RSG BHUTAN CONFERENCE

Final Report

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RSG BHUTAN CONFERENCE

"Bringing Together Field Researchers in Bhutan"

College of Natural Resources
Lobesa
October 29 to 31, 2015

Organized by:

College of Natural Resources
Royal University of Bhutan
Lobesa: Punakha

Royal Manas National Park
Department of Forests and Park Services
Gelephu: Sarpang

Funded by:

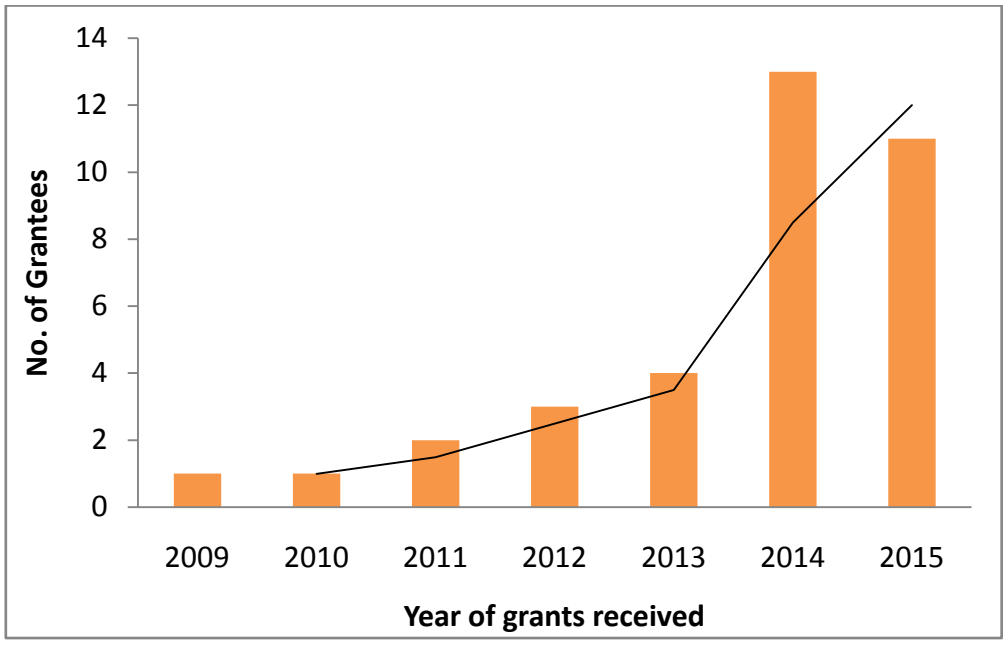
Rufford Small Grant Foundation

Introduction

The RSG Bhutan conference was held at the College of Natural Resources, Royal University of Bhutan, Lobesa from October 29 to 31, 2015. With the theme "Bringing Together Field Researchers in Bhutan" the conference was attended by 35 participants from two countries - Bhutan and Nepal. The participants comprised of 15 Rufford Grantees and 20 non-grantees. Of the 15 Grantees that presented paper on their field research supported by RSG, the broad research areas were mammals, birds, fishes, insects, Reptiles, Amphibians, wetlands and Human-wildlife conflicts (see the details in presentation abstract).

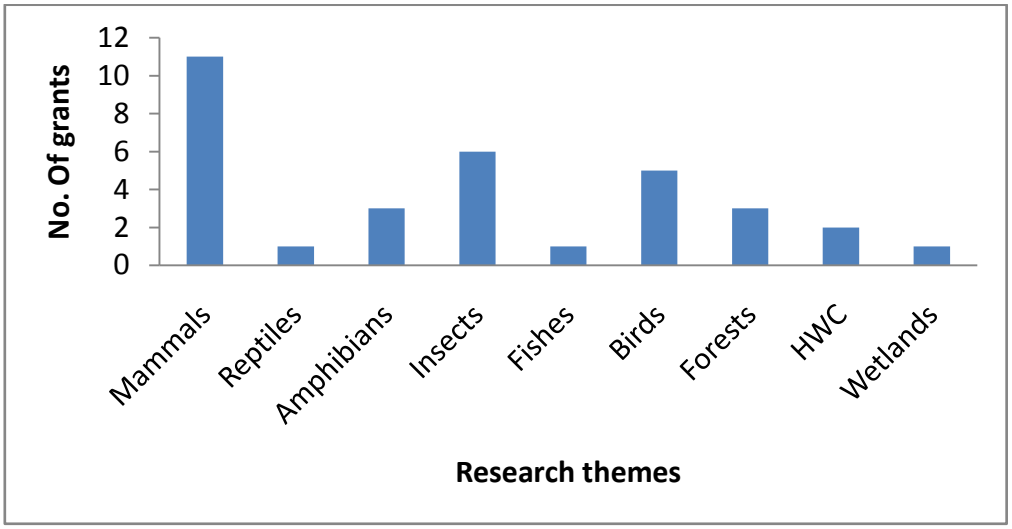
There were 33 researchers in Bhutan supported by Rufford small Grants as of October 31, 2015. The Rufford fund support for researchers in Bhutan started from 2009 and since then increasing numbers of individuals availed grants (see figure 1).

Figure 1. Year wise grant availed by researchers in Bhutan



At least eight research themes are taken up with most sought to conduct research on mammals (see figure 2).

Figure 2. Different research themes against number of grants



Summary of the conference sessions

Preconference session

The Director General of the College of Natural Resources, Dr. Phub Dorji was the chief guest for the opening sessions. The other guest included Deans and Program Head of the college. Josh Cole, Grant Director of RSG also attended meeting. The Chief Guest in his opening remarks said that today's generation is faced with so many challenges within this earth's finite resources - increasing resources consumption, global warming, habitat destruction, decreasing wildlife species, species extinction. All these challenges post greater task for the survival of mankind and therefore, there is need for strategies to address those challenges. This would require human capacity and financial resources, which is lacking in Bhutan. As such, he acknowledged that RSG funding could play sound base for a knowledge base society. He expressed his appreciation and gratitude to RSG for making this conference happen at the College of Natural Resources.

The participants with Chief Guest and Josh in the centre.

Oral presentation

Fifteen grantees have presented their research works during the conference. Each presentation was followed by discussions and sharing of experiences from the field. The abstract of the presentation are given under:

BAL KRISHNA KOIRALA
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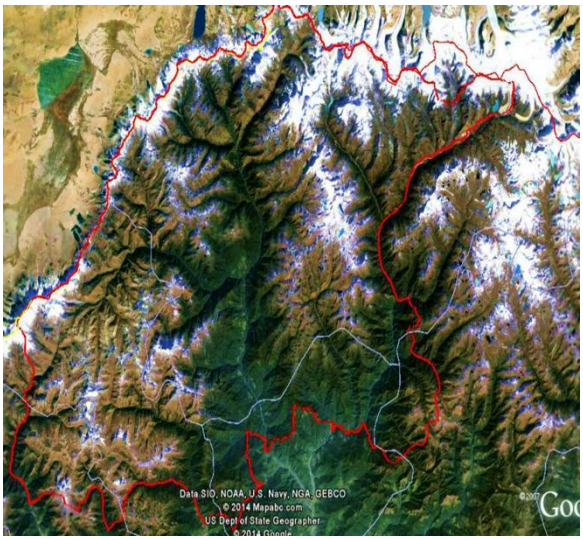
Project status: Completed

Species diversity and spatial distribution of snakes in Jigme Dorji National Park and adjoining areas, Western Bhutan



This paper presents the results of study conducted on diversity and spatial distribution of snakes along an altitudinal gradient in Jigme Dorji National Park and adjoining areas, Bhutan. The survey was conducted in the spring and summer months of 2014 and 2015. The study aimed to assess diversity and distribution of snakes along Mochu and Punatshang-chhu river valley using visual encounter survey technique. The study also accounts medically important species of snake found in the study area. A total of 17 species of snake belonging to 14 genera and 3 families were documented during the study period and the species richness peaked at 1200–1600 m with no species beyond 3200masl. More than 53% of species were recorded in the lower sampling sites (between 1200- 1600m) indicating more favorable climatic variables and habitat types for snakes assemblages at lower elevations and importance of protecting low land forest areas for the conservation of snakes in Himalayan region. His project details can be found at http://www.rufford.org/projects/bal_krishna_koirala.

Table 1. List of snake species documented in Jigme Dorji National Park and adjoining areas during May 2014 to June 2015.

Family	Scientific Name	Common Name
Colubridae	Ptyas nigromarginata	Green cat snake
Colubridae	Rhabdophis himalayanus	Himalayan keelbeck
Colubridae	Bioga multifaciata	Many banded cat snake
Colubridae	Trachischium spp	
Colubridae	Orthriophis cantoris	Mountain racer
Colubridae	Orthriophis taeniurus	Striped trinket
Colubridae	Amphiesma platcypes	Himalayan mountain keelbeck
Colubridae	Rhabdophis spp	Keelbeck
Colubridae	Lycodon aulicus	Wolf snake
Colubridae	Oligodon spp	Kukri snake
Colubridae	Sibynopis collaris	Collared black headed snake
Viperidae	Gloydius himalayanus	Himalayan pit viper
Viperidae	Ovophis monticola	Mountain pit viper
Viperidae	Protobothrops himalayanus	Habu Himalayan pit viper
Elapidae	Naja kaouthia	Monocled cobra
Elapidae	Bungarus niger	Black krait
Elapidae	Bungarus bungariodes	Himalayan krait

CHIMMI DORJI
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Project status: Ongoing

To Assess Effect of Electric Fencing as a Mitigation Measures to Human-Bear Conflict and Black Bear Ecology

Human wildlife conflict is defined as any event in which animals injure, destroy or damage human life or property, and also animals are killed, injured, captured or otherwise harmed as a result both humans and animals suffer from the interaction . It is one of the growing concerns and complex challenges that are currently being faced by the conservationists all over the world (Shrestha, 2007).
Like any other countries in the world, human wildlife conflict is one of the challenges in the field of conservation in Bhutan too. The wildlife in Bhutan enjoys the protection from any forms of threats and dangers. Unlike the other protected areas around the globe, Bhutan's protected areas have human settlements in the buffer zones. Also there are many human settlements in and around the forested areas. These features have led to the increasing issues of human wildlife conflict in the country. One such conflict is the Human Bear Conflict. In the recent years, black bears have started raiding meditation huts by breaking doors, windows and walls. There were even risks of bear attacking the human who were inside the huts. The huts are located inside and adjacent to the forest. After the concerned organization received complains and knew about this conflict, numerous measure like guarding the huts from the black bears at night and snaring and relocation of the bears have carried out. Since those measures could not control the conflict, electric fences are installed in pilot basis in the conflict areas. Since no comprehensive studies on black bear and effectiveness of electric fences in mitigating human-bear conflict is done as of now in Bhutan, this proposed study can answer the following questions.

1. How effective is the electric fencing in managing the conflict?
2. Is there any negative effect of fence on the bear behaviour?
3. Any necessary changes required in the design of the fence?
4. Ecology of the bear based on diet and behaviour?

His project details can be found at http://www.rufford.org/projects/chimmi_nil_dorji.

DORJI WANGCHUK
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Project status: completed

Evaluating Threats and its Impact on the Current Distribution of Golden Langur in Bhutan

After one decade of its initial assessment, the golden langur distribution across it habitats were assessed using line transect. One time survey in the entire habitat using the same transect for initial study (1999 - 2003) was carried out. The study found out that there is no significant difference in habitat occupancy.

Within the golden langur habitat the major infrastructure that are constructed in last one decade include 36 km of Mangdechhu project areas, 16 km of road bypass between Tingtibi and Wangdigang, and 35.5 km road widening between Tingtibi and Praling and 25 km new road between Praling and Pantang. These infrastructures passes through the golden langur habitat.

Although the infrastructure development has been assessed, we have not been able to assess the quantum of impacts from different development parameters. Such assessment would require long term observation and use of advance GIS application to model threats. Our observation shows that low vehicular traffic except few cases of road kills impose very negligible disturbance to this arboreal species.

In Bhutan the current study showed significant increase in mean group size (11) from 7 in 20013. However when we compared with the study from neighbouring states of Assam (10.8 in disturbed areas and 10.1 from undisturbed areas), we found very negligible increase in mean group size. The exact cause of such increase is not known and it is subject to verification with more scientific study.

His detail project report can be found at http://www.rufford.org/projects/dorji_wangchuk

Dr. D.B. GURUNG
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Project status: completed

Diversity, Distribution, and Ecology of Fishes of Bhutan

Due to the rapid development of a series of large-scale hydropower projects along the major river systems of Bhutan (10,000 MW planned by 2020), and in the absence of any reliable nationwide database on the fishes, the need to conduct a systematic species inventory in Bhutan is a high priority from the standpoint of conservation.

The ecology of the country's freshwater systems is also becoming more worrisome as the effect of brown trout (*Salmo truta*), introduced in 1930s, remains unclear and the plans to expand aquaculture of the recently introduced (and highly competitive) rainbow trout (*Onchorhynchus mykiss*) are advancing within the government without any consideration of its potential ecological impact, let alone an environmental impact study. This project, therefore, aims to generate a reliable baseline data on icthyological taxonomy and diversity of Bhutan, with the ultimate goal of providing enough data to enable the government to develop conservation plans for endemic or rare species that are likely to be discovered.

In this study, 83 species of fishes were enumerated as found in Bhutan. This figure exceeds the number of 53 species that is be being maintained for Bhutan. From the enumerated taxa, 27 species are new records for Bhutan. Therefore, this study has helped in generating enough scientific baseline information on the ichthyofauna diversity of Bhutan.

Voucher specimens for 45 species, comprising of 135 specimens in total, were prepared using standard protocols and catalogue system. These specimens will assist the college in delivery of modules related to freshwater ecology and fishery development.

His project details can be found at http://www.rufford.org/rsg/projects/dhan_gurung

JATISHWOR SINGH IRUNGBAM
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Project status: Ongoing

Study of Butterfly Diversity and its Conservation in Tsirang District, Bhutan

Bhutan is a part of Indo-Burma global Biodiversity Hotspot. It is also a meeting place of the central Asia and Chinese subdivision of the Palaearctic region. Hence, the region is considered very rich in terms of butterfly diversity and is an area of significant conservation importance. Vertebrate fauna of Bhutan has been fairly well documented, but little is known about the invertebrate fauna of Bhutan. Invertebrate fauna, especially butterflies, have not been studied thoroughly. Bhutan is expected to have about 800 to 900 species of butterfly, but information on their current status and distribution is lacking. Hence, the current study in Tsirang district is focused on systematic documentation of butterfly fauna. It may fill the gaps for future butterfly research and planning for conservation programs.

"Pollard Walk method" was adopted with modifications based on geographical and climate conditions of the area. "Standard Line Transect" was identified in different habitats with the help of GPS coordinates. Butterflies were studied through photo documentation and collected representative voucher specimens for future reference and identification. Field identification of the species was carried out with the help of reference books; in case of taxonomically difficult species experts were consulted by providing photographs and voucher specimens. Voucher specimens were sorted out, pinned and preserved as and when collected from the field with proper information. Presently all the voucher specimens are stored at Department of Science, MCS which upon completion of the project will be deposited at Invertebrate Referral Collection Centre, National Biodiversity Centre, Thimphu (Bhutan).

The survey was carried out at different locations of Tsirang district during April to July 2015. During the survey, a total of 169 species were encountered belonging to five families- Lycaenidae (38 species), Papilionidae (15 species), Pieridae (19 species), Nymphalidae (83 species) and Hesperiidae (17 species). Maximum species and individuals were recorded from Nymphalidae and are abundant in all the habitat types of Tsirang.

Many important and significant species were encountered during the survey. Species like *Rohana parisatis, Libythea lepita, Chitoria sordida, Elymnias malelas, Pseudergolis wedah, Lethe chandica, Papilio castor, Troides helena, Graphium sarpedon, Papilio protenor, Atrophaneura polyeuctes, Delias belladonna, Eurema herla, Dercus verhuelii, Allotinus drumila, Megisba malaya* are rare in all their distribution range and of conservation importance. *Papilio castor, Mota massyla, Apatura chevana, Libythea lepita* and *Chersonesia risa* are few species which are new addition to the known list of butterflies of Tsirang.

His project details can be found at http://www.rufford.org/projects/jatishwor_singh_irungbam

JIGME DORJI
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Project status: completed

Community-based Conservation Initiative of White-bellied Heron (*Ardea insignis*) in Mande River valley, Bhutan

The White-bellied Heron is classified as critically endangered on the ground of its small and rapidly declining population. This decline is projected to increase in the near future as a result of the loss and degradation of lowland forests and wetlands, and through direct exploitation and disturbance of its habitat. The population of this heron is placed in the band of 50 to 249 in the IUCN factsheets but it is anticipated to be much less than the projected number. Though it occurs across Eastern Himalayan Foothills, this heron species is not native to any country across its entire home range.

The White-bellied Heron, *Ardea insignis*, is Critically Endangered species of herons that occur in Bhutan's river system. The occurrence of such species boosts Bhutan's biodiversity richness, making it ideal place for conservation of flora and fauna. Located between world's two megadiverse countries; India and China and within the bio-geographical realm of the Eastern Himalaya, Bhutan harbors high faunal and floral diversity disproportionate to its area of 38,394 km^2 (RGOB, 2002). Bhutan's more than half of land areas has been designated as the protected areas and also highest proportion of its land areas under forest cover relative to any Asian nation. Bhutan is ranked in top ten percent of countries with highest species diversity and therefore is located in one of the most important biodiversity hotspots of world. Bhutan is home to 7000 species of vascular plants, 770 species of birds and 200 species of mammals (MOAF, 2011; Wangchuk *et al.*, 2004). However, the recent developments with construction of hydropower has created the major threat to White bellied Heron and such development would push the bird to extinction despite the government's strict conservation policy.

With Fund support from RSG, the population monitoring for White-bellied Heron is reinstated after two years of gap. The Heron population in 2013 was estimated at 18 individuals (12-24 individuals). The population trend shows that it is decreasing after starting hydropower projects in Punatsangchhu.

The large rivers and lakes with Chirpine tress around are found to be preferred habitat for White-bellied Heron in Bhutan. They roost and nest only on tall chirpine tress. They need shallow running water to prey in fishes.

His project details can be found at http://www.rufford.org/projects/jigme_dorji

JIGME TSHELTHRIM WANGYAL
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Project status: Ongoing (second grant)

A Photographic Guide to the Common Amphibians and Reptiles of Bhutan - A Tool to Enhance Awareness, Knowledge and Skill for Conservation of Herpetofauna

With the funding of RSGF, I studied Amphibians of Punakha-Wangdiphodrang Valley in 2011 and 2012 and I found that lot more needs to be done in this field. As such, producing a pictorial guide became a priority because this work would be very helpful for conservation of this specific group of animals. The study also found people had very limited idea about this taxon and many believe that all snakes are venomous with many people also believing that all frogs can be eaten, an idea very much detrimental to conservation of biodiversity and especially to conservation of herpetofauna. Therefore, a simple field guide on this taxa very similar to the one produced by Ahmed et al., for Northeast Indian species in 2011 through the same funding would work wonder for conservation. Further, this work is expected to help conservationists, forest officials, students of Universities and many other interested individuals to know the species.

The main objectives of this work are:

1. Producing first pictorial guide for people to be aware of the common species
2. Help researchers and interested individuals in identifying the species
3. Make people aware of which species are venomous
4. Increase the biodiversity value of the country
5. Advertise species so they get conservation attention from concerned naturalists so that necessary interventions are made possible if species are declining.

His project details can be found at http://www.rufford.org/projects/jigme_tshelthrim_wangyal

JIGME TENZIN
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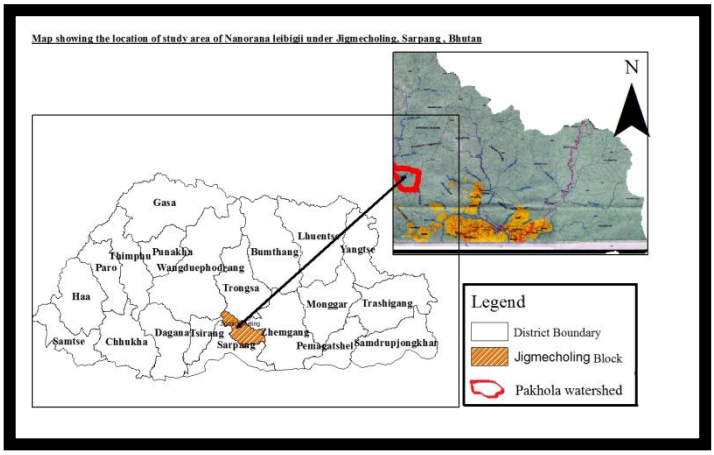
Project status: Ongoing

Conservation Initiatives of Himalayan Bull Frog, *Nanorana leibigii* (Gunther, 1860) Along the Simkhar Rivers & its Tributaries under Jigmecholing, Bhutan



Simkharthang is located at the altitude ranges of 1500-2500msl in the mixed cool broad leaved and sporadic bamboo forest. The river flowing through Simkharthang is known as Simkharchu and is fed by four main tributaries (i.e. Gurungkhola, Darzanikhola, Pakhola and Simchukhola that ultimately drained in Maukhola, a major river in Gelephu Dungkhag under Sarpang Dzongkhag.

Nanorana leibigii (frog) is commonly known as *Monpa* which the local people have resorted due to high socio-indigenous medicinal value was found within these tributaries of Simkharchu. As per IUCN (2014), frog status was categorized as Least Concern (LC) due to abundant population in the wild. However, climate change and anthropogenic had already impedes its population. Further, recent constructions of Gong-Jigmecholing farm roads and electric transmission lines have likely to threaten the habitat of the species. Besides these, lacks of awareness on the ecological importance of the species by the developmental authorities and the local people might led to over exploitation of the species which if not controlled could lead to local extinction. Therefore, intervention through this project has become very important.

With this project, the status of the species diversity and richness was studied using visual and encounter survey, time-constraint search and systematic hand searched along the tributaries. Meanwhile, water parameters like total dissolved solid (TDS), Electric conductivity (EC), Ph using Digital Hinna instrument and water temperature was collected for understanding the habitat ecology of the species. Current and future anthropologic threats within the habitat were also assessed through sign survey.

From preliminary survey till the completion of projects, local people within the study area were involved and main habitat of the Himalayan bull frog was designated base on the results of diversity and richness for sustainable management and protection of species in future.

His project details can be found at http://www.rufford.org/projects/jigme_tenzin

KAMAL THAPA
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Project status: completed

Assessment of Benefits and Evaluation of Ecosystem Services in Langtang National Park, Nepal

Protected Areas, such as National Park are the hotspot of biodiversity conservation. Besides the role of biodiversity conservation, these sites provide various ecosystem services that are of high importance to human welfare. Langtang National Park too provides various ecosystem services that are central to human development including food, timber, fuel-wood, timber, pasture, water sources, carbon sequestration, recreational or aesthetic benefits etc comprising all of the four major components of ecosystem services. However, they are not recognized technically and economically at the local/park level and national level and need to be documented.

Decision makers need to know how the changes in a site, either development or restoration would affect the delivery of services and distribution of benefits among stakeholders (Peh et al., 2013). Due to the absence of ecosystem service approach into park planning and management, park resources are often undervalued or treated as a free to use 'Nature Gift' threatening the long term survival of park. There has never been a single study carried out on economic aspects of ecosystem services nor benefits derived from park assessed in LNP. To some extent, the study output can also aid in exploring sustainable financing options for LNP and local community development by exploring international tourists willingness to pay (WTP) for park visit. This can help prevent LNP from falling prey into Paper Park ensuring sustainable financial flows required for park management. If the payment of ecosystem services concept is realized; Langtang National Park could generate sufficient financial resources for its management and surplus money can be invested in buffer zone development activities.
This study is first of its kind in Nepal's protected areas. Various methodologies and tools were used to conduct this study, especially TESSA toolkit, was used. Economic valuation methodology, questionnaire survey including stakeholder discussion and expert consultation was carried out.
The specific objectives of this study are:

- To identify and assess various ecosystem services (provisioning, regulating, supporting, and cultural services) offered by LNP.
- To carry out total economic valuation of LNP and its associated ecosystem services, including ecotourism and cultural values.
- To provide background information for the future design of PES.

His project details can be found at http://www.rufford.org/projects/kamal_thapa_0

KINLEY
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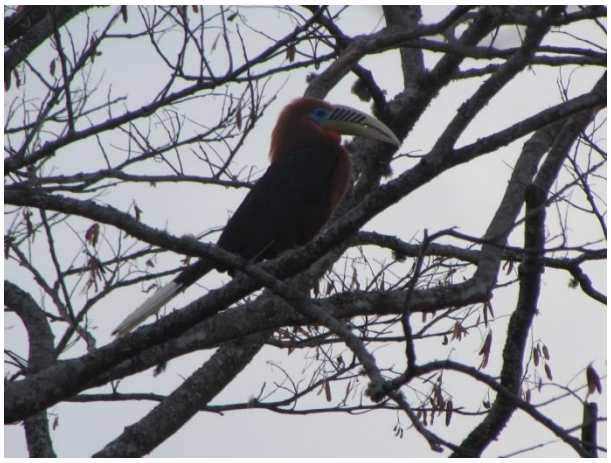
Project status: Ongoing

Ecology, People's Perception and Conservation Status of Rufous Necked Hornbill in South Central Bhutan



Rufous-necked hornbill (Aceros nipalensis) is classified as vulnerable by the International Union for Conservation of Nature (IUCN) and Birdlife International. Proposed project area caters important habitat for Rufous-necked Hornbill but no study has been carried out to determine the distribution, ecology, conservation status and anthropogenic threats of the species in the study area.

The study was carried out in Tsirang and Dagana Dzongkhags in south central Bhutan. The distribution ecology and conservation threats of Rufous-necked hornbill (Hodgson, 1829) were studied from December 2014 through March 2015. A total of 40 plots covering transect length of 75.14 kilometers along the existing cattle tracks, footpath, old logging roads and farm roads had been covered. The habitat components such as vegetation structure, species composition and habitat condition were assessed at the observation points. Rufous-necked Hornbill inhabits evergreen warm broadleaved forest with the maximum sighting in the disturbed forests. RNH occurs at an altitude range of 340 to 1760 M asl and prefers mostly south east aspect followed by east. Richer the floral diversity more occurance of RNH had been observed. The study results the presence of common threats such as cattle construction of farm road, electric line and tree felling in the RNH habitat. Inclusion of hornbill conservation activity in Community Forest (CF) management plans would be crucial as Rufous-necked hornbill were mostly sighted in community forest area. Local communities should be involved in monitoring and protection of nest and food trees that would contribute to long-term conservation of hornbill.

Till date I have completed studying on distribution ecology and listing conservation threats. However, I am to study the nesting habits and breading season of the species will be the first of its kind in Bhutan.

Through this project, I hope that Rufous-necked Hornbill will gain its conservation importance and its conservation efforts may grow from local level to national level. I am optimist that my goals will be achieved through this project.

His project details can be found at http://www.rufford.org/projects/mr_kinley

KINLEY TENZIN
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Project status: Ongoing

Ecology, Diversity and Conservation Implication of Bees and Wasps (Hymenoptera: Aculeata) in North Central Bhutan

Hymenoptera is the commonest, most diverse of all the terrestrial organisms and perhaps the most important insects for mankind (kannagi et al, 2013). Bees (super-family Apoidea) and wasps (super-family Vespoidea) (aculeate Hymenoptera excluding ants) play a significant role in terrestrial ecosystems as pollinators, bio-control agents, scavengers, predator and parasitoids of arthropods and the balancing and sustaining of natural ecosystem.

An insect of the Order Hymenoptera were well studied worldwide. Hitherto no single study has been done and their importance in ecosystem is not concerned humanly in the country. It is ambiguous whether some of the non formicid aculeate species were threatened, still exist or declined due to collection and consumption, anthropogenic disturbances in their habitat or due to natural phenomenon. Some species seen earlier cannot be spotted at present and not seen abundantly as before. As such it is viewed imperative to start with the study of ecology, determination of species diversity and assess conservation status of these fragile insects.

The study will be carried out by means of several approaches such as social interview followed by the "opportunistic visual encounter", "Pollard Walk method" and "Standard Line Transect". Different trapping methods will be used; live photograph in their natural habitat and specimens will be taken. Identifications will be done with the help of photographic guides, taxonomic literature and internet references; consult experts and take specimen to the laboratory for further identification.

Bhutan is anticipated to have very rich diversity of bees and wasps despite smallness of its geographical area. The country is considered conservation bastion of the Eastern Himalaya and recognized as one of the global biodiversity hotspots. This will be the first examination on fauna of bees and wasps in the country with the aim to determine species diversity, species richness and abundance by collecting and documenting the bees and wasps of North central Bhutan. The current and potential threats for the conservation will be assessed. Second aim is to prepare publicity and advisory materials through publication scientific paper and making the resources available online where by information will be disseminated to society at all level. The ultimate goal is to educate and transmit information to the local people, students, teachers and forest officials. The expected outcome is to establish baseline information for the scientific study on Hymenopteran fauna, publish pictorial field guide books and help frame rules to effectively control collection and hunting of these insects and its conservation. His project details can be found at http://www.rufford.org/projects/kinley_tenzin

KINLEY WANGCHUK
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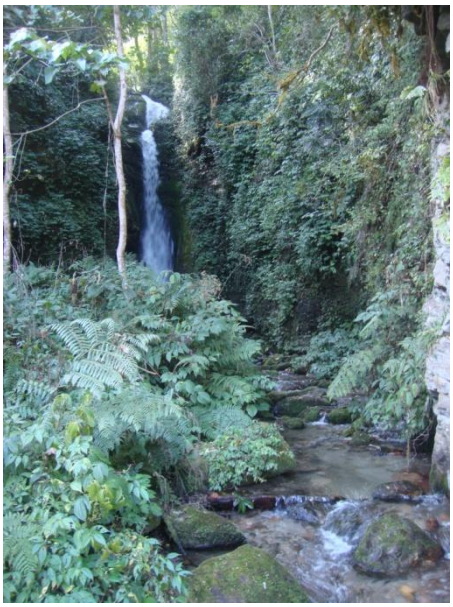
Project status: Ongoing

Macro-Invertebrates Diversity and Water Quality Assessment in Four Streams that Join Mo Chhu River, Punakha



Punatsangchhu is one of the major rivers of Bhutan originating from the snow-capped mountains of Gasa Dzongkhag. The whole Dzongkhag falls under the jurisdiction of Jigme Dorji National Park (JDNP). The headwaters of the Punatsangchu comprise of two major tributaries namely the Pho Chhu and Mo Chhu (male and female rivers respectively). The actual source of Pho Chhu is from the glacial lakes in Lunana while it is also fed by many streams that drains down into the basin. Similarly, the Mo Chhu originates from Laya and is joined by many wade able streams along its basin.

Macro invertebrates are animals without a backbone that can be seen with the naked eye. These include crustaceans and worms but most are aquatic insects. Beetles, caddis flies, stoneflies, mayflies, hellgrammites, dragonflies, true flies, and some moths are among the groups of insects represented in stream. Habitat of these animals includes streams, rivers, creeks, wetlands, dams and lakes or even drains. Rivers are ecosystems of great ecological value with a rich fauna like macro invertebrate, which has an important link in the food web between the producers (leaves, algae) and higher consumers such as fish. The fauna consists of communities with a complex structure and high biological value. This group of great diversity and ecological importance consists of invertebrates of macroscopic size, normally more than 1 mm, living permanently or during certain periods of life cycle linked to the aquatic environment.

The protection of watershed in the upstream is crucial for survival of these animals as well the life of our society. The survival of these animals is depended on the quality of water and threats. So, maintaining water quality, both sanitary and environmentally, is important, since it depends largely on the conservation of these animals (Fernandez-Diaz, 2003).

Macro invertebrate are important components of biodiversity in the headwater stream ecosystem which is impacted by different environmental variables and human interference. The study is going to carry out within and outside Jigme Dorji National Park to investigate the macro invertebrate diversity and to assess the water quality of different streams by using Family Biotic Index (FBI) and macro invertebrates. Macro invertebrate are going to sample from 32 reaches of four streams. Samples are going to collect using D-frame net of 0.5 m x 0.5 m and 500 µm mesh size. The specimens are going to store in 4% formaldehyde solution in the field and take to the Laboratory and identified. The environmental variables and Global Position System coordinates will be recorded from 32 reaches of the study sites. His project details can be found at http://www.rufford.org/projects/kinley_wangchuk

OM NATH KATEL
College of Natural Resources
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Project status: completed

Human Wildlife Conflict, Species Conservation and Community Livelihoods in Biological Corridors Connecting Two National Parks and a Wildlife Sanctuary in Bhutan

The study was carried out in biological corridor III linking Jigme Singye Wangchuck National Park, Phibsoo Wildlife Sanctuary and Royal Manas National Park in southern Bhutan. This study covered Lhamoyzingkha, Senge, Chunzom and Jigmecholing geog all located under the administrative jurisdiction of Sarpang Dzongkhag in southern Bhutan. In addition to the geogs in Sarpang Dzongkhag, Dunglagang geog in Tsirang Dzongkhag was also included in this study.

Data collection used pre-tested structured questionnaire for household survey. The questions were mainly asked regarding types and quantity of crops damaged, the type and number of wild animals encountered by farmers and the farmers' knowledge on hotspot habitat for problem animals.

Results indicate that villagers perceive Human Wildlife Conflict to be a major problem. Respondent's estimates the seasonal loss ranging from 15% to 50% of total production which also depends on one season to other. Although reliable figure on actual crop loss could not be obtained but farmers' perception to wildlife species conservation is found to be strongly associated either to the crop loss or property losses. About 50% of the farmers held negative attitudes towards farmers and this is because those farmers having negative attitude had either destroyed their crops or damages property or killed livestock in previous interactions.

Research revealed that HWCs are associated to location of households of farmers, for instance, farmers whose households located to close to forested areas linking other ecosystems are found to experience more conflicts (Figure 8). Theories predict that conflicts occur when one organism needs are encroached by the other like food, habitat etc however in case of Bhutan habitat destruction does not appear to be the significant variable. From this research two hypothesis can be formulated. Major HWCs emerge due to the existence of edge species like deer, wild pig and monkeys and HWCs associated to other species such as tiger and elephant emerge due to overlap of migrating corridor and location of agricultural farms adjacent to the migration corridor.
His project details can be found at http://www.rufford.org/projects/om_n_katel

SONAM TASHI
Wangchuck Centennial National Park
sonamtaashi@gmail.com
Project status: Ongoing

Galliformes of Central Region of Wangchuck Centennial Park, Bhutan

Galliformes is least studied in Wangchuck Centennial Park: Bhutan, although Galliformes plays a vital role as bio-indicators because of their vulnerability to human exploitation, sensitivity to habitat degradation and central position in the food web. The park being the kingdom's latest edition of the protected area, very less is done on Galliformes research. Due to this knowledge deficit and in strengthening the park's conservation management plan, the study aims to generate the diversity of Galliformes, abundance, habitat use, and awareness. The result from this study aims to benefit the whole Himalayan region in terms of collective conservation management plan within and with adjacent neighbouring countries where the birds are found. Density and abundance will help in delineating the specific area as the Galliformes dwelling zone and promote for Eco-tourism. On other hand this research will provide baseline data of the study area that can be refereed with entire country. Similarly the study on the habitat use and detail ecology of the species will help the Park authorities to generate sustainable and suitable conservation plan. Moreover, the study will help to create awareness among rural communities as well as school level students for the conservation of Galliformes in the study area. It will also help to take remarkable action against wildlife poaching and trade for the concern authorities. This project shall be milestone in conservation of Gallifomes in Bhutan, considering the sheer importance of such charismatic group of birds.

His project details can be found at http://www.rufford.org/projects/sonam_tashi

TSHERING NIDUP
Sherubtse Collge, Kanglung
tsheringtshang@gmail.com
Project status: Ongoing

Building Capacity in Amphibian Research in Bhutan

Thirty five confirmed anuran and a single salamander species are known from Bhutan. Reports on amphibian research are scarce and in-country expertise is lacking. Capacity-building in amphibian research in the country has become essential as, globally, amphibian taxa face an increasing rate of extinction. Public awareness of this group of animals is low and public education might reasonably be expected to improve the impact of conservation efforts. The two main aims of this project are to increase the capacity of in-country amphibian research and to undertake a study of, and identify threats to, amphibian diversity in Sherubtse Natural Resources Study Area.The aims will be achieved through: 1) Field and laboratory training focussing on the Habitat selection and survey (including water-testing),taxonomic identification, tissue sample collection for DNA analysis, determining the presence of *Batrachochytrium dendrobatidis* and recording of mating calls for acoustic analysis. 2) Outreach and community workshops in Sherubtse College and Khaling Community Centre focusing on the role and importance of amphibians in an ecosystem, amphibian ecology, identification and taxonomy of amphibian species and field research techniques. Until now one seminar was conducted at Sherubtse College where more than 250 students and faculties attended. Field was visited for three times and documented eight anuran species where one species was expected to be new record for the country and others range extension within Bhutan.

His project details can be found at http://www.rufford.org/projects/tshering_nidup_0

YESHEY WANGDI
Royal Manas National Park
Yeshey_wangdi@yahoo.com
Project status: completed

Assessing effectiveness of different human wildlife interface mitigation measures in RMNP buffer villages

The human-elephant conflict in particular the damage cause by elephant to crop is major challenge to the conservation of Asian Elephant. Conservative tools used to address this problems are capital intensive and require high level expertise. This case study on human elephant conflict and mitigation measure was carried out in two geowgs in Umling and Tarithang under Umling Range of Royal Manas National Park, Sarpang District. The aim of this study is to understand the casual effect of human elephant conflict and to intervene the appropriate method to benefit the local communities in many ways. The labour required to guard the crop will be reduced and protect the crop damage from elephant.

About 80 % of the respondents (N=60) indicated that decrease in forest areas due to various developmental activities have contributed to increase in conflicts. The part of the conflict has been attributed to blockage of traditional migratory routes by resettlement programmes in mid-1990s.

About 99% of the respondents (N=60) indicated that electric fencing is the most effective mitigation measures against elephant in the study areas. In support to their recognition, the project has supported reinstallation of 13.6 km of electric fencing covering four fringe villages benefiting about 200 households. After the fencing has been properly reinstalled, not single crop damage has been reported from the study areas.

There is no concrete evidence of people being forced to migrate due to single reason of threats posed by the elephants. The out migrations are mostly caused by the young generations being employed outside their home town and parents accompanying them. Only two houses in the project area is found abandoned due to above reason. The periphery lands are mostly found left fallow due to shortage of manpower to guard their crops at night. The crop raiding by elephants are partly attributed to land fallowing in the project areas.

Although most people in the project area are aware about the conflict situation, they were found ignorant about the behaviour and biological characteristics of the Asian elephant. The awareness education imparted through this project have empowered local communities to make unanimous decision of installing electric fencing around their entire villages on cost sharing basis. An additional 9 km of electric fencing has been secured from Department of Forests and Park Services due to their willingness to share the cost. The school teachers and students have agreed to adopt HEC advocacy program as their annual events to educate communities in their locality. His project details can be found at http://www.rufford.org/projects/yeshey_wangdi

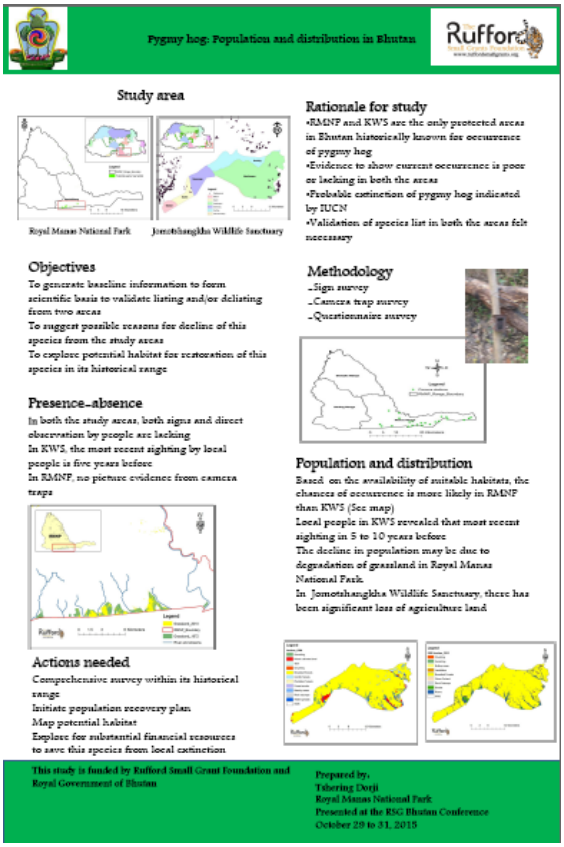
Video presentation

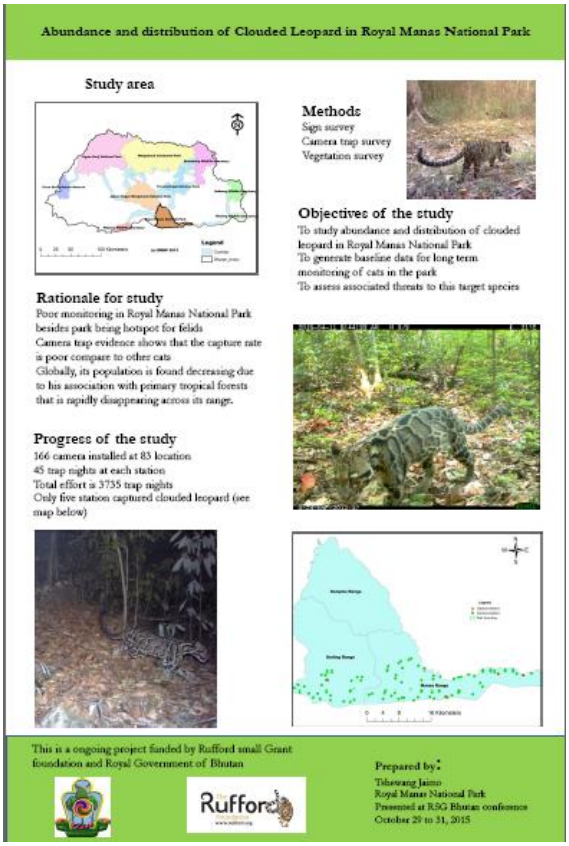
Only single video presentation was presented on White-bellied heron conservation in Bhutan. The video was part of the advocacy to stop habitat destruction by hydropower construction in Bhutan. The video is available at *https://www.youtube.com/watch?v=yAuxK_3DWfI*

Poster presentation

On four researchers who could participate in the conference have sent their posters. The posters were self explanatory and most of the participants accepted that poster presentation could be a effective communication means to disseminate information. Few picture story of the poster presentation are as follows:

Participants discussing on the poster presentation.





Some poster samples presented at the conference.

Field trip

The post conference field trip was joined by all the participants. The participants visited Phochhu areas- the prime habitat of critically endangered White-bellied Heron. The participants were lucky enough to see two herons. Some of them have seen for the first time in their life time. This has accomplished their quest to see this rare bird species.

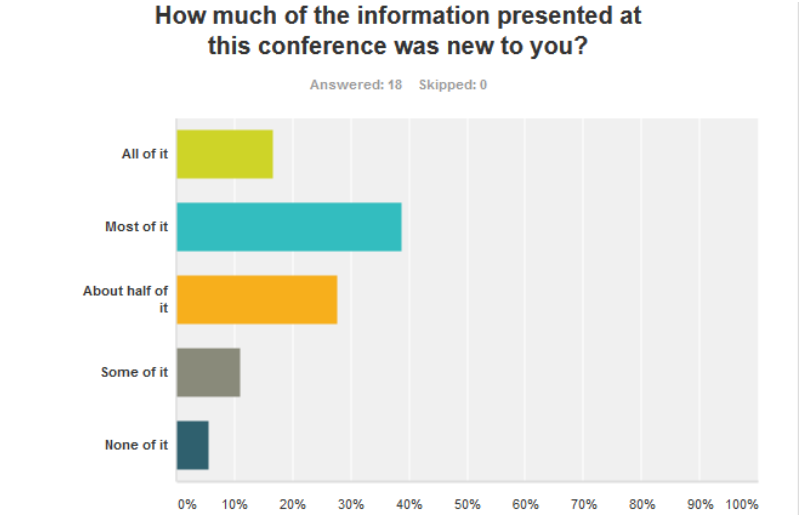
From the field trip, some participants have expressed their interest to conduct more research on this species. The interest areas included community based ecotourism, waste management at the heron habitats.

The participants busy watching herons at Phochhu river bank

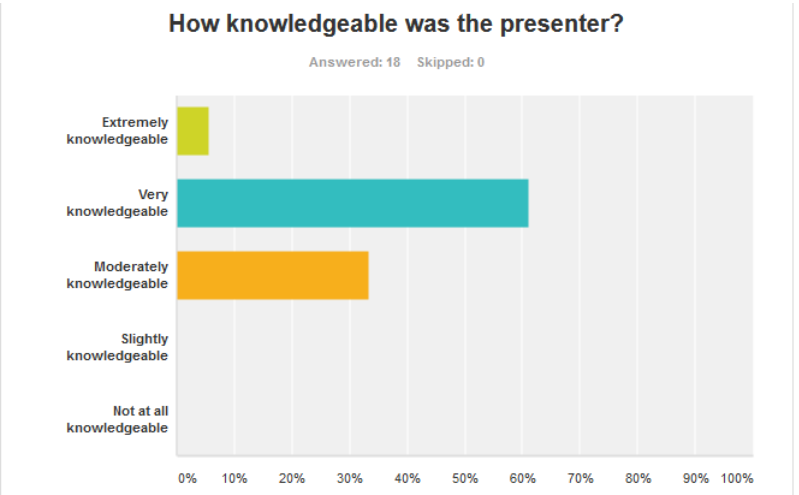
The participants discussing on ways to conserve heron habitat

Participants feedback

The participants have submitted their feedback through online questionnaire survey (https://www.surveymonkey.com/r/P98TTW8). The feedback on different aspects of the logistic arrangement for the conference are given in the following figures:



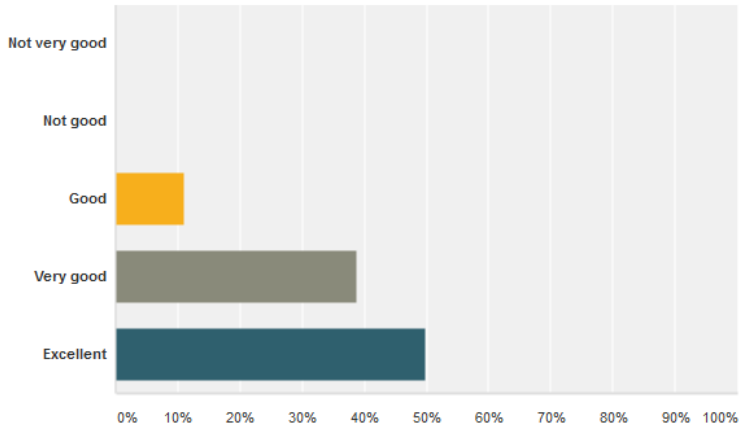
Answer Choices	Responses	
All of it	16.67%	3
Most of it	38.89%	7
About half of it	27.78%	5
Some of it	11.11%	2
None of it	5.56%	1
Total		18



Answer Choices	Responses	
Extremely knowledgeable	5.56%	1
Very knowledgeable	61.11%	11
Moderately knowledgeable	33.33%	6
Slightly knowledgeable	0.00%	0
Not at all knowledgeable	0.00%	0
Total		18

How was food and lodging facilities provided during the conference?

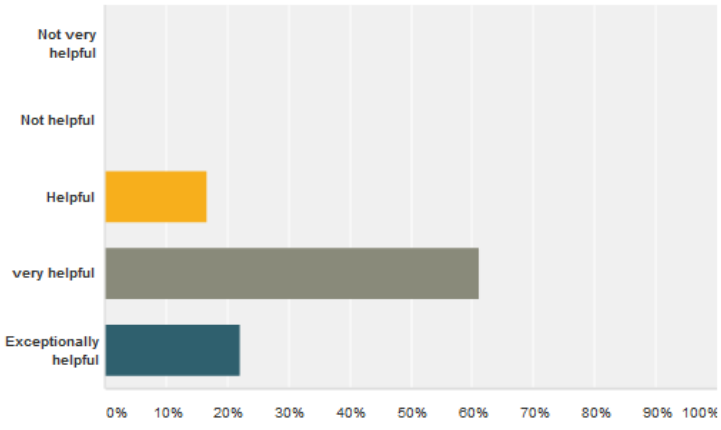
Answered: 18 Skipped: 0



Answer Choices	Responses	
Not very good	0.00%	0
Not good	0.00%	0
Good	11.11%	2
Very good	38.89%	7
Excellent	50.00%	9
Total		18

How usefulness was conference in developing your research capacity in the field?

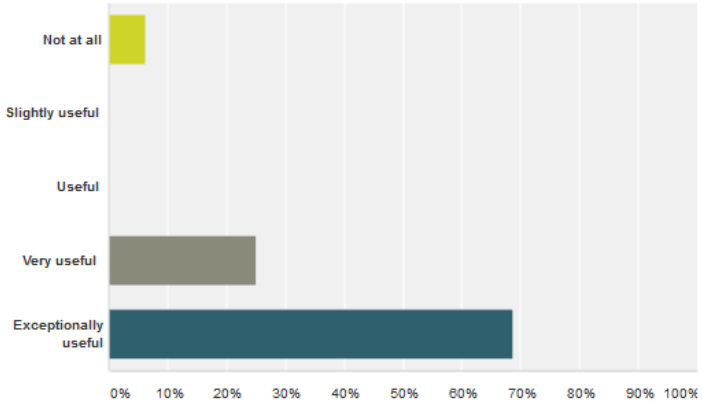
Answered: 18 Skipped: 0



Answer Choices	Responses	
Not very helpful	0.00%	0
Not helpful	0.00%	0
Helpful	16.67%	3
very helpful	61.11%	11
Exceptionally helpful	22.22%	4
Total		18

How much was RSG fund useful to your research work and conference?

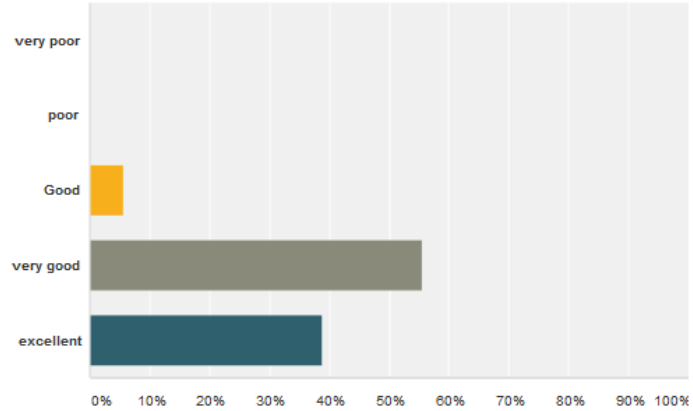
Answered: 16 Skipped: 2



Answer Choices	Responses	
Not at all	6.25%	1
Slightly useful	0.00%	0
Useful	0.00%	0
Very useful	25.00%	4
Exceptionally useful	68.75%	11
Total		16

How was the level of engagement and materials provided by the organizer (oral, posters and audio-visual presentation and field visit)?

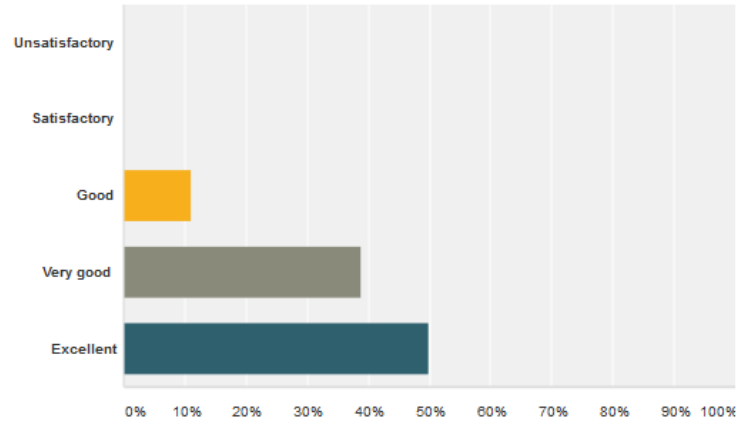
Answered: 18 Skipped: 0



Answer Choices	Responses	
very poor	0.00%	0
poor	0.00%	0
Good	5.56%	1
very good	55.56%	10
excellent	38.89%	7
Total		18

How was the overall management of the Conference?

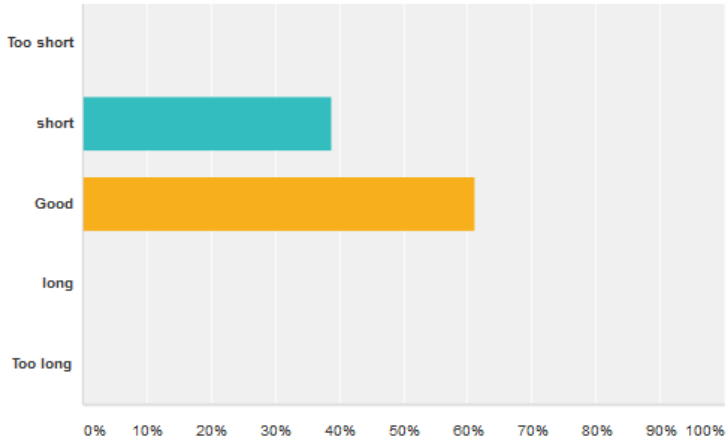
Answered: 18 Skipped: 0



Answer Choices	Responses	
Unsatisfactory	0.00%	0
Satisfactory	0.00%	0
Good	11.11%	2
Very good	38.89%	7
Excellent	50.00%	9
Total		18

How appropriate was the duration of the conference?

Answered: 18 Skipped: 0



Answer Choices	Responses	
Too short	0.00%	0
short	38.89%	7
Good	61.11%	11
long	0.00%	0
Too long	0.00%	0
Total		18

Conference program

October 28, 2015

Participants will arrive at Lobesa and halt at CNR guesthouse and Hotel YT

October 29, 2015

Session I: Preconference Session

8.30 am: Participants will arrive conference hall and start registration
9.00 am: Chief Guest and guest will arrive conference hall
9.05 am: Marchang ceremony
9.15 am: Welcome speech by Dr. D.B. Gurung
9.30 am: Short background on Rufford Grantee from Bhutan by Jigme Dorji
9.45 am: Key note address by Chief Guest
10.00 am: Group Photo session
10.05 am: Suja Dressi (Tea break and causal introduction between participants and guest)
10.30 am: Guest leave and normal workshop session begins

Session II: General Session

10.35 am: Brief introduction of participants and their research fields
11.20 am: Presentation on research guidelines of RUB by Dr. D.B. Gurung, followed by discussion
12.05 pm: Interaction with RSG officials

1.00 pm: Lunch break

Session III: Oral Presentations

(Presentation of individual research work by grantee)

2.00 pm: Study on Snake Diversity survey of Jigme Dorji National Park by Bal Krishna Koirala

2.20 pm: To Assess Effect of Electric Fencing as a Mitigation Measures to Human-Bear Conflict and Black Bear Ecology by Chhimi Dorji

2.40 pm: Evaluating threats and its impact on the current distribution of Golden Langur in Bhutan by Dorji Wangchuk

3.00 pm: Diversity, Distribution, and Ecology of Fishes of Bhutan by Dr. D.B. Gurung

3.20 pm: Tea Break

4.00 pm: Assessment of Anthropogenic Pressure in Wangchuck Centinnial National Park (WCNP) and its effect on Himalayan Musk deer *(Moschusleucogaster)* by Indra Prasad Acharja

4.20 pm: Study of Butterfly Diversity and its Conservation in Tsirang District, Bhutan by Jatishwor Singh Irungbam

4.40 pm: Community-Based Conservation Initiative of White-Bellied Heron (Ardea insignis) in Mande River Valley by Jigme Dorji

5.00 pm: END of the day

October 30, 2015 (Oral presentation continues)

9.00 am: A Photographic Guide to the Common Amphibians and Reptiles of Bhutan - A Tool to Enhance Awareness, Knowledge and Skill for Conservation of Herpetofauna by Jigme Wangyal

9.20 am: Conservation initiatives of Himalayan Bull Frog, *Nanorana Leibigii* (Gunther, 1860) along the Simkhar river & tributaries under Jigmecholing, Sarpang, Bhutan by Jigme Tenzin

9.40 am: Assessment of Benefits and Evaluation of Ecosystem Services in Langtang National Park, Nepal by Kamal Thapa, Nepal

10.00 am: Ecology, People's Perception and Conservation Status of Rufous Necked Hornbill in South Central Bhutan by Kinley

10.20 am: Tea break

11.00 am: Ecology, Diversity and Conservation Implication of Bees and Wasps (Hymenoptera: Aculeata) in North Central Bhutan by Kinley Tenzin

11.20 am: Macro-Invertebrates Diversity and Water Quality Assessment in Four Streams that join Mo Chhu River, Punakha by Kinley Wangchuk

11.40 am: Human Wildlife Conflict, Species Conservation and Community Livelihoods in Biological Corridors Connecting Two National Parks and a Wildlife Sanctuary in Bhutan by Dr. Om Katel

12.00 noon: Galliformes of Central Region of Wangchuck Centennial Park, Bhutan by Sonam Tashi

12.20 pm: Butterfly Diversity and Conservation in Royal Manas National Park (RMNP), Sarpang, Bhutan by Tshering Nidup

12.40 pm: Assessing Effectiveness of Different Human Wildlife Interface Mitigation Measures in RMNP Buffer Villages by Yeshey Wangdi

12.40 pm: Lunch break

Session IV: Video presentation

2.00 pm: A short documentary on White-bellied Heron by Jigme Dorji

Session V: Poster presentation

2.30 pm: Poster display and presentation. The posters will be rate by panel of judges and prize will be awarded.

3.00 pm: Tea break

4.00 pm: CNR Campus tour/ games

5.00 pm: END of the CONFERENCE

7.00 pm: Closing dinner (few guests will join)

October 31, 2015

8.30 am: field visit to heron habitat in Phochhu (optional for participants)

Participant's list

Grantee participants				
Sl. No.	Name	Institution	Type of grants	
			First Grant	Second Grant
1	Bal Krishna Koirala	College of Natural Resources	x	
2	Chimi Dorji	College of Natural Resources	x	
3	Dorj Wangchuk	Royal Manas National Park	x	
4	Dr. D.B. Gurung	College of Natural Resources	x	
5	Jigme Dorji	Royal Manas National Park	x	
6	Jigme T Wangyal	Trashigang Dzongkhag Forests		x
7	Jigme Tenzin	Sarpang Dzongkhag	x	
8	Kamal Thapa	IUCN Nepal	x	
9	Kinley	Tsirang Division	x	
10	Kinley Tenzin	College of Natural Resources	x	
11	Kinley Wangchuk	Bumthang Forest Division	x	
12	Om N Katel	College of Natural Resources	x	
13	Sonam Tashi	Wangchuk Centennial National Park	x	
14	Tshering Nidup	Sherubtse College	x	
15	Yeshey Wangdi	Royal Manas National Park		
Non-grantee participants				
16	Jangchu Wangdi	College of Natural Resources		
17	Gem Tshewang	College of Natural Resources		
18	Karma Tshering	College of Natural Resources		
19	Nima Gyaltshen	College of Natural Resources		
20	Karma Dorji	College of Natural Resources		
21	Phuntsho	College of Natural Resources		
22	Rinchen Dorji	College of Natural Resources		
23	Lakey Chaida	College of Natural Resources		
24	Ugyen Yangchen	College of Natural Resources		
25	Ugyen Dorji	College of Natural Resources		
26	Sonam Dupchu	College of Natural Resources		
27	Choney Rangdel	College of Natural Resources		
28	Tshering Nidup	College of Natural Resources		
29	Chimi Namgyal	College of Natural Resources		
30	Rinchen Dorji	College of Natural Resources		
31	Sangay Dorji	Royal Society for Protection of Nature		
32	Pem Lham	GPP Bhutan		
33	Pema Tshering Lepcha	College of Natural Resources		
34	Tshering Phuntsho	College of Natural Resources		