

## Traditional Uses of Animals among *Jirels* of Central Nepal

Usha Lohani

Central Department of Zoology, Tribhuvan University, P.O.Box 7844, Kathmandu 44600, Nepal  
Phone & Fax: 00 977 1 4891413, E-mail: ushalohani@hotmail.com

**KEYWORDS** *Jirels*. Ethnozoology. Nepal. Central Mountains. Himalayas

**ABSTRACT** Nepal harbors rich biodiversity because of a number of factors. Some of the important factors responsible for it could be attributed to the country's strategic location and rugged topography. It is situated along the central and eastern Himalayas, encompassing two zoogeographic realms - Palaerctic and Oriental with faunal elements of both the realms. There are diverse and unique assemblages of flora and fauna within a narrow horizontal expanse of less than 200 km. Equally diverse are the people who have been co-existing with these resources forming discrete blocks through ages. According to the government figures, there are fifty- nine ethnic groups in the country and the group *Jirel* is one of these ancient groups of people. Because of the co-existence with the surrounding faunal resources in continuity for centuries, *Jirels* have accumulated a rich body of ethno-zoological knowledge. This time tested traditional knowledge is now on the verge of extinction for most of the practices are no more in vogue. Present study attempts to analyze and document the vanishing ethno-zoological knowledge of this community from central Nepal. Tools such as questionnaire survey, structured interview, semi-structured interview, PRA and focus group discussions have been employed to gather data. *Jirels* have cultivated relationships with animals at cultural, spiritual and material levels. Altogether 49 species of animals with different ethno-zoological values have been reported. There is erosion of ethno-zoological knowledge among *Jirels* as younger people harbor less knowledge than the older ones. The paper emphasizes that similar studies be carried out in other ethnic groups of the country.

### INTRODUCTION

Nepal is a small mountainous country with an area of 147181 km<sup>2</sup>, which is not more than 0.1% of the world's land surface. Though small in size, the country harbors rich biodiversity that has emanated from a number of factors chief among these being its unique topography and strategic location. There is a sharp altitudinal difference from less than 100m in the south to more than 8000m in the north within a horizontal expanse of less than 200km. Besides this, the country embraces two zoogeographic realms, Palaerctic in the north and Oriental in the south with a rich diversity of fauna of both the realms. Equally diverse are the people who have been coexisting with these resources forming discrete blocks through the ages. Because of this unique co-existence in continuity for centuries, these people have accumulated a rich body of knowledge about resource use, conservation and management. *Jirel* animal relationship is viewed at material, cultural and spiritual levels. Relationship at material level is observed, for *Jirels* use a number of animals as food and medicines. In the same way a lot of animals both wild and domesticated are used in religion, magico-religion, different rituals and faith healing therapies. Some animals indicate omen and some predict future weather

condition to them. Although a lot of work has been done on ethno-botany in the country, work on ethno-zoology has often been neglected. So it is attempted here to study ethno-zoological knowledge of a *Jirel* community of Jiri VDC of central Nepal. Ethnic group *Jirel* is one of the fifty-nine ethnic groups of the country with a population share of only 0.02% (CBS 2001).

The importance of scientific ethno-zoological studies has recently been emphasized by many scientists all over the world (Maffi 1996; Lev E 2003; Costa-Neto 2005; Mahawar et al. 2006; Alves 2007). Similar need has been emphasized in Nepal too, especially in view of the growing trend of loss of biodiversity and ancient and diverse human cultures (Lohani et al. 2008; Lohani 2010). A comparative assessment on zootherapeutic remedies has been made in selected areas of Nepal, Albania, Italy and Spain by four scientists from these respective countries (Quave et al. 2010). Although a few scientists have reported food and medicinal value of some of the vertebrates (Shah et al. 1992; Shrestha 2003), a comprehensive ethno-zoological study in the country is still lacking. In other words, ethno-zoological study in Nepal is yet in its infancy. In view of this situation, present work aims to study the ethno-zoological knowledge of one of the many ethnic communities of the

country before more faunal resources and the populations who are the repositories of such knowledge disappear from the land for ever.

## MATERIALS AND METHODS

### Study Site and Study Group

The study was conducted among *Jirels* of Jiri Village Development Committee (VDC) which is one of the 51 VDC of the district Dolakha in the mid-mountainous region the country (Fig. 1). The VDC is an area of highest concentration of *Jirel* population. Of the total *Jirel* population of 5,316, more than half of them (3611) are confined only in the Jiri VDC (CBS 2004). The VDC experiences subtropical climate in the lower areas and warm temperate and temperate climate in the higher ones. The altitude ranges from 1700m—3200m with an annual rainfall of 2293mm. Minimum and maximum temperatures in the month of January and July of the year 2004 were recorded as  $-5.2\text{ C}$  and  $27.5\text{ C}$  respectively (CBS 2004).

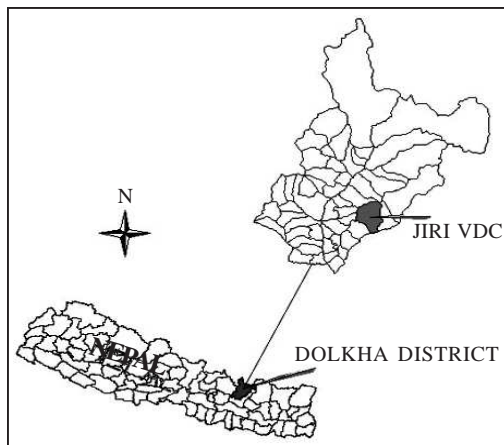


Fig. 1. Map of Nepal with Jiri VDC

*Jirel* economy is based on agriculture. Earlier, *Jirels* used to hold traditional areas of communal land called “*Jirel Kipat*” which has now been abolished and replaced by a more direct government control of the land (Bista 2000). They practice Lamanistic Buddhism and have their own Gods and Goddesses (Bista 2000). Clans also worship ancestor spirits. *Jirels* consider themselves and the resources to be a part of a large family. They believe that deities reside in the

mountains and thus show their respect by offering worship at least once a year, usually on Sundays.

## METHODOLOGY

Both quantitative and qualitative approaches of methodology were adopted. The quantitative data were obtained by employing Questionnaire Survey and Structured Interview techniques. Qualitative data were gathered by emic approach, applying different tools of participatory approaches such as Semi Structured Interview, Participatory Rural Appraisal, Key Informant’s Interview and Focus Group discussion.

Of the total 722 households of *Jirels* in the study area, 10% households were selected by simple random sample technique for household level survey. Since a particular ethnic group is notably a homogenous group, a sample of 10% households was considered to be a representative one. Data on demographic structure, socio-economic status, and livestock were obtained by employing questionnaire survey technique. Ethno-zoological information from people of different age groups was obtained by structured interview method. For this purpose, 20% people of different ages were selected from the household sample by employing stratified random sampling technique. The ages of 74 informants thus selected ranged from 16 to 86 years. Trend of ethno-zoological knowledge was also studied in the same group. For trend study, knowledge of each informant was gauged in terms of the number of ethno-species reported by him. The highest number of ethno-species reported was taken as 100 percent and percentage of each number reported by each informant was then calculated. It was assumed that greater the number of animals reported by the informant more was his ethno-zoological knowledge.

Different tools of Participatory Rural Appraisal (PRA) were used to gather information on village resources and their distribution, cropping calendar, festival calendar, and animal uses in different festivals. Other tools of participatory approaches, like key informant identification and semi structured interview, were also used to obtain in-depth knowledge on uses of animals. Ethno-zoological data from the key informants and from other knowledgeable people of the village were gathered by following methods given by Martin (1995).

**Animal Identification**

Smaller animals were captured and identified with the help of Standard Taxonomic Keys (Bingham 1897; Pocock 1900; Thapa 1995 and 2000; Tikadar 1987). Larger animals were identified according to folk description of each specimen and from pictures shown to them. Standard Taxonomy keys were used in case of confusion (Flemming et al. 1979; Shah et al. 2004; Shrestha 1981; Shrestha 1997). Most of the animals are identified up to species level and very few animals could be identified only up to generic level. Name of the authorities are provided as far as possible.

**RESULTS**

**Socio-economy**

Literacy rate of *Jirels* is 70%, which is higher compared to the district literacy rate of 51.1% (Fig. 2). Average family size is 6.35 (district average 4.7) with average female and male number per family being 3.08 and 3.27 respectively (Total number- 470, male-242, female- 228) (Fig. 3).

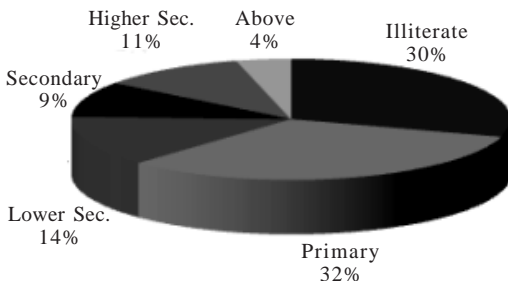


Fig. 2. Education levels of *Jirels* (n=74)

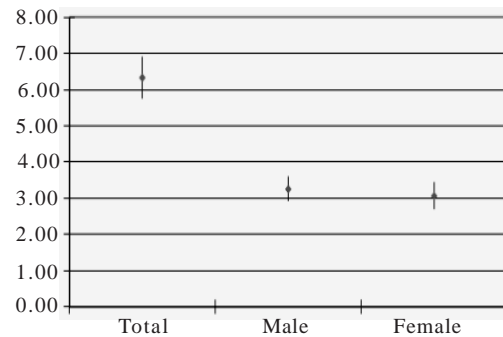


Fig. 3. Average family size of *Jirels* (n=74)

*Jirel* economy is based on agriculture. But it is difficult for most of them to thrive on only agriculture for the whole year. They are thus engaged (about 60%) in other economic activities such as government or private service (30%), wage earning (13%), business (5%) and teaching (8%) (Fig. 4). Rice is not grown in the valley except at the lower wetlands. Other main crops grown are wheat, maize, millet and potato.

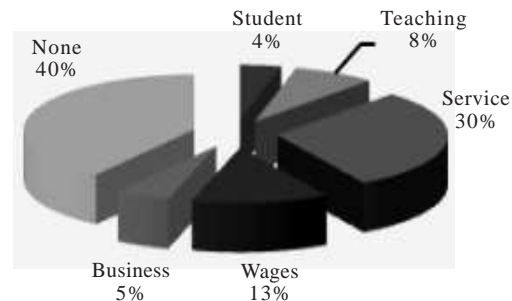


Fig. 4. Other economic activities of *Jirels* besides agriculture (n=74)

Percentages of families rearing cows, buffalos, oxen, goats, pigs and poultry are 40.5, 32.4, 43.2, 83.7, 10.8 and 82.4 respectively (Fig. 5). Per family livestock unit (LSU) is 3.67 (1 Cow=1 LSU, 1 Buffalo= 1.5 LSU and 1 goat or 1 sheep=0.2 LSU). *Jirels* collect fodder and bedding materials for their livestock from their own farm and nearby forests. Besides livestock, *Jirels* domesticate other animals like pigeon, cat, dog, and rabbit also. Apiculture, which was a common practice in the recent past, has been abandoned over the years largely because of the eradication of bees due to excessive use of pesticides in the farmlands. Besides livestock, *Jirels* keep dogs which guard wild animals that come from the nearby forest to graze in the farm land and hunt livestock.

**Ethno-zoological Knowledge of *Jirels***

*Jirels'* knowledge on various uses of 49 animals has been documented and given in Table 1. Fauna are given with their zoological names along with their local names. In case of medicinal uses, details covering method of preparation of animal medicine, different part or product used and method of application of medicine have been provided.

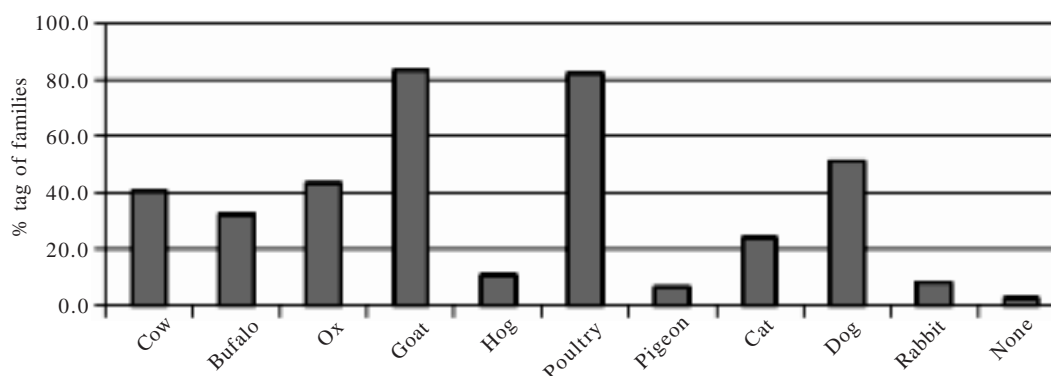


Fig. 5. Livestock raised by Jirels in percentages (n=74)

Table 1: Traditional uses of animal amongst Jirels of Jiri VDC Nepal

S. No.	English name and local name	Binomial nomenclature	Uses
1	Earthworm "Gadeula"	<i>Pheretima</i> spp	<b>Medicinal use:</b> Used against measles, diarrhea, jaundice and pneumonia. For this purpose a few earthworms are boiled in water and the soup is given to the patient.
2	Honeybee "Mauri"	<i>Apis cerana</i> <i>A. laboriosa</i> <i>A. dorsata</i> <i>A. florea</i>	<b>Medicinal use:</b> i). Honey is taken orally to be cured from body ache and gastritis. Honey is also eaten in case of snakebite. ii) Bee is allowed to sting the heart patients for relief. <b>Food value:</b> i) Honey is a highly preferred food item. ii) Fried honeybee broods like larvae, pupae and eggs are eaten with great taste.
3	Wasps and hornets "Barulo" "Aringal"	<i>Polistes</i> spp <i>Vespa</i> spp	<b>Food value:</b> These are eaten as food but the broods (eggs, larvae and pupae) are preferred to the adults and are eaten after frying in oil.
4	Spider "Makuro"	<i>Araneus</i> spp <i>Lycosa</i> spp	<b>Medicinal use:</b> Spider web is applied to fresh wound to stop bleeding. <b>Food value:</b> Whole animal is given to chicken for nourishment
5	Crab "Gangato"	<i>Himalayapotamon atkinsonianum</i> Brandis	<b>Food value:</b> Crab serves as good source of protein. <b>Medicinal use:</b> i) Whole body is crushed into fine powder and mixed with water to get a smooth paste. The mixture is taken orally to cure dysentery.ii) Crushed crab powder is also applied at the bleeding wound. iii) Asthma patients eat roasted crab for relief.
6	Slug "Chiplekira"	—	<b>Medicinal use:</b> i) Whole animal is swallowed with a small-solidified ball of clarified butter by patients suffering from tuberculosis and gastritis. ii) It is also eaten without cooking in case of fracture. iii) The person with bladder stones also eats the slug with the belief that the stone would be discharged out from the body. iv. Slug is ground to fine paste, which is then applied externally at the site of the fracture.
7	Snail "Shankhe kiro"	—	<b>Medicinal use:</b> People suffering from sexual problems and gall bladder stone problems eat cooked snails. <b>Food value:</b> The fish is a popular food item among the middle hill people because of its good taste. <b>Other uses:</b> During marriage ceremony, daughter-in-law takes the fish as gift to her mother-in-law.
9	Indian bull frog "Paha"	<i>Hoplobatrachus tigerinus</i> (Daudin)	<b>Medicinal use:</b> i) Sun-dried skin of the frog is powdered and mixed with water to make a smooth paste. The paste is then applied on burns, in the area of fractured bone and sprains. ii) Patients with diarrhea take the paste orally. iii) Not only the skin part, people also eat the cooked flesh as medication in case of other minor ailments like diarrhea, dysentery, cold and cough. <b>Food value:</b> Patients with chronic ailments eat cooked flesh for nourishment.
10	Liebig's frog "ManPaha"	<i>Paa liebigii</i> (Gunther)	<b>Medicinal use:</b> Dried animal paste is taken orally to cure a number of ailments like dysentery, diarrhea and other gastric problems. <b>Food value:</b> Thigh muscles serve as nutritious food.
11	Langtang frog "SunPaha"	<i>Paa polunini</i> (Smith)	<b>Medicinal use:</b> Cooked flesh is eaten to cure dysentery.

**Table 1: Contd.....**

S. No.	English name and local name	Binomial nomenclature	Uses
12	Python "Azingar"	<i>Pythonmolurus bivittatus</i> (Kuhl)	<i>Magico-religious value:</i> Python secretion (semen) is kept in the store of the house to drive off evil spirits.
13	Sparrow "Bhangera"	<i>P. domesticus</i> (Linn)	<i>Medicinal use:</i> i) It is eaten after cooking, to improve memory power and to increase sexual desire. ii) It is also eaten as a curative for arthritis.
14	Starling "Saraun"	<i>Sturnus contra</i> (Linn)	<i>Medicinal use:</i> Body without head is cooked and eaten as a curative for piles, asthma, cough and pneumonia. Head of the animal is not eaten because of taboo.
15	Kaliz pheasant "Kaliz"	<i>Lophura leucomelanes</i> (Latham)	<i>Food value:</i> It is considered to be a good source of animal protein by the rural folk.
16	Himalayan monal "Danphe"	<i>Lophophorus impejanus</i> (Latham)	<i>Symbolic value:</i> It is the national bird of Nepal and is thus a symbolic animal of the country. <i>Medicinal use:</i> The person suffering from heart problem eats its stool.
17	Blood pheasant "Chilime"	<i>Ithaginis cruentus</i> (Hardwicke)	<i>Medicinal use:</i> Stool is eaten in case of heart ailment.
18	Wolly-necked stork "Garud"	<i>Ciconia spp</i>	<i>Magico-religious value:</i> i) Charms are made out of different parts of its body and are normally tied round the neck, as a preventive measure from snakebite. ii) Some people also apply its bone paste (bone powder and water), to the area of snakebite.
19	Besra "Besara"	<i>Accipiter virgatus</i> (Temminck)	<i>Medicinal use:</i> Cooked flesh is given to the patients suffering from piles and dysentery
20	Common Quail "Battai"	<i>Coturnix coturnix</i> (Linnaeus)	<i>Medicinal use:</i> Head of the bird is cooked and eaten to enhance memory power.
21	Lapwing "Huttityaun"	<i>Vanellus indicus</i> (Boddaert)	<i>Use in faith healing therapy:</i> Eggs are used in faith healing therapy.
22	Crow "Kaag"	<i>Corvus splendens</i> Vieillot <i>C.macrorhynchos</i> Wagler	<i>Medicinal use:</i> Cooked flesh is consumed to get a relief from body aches.
23	Whistling Thrush "Kalchaude"	<i>Myophonus caeruleus</i> (Scopoli)	<i>Medicinal use:</i> Cooked flesh is given to persons suffering from asthma and pneumonia.
24	Magpie "Lampuchre"	<i>Urocissa spp</i>	<i>Medicinal use:</i> Dried legs are powdered and mixed with water to make bone paste. Moderate amount of the paste is given to livestock suffering from diarrhea.
25	Pigeon "Parewa"	<i>Columba spp</i>	<i>Magico-religious value:</i> Excreta are administered orally to the buffalo believed to be suffering from effects of "evil eye".
26	Shrike "Bhadrai"	<i>Lanius cristatus</i> Linn	<i>Medicinal use:</i> Cooked flesh is consumed to sharpen memory power
27	Fowl "Kukhura" "Luinche" (wild)	<i>Gallus gallus</i> (Linn)	<i>Medicinal use:</i> Parts and products like fat and eggs are used in burns. Food value: Chicken soup is given to the mother immediately after her delivery. It is believed that the soup helps the mother to bounce back to normalcy soon.
28	Squirrel "Lokharke"	<i>Calloscirus pygerythrus lokroides</i> (Hodgson)	<i>Magico-religious value:</i> Both the items- fur and dried flesh are used in making charms.
29	"Porcupine" Dumsi"	<i>Hystrix indica</i> (Kerr) <i>H.brachyura</i> (Linnaeus)	<i>Medicinal use:</i> Usually during the months of March and April, alimentary canal with its contents is boiled and given to the patients suffering from asthma. Sometimes even viscera along with gallbladder are believed to cure asthma. <i>Magico-religious value:</i> Its spines are kept in the house with a belief that they drive off evil spirits and disease- causing elements.
30	Rabbit "Kharayo"	<i>Lepus nigricollis</i> (Cuvier)	<i>Medicinal use:</i> Cooked flesh is given to asthma patients.
31	Mongoose "Nyauri"	<i>Herpestes spp</i>	<i>Magico-religious value:</i> Charms are made out of different body parts. The charms are usually tied round the neck of children to keep them safe from bad happenings.
32	Marten "Malsanpro" or "Kuthauri"	<i>Martes flavigula flavigula</i> (Bod-daert)	<i>Medicinal use:</i> Cooked flesh is given to the asthma patients



**Table 1: Contd.....**

S. No.	English name and local name	Binomial nomenclature	Uses
33	Jackal "Syal"	<i>Canis aureus</i> (Linn)	<i>Food value:</i> Jackal meat is eaten as proteinous diet in the locality. <i>Medicinal use:</i> i) A piece of its flesh is mixed with locally available cereals and the mixture is fermented to obtain alcohol. The alcohol thus prepared is locally called "alcohol of jackal" and is applied to the aching joints or whole of the aching body relief. ii) It is even taken orally by gout and asthma patients. Use of "alcohol of jackal" is very common even these days among the Jirel ethnics.
34	Himalayan black bear "Bhalu"	<i>Selenarctos thibetanus</i> (Cuvier)	<i>Medicinal use:</i> i) Bile juice is mixed with milk and taken orally to be relieved from a number of ailments like malaria, jaundice, heart problem, gout etc. ii) Bear fat is smeared in case of fractures, sprain, burns, wounds, boils etc.
35	Sloth bear "Rato Bhalu"	<i>Melurus ursinus</i> (Shaw)	<i>Medicinal use:</i> Bile and fat are used as medications in a number of ailments like jaundice, malaria, gout, burns, wounds etc.
36	Leopard "Chituwa"	<i>Panthera pardus</i> (Linnaeus)	<i>Magico-religious value:</i> Whiskers, pieces of bones, teeth and claws are used in making charms. The charms are worn to ward off evil spirits and/or to frighten the enemy. <i>Medicinal use:</i> Bone paste made out of bone powder and water is applied on burns, wounds etc.
37	Black dog "Kalo kukkur"	<i>Canis alpinus</i>	<i>Medicinal use:</i> Its stool is eaten as general antidote to poisoning.
38	Wolf "Bwanso"	<i>Canis lupus pallipes</i> (Sykes)	<i>Medicinal use:</i> Flesh is eaten in case of body aches.
39	One-horned Rhinoceros "Gainda"	<i>Rhinoceros unicornis</i> (Linnaeus)	<i>Medicinal use:</i> i) Urine is taken orally as medication by asthma patients. ii) Flesh and bone are burnt to get the fume, which is inhaled to be cured from different body ailments. The fume is also given to livestock suffering from foot and mouth disease and earache. ii) Rhino horn paste is used as Aphrodisiac substance.
40	Musk deer "Kasturi Mriga"	<i>Moschus chrysogaster</i> (Linnaeus)	<i>Medicinal use:</i> Musk is used in a number of ailments. i) It is given to the patients of chronic illness. ii) It also used as an antidote of snake venom. They believe that the smell of the musk drives the snake away. For this reason the musk is normally kept in their houses.
41	"Deer" Mriga" "Sambar" "Jarayo" "Chital"	<i>Muntiacus muntjac</i> (Zimm) <i>Cervus unicolor</i> (Kerr) <i>Axis axis</i> (Erxleben)	<i>Medicinal use:</i> i) Deer milk is taken orally to cure gastritis. ii) Fetus as well as dried meat is eaten without cooking to cure dysentery. iii) Paste made out of bone and horn powder is applied at wounds. It is also taken orally to treat common cold.
42	Himalayan cow "Chouri Gai" "Yak"	<i>Bos grunniens</i> (Przewalski)	<i>Medicinal use:</i> Urine is taken orally to be relieved from chronic ailments. It is believed that the urine has medicinal properties because the cow eats a lot of medicinal herbs of Himalayan alpine while grazing.
43	Ox "Goru"	<i>Bos spp</i>	<i>Medicinal use:</i> Cooked flesh is given to TB patients for speedy recovery.
44	Domestic cow "Gai"	<i>Bos spp</i>	<i>Symbolic animal:</i> i) As cow is a sacred animal to Hindus its urine is highly valued. It is sprayed in the house and the adjoining areas to sanctify and to disinfect. ii) Urine is also used as pesticide and is sprayed in the agricultural field to kill the pests.
45	Wild boar "Bandel"	<i>Sus scrofa</i> (Linn)	<i>Food:</i> Wild boar meat is a delicacy.
46	Assamese Monkey "Seto Bandar"	<i>Macaca asamensis</i> (McClland)	<i>Medicinal use:</i> Body parts like flesh and viscera are given to the patients suffering from tuberculosis for nourishment. <i>Food:</i> Flesh is eaten as food.
47	Rhesus Monkey "Rato bandar"	<i>Macaca mulatta</i> (Zimmermann)	<i>Food:</i> Jirels eat the cooked flesh of these monkeys but is less preferred to the flesh of the Assamese Monkeys.
48	Bat "Chamero"	<i>Myotis spp</i> <i>Scotophilus spp</i>	<i>Medicinal use:</i> These are kept preserved in cooking oil and the decanted oil is applied regularly at the scalps in the head region for rapid hair growth.
49	Black goat "Kalo boka"	<i>Capra hircus</i> (Linnaeus)	<i>Medicinal use:</i> Milk is applied in the skin to get rid of boils and other skin problems.

**Classification of Fauna:** Out of a total of 49 animals, 7 animals (14.28%) belong to the Invertebrate group and 42 animals (85.72%) belong to the Vertebrate group. Out of 7 animals from the Invertebrate group, 1 animal belongs to the Phylum Annelida, 4 animals are from the Phylum Arthropoda and 2 animals from the Phylum Mollusca. In the Vertebrate group, 1 animal (2.38%) belongs to the Series Pisces (Class Teleostomii), 4 animals (9.52%) belong to the group Herpetofauna, 15 animals (35.72%) belong to the Class Aves and the rest 22 animals (52.38%) belong to the Class Mammalia.

**Types of Animals Used:** Altogether 3 (6%) animals are domestic and the rest 46 (96%) are wild. Domesticated cow and ox both of the genus *Bos* spp. and black goat zoologically named as *Capra* spp. are the fauna that are used in healing a number of ailments. Cow has religious value besides its medicinal value.

**Categories of Use and Sources:** Animals cited by the informants belong to different use categories such as food, medicine, magico-religious, faith healing, omen indication and weather prediction. Animals are used either whole or in parts in all the use categories. Zootherapeutic remedies are derived from three sources- parts of the animal, metabolic products and glandular secretions. Parts of the animal used are skin, flesh, viscera, bones, gastrointestinal tract. Metabolic products used in remedies are feces and urine and glandular secretions used are honey, spider-web and eggs.

**Food Value:** Normally parts such as flesh and viscera are used as food. Such animals form important source of protein for the rural populations of the country. Parts and products of some animals are taken as nutraceuticals by the patients of chronic illnesses.

**Magico-religious Value:** Some animals are used as magico-religious animals. Only the hard parts of the animal which do not decompose easily such as endoskeleton and exoskeleton are used as "charms". These charms are worn normally in the forms of amulets and pendants which are locally called "*buti*" to ward off perceived "evil eye" effects.

**Animals in Faith Healing Therapy:** Only live animals are used in faith healing therapy. These animals are either set free live as augury as in case of pigeon or even offered to the deity as sacrificial offerings as in case of cocks and goats.

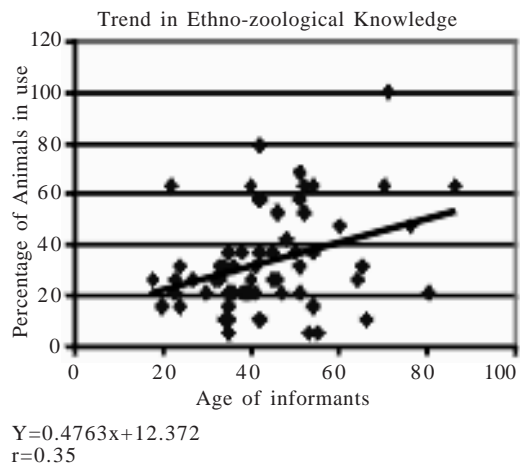
Sacrificial offerings are made to please the deities or ancestral spirits which are supposed to control the life of these people.

**Animals in Omen Indication:** Different socio-cultural values are attached to a number of animals. Consequently the sudden sight of some animals are perceived as good omens and some as bad omens. While in some cases only the sight of the animal is enough to indicate good or bad omen in others specific behavior and unusual sound produced by the animal are taken as indications of good or bad omen.

**Animals in Weather Forecast:** Behavioral activities of some of the animals are watched very carefully. Special behavior shown by these animals at certain time actually foretells the future weather condition.

**Etic Categories of Disorders/Diseases:** *Jirels* have their own way of making diagnosis and categorizing ailments. Disorders or diseases identified by *Jirels* range from cough, cold and general weakness to "evil eye effect".

**Trend in Ethno-zoological Knowledge:** Nine informants (12.16%) out of total number seventy-four did not report any animal use. Remaining sixty-five informants reported various uses of animals. A moderate positive correlation was established between number of animals reported and the age of the person with correlation coefficient ' $r$ ' = 0.35 and was found to be significant at 95% level of confidence. Significance test of the sample estimate was performed by direct reference to correlation coefficient table (Fig. 6).



**Fig. 6.** Correlation between ethnozoological knowledge and the age of the informants

## DISCUSSION

It is evident from the documented data that *Jirel*- animal relationship is holistic as it is intact at both material and spiritual levels. At material level, majority of the animals are providing food and therapeutic remedies to the *Jirel* while some are helping them in finding out future weather condition. Animals, both domestic as well as wild, have played important role in *Jirel* socio-economy. Both domestic and wild animals are the sources of food and medicine. Though the group has abandoned most of the animal use practices in curing human ailments, some of these are still prevalent till date.

**Relationship with Smaller Animals:** Medicinal properties of earthworms (*Pheretima* spp.) have been identified and these are used in treating different ailments like measles, diarrhea, jaundice and pneumonia by *Jirels*. There are reports of medicinal properties of earthworm from other parts of the world where these are used in curing asthma, hypertension, epilepsy, cancer; snake and spider bite (Zhang et al. 1992; Solovan et al. 2004; Jamir et al. 2005). Snails and slugs are used in treating ailments like tuberculosis and as plastering material to set the broken bone and sprains not only by *Jirels* also by *Naga* tribes of north-eastern India (Jamir et al. 2005). Animals whether big or small have always made a considerable contribution to the protein diet of people. Besides honey, even honeybee broods (*Apis* spp.) and broods of *Polistes* and *Vespa* spp. are consumed as delicious food item and protein supplement not only by *Jirels* but also by the tribal people of India (Kakati et al. 2002).

**Relationship with Herpetofauna and Birds:** Herpetofauna like *Paa liebigii*, *P. polunini*, and snake like *Python molurus* are good sources of food and medicine to *Jirels* as liked by some indigenous people in India (Jamir et al. 2005). *Jirels* possess rich knowledge of food and medicinal uses of 15 (36%) species of birds. Birds not only fulfill protein requirement of the community but their parts or products are also used in curing different body ailments and in faith healing therapy. Cooked meat of birds such as starling (*Sturnus* spp.) and whistling thrush (*Myophonus* spp.) is administered orally to the patients of asthma, pneumonia, cough, cold and piles. Medicinal properties of different birds have been reported from the tribal people of India also (Joseph 1982; Sharma 1987; Rosner 1992; Solovan et al. 2004; Sharma et al. 1995).

**Jirel Mammal Relationship:** *Jirels* extensively use body parts like flesh, viscera, bones, gastrointestinal tract, skin, claws, whiskers, fur, spines, and products like musk, milk, semen, fecal matter, urine, etc. of larger mammals to cure disorders like asthma, pneumonia, gout, tuberculosis, skin problem, snake bite, sexual problem, body aches etc. Similar uses of mammals are reported from different parts of India, China and some other parts of the world (Sharma 1987; Sharma et al. 1995; Ghosh et al. 1996; Singh et al. 1998; Kala 2002, 2005; Solanki et al. 2004; Costa-Neto et al. 2005; Jamir et al. 2005). Alcohol prepared by the fermentation of flesh of golden jackal (*Canis aureus*) and locally available cereal is found to be popular among the group with the highest frequency of use. It is consumed orally or applied externally all over the body in treating gout, arthritis and body aches. Similarly, *Jirels* use gastrointestinal contents of porcupine (*Hystrix* spp.) and urine of Himalayan cow (*Bos sp.*) as medicine to cure asthma and chronic ailments. Like "jackal alcohol" this practice is also found to be popular among the ethnic population. During PRA discussion the researcher came to know that these animals normally consume a lot of Himalayan herbs of medicinal value in the Himalayan alpine and their gastrointestinal content and urine retain properties of ingested herbs. Animal products such as urine of rhinoceros, black dog and domestic cow are used in curing body ailments like asthma, heart problem, as antidote of snakebite, disinfectant and insecticide respectively. Similar use practices of animal products such as stool of dog and urine of goat, dog and human being is found among the Naga tribe of Nagaland (Jamir et al. 2005). Endangered animal *Rhinoceros unicornis* is not found in the studied area. But it was learnt during PRA exercise that it was a normal practice in the community to buy rhino urine from Zoo of the capital city Kathmandu to use it as medicine.

**Jirel Animal Relationship at Spiritual Level:** Man resource relationship at all levels- material, cultural, spiritual etcetera contributes to the overall well-being of human beings. *Jirels* have cultivated relationship with the animals at the spiritual level also. Spiritual relationship with animals is overt as some of the animals usually of strong and fearful nature such as tiger, rhinoceros, bear, musk deer etc. are sources of charms and amulets. It is believed that the wearer of such charms and amulets is well protected from the perceived



“bad effects” of unseen elements. The wearer thus gets emotional security. This practice underlines the importance of certain animals to the *Jirels* in their day to day life activities. Such a notion is the result of their positive attitude towards animals. It can be argued that such notion towards fellow animals if managed properly could contribute to their conservation. Also, a number of animals are used in faith healing therapy to appease the deity believed to govern their health. Animals used in such magico-religious sphere are *Python molurus* (reptile), *Ciconia* spp. (bird), *Vanellus* spp. (bird), *Corvus* spp. (bird), *Columba* spp. (bird), *Gallus gallus* (cock), *Calloscirus* spp. (mammal), *Herpestes* spp. (mammal) and *Panthera tigris tigris* (mammal). Certain phenomena such as abnormal sound of *Bubo bubo* in the night and sudden sight of snakes, lizards and cats before the onset of long journey of a person indicate bad omen. Similar kind of man animal relationship at spiritual level is found among the Yi people of China (Hong 1990) and some tribal groups of India and abroad (Borang 1996). Ethno-zoological data obtained from different sources were cross-checked during PRA exercises also.

**Trend in Ethno-zoological Knowledge:**

Younger people harbor less knowledge about animals and their various uses. This could be attributed to mainly three reasons. The primary reason could be because of less association of younger people with the older ones as a result of which the ethno-zoological knowledge could not be transferred to the successively generations efficiently. Secondly, it could be because of the lesser use of traditional zootherapeutic remedies in healing due to an easy access to the modern health care systems. Thirdly, it could be because of the unavailability of desired faunal resources as a result of strict animal conservation laws of the government. There is common trend of erosion of traditional knowledge in other parts of the world as well.

### CONCLUSION

*Jirel*-animal relationship is viewed both at spiritual and material levels. Both domestic and wild animals are sources of food and medicine to them. Most fearful, strong, rare and large sized animal are the sources of the most potent zootherapeutic remedies. Charms made out of bone, exoskeleton, glandular secretions of such animals provide emotional security to *Jirels*. They

believe that these charms protect them from bad effects of “evil eye”. Endangered status of most of the large mammals could be the result of their excessive use in the past. Sustainable use of these animals now is possible only when their number increases to an optimum level.

Some of the smaller animals such as *Pheretima* spp., *Vespa* spp., *Polistes* spp., *Araneus* spp., *Lycosa* spp. and slug spp. are generally regarded as useless creatures by human beings. Present study shows that the *Jirel* store valuable traditional knowledge regarding various uses of these animals. Further research on these animals could lead to new sources of important drugs in future and benefit the community from where the knowledge originated. Besides food and medicinal values of these smaller animals, their contribution to the biological diversity of the country is equally important.

Many species of birds are the sources of zootherapeutic remedies to *Jirels*. In other words, *Jirel* possess rich ethno-ornithological knowledge. Such time tested knowledge could be useful while designing conservation and management policy of avian fauna.

Sustainable use of some of the endangered animals such as jackal (*Canis aureus*), bear (*Selenarctos thibetanus*), sloth bear (*Melurus ursinus*), leopard (*Panthera* spp), musk deer (*Moschus moschiferus*), yak (*Bos grunniens*) and Primates is possible only when their number increases to an optimum level.

From the study it is clear that there is erosion of ethno-zoological knowledge amongst *Jirels*. It is urgent to document ethno-zoological knowledge of other ancient communities of the country before the knowledge disappears from the land for ever.

### RECOMMENDATIONS

- It is suggested that the animals that are the sources of the most potent zootherapeutics be listed in the top priority of conservation and management. It has now become an established fact that sustainable development could be achieved only through full integration of cultural and biological diversity.
- It is necessary to generate awareness about the importance of some of the smaller and often thought to be “useless” animals such as earthworm, slugs and some insects among the general public.
- Possibilities of captive breeding of some of

the larger animals that are of excessive use value to the community need to be explored. This could be possible only when the traditional knowledge on the various aspects on these animals is taken into an account. Appropriate policy needs to be formulated in this regard.

- Further research on the zootherapeutics of wider usage is recommended.

### REFERENCES

- Alves RRN, Rosa IL, Santana GG 2007. The role of animal-derived remedies as complementary medicine in Brazil. *BioScience*, 57(11): 949-955.
- Bingham CT 1897. *Fauna of British India Including Ceylon and Burma, Hymenoptera: 1. Wasps and Bees*. London: Taylor and Francis.
- Bista DB 2000. *People of Nepal*. Kathmandu, Nepal: Ratna Pustak Bhandar.
- Borang A 1996. Studies on certain ethnozoological aspects of Adi tribes of Siang district, A.P. India. *Arunachal Forest News*, 14(1): 1-5.
- Central Bureau of Statistics (CBS) 2001. *National Population Census 2001, Nepal*. Kathmandu: National Planning Commission.
- Central Bureau of Statistics (CBS) 2004. *Population Monograph of Nepal Vol 1*. Kathmandu: National Planning Commission Secretariat.
- Costa-Neto EM 2005. Animal-based medicines: Biological prospection and the sustainable use of zootherapeutic resources. *Anais da Academia Brasileira de Ciencias*, 77(1): 33-43.
- Costa-Neto EM 2005. Entomotherapy or the medicinal use of insects. *Journal of Ethnobiology*, 25: 93-114.
- Flemming RL Sr., Flemming RL Jr., Bangdel LS 1979. *Birds of Nepal*. 2<sup>nd</sup> Edition. Kathmandu: Avalok.
- Ghosh AK, Maiti P K 1996. Investigation of some animal drugs (Mammals) used by the tribal people in India. In: SK Jain (Ed.): *Ethnobiology in Human Welfare*. Lucknow, India: Deep Publications.
- Hong L 1990. Animals and the Culture of Yi Nationality. *Proceedings: Challenges of Ethnobiology in the 21st Century*. II Ethnobiology Congress, China.
- Jamir NS, Lal P 2005. Ethnozoological practices among Naga tribes. *Indian Journal of Traditional Knowledge*, 4(1): 100-104.
- Joseph ANT 1982 Use of animals as drugs in certain tribals of Madhya Pradesh. *Journal of Pharmacology*, 2: 229-235.
- Kakati LN, Doulo V 2002. Indigenous knowledge system of zootherapeutic use by Chakhesang tribe of Nagaland. *Journal of Human Ecology*, 13(6): 419-423.
- Kala CP 2002. *Medicinal Plants of Indian Trans-Himalaya: Focus on Tibetan Use of Medicinal Resources*. Dehradun, India: Bishen Singh Mahendra Pal Singh, P.200.
- Kala CP 2005. Health traditions of Buddhist community and role of amchis in trans-Himalayan region of India. *Current Science*, 89(8): 1331-1338.
- Lev E 2003. Traditional healing with animals (zootherapy): Medieval to present-day Levantine practice. *Journal of Ethnopharmacology*, 85: 107-118.
- Lohani U 2010. Man-animal relationships in Central Nepal. *Journal of Ethnobiology and Ethnomedicine*, 6: 31.
- Lohani U, Rajbhandari K, Katre S 2008. Need for systematic ethnozoological studies in the conservation of ancient knowledge systems of Nepal- A review. *Indian Journal of Traditional Knowledge*, 7(4): 634-637.
- Maffi L 1996. "The Blisters": Smallpox and an early care of Mayan self-help. In: S K Jain (Ed.): *Ethnobiology in Human Welfare*. New Delhi: Deep Publications.
- Mahawar MM, Jaroli DP 2006. Animals and their products utilized as medicines by the inhabitants surrounding the Ranthambhore National Park, India. *Journal of Ethnobiology and Ethnomedicine*, 2(46): 1.
- Martin G 1995. *Ethnobotany- A Method Manual*. London: Chapman and Hall.
- Pocock RI 1900. *Fauna of British India Including Ceylon and Burma; Arachnida*. New Delhi: Today's and Tomorrow's Publisher.
- Quave CL, Lohani U, Verde A, Fajardo J, Rivera D, Obo'n C, Valdes A, Pierone A 2010. A comparative assessment of zootherapeutic remedies from selected areas in Albania, Italy, Spain and Nepal. *Journal of Ethnobiology*, 30(1): 92-125.
- Rosner F 1992. Pigeons as a remedy for jaundice. *New York State Journal of Medicine*, 92: 189-192.
- Shah KB, Giri MK 1992. Some amphibians and their local uses in Arun Basin. *Journal of Natural History Museum*, 13(1-4): 9-17.
- Shah KB, Tiwari S 2004. *Herpetofauna of Nepal- A Conservation Companion*. Kathmandu: IUCN.
- Sharma VP 1987. The relevance of traditional animal drugs of bird origin used by Bhil tribals of Rajasthan State. *Geobios News Reports*, 6: 129-132.
- Sharma VP, Khan AU 1995a. The ethnomedic zoological drugs of bird origin used by Garo tribals, Meghalaya. *Annals of Forestry*, 3(2): 1.
- Shrestha J 1981. *Fishes of Nepal*. Kathmandu: Curriculum Development Centre, Tribhuvan University.
- Shrestha TK 1997. *Mammals of Nepal*. Kathmandu: Mrs. Bimala Shrestha.
- Shrestha TK 2003. *Wildlife of Nepal*. Kathmandu: Mrs. Bimala Shrestha.
- Singh KK, Singh RKG, Sharma SK, Laitonjam A 1998. Ethnomedicozoological study of vertebrates among the Meetei community of Manipur. *Uttar Pradesh Journal of Zoology*, 18(1): 19-26.
- Solanki GS, Chutia P 2004. Ethnozoological and Sociocultural aspects of Monpas of Arunachal Pradesh. *Journal of Human Ecology*, 15(4): 251-254.
- Solovan A, Paulmurugan R, Wilsanand V, Singh A J A R 2004. Traditional therapeutic uses of animals among tribal population of Tamil Nadu. *Indian Journal of Traditional Knowledge*, 3(2): 198-205.
- Thapa VK 1995. *Enumeration of spiders*. Kathmandu: Biodiversity Profiles Project Publication.
- Thapa VK 2000. *An inventory of Nepal's Insects (Hemiptera, Hymenoptera, Coleoptera and Diptera)*. Kathmandu: IUCN.
- Tikadar BK 1987. *Handbook of Indian Spiders*. Calcutta: Zoological Survey of India.
- Zhang Fx, Guo B, Wang HY 1992. The spermatocidal effects of earthworm extract and its effective constituents. *Soil Biology and Biochemistry*, 24: 1247-1251.