; Nash et al. 2016; Trageser et al. 2017) as well in clinical medicines (Wu & Ma 2007). Both meat and scales are used for treatment of various ailments (Challender 2011; Katuwal et al. 2013; Mohapatra et al. 2015; Aisher 2016; Xu et al. 2016). In India, it was not a surprise that people utilized pangolin parts and had traditional superstitious beliefs because of the relation between pangolin and the local community (Mohapatra et al. 2015; D'Cruze et al. 2018). Across the northeastern part of India, traditional remedies associated with ethno-zoological practices are linked to wild animals and their body parts, which are imbedded for generations in some local cultural practices (Solanki et al. 2005; Chutia 2006; Parbo et al. 2023). Katuwal et al. (2013) had reported the use of pangolin scales in treating communicable diseases in children. Similarly, various societal beliefs are also reported about the scales of Chinese Pangolins, such as cure in vomiting, protecting wood properties from termites, lucky charm, and magical power (Nash et al. 2016; D'Cruze et al. 2018). In contrast, the sighting of a Chinese Pangolin during the day is reported as a sign of an unlucky or bad omen (Nash et al. 2016). The skin and scales of Chinese Pangolin were used in the making of garland, jewelry, rings, bags, purses, and musical instruments (Katuwal et al. 2013; D'Cruze et al. 2018). Pangolin derivatives were used as an item in religious ceremonies and for decorative purposes (Mahmood et al. 2012; Mohapatra et al. 2015).

Earlier, eight species of pangolins were reported (Challender et al. 2012; Bao et al. 2013; Katuwal et al. 2013; Bhandari & Chalise 2014; Trageser et al. 2017; Yang et al. 2018), of which four species were from Asian countries (Challender et al. 2012; Mahmood et al. 2012; Nijman 2016; Trageser et al. 2017). In recent years, two new species of pangolins were added namely Asian Mysterious Pangolin *Manis mysteria* and Indo-Burmese Pangolin *Manis indoburmanica* from the Asian continent (Gu et al. 2023; Wangmo et al. 2025). These two additions makes six species of pangolins in Asia and total 10 species of pangolins globally. In India, two species of pangolins, namely Indian Pangolin *Manis crassicaudata* and Chinese Pangolin *Manis pentadactyla* are reported (Mohapatra et al. 2015; D'Cruze et al. 2018). The Indian Pangolin is distributed all over India (Mohapatra et al. 2015), while the Chinese Pangolin is restricted to the northeastern states (Mohapatra et al. 2015). The global distribution of Chinese Pangolin is reported in Bangladesh, Bhutan, Nepal, Myanmar, China, Lao PDR, Taiwan, Thailand, Vietnam, and India (Srinivasulu & Srinivasulu 2004; Shrestha 2005; Katuwal et al. 2013; Challender et al. 2015; Mohapatra et al. 2015; Sharma et al. 2020).

Pangolins (Pholidota: Manidae) are one of many animal groups used for ethnozoological purposes, and they are globally threatened with local extinction in many areas in its distribution range due to numerous anthropogenic threats (Wu et al. 2004; Liou 2006; Yang et al. 2007; Bhandari & Chalise 2014; Nijman et al. 2016). Conservation status of Chinese Pangolin is reviewed in 2019 by IUCN Red List of Threatened Species and listed the species as 'Critically Endangered' under criteria A3d+4d (Challender et al. 2019). Chinese Pangolin is also

listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) since 2017 (Challender & O'Criodain 2020) and Schedule I species under Indian Wildlife (Protection) Act, 1972 (Mohapatra et al. 2015). In order to draw attention to its current conservation concerns facing the species, we planned to investigate how communities living in and around the Yangoupokpi Lokchao Wildlife Sanctuary (YLWS), Manipur, India, perceive and use Chinese Pangolins. Our research is based on local people's understanding on the significance and utility of this species. In particular, the responses of various communities were emphasized according to their patterns of use, which could be helpful in creating conservation policies that are more equitable and successful.

MATERIALS AND METHODS

Study area: Yangoupokpi Lokchao Wildlife Sanctuary (YLWS)

Yangoupokpi Lokchao Wildlife Sanctuary is located within the Tengnoupal District of Manipur, covering an area of 184.80 km^2. The sanctuary was established in 1989 in the Chandel District and is now in Tengnoupal District after bifurcating from Chandel in 2016. It lies on the border between Burma (Myanmar) and Manipur, which is also a part of the Indo-Malayan biodiversity hotspot. The important town of Moreh, which is a commercial town located on the border of India and Myanmar, is also a part of the sanctuary, and trade occurs between the two countries, i.e., India and Myanmar. The temperature recorded in January goes down to 4°C, and in June it reaches up to 40°C, with varying humidity fluctuating from 35% in winter to 80% in monsoon season. The annual average temperature recorded was 24.3 °C, and the average rainfall measure around 2,263 mm annually (Bungnamei & Saikia 2020). The sanctuary is home to various flora and fauna due to the convergence of Indo-Malayan biodiversity hotspots. Four types of forest are found in the sanctuary: tropical semi-evergreen forest, scrub forest, sub-tropical pine forest, and moist bamboo brakes. Some of the important floral species found in the sanctuary are *Tectona grandis*, *Dipterocarpus turbinatus*, *Terminalia tomentosa*, *Gmelina arborea*, *Bauhinia* spp., *Daubanga sonnoroedes*, bamboo, and orchid species. This sanctuary also nurtures a diverse group of wildlife resources, starting with birds, mammals, reptiles & amphibians, fishes, and insects. A total of 40 species of mammals, 65 species of birds, 27 species of reptiles, six species of amphibians, and 65 species of fish were recorded from the sanctuary (Bungnamei & Saikia 2020). Some of the important wildlife found in the sanctuary includes Leopard *Panthera pardus*, Jungle Cat *Felis chaus*, Asian Grey Mongoose *Urva edwardsii*, Sāmbhar Deer *Rusa unicolor*, Wild Boar *Sus scrofa*, Red Serow *Capricornis rubidus*, Capped Langur *Trachypithecus pileatus*, Stump-tailed Macaque *Macaca arctoides*, Western Hoolock Gibbon *Hoolock hoolock*, Porcupine *Hystrix brachyura*, Chinese Pangolins *Manis pentadactyla*, Tokay Gecko *Gekko gecko*, Burmese Python *Python bivittatus*, Indian Monitor Lizard *Varanus bengalensis*, King Cobra *Ophiophagus hannah*, Common Krait *Bungarus caeruleus*, Great Indian Hornbill *Buceros bicornis*, Rose-ring Parakeet *Psittacula krameria*, Red Jungle Fowl *Gallus gallus*, Blyth's Tragopan *Tragopan blythii*, Burmese Peafowl *Pavo muticus* (Sunil 2016).

Data collection and methods

The study area was surveyed with a structured open and closed questionnaire between October 2019 and December 2023. The respondents were selected using a snowball sampling technique based on their experiences with wildlife, particularly the Chinese Pangolin. Later on, the questionnaire survey was conducted by taking prior appointments from the selected respondents from nine established villages around the YLWS (Table 1). These nine villages were represented by three communities, namely Naga Maring, Meitei, and Kuki. The questionnaire sheet comprised mainly of the following questions: (i) name, (ii) age, (iii) gender, (iv) occupation, (v) hunting reason, (vi) hunting method, (vii) trade, (viii) use pattern, and (ix) conservation issues or threats (Babbie 2013). The individuals were not asked direct questions; instead, an interactive communication approach was used.

. The conversation was conducted in Manipuri, with a translator assisting in communicating a local Kuki dialect. This was then immediately translated into English and written down on data sheets.

RESULTS

Respondents' Socio-Demographic Characteristics

In the present study, we interviewed 71 respondents who were basically traditional male hunters. The age of respondents ranged between 36–65 years, with a mean age of 52.3 ± 5.80 years. Majority (65%) of the respondent's age ranged between 46–55 years (Figure 2a). Furthermore, most respondents had lived in the area since their birth. Most of the selected respondents were

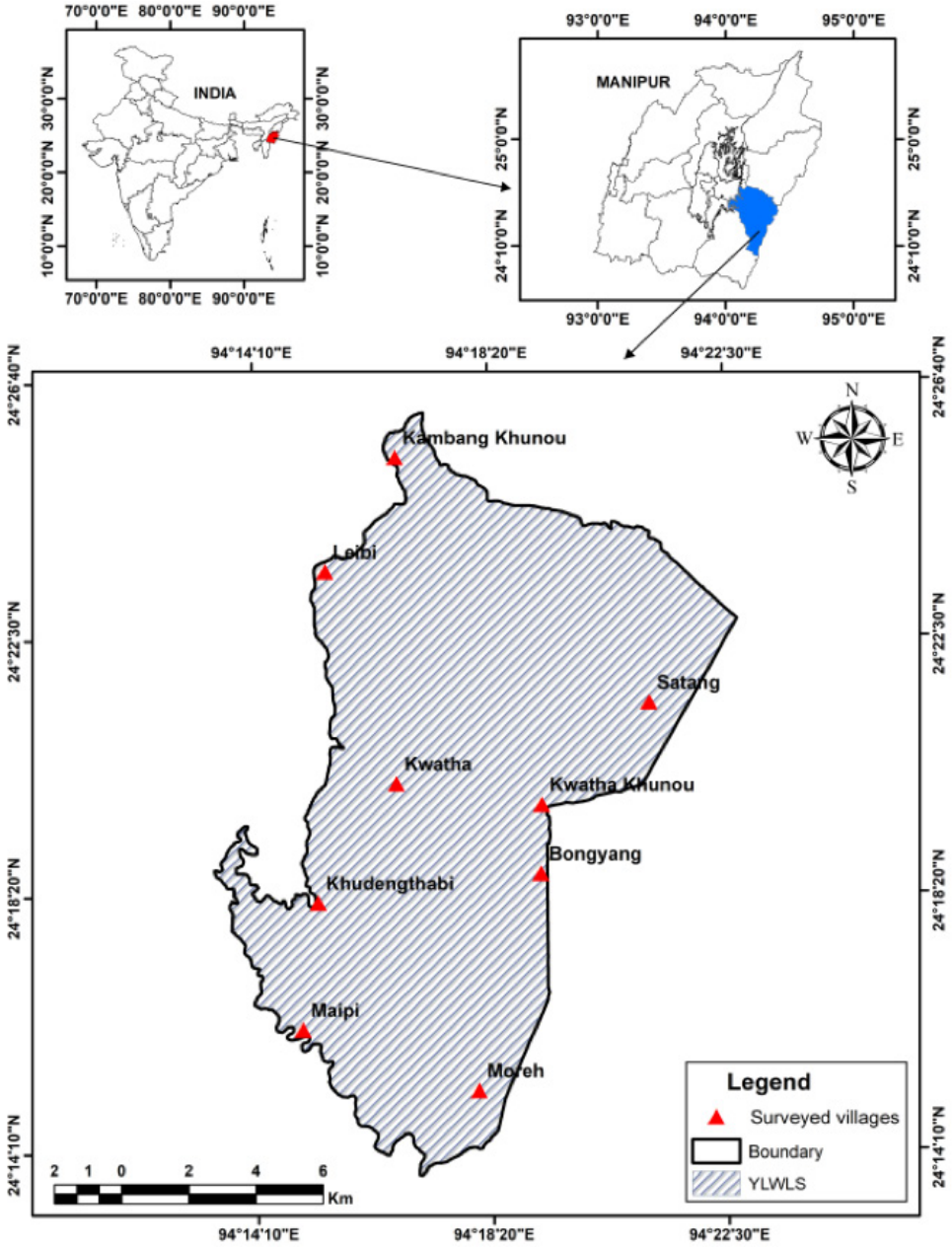

Figure 1. Map of the Yangoupokpi Lokchao Wildlife Sanctuary along with locations of surveyed villages.

uneducated (37%), followed by those having education up to class 10 (31%), class 12 (18%), and less than class 8 was 14% (Figure 2b). Most of the respondents were involved in hunting and poaching activities of wildlife in the past, but nowadays only a few (15%) are still active in hunting and poaching of Chinese Pangolin opportunistically or only if there is demand for scale or whole animal.

Hunting methods and reasons

The findings showed that, in addition to dogs, the most common weapons used for hunting and poaching were spades, teiyon, spears, rifles, and traps. According to the respondents' opinions, the noose trap was the most widely used method (68%) for Chinese pangolin hunting and poaching, followed by the spear (46%), the gun (38%), the spade, and teiyon (41%) each, and the least popular method was the use of dogs 23% (Figure 3). The respondents categorized the motives for hunting and poaching of Chinese Pangolins into three groups: meat, scales, and whole animal. Seven percent of the 61% of hunters who go pangolin hunting also target and

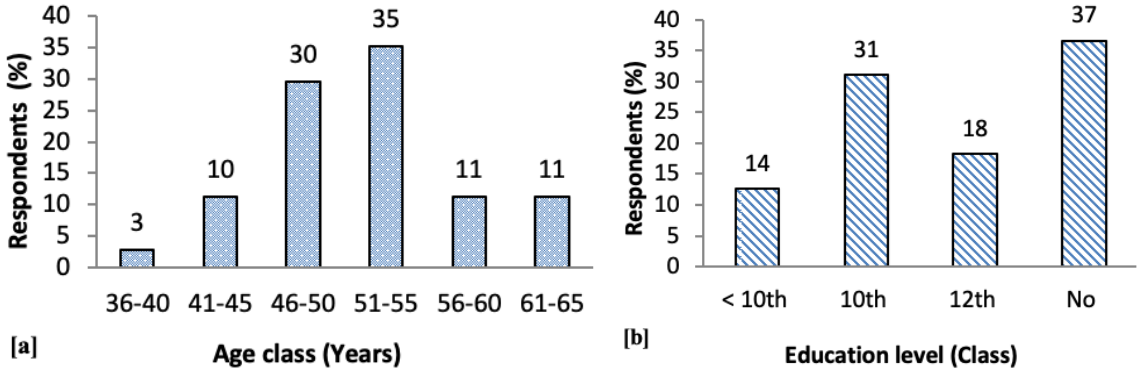

Figure 2a&b. Descriptive profile of survey respondents in study area.

Table 1. Number of respondents, their gender, and community selected for interview and questionnaire survey from villages established in and around Yangoupokpi Lokchao Wildlife Sanctuary, Manipur.

	Name of villages	No. of respondents	Gender	Community
1.	Moreh	15	M	Mixture of communities
2.	Kwatha	7	M	Meitei
3.	Kwatha khunou	5	M	Meitei
4.	Khambang Khunou	12	M	Maring Naga
5.	Leibi	10	M	Maring Naga
6.	Satang	7	M	Maring Naga
7.	Maipi	5	M	Kuki
8.	Khudengthabi	5	M	Kuki
9.	B. Bongjang	5	M	Kuki

sell entire pangolins based on middlemen's demands. All respondents (100%) said that the Chinese Pangolin is hunted for its flesh, which is perceived to be extremely tasty (Choudhary et al. 2018).

It was found that most respondents (84%) had hunted pangolin either for bushmeat or to sell for cash income, with 7% hunting them when a middleman offered advance money for the species. During the survey, only in four incidents, the sale of live pangolins were recorded with prices ranging from Rs. 15,000 per animal in 2014 to Rs. 25,000 in 2019, prior to the COVID-19 pandemic. According to respondents, the Chinese Pangolin hunting and poaching have decreased in the present research area due to difficulties in spotting the species, possibly as a result of historical overhunting, declining forest cover, and changes in land use patterns. In addition, many respondents stated that other factors contributing to decline in hunting in the area included the migration of residents to towns for employment or settlement, as well as increased education and awareness of wildlife

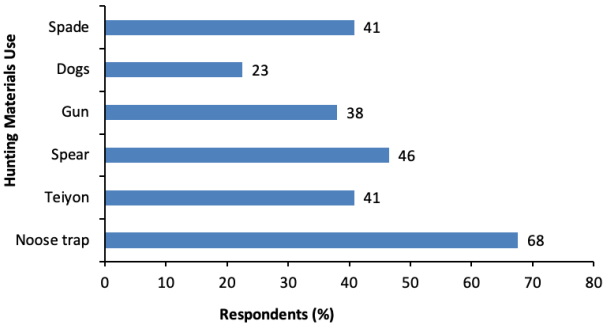

Figure 3. Hunting methods used for Chinese Pangolin in the study area.

and wildlife laws.

Price of scales

The correlation analysis of price and scale shows 0.873, which is significant at the 0.01 level. This suggests that as the year went on, the price of scales also increased. According to an elderly respondent, in the early 1980s, he used to sell pangolin scales for Rs. 400/kg. In the mid- and late-1990s, the cost of Chinese pangolin's scale grew significantly at the rate of average price per kg from Rs. 7,000–Rs. 8,000. According to the current analysis, the peak average price of pangolin scale selling was Rs. 23,000/kg before the Covid-19 epidemic (Figure 4). But, immediately after the COVID-19 pandemic, people were willing to sell pangolin's scale at the rate of Rs. 3000 to Rs. 5000 per kg. Despite this, no purchasers appeared due to the upheaval in Manipur and Myanmar.

Medicinal Uses

Chinese pangolins were generally used in Manipur, especially in the current study area, to treat a variety of ailments. The highest medicinal uses of body parts of Chinese Pangolin were in treatment of piles (29%) followed by asthma (18%), throat pain (14%), allergy

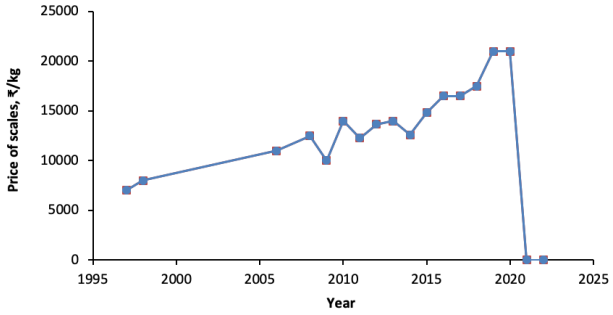

Figure 4. Average price of pangolin scale reported by respondents of study area.

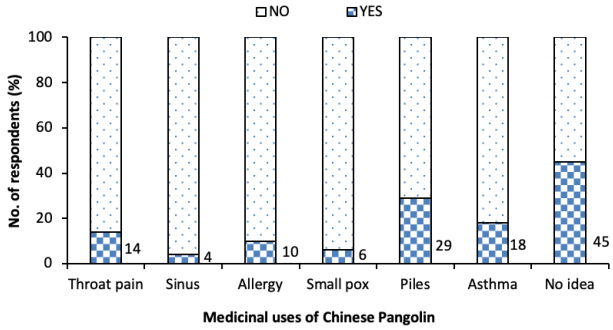

Figure 5. Respondents' knowledge on traditional medicinal uses of Chinese Pangolin.

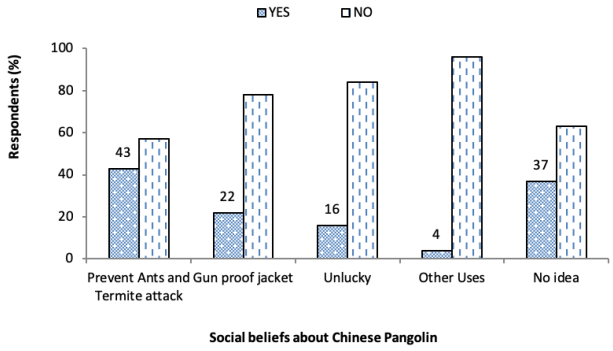

Figure 6. Respondent's knowledge on social beliefs about Chinese Pangolin.

(10%), Smallpox (6%), and the lowest use was in curing sinus (4%) while majority of hunters (45%) are unaware of the traditional medicinal uses of Chinese Pangolin (Figure 5).

Social Beliefs and other Uses

The understanding of medicinal uses is significantly impacted by age (p = —0.041), as observed by the odd ratio and confidence interval (OR = 3.25; 95% CI:1.02–10.40). The relationship between age and the mode of medicinal uses was also shown to be significant (p = 0.045) (OR = 4.0; CI:0.96–16.61). The current occupation and knowledge of medicinal uses did not significantly correlate (p = 0.097) (OR = 0.37; CI:0.11–1.28). For the modalities of uses knowledge, the influence of profession is significant (p = 0.003) (OR = 0.11; CI:0.02–0.5). Data presented in Table 2 maintains a significance threshold of 0.05. There was no significant (p = 0.054) relationship observed with current occupation (OR = 1.13; CI:0.35–3.71) while there was a significant (p = 0.006) correlation with social views and age (OR = 5.34; CI:1.57–18.11) (Table 2).In order to prevent termites and ants from destroying their wooden and bamboo homes, the majority of respondents (43%) said they buried pangolin scales beneath the main pillar (Figure 6). Twenty-two percent of the respondents claimed that they used to stitch pangolin scales into clothing, believing it would protect against bullet from traditional weapons, although this belief is no longer relevant. The respondents who believe in seeing pangolin as unlucky were 16%, and 4% of respondents believe other uses like keeping pangolin scale on chest of milking baby during sleep stops excess saliva drops from mouth. A total of 37% respondents reported that they have no idea about social belief since they do not practice it in their society (Figure 6). Figure 7 depicts the Chinese Pangolin's community-wise use pattern, which reveals that the three groups solely shared the use of scales to keep out ants and termites from wooden and bamboo made houses.

DISCUSSION

The average age of respondents who participated in the survey was 52.3 ± 5.80 years, ranging from 36 years to 65 years with most comparable to the research findings reported by Phuyal et al. (2023). Additionally, respondents stated that there has been a decreased trend in Chinese Pangolin hunting and poaching compared to previous years in the present study area. It is recorded that younger generations said to be leaving their villages for cities and towns to pursue higher education, better careers and livelihood that provide a steady income as opposed to occasionally making money from hunting and selling wild animals as well as increased wildlife awareness and strict implementation of wildlife laws and policies in the state. As a result, Chinese Pangolin hunting and poaching have declined in the study villages. Besides these, there could be some other factors for declining the Chinese Pangolin's

Table 2. Respondents' opinions on knowledge of social belief and medicinal uses.

	Social belief		Medicinal uses		Modes of uses	
	OR (95% CI)	*p*-Value	OR (95% CI)	*p*-Value	OR (95% CI)	*p*- Value
Age	5.34 (1.57–18.11)	0.006	3.25(1.02–10.40)	0.041	4.0 ((0.96–16.61)	0.045
Present occupation	1.13 (0.35–3.71)	0.54	0.37 (0.11–1.28)	0.097	0.11(0.02–0.5)	0.003

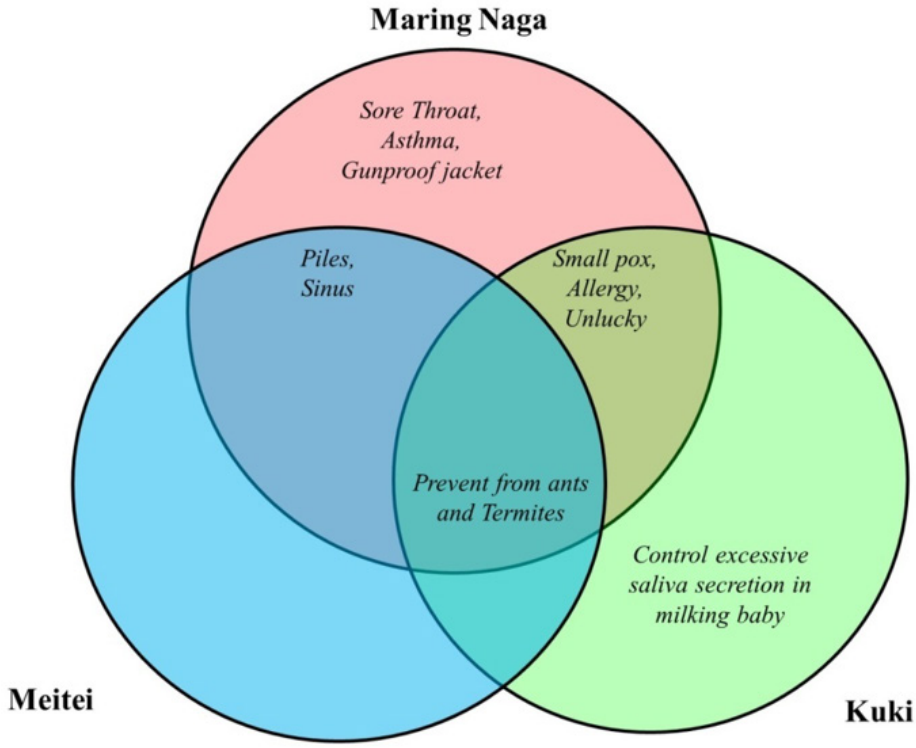

Figure 7. Community-wise uses of Chinese Pangolin in the study area.

hunting, viz., decreasing quality and quantity of forest cover or the habitat of species, changes in land use and cover patterns, and possibly historical overhunting or low population density. These factors might be making it more difficult to spot or locate the species, which would further discourage hunting.

The results of the present study (Figure 3) showed that the noose trap was the most often used method for hunting and poaching Chinese Pangolins, which was corroborated by the results of several studies (Newton et al. 2008). Similarly, Aisher (2016) reported that Nyishi hunters in Arunachal Pradesh also used the same trapping method to hunt Chinese Pangolins. In contrast, just one respondent was reported in the study area utilizing a trap and digging out from a burrow to hunt Chinese Pangolins, which can be corroborated by other studies (Newton et al. 2008; Nash et al. 2016; Katuwal et al. 2017; Zhang et al. 2017). Additionally, the present study recorded the use of trained dogs in Chinese Pangolin hunting. Similar observation was also reported by Archer et al. (2021). Although it was said that the usage of firearms for hunting had decreased following the early 1990s ban on private firearms (Sterling et al. 2006), most hunters at the present study area continue to use firearms to hunt various animals, including Chinese Pangolins. Numerous studies have also documented the usage of firearms for pangolin hunting (Friant et al. 2015; Mambeya et al. 2018). The shovel, spear, and 'Teiyon' (traditional digging tools) used for pangolin hunting in the past were also documented in this study and were not found to have been mentioned in other studies. Respondents also mentioned that because pangolin sightings are rare these days, they mostly concentrate on capturing whenever a new tunnel or other evidence of a pangolin's presence is discovered, as they believe it to be much simpler and more successful (Figure 3). Most

Table 3. Utilization pattern of Chinese Pangolin reported from the present and other studies.

Categories	Reported in the present study	Reported in other studies	Sources
Used in treatment of diseases	Piles	Piles	Mohapatra et al. 2015; D'Cruze et al. 2018
	Sinus	-	-
	Sore throat	Sore throat	Nash 2016
	Asthma	Asthma	Kaspal 2009; Boakye et al. 2015; Maurice et al. 2019; Mouafo et al. 2021; Sexton et al. 2021
	Small pox	Small pox	Sexton et al. 2021
	Allergy	Allergy	Sopyan 2009; Sexton et al. 2021
Used in social belief	Prevent from termites and ants in wooden house	Prevent from termites and ants in wooden house	D'Cruze et al. 2018
	Gun proof jacket	Gun proof jacket	Soewu & Ayodele 2009; Mouafo et al. 2021
	Unlucky	Unlucky	Katuwal et al. 2013; Khatiwada 2016; Nash et al. 2016; D'Cruze et al. 2018; Mouafo et al. 2021
Others uses	Controls excessive saliva secretion in milking baby while sleeping)	-	-

respondents had previously engaged in wildlife hunting and poaching, but today very few continue to hunt and poach Chinese Pangolins opportunistically or only when the demand for a large or entire animal exists.

Mouafo et al. (2021) reported in their finding that the majority of the hunters' aim for hunting pangolin was income generation in contrast to the present study where domestic consumption of meat was the primary reason for hunting pangolin. Pangolin meat is widely consumed locally and is thought to be among the best meats (Choudhary et al. 2018). A number of studies have revealed that people sold the meat to make money, but only a small number of them hold the opinion that people who can afford to eat pangolin meat come from higher social classes, have pride in their culture, and become unique individuals (Nasi et al. 2011; Mohapatra et al. 2015; Ichikawa et al. 2016; Archer et al. 2021). Shepherd (2009) noted that middlemen frequently make village visits, and Chinese Pangolin buyers and sellers get together at a hidden location. According to D'Cruze et al. (2018), hunters typically travel to cities to hunt for potential customers of pangolin scales. The current study revealed that the vendor purposefully avoided travelling to another town or village in search of a buyer, instead gathering information indirectly from reliable sources ahead of time for the sale of pangolins. Rather than engaging in open trade in the village or local market, they set up a rendezvous in a designated hidden location.

Several studies revealed that pangolins were stolen for their scales, which are thought to be connected to traditional Chinese and Vietnamese remedies (D'Cruze et al. 2018; Sexton et al. 2021). Giant Pangolin scales were said to be used in times of conflict since people traditionally believed them to be bulletproof (Mouafo et al. 2021). A similar observation made in the current study is on the use of Chinese Pangolin scales to make a bulletproof garment that was utilized in Manipur during the 1992 Naga-Kuki war (Butalia 2008). The cost of pangolin scales is estimated to range from $100–120 per kg in international trade (Challender et al. 2015). In Dima Hasao, the average cost of scale is Rs. 17,000 per kg according to D'Cruze et al. (2018) which is in line with the present study. Chinlampianga et al. (2013) reported a rise in scale prices in Mizoram between 1996 and 2012, from Rs. 1,000 per kg to Rs. 13,000 per kg. Wu et al. (2007) reported that the price of scales in China increased between the 1980s and 2000s, going from RMB (Renminbi) 8–12 in the early 1980s to RMB 420–450 in the early 2000s. In contrast, the current study reports that Chinese Pangolin scales sold for Rs. 800/kg in the late 1980s and as high as Rs. 23,000/kg by 2020. As proposed by Thapa et al. (2014) the price of pangolin scales varies not only between villages and individuals but also between sizes, with adult pangolin scales being preferred over younger ones. This variation in scale prices is also dependent on the level of knowledge about the value of the pangolin scales in the illegal trade market. According to Newton et al. (2008), respondents claimed that all pangolins that are caught are now sold to traders; however, the current investigation observed that the alive or whole body of pangolins are only sold when customers specifically request them.

Table 3 summarizes the utilization pattern of Chinese Pangolins from both the current study and previous research. According to earlier research, there

Image 1. Interaction with respondents and Chinese Pangolin's scales and cooked meat: a—interaction with respondent | b—cooked meat of Chinese Pangolin | c—old pangolin scale | d—fresh pangolin scale. © Yengkhom Roamer Zest.

is a generational transfer of information regarding the traditional medicinal usage of pangolins in therapeutic practices, viz., kidney stones, asthma, dermatological issues, and tuberculosis (D'Cruze et al. 2018; Mouafo et al. 2021). According to Chinlampianga et al. (2013) and Mohapatra et al. (2015), bile is used to treat splenomegaly, or spleen enlargement, however a study participant claimed that bile is also used to treat smallpox in youngsters. According to Nash et al. (2016), some hunters claimed that Chinese pangolin parts could be used to treat sore throats. They also reported that scales and bile were used in traditional medicine, which is consistent with the results of the current study, which show that scales are typically used in treatment, with bile being used in a small number of cases (Table 3).

In contrast to the current study, which has no accounts of this concept, some investigations have suggested that pangolin scales are worn as rings to ward off evil spirits. A few people claimed that termites could be warded off with scale (D'Cruze et al. 2018). The results of the current survey indicated that pangolin scales were used to keep ants & termites away from the bamboo & wooden materials used to build houses. According to several studies (Nash et al. 2016; D'Cruze et al. 2018; Mouafo et al. 2021), seeing a pangolin is said to be unfortunate. In contrast, sighting a pangolin once a year was reported as fortunate in the Philippines (Archer et al. 2021). According to the current study, seeing a Chinese Pangolin was once thought to bring bad luck, but this belief has since faded. But, Sharma et al. (2020) state that seeing a pangolin is only unlucky if a living one is slain or a dead one is spotted. Conversely, pangolin parts were used as a means of driving away ill luck (Ingram et al. 2018). Thus, use pattern of pangolins and its body parts varied place to place in their distribution range.

CONCLUSIONS

From the present study it is concluded that only male local peoples belonging to an average age of 52 years old were mostly involved in hunting and poaching of Chinese Pangolin in the area. Most respondents had previously got engaged in wildlife hunting and poaching, but today a very few continue to hunt and poach Chinese Pangolins opportunistically or only when the demand for a large or entire animal exists. As anticipated, similar to certain previous research (Mohapatra et al. 2015; D'Cruze et al. 2018; Xing et al. 2020), the investigation also looked into the applications of Chinese Pangolin in meat, traditional medicine, and in social beliefs. The present study also revealed two novel findings that had not been reported in previous studies: the treatment of sinuses and the excessive control of saliva in nursing babies by using the scales. Using scales to keep out ants and termites was one feature that all the communities had in common in the study area. Although some respondents may not have been aware, the Chinese Pangolins are highly sensitive and trafficked animals (Challender et al. 2015; Nash et al. 2016). The average price shows an increasing trend through 2020, right before the Covid-19 outbreak. Respondents said that the pangolin trade had abruptly decreased, presumably as a result of intermediaries' restrictions, and that traders were endangered because of political upheaval in Manipur and Myanmar.

Overall, the study suggests that a combination of social, economic, and environmental factors have contributed to a decline in the hunting and poaching of Chinese Pangolins in the study area. However, this species in Manipur, particularly population of YLWS is highly threatened and need urgent conservation and management approach, as globally it is a 'Critically Endangered' species. Therefore, further exploration of these trends could provide more insight into the long-term sustainability of these changes for species.

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