Bird hunting in Mishmi Hills of Arunachal Pradesh, north-eastern India

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Introduction

Arunachal Pradesh (26°28'–29°30'N, 91°30'–97°30'E), also known as the 'land of the rising sun,' is located in the north-eastern corner of India **(Fig. 1)**. Formerly known as North East Frontier Agency (NEFA), the state of Arunachal Pradesh covers an area of 83,743 km^2. It is bordered by Bhutan on the west, China (Tibet) on the north and north-east, and Myanmar on the east and south-east. The Indian states of Assam and Nagaland are located to its south. The population density of the state is one of the lowest in India, with 13 persons per square kilometer, whereas the country's average is 324 (Anonymous 2006).

Arunachal Pradesh is rich in biodiversity and has become a hub of scientific explorations leading to the discovery of new taxa species. In 2003, a new race of Sclater's Monal *Lophophorus sclateri arunachalensis* was discovered in the Subansiri region (Kumar & Singh 2004). A new species of primate, the Arunachal macaque *Macaca munzala* was discovered from Tawang district in 2004 (Sinha *et al*. 2005). In 2006, a new bird species, the Bugun Liocichla *Liocichla bugunorum* was discovered near Eaglenest Wildlife Sanctuary in western Arunachal (Athreya 2006). Of late Arunachal Pradesh has become the focus of national and international wildlife research and conservation, partly due to its status of being in the Eastern Himalayas 'biodiversity hotspot' (Myers *et al*. 2000).

Arunachal Pradesh has always attracted botanists, ornithologists, and explorers, both in colonial, and post-colonial periods, including Ali & Ripley (1949), Singh (1995), Choudhury (1998, 2006), and Datta (1998, 2007). However, given the important geographical location of the state, information on Arunachal Pradesh's avifauna in general, and Mishmi Hills in particular, is lacking.

Study area

Anjaw district was part of Lohit district till 2004 when it was separated into a new district **(Figs. 1 & 2)**. Most of the district is hilly and rugged. Other than a metal road till Kibithoo, Hawai, and Hayuliang, the rest of Anjaw is difficult to access. Frequent landslides and lack of transportation are major hurdles in reaching large parts of the district. The Mishmi Hills are formidable, with peaks ranging from 3500 m to 5000 m. There are seven administrative circles, namely, Hayuliang, Hawai, Walong, Kibithoo, Chaglagam, Manchal, and Goilliong with headquarters in Hawai. Anjaw district is in the north-eastern extremity of the state, bordering China (Tibet), and Myanmar.

The forests in Anjaw district are classified as Northern Tropical Semi-evergreen Forest (Eastern Alluvial Secondary Semi-evergreen Forest), Assam Sub-tropical Pine Forest, and East

Fig. 1. District map of Arunachal Pradesh

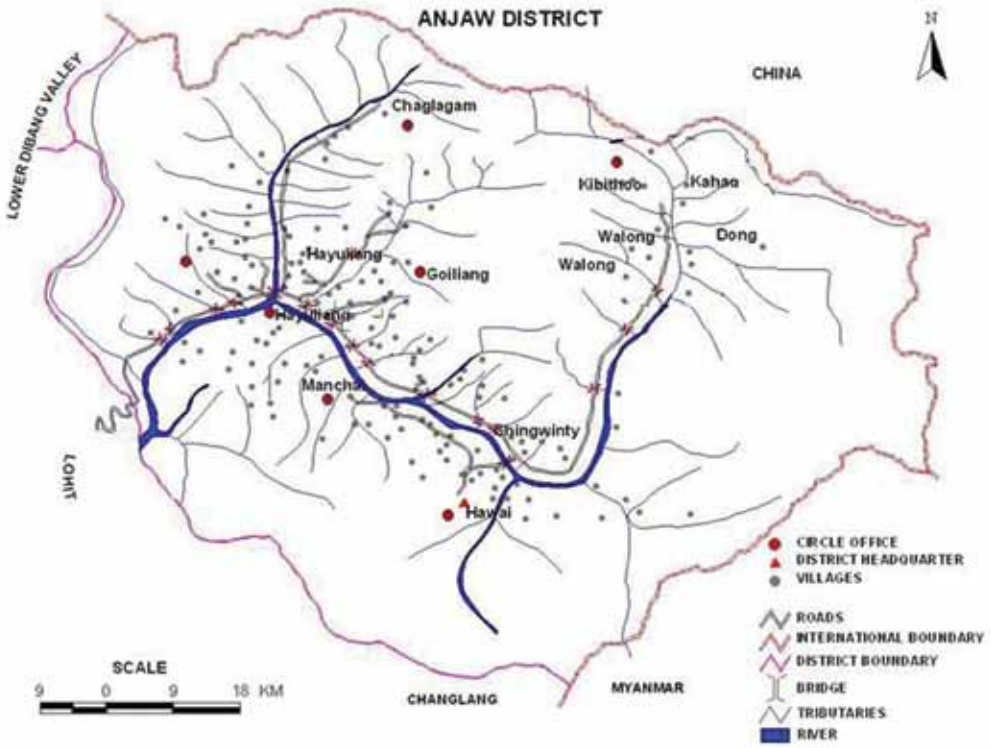

Fig. 2. Anjaw district and the circle offices

Himalayan Sub-alpine Birch/Fir forest (Anonymous 2005). There are no Protected Areas in Anjaw district, the nearest being the Kamlang Wildlife Sanctuary in the adjoining Lohit district, which is approximately 110 km from Hayuliang.

Hayuliang is the functional headquarters of Anjaw district (officially, Hawai is the headquarters) and is a Block Development Office. Except for Manchal, Hayuliang, and Walong, other locations lie along the Indo–China border. Walong and Kibithoo have large army establishments. The local population belongs to the Meyor and Mishmi tribal groups. Around 120 exogamous clans of Mishmi are known, the three main groups being Miju Mishmi in upper Lohit, and Anjaw districts; Digaru Mishmi in the western part of Lohit district; and Idu Mishmi in Dibang Valley (Mills 1952; Chowdhury 1982).

Methods

Anjaw district was visited four times from 2006 to 2009 to study wildlife hunting practices of local communities **(Table 1)**. The recordings are based on *ad hoc* encounters during village trails, interviews, and interactions with professional hunters, and children who hunted birds with catapults. Pictorial bird guides were used to generate interest during the interviews and were used to confirm identifications of birds. Evidence of birds found in the region was also recorded through artifacts used by the local people. Village ceremonies, festivals, and celebrations were attended to document the utility of wildlife parts, and to gather additional information about hunting. Villagers demonstrated various types of traps used by them near the *jhum* fields, or in the canopies. Occasionally villagers made models of the traps and explained the mechanism.

Tribal communities

The major tribal inhabitants of Anjaw district are Miju Mishmi, Digaru Mishmi, and Meyor. Mishmi are shifting cultivators who follow animism and believe in the presence of spirits in mountains, rivers, and trees, and the different names given for them emphasise the importance to their relationship with nature. This relationship is maintained in the form of domestic animal sacrifices, and wildlife hunting. The main crops grown are maize, millet, and some vegetables. Cash crops grown are cardamom, opium, and oranges. Agriculture, and other cultivated products are an important part of their economy and crop protection is a priority. Trapping overlaps with the shifting cultivation and is a frequently used technique to capture wild animals found near villages and in fields.

The Meyor, one of the lesser-known tribes of India, inhabit the Walong and Kibithoo circles of Anjaw district. They are Buddhists and are believed to have migrated from China to evade taxes. They are good at hunting and frequently travel to the snow-covered region to hunt. Unlike Mishmi, who practice slash-and-burn cultivation, Meyor practice terrace cultivation.

Table 1. Dates and sites visited in Anjaw district

Dates	Sites
27/01/2006–24/02/2006	Hayuliang, Walong, Kibithoo, Chaglagam, Goilliong
19/08/2007–01/11/2007	Hayuliang, Walong, Kibithoo
06/01/2008–17/02/2008	Hayuliang, Chaglagam
05/06/2009–20/07/2009	Hayuliang, Manchal, Goilliong

Hunting methods

Hunting is a way of life among the Mishmi—whether for consumption, trade, cultural reasons, or sometimes for fun during leisure (Aiyadurai *et al*. 2010). Wildlife hunting is usually a winter activity when wild animals and birds descend from the snow-covered mountaintops in search of food. Pheasant hunting is common in winter in high altitude villages (Hilaludin *et al*. 2004; Aiyadurai 2007). Smoked wild meat is given as a 'bride-price' during Mishmi weddings. During village functions and ceremonies, wild meat is usually a luxury, reserved for special guests like priests or government officials. After the meat is consumed, parts like tail feathers are used as artefacts, some for ornamental purposes and some for religious ceremonies.

Bird hunting and trapping is common in the Anjaw region of Mishmi Hills. Tail feathers of Himalayan- *Lophophorus impejanus*, and Sclater's Monal *L. sclateri* are used as hand-fans, especially by chanting priests waving them during rituals. Some bird parts, like wing feathers, are used for decorative purposes, and occasionally women wear monal feathers around their necks (Aiyadurai 2007).

Hand-fans made from pheasant tail feathers are commonly seen in most Mishmi households. It is not clear why only pheasant tail feathers are used. Tails of six pheasant species were recorded in the villages visited: Himalayan-, and Sclater's Monal Blyth's-*Tragopan blythii*, and Temminck's Tragopan *T. temminckii*, Kalij Pheasant *Lophura leucomelanos*, and Grey Peacock-pheasant *Polyplectron bicalcaratum*.

Hand-fans are sometimes partly covered with an ungulate's skin, usually goral *Nemorhaedus goral*, barking deer *Muntiacus muntjak*, or sambar *Cervus unicolor*. Feathers of other wild birds like Red Junglefowl *Gallus gallus*, and Racket-tailed Drongo *Dicrurus paradiseus* also find their place on these fans.

Traps

Different kinds of traps are used for hunting birds. Six most commonly used traps are shown in **Table 2**.

Some traps are easy to make, like *Handam, Kheyet,* and *Diow* **(Fig. 3)**, require limited skills, and can be reused. Trapping is a low investment and low cost method as traps are prepared with locally available material like bamboo. Trapping is practiced in a wide range of habitats, from farmlands, riverbeds, kitchen gardens, to forests, and mountaintops. Traps are set up at

Table 2. Types of indigenous traps used by the villagers

Traps	Material used	Species targeted	Landscape	Frequency of use
*Diow** (Loop bamboo strip trap)	Plant fiber, nylon rope	Ground-dwelling birds, especially pheasants	Mountains in snow covered regions	High
*Hakap** (Canopy traps)	Bamboo	Birds	Around villages and near crop fields (set on the tree canopy)	Medium
*Handam** (Stone trap)	Stone, bamboo	Rodents, birds	Crop fields, kitchen gardens	High
*Kheyet**	Metal wire, bamboo	Wild pig, bears, barking deer, but ground-dwelling birds like pheasants are also likely to be trapped	Forests, crop fields, mountains	High
*Paipit** (Noose with a coloured seed as bait) **(Fig. 3)**.	Nylon rope / plant fiber, bamboo	Large and small birds	On the ground, near crops fields and villages	Medium
*Tawan** (Triangular trap)	Wires (used in fencing), bamboo	Rodents, birds, squirrels, sometimes snakes	Around granaries, crop fields	High

different heights: *Hakap* and *Tawan* **(Fig. 3)** traps are set at tree canopy level, targeting birds that arrive to feed on fruits, which are otherwise difficult targets for catapults or guns. Traps for pheasants and other ground-dwelling birds are set on the forest floor and checked after three or four days.

Catapults

Boys start hunting at the young age of 12–14 years, using catapults, mainly targeting birds and squirrels. As they grow up, they join their fathers and uncles as assistants (porters and cooks) on hunting trips when they acquire hunting and trapping skills. There is no specific age for hunting. Men in their 20s hunt till they are in their 50s, indicating that hunting continues to be a popular activity and that skills continue to be acquired by younger generation.

Guns

Hunters with guns search and pursue animals. Generally

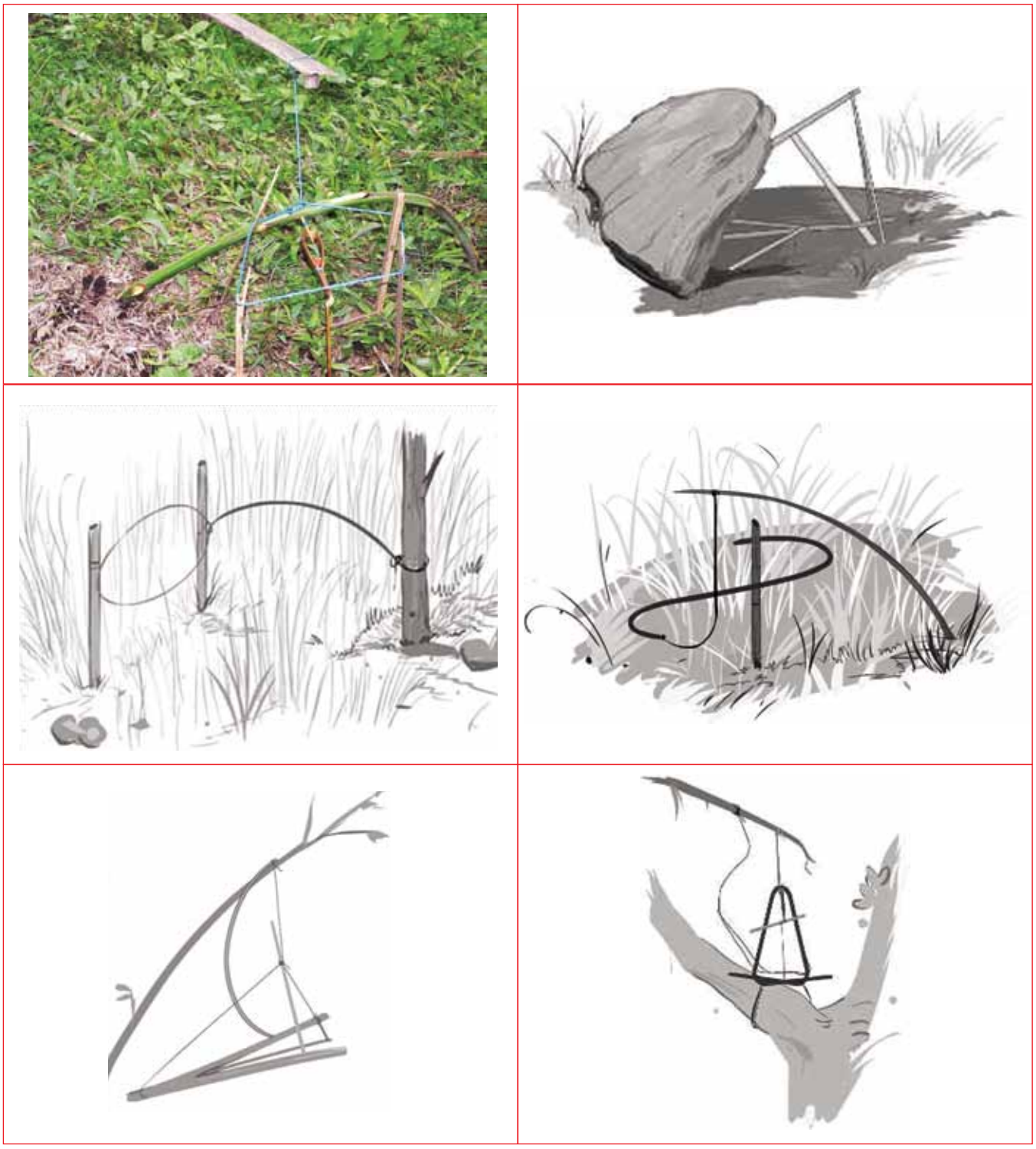

Fig. 3. Clockwise from top right: Different types of traps: *Handam*, *Kheyet*, *Diow*, *Hakap*, *Tawan,* and *Paipit*.

Table 3. Attributes of hunting and trapping methods

Hunting method	Who uses	Where	Seasons
Catapults	Boys, adult men	Around villages, crop fields	No particular season but more in winter
Traps	Men, women (sometimes), children	Around villages, kitchen gardens, crop fields and in the mountains	Guarding and harvest season (Aug-Nov), winter
Guns	Adult men only	Forests, crop fields, mountains	Winter (long duration trips), guarding and harvest season

shotguns are used, but one respondent in Yatong village (Anjaw district) had a 0.22 rifle with a telescopic vision. Guns are both, locally made, and bought in the open market on government-issued licenses. Most widely used are double-barreled shotguns (DBBL), single-barrel shotguns, and a hand shotgun. DBBL is preferred for its effectiveness. Guns are currently used for hunting along with a variety of traps and catapults **(Table 3)**.

Checklist of birds recorded during the surveys (list includes both live and dead birds)

Great Cormorant *Phalacrocorax carbo*: Hayuliang (Dead specimen, shot).
Temminck's Tragopan *Tragopan temminckii*: Chaglagam (Dead specimen, trapped).
Eurasian Crane *Grus grus*: Walong (Dead specimen, shot).
Rufous-necked Hornbill *Aceros nipalensis*: a pair near Parshuramkund. Also reported by Ali & Ripley (1949) from near Tidding, and by Singh (1995) from near Hayuliong road.
Great Barbet *Megalaima virens*: Chipru, near Hayuliang. Common during this season.
Golden-throated Barbet *M. franklinii*: Common around Hayuliang.
Sand Martin *Riparia riparia*: Common, Khupa.
Nepal House Martin *Delichon nipalense*: Common, Hayuliang, and Chipru.
White Wagtail *Motacilla alba*: Common.
Scarlet Minivet *Pericrocotus flammeus*: Common around Hayuliang.
Black-crested Bulbul *Pycnonotus melanicterus*: Common.
Red-whiskered Bulbul *P. jocosus*: Common.
Black Bulbul *Hypsipetes leucocephalus*: Common.
Orange-bellied Leafbird *Chloropsis hardwickii*: Hayuliang.
Blue Whistling Thrush *Myophonus caeruleus*: Common along the roads, close to farms.
White-collared Blackbird *Turdus albocinctus*: Taflagam, Chaglagam.
Orange-flanked Bush-Robin *Tarsiger cyanurus*: Loilum, dead specimen.
Black Redstart *Phoenicurus ochruros*: Common.
Blue-fronted Redstart *P. frontalis*: Chaglagam, Yatong, and Hayuliang
White-capped Water-Redstart *Chaimarrornis leucocephalus*: Common near streams.
Black-Backed Forktail *Enicurus immaculatus*: Sightings from Hayuliang to Chaglagam.
White-crested Laughingthrush *Garrulax leucolophus*: Common in undergrowth.
Striated Laughingthrush *G. striatus*: Khupa.
Blue-winged Laughingthrush *G. squamatus*: Captured alive.
Silver-eared Mesia *Leiothrix argentauris*: Dead specimen. Catapulted.
White-naped Yuhina *Yuhina bakeri*: Hayuliang, Chipru, and Chaglagam.
Fire-tailed Myzornis *Myzornis pyrrhoura*: Chaglagam.
Slaty-backed Flycatcher *Ficedula hodgsonii*.
Asian Paradise-flycatcher *Terpsiphone paradisi*: Chipru.
Yellow-bellied Fantail *Rhipidura hypoxantha*: Around Chipru, Metaliang, and Chaglagam.
Mrs. Gould's Sunbird *Aethopyga gouldiae*: dead specimen.
Little Spiderhunter *Arachnothera longirostra*: Chaglagam. Dead specimen, catapulted.
Little Bunting *Emberiza pusilla*: Chaglagam.

Discussion

Hunting for wild meat is a major issue in several countries across the world. Wildlife hunting is widespread in Arunachal too. With changes in lifestyle, improved infrastructure like roads, providing easy access to remote forests, and availability of modern hunting technology, the pressure on forests and wildlife is tremendous, and hunting is reported as one of the major threats to the avifauna of the state (Kumar & Singh 2003). Hunting is not only for the pot but also strongly linked to local culture. So what can be done about this issue of hunting is the main question. Conservation projects need to consider the social, economic, and cultural aspects of the local communities, since the ultimate aim is to prevent wildlife from declining, by involving local people. Their knowledge about the local ecology is very rich, and it is this knowledge and skill that can be harnessed for designing and implementing better conservation projects.

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