



A preliminary study of zoo therapy of Dimasa society of Dima-Hasao District, Assam

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India has diverse range of cultural affinities and also diverse numbers of indigenous communities which share a varied quantum of knowledge related to traditional practices. The present research aims to focus on zoo therapeutic knowledge and practices of the indigenous ethnic community of Dimasa in Dima-Hasao district. The study includes a preliminary survey stating animal usage and use of their by products to cure medical ailments. Data was collected through in person interviews based on a series of questionnaires. A total number of 16 species is used for the cure of 11 medical ailments for the use of zoo therapeutic practices. Conservation strategies and resource use managements of the species used by the ethnic community was studied for better use of species in resource management in the surrounding environment of the study area.

Keywords: Dimasa, Ethnozoology, Medical ailments, Zoo-therapeutic practices

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Animal and human beings mutually share co-dependencies with each other in every facet of dynamic relationships since the latter expanded in evolutionary means subjugating a co-dependent relationship with nature and animal kingdom itself. Since prehistoric era animals have been infused in utilitarian and optimal choices worldwide for various forms of human survival, medical relations, spirituality, intangible components and cultural relations. Hunting is one of the oldest interactive sessions that existed with the hominids and the animals, although it was purely based on predatory benefits and survival strategies but the dependency over animals for the food and other sustainable amenities cemented the first link between the two groups. These interactions provided the path towards fishing, drawing of animals and hunting activities as rock arts and subsequently leading to domestication^{1,2}. The amount of knowledge collected by the human communities over the animal is inherited over by the upcoming generations which were synthesized over oral traditions and exchange of those traditions between the communities³. Animals were also included in totemic and mythological symbols serving social and symbolic functions having more magnitude

than their dietary role. This varied subject matter focusing on the in depth relationship of human and animal and also stating facts on their interactions of past and present sphere is the fundamental approach of ethnozoology³. Ethnozoological studies have been taken up by academic proliferation for increased conduits on conservation biology, sustainable management of wildlife resources and also to focus on the areas of accumulating zoological knowledge which would be viable for academics and understanding of the environment¹.

Apart from using animals as food and religious purposes they are also used as disseminators and sentinel of human health that have sustained the links between human and animal since the evolution of human race¹. Zoo therapy is a component of ethnozoology which stands out for alternative medical treatments by traditional use of medicine worldwide. Zoo therapy is defined as the use of animals and animal based products for treatment of human ailments and diseases. Many traditional societies use animals and their organs for healing purposes and medicinal qualities as availing to modern medicines are out of their reach⁴. As per WHO (World Health Organization) about 60-90% of the world population relies on the zoo therapeutic needs and medicines obtained by traditional processes¹. Traditional

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medicinal systems often employ wild and domestic animals and their by-products as zoo therapeutic knowledge^{4,5}. This practice also tends to maximize their influence in the faunas which are found locally and in turn depletion of various species in the ecosystem and niches are characterized by zoo therapeutic activities^{3,4}.

Biodiversity is the source for therapy among different cultures around the globe⁶. India has a quantum amount of faunal and floral diversity along with cultural diversity which are linked with indigenous ethnic communities who are dependent on traditional knowledge of medicines for their healthcare⁷. In Indian context about 15-20% of *ayurvedic* medicines come from the source of faunal derived products and animals⁸. There is a certain lack of ethnozoological documentation of practices taken up by the indigenous peoples in the country. The traditional medicine records in India have modestly focused on herbology and plant derived medicines by ethnic communities⁶.

Ethnozoological documentation and exploration is necessary means for new discoveries in the medical field^{1,6}. These explorations and documentation on ethnic communities opens up a platform for intermixing of diverse culture groups and also accepting new methods in their livelihood. There is grave need in documenting and study of zoo-therapeutic methods within ethnozoological studies of indigenous peoples prior to the effects of modernization on them⁷.

Recent studies on North East Indian traditional knowledge of medicines based on animals are subsequently less due to lack of written records. As per the census record of 2011 there are around 200 indigenous ethnic communities in the North Eastern part of India⁸. These indigenous people are dependent on traditional medicine and this particular knowledge of traditional medicines and methods widely accessible to the communities⁹. They also vary from one community to another, geographical features etc. *Garasia* ethnic communities rely on traditional knowledge that they have gained from parental heritage and use the medicinal value of animals to heal themselves. The study also focuses on the conservation of animals in the area. They use 24 different species of animals for their medicinal values¹⁰. The state of Gujarat have identified 34 animals and bird species used in primary health care⁷. Chhattisgarh also accounts of indigenous usage of for

500 insects¹¹. Several traditional ecological practices are also seen in Orissa comprising of 13 animal species in 7 different tribes¹². *Nyishi* tribes of Arunachal Pradesh are also in zoo therapy practices using 36 vertebrate species for ailments¹³. *Karbis* are important ethnic tribes of Assam considered to be migrated from Myanmar and have distinct culture and traditions. Survey reveals that 14 animal species are used for medicinal purposes to cure 27 different ailments present in Karbis¹⁴. Assam also holds records of traditional usage of 44 species of animals to treat 40 different ailments. These 44 species comprise both vertebrates (25 species) and invertebrates (19 species). The most common zoo-therapeutic animals are from the domestic clan. These findings demonstrate the importance of local fauna, folk medicinal usage. The study concluded in documenting treatment of asthma, pneumonia, cancer, fever, piles, gastric, diabetes, snake bites, etc⁸. *Galos* are inhabitants of the west and east *Siahang* district of Arunachal Pradesh and have a rich knowledge of ethnozoology. Their knowledge of edible insects is very prominent and helps them with the needs of nutrients, fats, and proteins. Their data reveals that a total of 12 species of edible insects are used to treat medical ailments and for food as well¹⁵. The use of animals for traditional medicinal purposes is a relevant matter in conservation biology. India with rich variation in biology and biodiversity produces a rich quantum of knowledge about the inclusion of animal and animal related products in various field of subsistence such as healthcare. constitutes highly knowledgeable about animals and animal products used in healthcare.

The objective of the study is to record the therapeutic practices of the *Dimasa* ethnic community that are being obtained from wild and domestic animals for their sustenance for medical attention. The impact of these practices on the local faunal population will also be taken into consideration.

Methodology

Study area

The study focuses on zoo therapeutic knowledge of *Dimasa* ethnic community based on the village of *Longmailai* (25°24'28.20"N 93°03'60.00"E), *Hojai dobongling* (25°21'33"N 92°57'10"E) and *Taimodling* (25°22'24.60"N 92°58'27.60"E) in the district Dima-Hasao, Assam as shown in (Fig. 1). The physical surroundings of the district are bordered by Karbi

Anglong and Hojai district, the Naga Hills in the north; in the east by Naga Hills and the state of Manipur; on the south by the Lushai Hills district (Mizoram). Dima-Hasao district is home to various ethnic communities of India amongst them *Dimasa* is one such community. The villages of the tribal communities are located deep in the forests and on the slopes of the hills which make their reliability on modern day communication and dependency on medical needs and commercialization very limited¹⁶.

The *Dimasa* ethnic community is part of indo-mongoloid ancestry and is regarded as one of the

earliest inhabitants of the Brahmaputra valley. The name of the *Dimasa* community is arrived from the river they have based their life around. The word "*Dimasa*" stands for children; culminating into the "*children of the big river*"¹⁷. The main stay of the villagers is of *jhum* cultivation and hunting which is also a part of their subsistence needs. This tribe has close affiliation with forest derived products and animals. They share a major dependency of their lifestyle to wild and domestic fauna leading them to harness medicinal gains out of wild and domesticate animals according to their medical needs.

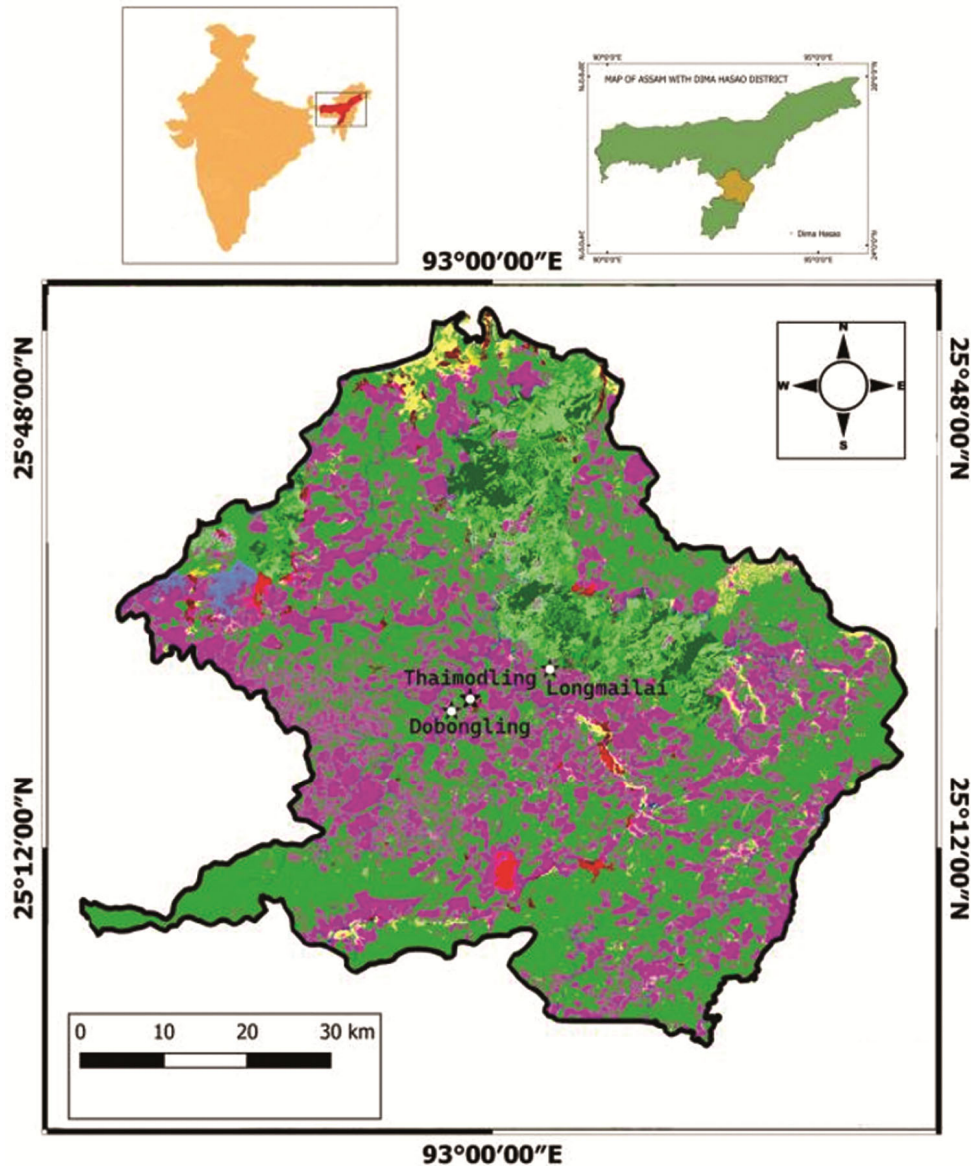


Fig. 1 — Map of Dima-Hasao showing forest cover (Source: Bio Author) (QGIS 3.28.11 'Firenze'; NRSC (2020), Land Use / Land Cover database on 1:50,000 scale, 2015-2016. National Remote Sensing Centre, ISRO, Hyderabad)

The dependence on traditional zoo therapeutic practices over the use of medicines is due to its low income consumption, local availability and retaining of cultural heritage by the ethnic communities⁴.

Data collection

Field work was done through in-person interview with set of questionnaires related to zoo therapeutic measures adopted by them. The members of each village were gathered under one roof preferably the village headman and questions were asked about therapeutic knowledge. Photos of different species of animals, birds, reptiles were shown to the villagers to bridge the communication gap for the identification of species. Pictures of animals, reptiles, birds were selected found near the vicinity of the three villages. A written consent was also taken from the village headman for the data recording process. The data collected from the individuals were subjected to written consent (PIC) from the village headman and the villagers commonly known as the “*gaon-bura*”. The data collected from the fieldwork was quantified and non-parametric statistics were applied to the tabulation data for better synthesis of the relationships between the villagers and the faunal resources.

Materials and Methods

Data analyses were done on the basis of field work as the selections of individuals for the interview were clearly random. The participation of male participants was more than that of female participants and both the groups shared resources and information which helped in recording the zoo-therapeutic practices. The frequency samples were purely based on random selection of individuals depending on the accessibility of the villagers (Table 1). The demographic characters were based on two groups, the first group comprised of the age group of the individuals dividing them over class intervals and the second group being the gender disparity between the participants.

Table 1 — Demographic characteristics of the informants

Age group of informants	Frequency
children - 20 years	0
20- 40 years age	17
40-60 years age	10
60 + and above	6
Total	33
Gender	Frequency
Male	27
Female	6
Total	33

The data collected was in qualitative form which was converted into quantitative data for deriving out statistical analysis. As the data was non-parametric Karl Pearson correlation was applied. Correlation is used to understand the relationship between two variables sets and how much they are linked with each other which would assess in interpretation of those variables assisting the research. The relationships can be of three types namely is positives, negative or 0 relation correlation.

The formula of Karl Pearson correlation is

$$r = \frac{\sum(x - \bar{X})(y - \bar{Y})}{\sqrt{(x - \bar{X})^2} \sqrt{(y - \bar{Y})^2}}$$

Where \bar{X} is the mean of x (n) no of variables in variable set 1 (x), \bar{Y} is the mean of y (n) no of variables in variable set 2 (y).

The animals used for zoo therapeutic practices was also categorized based on the IUCN Red list 2020 to note the status of conservation of the wild animals used for zoo-therapeutic practices.

Results

The usage of animals for the zoo therapeutic practices differed on the raw material used for different diseases. The overall animal composition is of 10 mammals, 2 aves, 2 reptiles, 1 amphibian and 1 invertebrate to treat a total number of 11 medical ailments (Fig. 2). The medical ailments were grouped under various medical categories based on the body part they were affecting. The pain for tooth ache has been categorized under dental ailments, jaundice is categorized as stomach ailments, child birth, post-partum problems as gynecological ailments, heat

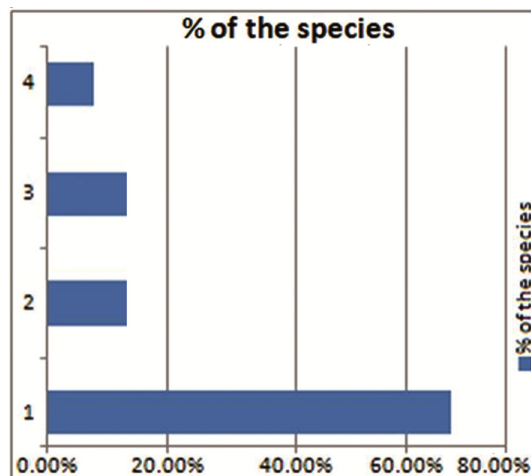


Fig. 2 — Number of species used in medical ailments

stroke as hypothermia, paralysis as neurological ailments, heartache as circulatory ailments, joints and bone pain as orthopedic ailments, muscle pains and cracked heels as physical ailments, tuberculosis as respiratory ailments. Wounds and cuts are not been categorized differently as they affect any random parts of the body parts therefore they are categorized under physical ailments.

The study reveals that the animals are either eaten for the necessary medical requirements or their body parts are processed in order to cure the ailments. Animals and their by-products are also used for cuts and wounds generally as first aids. The body hair of slow loris (*Nycticebus coucang/ bengalensis*) is applied to cuts and wounds and bandages. They are used as antiseptic alternatives for the wounds. Molar pains and dental ailments have remedies which are processed out of folk tales. It is believed by the *Dimasa* people that if anyone is suffering from molar toothache the person needs to apply monkey's hand on the cheek on alternative days to ease out the pain. The practice of this tradition is purely based on folk tale concepts with no scientific evidence.

Respiratory ailments

The cure for respiratory ailments are also processed from wild animals found in the close vicinity of the villages. Flesh of the fox is mixed with rice beer for the treatment of tuberculosis. As tuberculosis still poses a potential threat to people and for those who reside in interior parts of forest getting immediate medical attention is not a very viable option.

Gastric and gynecological ailments

Gastric disorders and stomach ache are the most common diseases that can affect one individual. These diseases also contain the most number of animals used for their treatment. The flesh of pangolin, black bear and porcupine is given to the people for the cure of stomach ache and gastric problems. The black bear is hunted mainly for food by the villagers and its meat also contains medicinal properties for the cure of stomach ache. The meat of black bear is also used for the cure of body aches and joint pains. Crab meat is also taken up by the villagers as a cure for jaundice. Its flesh is used for the treatment of stomach ache.

Gynecological ailments and their cure are still in a much diminished form in interior villages. At times of childbirth there is a danger to both the mother and child as age old practices are performed for the delivery process. If there is a problem in the delivery

procedure; the pancreas of the python is dipped in water and then that specific pancreatic water is given to the mother for a safe passage for the birth of the child. At times when there is mortality danger to the mother, the milk of the tiger is given to the newborn child. This practice of giving the milk of a tiger or leopard exists in folk tales and the efficiency of this practice hence cannot be gauged correctly.

Neurological ailments and hyperthermia

Disorders in nerves, paralysis and heat stroke are categorized under neurological ailments and hypothermia. The cures of these ailments according to traditional knowledge recorded are very few among the *Dimasa* ethnic community. The meat of sparrows is taken for the treatment of heat stroke which is also known as Hypothermia. The meat is swallowed at one go by the patient. The treatment of paralysis as recorded in the field work states that the meat of the tiger is taken by the patient. This tradition of medicinal practices is also recorded in folk tales.

Cardio-vascular ailments/ circulatory ailments

Cardio-vascular or circulatory ailments includes coronary heart diseases, high blood pressure known as hypertension or sudden cardiac arrests. These terms for the people of *Dimasa* were described as heartache and heart related ailments. The traditional cure of these ailments is warded off by eating porcupine flesh. The dosage of the meat and the medicine making was not clear as this flesh is taken directly with food.

Skin diseases and physical ailments

Physical ailments includes burns, cuts wounds, cracked heels, allergies related to skin, rashes etc where both wild and domestic animals are employed for these ailments. The flesh of Tokay gecko (*Gekko gecko*) (Table 2) is used for the treatment of skin rashes, allergies and skin diseases. Fats of python (*Python molurus*) are applied on cracked heels for speedy recovery. The flesh of an otter (*Lutrogale perspicillata*) is taken if a fish bone gets stuck on the throat. Deer (*Axis proconis/ Cervus unicolor*) meat is processed to make oils which are then applied to the body for the cure of bone and joint pains.

The religion point of view states that the three villages have followers of Hinduism and there were no disparity of other religion amongst them. Cows (*Bos indicus*), pigs (*Sus domesticus*), chickens (*Gallus gallus*), mainland serows (*Capricornis sumatraensis*) and porcupines (*Hystrix indica*) are taken as

Table 2 — Animals categorized under IUCN Red list

Serial Number	IUCN Status	Name of species	English Name
01	Neat threatened	<i>Python molurus</i> (Linn., 1758) /Pythonidae	Python
02	Least Concern	<i>Gekko gekko</i> (Linn. 1758) /Gekkonidae	Tokay Gecko
03	Neat threatened	unidentified*	Monkey*
04	Vulnerable	<i>Lutrogale perspicillata</i> (Geoffroy, 1826) /Mustelidae	Smooth coated otter
05	Least Concern	<i>Hystrix indica</i> (Kerr, 1792)/Hystricidae	Indian Crested Porcupine
06	Endangered	<i>Nycticebus coucang</i> (Boddaert, 1785) /Lorisidae	Slow Loris
07	Vulnerable	<i>Capricornis sumatraensis</i> (Bechstein, 1799) /Bovidae	Mainland Serow
08	Endangered	<i>Axis proconis</i> (Zimmermann, 1780, Cervidae)	Hog Deer
09	Vulnerable	<i>Cervus unicolor</i> (Kerr, 1792, Cervidae)	Sambar Deer
10	Least Concern	<i>Herpestes edwardsii</i> (E. Geoffroy, 1818, Herpestidae)	Mongoose
11	Data deficient	unidentified	Tortoise
12	Endangered	<i>Panthera tigris tigris</i> (Linnaeus, 1758, Felidae)	Royal Bengal Tiger*
13	Vulnerable	<i>Panthera pardus fusca</i> (Meyer, 1794, Felidae)	Leopard
14	Not Evaluated	<i>Gallus gallus</i> (Linnaeus, 1758, Phasianidae)	Chicken
15	Not Evaluated	<i>Sus domesticus</i> (Erxleben, 1777, Suidae)	Pig
16	Critically Endangered	<i>Sus scrofa cristatus</i> (Wagner, 1839, Suidae)	Wild Boar
17	Endangered	<i>Bubalus bubalis</i> (Linnaeus, 1758, Bovidae)	Buffalo
18	Vulnerable	<i>Bos gaurus</i> (Smith, 1827, Bovidae)	Gaur
19	Endangered	<i>Manis crassicaudata</i> (E. Geoffroy, 1803, Manidae)	Pangolin
20	Data deficient	<i>T. chrysoterum</i>	Sparrow
21	Data deficient	<i>Paratelphusa</i> sp.	Crab
22	Least Concern	<i>Vulpes bengalensis</i> (Shaw, 1800, Canidae)	Fox
23	Vulnerable	<i>Ursus thibetanus</i> (G. Cuvier, 1829, Ursidae)	Bear
24	Least Concern	<i>Polyplectron bicalcaratum</i> (Linnaeus, 1758, Phasianidae)	Grey Pheasant Peacock
25	Not Evaluated	<i>Felis Catus</i> (Linnaeus, 1758, Felidae)	Domestic cat
26	Data deficient	Unidentified	Bird

*Animals mentioned by the community as folk tales

sacred animals. These animals are related in ritualistic purposes as were all in treatment of diseases.

A total of 16 medical ailments are treated by employing 15 species from the taxonomic groups of mammals, aves, reptiles and invertebrates. A total number of animals used for the zoo therapeutic practices are 15 out of which 10 species are of mammals (Table 2), 2 of aves (Table 2), 2 of reptiles (Table 2) and 1 of invertebrate (Table 2). The percentile distributions of the taxonomic groups are as follows; for mammal is the highest 66.70%, aves is 13.30%, a reptile is 13.30%, and lastly invertebrate is 6.70%. The highest usages of species in diseases are of the gastric ailments and gynecological ailments with three different species with a percentile of 18.75% followed by physical ailments with 12.5% out of total faunal species recorded in zoo therapeutic medicines (Fig. 3). The correlation between the species were seen and calculated based on the Karl Pearson Coefficient analysis with a p-value of 0.190683 which is further being explained in the next segment.

Discussion

Traditional knowledge of medicines and usage of animals and animal by-products plays a crucial role in

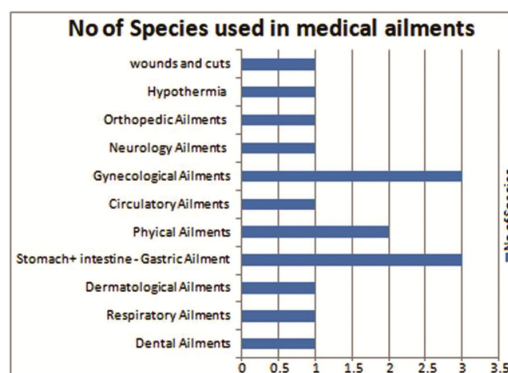


Fig. 3 — Percentage of different taxonomic groups in zoo therapy primary health care system since the ancient time period. As there is a substantial growth in population with the passage of time the daily usage of wild progenies as medicinal measures might possess a threat to the environment and conservation of species⁴. Hunting is an everyday part of daily sustenance activities by the *Dimasa* people. Most of the animals are hunted for food and amongst them some also holds medicinal values. The usage status of animals by the villagers for medicinal and domestic utilities were grouped and studied to see the how many animals were exposed to mortal danger.

Animals killed for medicinal values and domestic utilities were 15 including all the taxonomic groups available in the vicinity (Table 3). The remedial agreement of the species has high variation as species cited for each disease is mostly singular. The procurement of wild animals for hunt is defined over three possibilities. Most of the animals are killed in

order for the usage in medicinal ailments, some are not mortally wounded but are wounded enough for the procurement of medicines and some are not harmed in a slight manner. The differentiation is based on the parts used by the animals. Most of the animals are used for their meat and flesh which is used to cure diseases (Table 4). Animals such as slow loris (Table 2),

Table 3 — Utilizations of animals based on mortal danger

Usage status of animals by the villagers	No of medicinal usage and other domestic stuff	No. of animals/ birds used	Parts used
Animals killed for the medicinal usage and other domestic/ religious stuff	15	15	flesh, scales, meat, flesh used for hunting bait, pancreas, fats
Animals partially injured for medicinal usage and other domestic/ religious stuff	3	4	feet, hairs, feathers, dairy products
Animals injured less for medicinal usage and other domestic/ religious stuff	5	2	dung, fur, body hair, feathers

Table 4 — Zoo therapeutic practices recorded from field work

Serial no	Scientific Name	Common Name	Local Name	Parts used	Application	Medical Ailments
1	unidentified	Monkey Indet	<i>Maugusa</i>	Hand	Molar pain, gums are swollen, odd numbers wise followed and applied to the face	Molar pain
2	<i>Vulpes bengalensis</i> (Shaw, 1800)	Fox	<i>Mouromj</i>	Meat	Rice paste is added and fermented with herbs, then after fermentation fox eat is added with excess water	Tuberculosis
3	<i>Gekko gekko</i> (Linnaeus, 1758)	Tokay Gecko	<i>Gogema</i>	Meat	Meat is eaten by the villagers	Skin diseases and skin rash
4	<i>Paratelphusa</i> sp.	Crab	<i>Kangkrai</i>	Whole	Eaten raw	Jaundice
5	<i>Manis crassicaudata</i> (Linnaeus, 1758)	Pangolin	<i>Kothai</i>	Flesh	Hunted for Food	Gastric and Muscle Pain
6	<i>Ursus thibetanus</i> (G. Cuvier, 1823)	Himalayan Black Bear	<i>Musugurama</i>	Pancreas	Flesh eaten, pancreas is eaten to cure ailments	Stomach ache, Body ache
7	<i>Axis cf proconis/ Cervus cf unicolor</i>	Deer	<i>Misai</i>	Meat	Data deficient	Bone pain, joint pain
8	unidentified	Birds Indet	<i>Misingra</i>	Meat	Data deficient	Heat stroke
9	unidentified	Sparrow	<i>Chidia</i>	Brain	Whole Body	Impotency
10	<i>Hystrix indica</i> (Kerr 1792)	Porcupine		Dung, Flesh	Flesh and dung also used in ritualistic purposes	Heart-ache and Stomach-ache
11	<i>Panthera pardus fusca</i> (Linnaeus, 1758)	Leopard	<i>Meecene</i>	Milk and Meat	This practice is taken as a cautionary folk tale, not be practiced in the present day scenario.	Paralysis
12	<i>Panthera tigris tigris</i> (Linnaeus, 1758)	Tiger	<i>Meecene*</i>	-	Protection of harvest or crops from tiger attacks	Part of Group hunt and medical treatment
13	<i>Python molurus</i> (Linnaeus, 1758)	Python	-	Fats Pancreas	Applied to cracked heels Pancreas dipped in water and then it is eaten up the water and pancreas both during child birth related problem, so birth of the child and deliver is made easier for the woman.	Cracked Heels Complications in child birth
14	<i>Nycticebus coucang/ bengalensis</i> (E. Geoffroy, 1812)	Slow loris	<i>Mudimma</i>	Body Hair	Applied on wounds and cuts and burns	Wounds
15	<i>Lutrogale perspicillata</i> (E. Geoffroy, 1826)	Otter	-	Flesh Fur	-	Fish bone stuck in throat

Indet- the species in indetermined, * the same species might be having the same local name

pangolins are used for their fur and scales which in turn comes out to partially harm of the animals. The village of *Taimodling* is already facing with scarcity of faunal resources of animals such as slow loris, deers, pangolins, elephant, tigers and porcupines. The villagers have noted they have not hunted these animals for several years as their availability has decreased from the near surroundings. Whereas in the village of *Longmailai* and *Hojai dobongling* there is an abundance of the same animals except the elephant which are absent in *taimodling*. It already indicates a shift of specific wild faunal resources geographically which can be infused due to over hunting of these animals. The species might have migrated to different parts in the forest to mitigate their survival existence. Another reason of not less speciation might be over usage of faunal resources which has ultimately lead to its depletion in the number and hence the decline in availability of the specific species.

The quantitative analysis between the relationships of species with medical ailments was taken out on the basis of correlation process as two data sets of variable were present. The two variables are determined over the categories based on the harmful effect over the animals. Three derivatives are animals those who are mortally wounded for the purpose of zoo therapeutic practices, second based on the animals harmed partially for the zoo therapeutic practices and lastly animals not harmed for zoo therapeutic practice (Fig. 4). The correlation came out to be of positive in nature numbered as 0.955477. This states that the relationship is normal and therefore Pearson correlation is applied to it. The result came as a positive relationship with p value of 0.190683. The data above shows a positive relationship between the variables. The value of p should be between 0-1. The main characteristic of Karl Pearson's correlation indicates the strength between the two variables. The Pearson coefficient is a measure of the strength of the association between two continuous variables. The positive response indicates that the animal or the species used for the therapy are in abundant number. Or we could be of the opinion that the medical ailment does include a single species from the major taxonomic groups which states the optimal usage of animal.

As per the above mentioned zoo-therapeutic practices animals were categorized under IUCN red list according to which near threatened animal is 02, animals those who are marked endangered is 04,

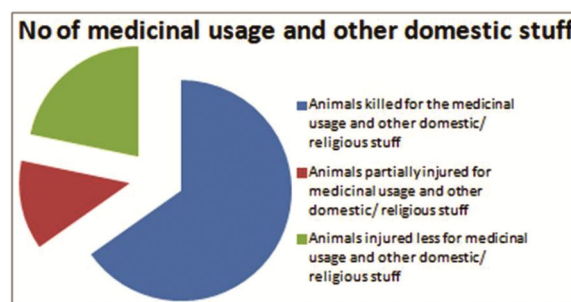


Fig. 4 — Number animals exposed to mortal danger as per zoo therapeutic usage

vulnerable is 04 and species which are regarded as least concern is of 05¹⁸ (Table 2). This present study sheds light on the factor of ways where exploitation of faunal resources is necessary but it still provides a sustainable impact on the wild progenies which in turn makes it a challenge for the primitive people involved. The sudden shift of faunal resources from the village surrounding could be of various reasons like induced anthropic activities and geographical migration of species to avoid exploits of excessive hunting.

Conclusions

The proposed research states the villagers share a pre-existing relationship with the animals in the forest with their own sustainable needs, traditions and cultures which are essential for making a mark in oral history of India. A total of 15 species of animals are used to treat 11 different medical ailments amongst which some are in the vulnerable list of the IUCN status of conservation. The conservation approach of the villagers towards the faunal resources surrounding them could be taken as negligible. The villagers are not acquainted with process of sustainable developments as a result we could see a decline in the numbers of faunal resources. Linear conservation methods are practiced by several different NGOs and government organization to raise awareness among the indigenous villagers. Necessary measures to avoid hunting of exotic animals are also implicated on the villagers. As far as exploitation of wild fauna is considered sustainable steps are undertaken by the villagers in maintaining their utilitarian activities. Domestication of cows, buffaloes, pigs, goats and chickens are functioned as mainstay meat and dietary requirements of the indigenous people. Since the villages are located in far of distant parts of forests commuting to urban places have certain drawbacks. Modernization is yet a foreign concept in their life.

Ethnozoology operates on a viable platform of socioeconomic and cultural understanding which could be formulated to approach sustainable measures in these villages in dual mode. The traditional knowledge needs to be redeemed as it is part of oral traditions and intangible cultural heritage reflecting the past relations of the present ethnic communities. Conservation measures on the different species population also could be imbibed based on the IUCN status of conservations.

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Conflict of Interests

There is no conflict of interests present between the authors and both the authors have approved the submission of the manuscript.

Author Contributions

AM and TT formulated and designed the research; field data was collected by AM and TT; AM wrote the manuscript; data was analyzed by AM; manuscript was revised and corrected by TT.

Prior Informed Consent

All respondents provided prior informed consent. Additionally, permission was obtained from village headman, individuals assisting me in the field work and data gathering process and also to conduct the survey.

Data Availability

Data will be made available by the first and corresponding author upon reasonable request.

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