



3rd Asia Protected Areas Partnership (APAP) Technical Workshop: Human-Wildlife Conflict

Thimphu, Bhutan, 6-8 November 2017
Summary Report



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Asia Regional Office

63 Sukhumvit Soi 39,

Sukhumvit Road, Wattana

Bangkok 10110, Thailand

Tel: +66 2 662 4029

Fax: +66 2 662 4387

www.iucn.org/regions/asia

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I. Background and Introduction

Human-wildlife conflict (HWC) is a rapidly growing problem in Asia. As the human populations of the region continue to expand and land-use pressures continue to mount, both the frequency and severity of HWC are increasing. Conflicts can lead to serious negative impacts on human interests, including loss of income, reduced food security, restricted livelihood opportunities and even injury or loss of life.

HWC also poses a serious threat to biodiversity. It undermines public and political support for conservation, and many animals are killed or injured by communities every year in their efforts to protect crops and livestock. In those instances of HWC involving threatened species (e.g. tigers), the loss of even a few animals can have long-term conservation implications.

In light of these concerns, there is an increasingly urgent need to find ways of reducing and mitigating HWC in Asia, in order to protect rural livelihoods and maintain biodiversity over the long-term. It is for this reason that HWC was selected as the theme of the 3rd Asia Protected Areas Partnership (APAP) technical workshop. More information about APAP can be found at: <http://www.asiapapartnership.org>.

The workshop was jointly organised by the Royal Government of Bhutan (RGoB) and the IUCN Asia Regional Office, under the auspices of APAP and with the generous financial support of the Ministry of Environment, Japan; the Ministry of Environment, Korea; RGoB; World Wildlife Fund (WWF) - Bhutan; ICIMOD (International Centre for Integrated Mountain Development); and the United Nations Development Programme (UNDP). Technical support was provided by the IUCN Species Survival Commission's Task Force on Human-Wildlife Conflict.

II. Objectives

The workshop was designed to:

- Enable participants to understand HWC within an overarching conceptual framework;
- Develop an overview of HWC in Asia, including its underlying causes and impacts;
- Share experiences and lessons from the Asia region; and
- Identify emerging best practices and priorities for the future.

III. Opening Session

The workshop was opened with speeches by: Mr Kinley Tshering, Officiating Director of the Department of Forest and Park Services, Ministry of Agriculture and Forests, Bhutan; Prof Yoshitaka Kumagai, APAP Co-Chair; Dr Scott Perkin, Head of Natural Resources, IUCN Asia Regional Office; HE Lyonpo Yeshey Dorji, Minister of Agriculture and Forests, Bhutan; and Mr Sonam Wangdi, Chief Forestry Officer of the Nature Conservation Division, Department of Forests and Park Services, Ministry of Agriculture and Forests, Bhutan.

- Prof Yoshitaka Kumagai gave a brief overview of APAP and introduced the 3rd APAP technical workshop, emphasising that this was the first to be held outside Japan. He gave thanks to the Ministry of Environment of Japan for its three years as co-chair and also welcomed the new co-chair, the Ministry of Environment of the Republic of Korea;
- Dr Scott Perkin gave an overview of the workshop agenda and objectives. He noted that HWC is a rapidly growing problem in Asia and that Bhutan has been at the forefront of pioneering and testing approaches to conflict prevention and mitigation; this experience made Bhutan an ideal venue for the workshop;
- HE Lyonpo Yeshey Dorji, Hon'ble Minister of the Ministry of Agriculture and Forests of Bhutan, gave his keynote address. He welcomed all the international and national participants who had joined the 3rd APAP workshop in Bhutan. He noted that HWC has become a global issue and serious problem for both conservation and human livelihood. Since Bhutan is a country which depends heavily on agriculture, HWC is one of Bhutan's greatest challenges. He stressed that interdisciplinary approaches, including ecological, social and economic considerations, as well as transboundary cooperation, are required to address HWC. He expressed his gratitude to the Ministry of Environment of Japan for their contributions to APAP since its founding three years ago, as well as to the Ministry of Environment of the Republic of Korea, which would take over as APAP co-chair beginning in November 2017.



Figure 1: Group photo of workshop participants during the opening session

IV. Summary of Sessions

6 November 2017

Session 1: Setting the Context

This session was chaired by Prof Kumagai. Dr Alexandra Zimmermann, Chair of the IUCN Species Survival Commission (SSC) Task Force on Human-Wildlife Conflict and Head of Conservation Science for Chester Zoo, began the session by introducing a *Conceptual Framework for Understanding HWC*. Mr Phub Dendup, Chief Forestry Officer for Sarpang Forest Division in Bhutan, delivered a *Special Presentation on HWC in Bhutan: Status, Trends and Prospects*.

1. Conceptual Frameworks for Understanding Human-Wildlife Conflict (HWC)

Dr Zimmermann noted that there are no universal rules for addressing HWC and that different species require different approaches. She emphasised that a deep understanding of underlying socio-cultural dynamics is essential for successful prevention and mitigation of HWC. Two myths, two obstacles, and seven principles about HWC mitigation were introduced:

- Myths
 - *Myth: Losses determine the extent of retaliation;*
 - *Myth: Attitudes and awareness determine behaviour.*
Reality: Social norms and peer behaviour determine people's behaviour.
- Obstacles
 - Poor theories of change;
 - Poor engagement processes
- Principles
 - Information on the behavioural ecology of the species involved is essential;
 - *It is equally important to know the fundamentals of human social psychology:* People's behaviours are based on values and social norms. Attitudes may change, but values do not;
 - *Understanding the depth of the conflict:* Before taking action on HWC, it is essential to listen to communities' voices - ideally for at least six months to one year - and to develop an understanding of the level of severity of the conflict. Different levels require different approaches;
 - Values and benefits from wildlife need to be created;
 - *A process of real engagement is critical:* The most important principle in community-based HWC mitigation is to transfer ownership of the process, including decision-making and responsibility, to communities themselves and to re-align the balance of power;

- *Designing a sound theory of change*: HWC mitigation works when practical interventions, based on culture and context, and a participatory approach are used together. Understanding and mitigation cannot be separated.

2. Special Presentation on HWC in Bhutan: Status, Trends and Prospects

Mr Phub Dhendup, Chief Forestry Officer, Sarpang Forest Division, introduced the status of HWC in Bhutan and current mitigation approaches. In Bhutan, protected areas cover 51.44 per cent of the total geographical area of the country. Bhutan is an agrarian society, and rural livelihoods and conservation are closely linked. HWC is caused by tigers, snow leopards, black bears, wild pigs and elephants; according to a state report, farmers suffer significantly from crop destruction and livestock depredation by wildlife.

Mr Dhendup observed that many different measures are being used in Bhutan to address HWC, including: solar/electric fencing; blank firing; a variety of traditional methods; alarms and sirens; radio collaring; community conservation committee insurance; awareness raising; emergency relief by quick response teams; habitat enrichment; corridor management; and transboundary collaboration.

Mr Sangay Dorii, from the Weed and Vertebrate Pest Management Unit of the National Plant Protection Centre, then introduced WWF's *Safe Systems Approach (SSA) to HWC*, which is based on six dimensions and five procedural steps.

Mr Dhendup concluded the session by summarising some of the lessons that have been learned to date, as follows:

- Electric fencing has been found to be effective in mitigating HWC; however, poor fence management by communities remains a problem;
- Crop compensation and crop insurance schemes should extend to all administrative areas. However, the amount of seed funding awarded should depend on the severity of HWC;
- Strong management and stewardship bylaws are required;
- One nodal institute at the local government level should take up HWC-related issues and provide constant monitoring, evaluation, and technical guidance to local groups;
- HWC baseline data, in-depth research and effective transboundary collaboration with neighbouring countries are required.

Session 2: Members' Presentations and Case Studies

This session was chaired by Prof Kumagai. Representatives from Bangladesh, Cambodia, India, Japan, Mongolia and Myanmar were invited to present their country reports. A presentation on financing was also given by UNDP.

1. Bangladesh Country presentation

Mr Quazi Md. Nurul Karim, Assistant Conservator of Forest, Wildlife Management and Nature Conservation Division of the Bangladesh Forest Department, made the presentation for Bangladesh. He noted that people in Bangladesh come into conflict with tigers, elephants, crocodiles, wild boar, fishing cats, otters, monkeys, monitor lizards, dolphins, turtles and snakes. HWC has resulted in human death and injury, destruction of crops, damage to domestic livestock, disease transmission from livestock to humans, adverse interactions and wildlife killings. One of the underlying causes of HWC is the degradation of natural habitats as a result of industrialisation and urban development. More recently, HWC has been exacerbated by the establishment of refugee camps in elephant habitat and corridors.

Mitigation measures have been introduced to address human-tiger conflict (HTC) and human-elephant conflict (HEC). HTC is mitigated by Village Tiger Response Teams (VTRTs) and Forest Tiger Response Teams (FTRTs). HEC is mitigated through a variety of approaches including power fences and trenches, habitat management, compensation, changing crop planting patterns, the use of deterrents, creation of elephant corridors, and transboundary conservation. During the presentation, the *Bangladesh Elephant Conservation Action Plan for 2016 to 2025*, prepared by Bangladesh Forest Department and IUCN Bangladesh, was introduced as well.

2. Cambodia Country Presentation

Mr Ou Ratanak, General Director of the Administration for Nature Conservation and Protection, Ministry of Environment of Cambodia, made the presentation for Cambodia. People in Cambodia come into conflict with elephants, wild boar, long-tailed macaques and wild cattle. During 2003-2008, a large population of elephants in Mondulhiri, Kampong Speu, Koh Kong Province caused damage to rice and banana crops, among others. A compensation policy has not yet been developed by the government, but NGOs are trying such an approach.

Mr Ou Ratanak suggested that protected area (PA) zoning and management plans could help prevent and mitigate HWC. He noted that, in Cambodia, protected areas are divided into a core conservation zone, a sustainable use zone, and a community zone. He emphasised that successful resolution of human-wildlife conflicts requires that conservation and sustainable development issues be considered together. He introduced a number of additional recommendations and identified the need for: continued inscription of state land into the PA system; increased awareness; and the establishment of biodiversity conservation corridors.

He explained that the Cambodian government plans to establish three elephant corridors, but that communities had raised concerns about the plans.

3. India Country Presentation

Mr Sanjay Shrivastava, Chief Conservator of Forests for Uttar Pradesh in India, made the presentation for India. People in India come into conflict with many different species, including tigers, leopards, elephants, nilgai, wild boar, monkeys, sloth bears and rhinoceroses. Some species are affecting human lives and crops. Mitigation measures include hard approaches such as trenches, solar fencing and barriers, as well as soft approaches such as crop compensation and the creation of Eco-development Committees (EDCs) in villages around PAs. EDCs are currently supported by the government but are becoming increasingly self-sustaining. They help to protect wildlife and control wildlife crime.

In Uttar Pradesh, the Tiger Conservation Society, established in 2008 under the Society Registration Act, helps to protect tigers and their habitat; it also addresses HWC, using the management methods described above. When all other measures have failed, problematic animals are removed, after fulfilling all the necessary legal requirements in advance.

Mr Sanjay Shrivastava then described the HWC measures that have been implemented in the Terai Arc Landscape (TAL) as part of the transboundary cooperation programme between India and Nepal. Protection strategies in TAL include the identification of sensitive areas and suspects, monitoring of wildlife movement trends and development of an intelligence network at all levels. The strategies are implemented through cooperation among relevant agencies and stakeholders, including government departments, law enforcement authorities, wildlife supporters, neighbouring communities, EDCs and NGOs.

4. Financing for Biodiversity Conservation and Human-Wildlife Conflict

Mr Ngawang Gyeltshen, Biodiversity Financing Initiative (BIOFIN) Coordinator with UNDP Bhutan, gave a presentation on *Financing for Biodiversity Conservation & Human-Wildlife Conflict*. According to his presentation, public finance will be the catalyst for the implementation of the United Nations Sustainable Development Goals (SDGs) and Aichi Targets, but private finance will be necessary in the future to achieve the agenda.

BIOFIN, coordinated by UNDP, is a global partnership addressing biodiversity finance; some 30 countries are currently involved in the programme. It provides a methodology to enable countries to measure their current biodiversity expenditures, assess their financial needs, and identify the most suitable finance solution to bridge their national biodiversity finance gaps. Mr Gyeltshen explained that the preliminary financing solutions in Bhutan linked with HWC are ecotourism and innovative insurance schemes. He also commented that significant changes in

people's attitudes toward HWC may be expected after the implementation of ecotourism and innovative insurance schemes.

5. Japan Country Presentation

Mr Yuki Takase, from the Office of Wildlife Management in the Ministry of Environment's Nature Conservation Bureau, presented the *Legislative and Administrative System of Wildlife Management in Japan*. In Japan, people come into conflict with Sika deer and wild boar. Sika deer cause agricultural damage and changes to understory vegetation, have a negative effect on alpine plants, and cause disruption when they are involved in traffic and rail accidents. According to scientific data and a national survey, the populations of Sika deer and wild boar have increased and their distribution has expanded. These trends in Japan are correlated with a decrease in recreational hunting.

To help address these concerns, the Act on Wildlife Protection and Proper Hunting has been revised to enhance population control by culling and hunting through methods such as lowering the age limit for obtaining trapping and netting licenses and fostering organisations that can conduct culling. Mr Takase identified a number of challenges, such as the difficulty of establishing a public culling system in each prefecture and fostering the certified culling operations. He also introduced the ecosystem maintenance and recovery plans that had been prepared in nine national parks and two quasi-national parks in November 2017, which are targeting deer and invasive species of fish and plants.

6. Mongolia Country Presentation

Mr Enkhmunkh Ganbold, Senior Officer in the Department of Protected Areas Management of the Ministry of Environment and Tourism, made the presentation for Mongolia. People in Mongolia come into conflict with Mongolian wild ass (*khulan*), Mongolian gazelle, snow leopards, Gobi bears, red deer, Siberian musk deer, and reindeer.

The Tost and Toson Bumba mountains were designated as a new 800,000 ha protected area in March 2017 to protect snow leopards from mining activities. HWC in the area appears to be linked to the expansion of the human population into animal habitat, displacement of natural wildlife territory, and the reduction of natural prey and food sources. The Mongolian government uses HWC mitigation measures such as improving protection, conducting long-term studies, increasing PAs, and revoking mining licenses. A fully community-driven livestock insurance programme has been implemented, along with an education and enterprise programme for various stakeholders including communities, PA administrators and government specialists.

7. Myanmar Country Presentation

Dr Tin Zar Kywe, Assistant Director of the Nature and Wildlife Conservation Division of the Forest Department, made the presentation for Myanmar. People in Myanmar mainly come into conflict with elephants and crocodiles. Minor conflicts with monkeys, wild boar, deer, bears and parakeets occur in some protected areas. Human-Crocodile Conflict (HCC) happens during the breeding season, from June to November, when people are setting fishing nets, catching crabs, bathing, and feeding domestic animals. Several mitigation measures have been implemented, such as education and awareness programmes, equipping mobile education teams with alarm systems, distributing handouts, installing warning signals, and conducting conservation and research activities in collaboration with IGOs and NGOs.

Human-Elephant Conflict (HEC) mainly occurs during harvest time, from October to November, in areas with heavy agriculture. Elephants cause crop loss and human injury or death. HEC also has indirect impacts on children's attendance at school, since many must stay at home to protect their families' crops from elephants. Several HEC mitigation measures have been introduced, including: collaboration with other government bodies; training by the Myanmar Timber Enterprise of an elephant team; employment of management measures such as burning tires or dung with chillies, planting alternative crops, and setting up alarm systems and homemade electric fencing; and implementing an education programme. Elephant collaring is another management approach, providing data on elephant movements and helping to identify priority areas for mitigation measures. Dr Tin Zar Kywe identified an urgent need to acquire staff, funding, materials and data and to build capacity for information sharing and collaboration among different sectors.

Session 3: Group Discussion

The group discussion session was chaired by Dr Scott Perkin, Head of the Natural Resources Group at the IUCN Asia Regional Office. Participants broke into four groups and shared their experiences related to the following discussion questions:

- What measures have worked particularly well in your country and why?
- What measures have worked less well in your country and why?

A brief summary of the results of the group discussions is given below:

1. What measures have worked particularly well in your country and why?

Group 1 identified incentives, insurance schemes, conservation endowment funds, electric fencing, awareness and advocacy, traditional hunting, ecotourism, legal support, innovative traditional measures and changes in crop patterns as their most successful HWC mitigation measures.

Group 2 identified solar and electric fences, population control, translocation and compensation as their most successful HWC mitigation measures. Participants felt

that solar and electric fences work particularly well when: there is community ownership of the structures surrounding the fields and settlements; fences do not obstruct animals' migratory routes; costs are shared; and when there are by-laws to ensure the sustainability of fences and insurance schemes.

Group 3 presented their findings by country:

- Bangladesh: Village Tiger Response Teams and Forest Tiger Response Teams have been the most successful HWC mitigation measures, as a result of community engagement and ownership.
- Japan: The review of the hunting law and policy has been the most successful measure.
- Viet Nam: Changes in crop patterns and land-uses in buffer zones have been effective.
- Bhutan: Solar and electric fencing, community-based insurance schemes, Quick Response Teams (QRTs), fire torches, Early Warning Systems, and GPS collaring and monitoring have been the most successful HWC mitigation measures.

Group 4 identified solar and electric fencing, trenches, predator-proof corrals, and effective habitat management as their most successful HWC mitigation measures. They suggested that if the shape of the fences were modified by putting angular bars on the top and at the middle of the poles, they could be more effective. However, electric fencing needs to be well-maintained and its effectiveness relies on strong community engagement and by-laws.

2. What measures have worked less well in your country and why?

Group 1 identified trenches and compensation as the least successful HWC mitigation measures.

Group 2 identified a number of difficulties and challenges associated with solar/electric fences and culling:

- Solar and electric fences can work well, but it can be difficult to motivate the community to maintain them, and wildlife can often find a way through;
- Population control through culling can have many logistical and other complications.

Group 3 presented their findings by country:

- Bangladesh: Electric fences and trenches have been less successful HWC mitigation measures because of the lack of electrical power, insufficient community involvement in planning, the difficulty of maintaining trenches, and a lack of funding.

- Japan: Culling has been a less successful HWC mitigation measure, as the number of hunters has declined even as the reproduction rate of Sika deer has increased.
- Viet Nam: Electric fencing and trenches have been less effective as mitigation measures, because of a lack of electrical power, energy and funding.
- Bhutan: Bio-fences, trenches, habitat management and compensation schemes have been the least effective HWC mitigation measures:
 - Bio-fences take a long time to create;
 - Trenches are not cost-effective;
 - There is a lack of adequate funding for habitat management;
 - Compensation schemes may not be sustainable.

Group 4 identified repellent techniques (e.g., chilies, gunfire and fire-flashes), compensation schemes, and population control through sterilization as their less successful HWC mitigation measures.

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Prof Kumagai welcomed participants to the second day of the workshop and gave a brief summary of the previous day's proceedings. He drew attention to the scale and diversity of HWC across the region, and identified some of the most common mitigation measures, including hard approaches such as electrical fencing and trenches and soft approaches such as community insurance schemes.

Session 4: Members' Presentations and Case Studies

This session was chaired by Dr Tshering Tempa, Project Director of the Regional Tiger and Cats Research Centre in Gelephu, Bhutan. Representatives from Pakistan, the Republic of Korea, Sri Lanka and Viet Nam were invited to present their country reports. Dr Nakul Chettri, Programme Coordinator and Senior Biodiversity Specialist with the International Centre for Integrated Mountain Development (ICIMOD), also gave a presentation on *Human-Wildlife Conflict in the Hindu Kush Himalayas*.

1. Pakistan Country Presentation

Mr M. Samar Hussain Khan, Assistant Secretary of Wildlife with the Ministry of Climate Change, and Mr Safdar Ali Shah, Chief Conservator of Wildlife with the Khyber Pakhtunkhwa Wildlife Department, delivered a joint presentation on HWC in Pakistan. People in Pakistan mainly come into conflict with snow leopards, common

leopards, Asiatic black bears, and wolves. Depredation of livestock and crops results in considerable losses to communities, and generates a negative attitude toward wildlife among the community. Retaliatory killings impact the populations of some species, such as snow leopards, common leopard and black bear.

HWC mitigation measures currently under implementation include: the promotion of responsible livestock husbandry practices; the creation of livestock insurance schemes; awareness-raising; community-based trophy hunting; the provision of livelihood alternatives to agriculture; the establishment of endowment funds for community-based conservation activities; protected area management; and translocation of problematic animals. Incentive mechanisms and awareness-raising have resulted in particularly positive responses from local communities.

Mr Hussain highlighted a number of future HWC priorities, including the need to: document best practices; ensure the financial sustainability of incentive mechanisms; carry out training, capacity-building and awareness raising; identify HWC hotspots; promote research; and develop regional projects on HWC.

2. Republic of Korea Country Presentation

Mr Gi-min Jung, Deputy Director of the Biodiversity Division of the Ministry of Environment, gave the ROK country presentation. In Korea, people come into conflict with wild boar, water deer and magpies, resulting in an estimated economic loss of US\$ 10 million every year from crop damage and human injuries. Water deer – categorised as Vulnerable on the IUCN Red List of Threatened Species – present a particular issue in Korea, as about 60,000 water deer are killed each year in traffic collisions. This poses a serious threat to human safety as well as wildlife conservation. The underlying cause of this conflict is the lack of predators to control the population of water deer. Recently, the feasibility of a predator restoration project was reviewed; the conclusion was reached that this might be inappropriate because of the lack of sufficient habitat and the possible threat to human safety. Current HWC minimisation measures include the establishment of prevention facilities, damage compensation, wildlife population control, habitat improvement and ecological restoration.

As a case study, an Asiatic black bear restoration project was introduced during the presentation. The project, conducted by the Korea National Park Service (KNPS), has been successful, resulting in a population of 47 bears in Jirisan National Park. For better bear management, a management boundary for bears has been designed and monitoring is underway. Current mitigation measures include electric fences, insurance and damage compensation, and awareness raising. Recently, the unexpected migration of one Asiatic black bear from Jirisan National Park to a neighbouring region almost 100 km away become a huge issue in Korea. As a result, the management focus will transition from species-based to habitat-based, and engagement with local people will be enhanced.

3. Sri Lanka Country Presentation

Mr Dhammike Pebotuwa, Assistant Director for Elephant Conservation at the Department of Wildlife Conservation, gave the Sri Lanka country presentation. People in Sri Lanka mostly come into conflict with elephants and crocodiles, and, to a lesser extent, with species such as wild boar, Toque macaques, leopards, giant squirrels, porcupines and peafowl. HWC has economic, social and environmental impacts such as:

- Economic Impacts: Loss of crops; damage to houses and other infrastructure; costs for reconstruction, compensation and mitigation; high demand for human resources for mitigation; and reduction of investments;
- Social Impacts: Injury and loss of human lives; fear for safety; changes in family structure; falling school attendance; and disruption of farming and daily activities;
- Environmental Impacts: Loss of both HWC and untargeted species; environmental imbalance; increase in negative attitudes toward wildlife conservation; and reduced public support.

In Sri Lanka, HWC is mitigated through a variety of approaches, including: capture and translocation; drives; electric fencing; live fencing; fire crackers and air rifles; and compensation and insurance schemes. Other measures include land-use zoning and land-use planning approaches, population culling, removal of individual problem animals, and incentive-based mitigation schemes that include benefit sharing, collaborative management, and development of community-based ecotourism. A 'coexistence model' for human-elephant cohabitation is underway as well. Mr Dhammike Pebotuwa explained that translocations and drives are not effective but that elephant holding grounds seem to be successful.

4. Viet Nam Country Presentation

Mr Tran Trong Anh Tuan, Head of the Species Conservation Division of the Biodiversity Conservation Agency of the Viet Nam Environment Administration, Ministry of Natural Resources and Environment, gave the Vietnam country presentation. He drew particular attention to the human-elephant conflict occurring in Dong Nai province. HWC is caused by land use changes, increased livestock populations, the growing human presence around protected areas, and climatic factors including drought. HWC interventions include physical barriers such as fences and trenches, adaptive land use, early warning systems, awareness raising, and economic incentives such as compensation and insurance. Efforts are also being made to increase wildlife carrying capacity through community-based natural resource management. The possibility of removing problem animals is being considered.

The Ministry of Agriculture and Rural Development, the Ministry of Natural Resources and Environment, and the Provincial People's Committee are collaborating to address HWC. The *Viet Nam National Elephant Action Plan (2006)* and the *Emergency Elephant Conservation and Capacity Building to Control Ivory Trade in Vietnam till 2020 Project* have been developed and approved by the government. Local communities requested support from local authorities to provide an allowance for electric fence installation, and the project is ongoing. In Viet Nam, HWC mitigation measures will be reviewed and evaluated to propose suitable solutions and develop related policies to reduce HWC.

5. Human-Wildlife Conflict (HWC) in the Hindu Kush Himalayas

Dr Nakul Chettri, Programme Coordinator and Senior Biodiversity Specialist for the International Centre for Integrated Mountain Development (ICIMOD), gave a presentation on HWC in the Hindu Kush Himalayas. ICIMOD is an inter-governmental, non-political international organisation for mountain learning and knowledge; it enables the promotion of regional cooperation and also seeks to link research with policy and practice. The Hindu Kush Himalayas span eight regional member countries: Afghanistan; Bangladesh; Bhutan; China; India; Myanmar; Nepal; and Pakistan.

The Kangchenjunga Landscape (KL), one of the six transboundary landscapes identified by ICIMOD, lies between Bhutan, India and Nepal. HWC within the landscape has led to loss of livestock, crop destruction and human casualties. Efforts to address HWC include prevention (e.g. fencing, crop guarding, deterrence mechanisms, integrated land use, habitat restoration and construction of water holes), reactive measures (e.g. lethal removal, relocation of human settlements, relocation of problematic animals), and financial measures (e.g. compensation to HWC victims and the introduction of insurance schemes).

A cooperative framework has been endorsed by Bhutan, India and Nepal that integrates scientific studies, policy design, practice and action, and effectiveness evaluation. HWC has been included in the regional cooperation framework as well. Dr Nakul Chettri emphasised that, in addition to government-level cooperation, encouraging engagement at the local level is essential to transboundary cooperation. The plans for a meeting on *Reconciling human-wildlife interface through policy dialogue in the Kangchenjunga Landscape*, to be held from 20 to 25 December 2017 in North Bengal, were also introduced during the presentation.

Session 5: Group Discussion

The group discussion session was chaired by Dr Alexandra Zimmerman, Chair of the IUCN Species Survival Commission Task Force on Human and Wildlife Conflict. Participants discussed their ideas on the following topics:

- Compensation and other kinds of financial instruments;
- What indicators can we use to measure the effects of our HWC activities?

A brief summary of the discussion on these two topics is given below:

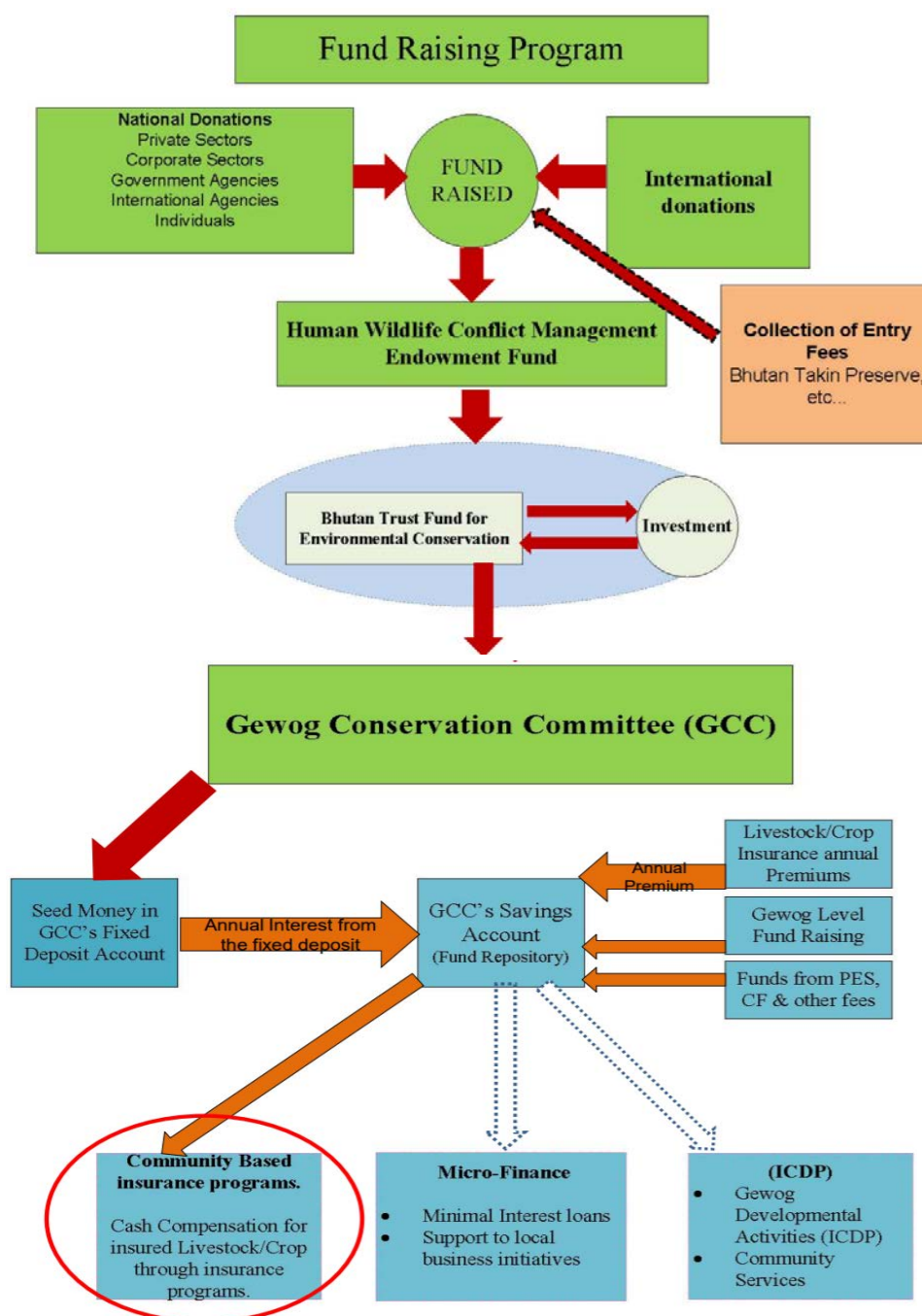
1. Compensation and other kinds of financial instruments

During the discussion, particular interest was expressed in the community-based insurance scheme being implemented in Bhutan. Following the adoption of Bhutan's National Human-Wildlife Conflict Management Strategy in 2008, a community-based insurance scheme was launched to help compensate for the loss of livestock and crops caused by HWC. In order to make the insurance scheme sustainable, an Endowment Fund for Human-Wildlife Conflict Management was established. Funds are raised from donors (private sector, government agencies, international agencies, etc.) and from wildlife preserve entrance fees. This money is invested in the Bhutan Trust Fund for Environmental Conservation (BT FEC) and the interest generated is used as seed money for the Gewog Conservation Committees (GCC) (community conservation committees). The seed money is saved in the GCCs' fixed deposit accounts and this generates annual interest. Annual interest, annual insurance premiums paid by community members and funds raised at the Gewog level are used as compensation for livestock and crops damaged by HWC.

A diagram summarising this scheme is shown in Figure 2. Additional information can be found at the following links:

- <http://www.asesg.org/PDFfiles/2012/35-25-Jigme.pdf>
- http://www.sandeeonline.org/uploads/documents/workshop/238_WRKDOC_Session_12.2_Markets_for_Ecosystems_Bhutan_HWC.pdf

Figure 2: Bhutan's community-based insurance scheme



In Pakistan, a combination of compensation and insurance is used, supported by legal mechanisms. Costs are shared with the community (25%), whilst seed funding is provided by protected area donors such as the World Bank and GEF (75%). In Sri Lanka, a Wildlife Conservation Fund (WCF) has been created, which is funded by park entrance fees (about LKR 3 billion per year).

2. What indicators can we use to measure the effects of our HWC activities?

Participants discussed the indicators that can be used to measure the effects of HWC activities in two areas: human wellbeing and wildlife conservation.

- Human wellbeing: Indicators include: the number of HWC-related injuries and human deaths; the degree of community engagement; crop harvests; wildlife tolerance; education and school attendance rates; general health; amounts of sleep; stress levels; time spent guarding against wildlife versus time for other activities such as teaching and education; poverty levels.
- Wildlife conservation: Number of retaliatory killings; number and value of the demands for compensation; wildlife sightings, etc.

Dr Alexandra Zimmerman concluded the discussions with the following summary:

- Best practices in HWC mitigation require: good analysis; good strategy; good implementation; and good monitoring, evaluation and learning (ME&L) models:
 - Good Analysis: Understanding the varying levels of conflict.
 - Good Strategy: Planning backwards from impact and outcomes to activities. Conflict mitigation must work through people. It is recommended that the assistance of social scientists be sought.
 - Good Implementation: The most important part of community-based HWC mitigation is transferring ownership of the process, such as decision-making and responsibility, to the affected community, and realigning the balance of power.
 - Good ME&L: The indicators used to measure the effects of HWC activities on human wellbeing and wildlife conservation perspectives must be carefully considered. Best practice forums, such as the Asia Protected Areas Partnership (APAP), can be valuable platforms for exchange and sharing of lessons.

Dr Zimmerman also introduced the IUCN Species Survival Commission Task Force on Human Wildlife Conflict, which aims to support the IUCN SSC network and conservation community to address HWC by providing interdisciplinary expert guidance and assistance.

Following the wrap-up presentation, another discussion was held to compile species-specific best practices for bears, tigers, leopards, wild boar, and deer. Participants shared their countries' successful measures on specific species, as well as the challenges encountered.

At the end of the discussion, Dr Zimmermman identified a number of other important considerations to bear in mind when planning HWC prevention and mitigation measures:

- Climate change-induced increases in HWC;

- Anticipating emerging and new conflicts;
- The media's impact on HWC;
- Incorporating ecotourism into HWC mitigation.

V. Closing Session

At the closing session, speeches were delivered by: Dr Scott Perkin, from the IUCN Asia Regional Office; Mr Kaka Tshering, Chief Forestry Officer, Paro Forest Division on behalf of the Director of the Department of Forest and Park Services, representing the Ministry of Agriculture and Forests, Bhutan; and Ambassador Masahiko Horie, IUCN Councillor.

Dr Scott Perkin thanked all participants for their contributions, and expressed his gratitude again to the Royal Government of Bhutan for hosting the workshop. He emphasised that HWC is a problem across the region; although the species involved may differ and the specific challenges may vary, virtually every country in Asia is experiencing HWC to some degree. He introduced PANORAMA, a new online platform for sharing successful approaches in conservation and development, and encouraged participants to upload and share their countries' best HWC mitigation practices.

Mr Kaka Tshering gave special thanks to a number of organisations for their support in organising the workshop, including: the Ministry of the Environment, Japan; the Ministry of Environment, Republic of Korea; ICIMOD; WWF Bhutan; UNDP Bhutan; and the IUCN Asia Regional Office.

Ambassador Masahiko Horie briefly explained the history of APAP and expressed his hope that membership in the Partnership would continue to expand. He expressed his anticipation for the next phase of APAP, with the Ministry of Environment, Republic of Korea serving as the new co-chair.

VI. Field trip

On 8 November, a one-day field trip was organised with generous support from the Department of Forests and Park Services of the Ministry of Agriculture and Forests, Bhutan. Participants visited the Tango Monastery, the Wildlife Rescue and Animal Health Unit, and the Royal Takin Preserve.

Tango Monastery

Tango Monastery is located inside the Jigme Dorji National Park. Human-bear conflict is the most common conflict reported from this park. Himalayan black bears (HBB) have been involved in livestock depredation, property damage, house raiding, and even attacks on humans. HBB have been sighted in and around Tango Monastery, often raiding the meditation huts of the resident monks. The wildlife rescue team has been regularly monitoring the site and has set up live-capture traps in and around the monastery. Four HBB have been relocated from the monastery area in the last five years.

Wildlife Rescue and Animal Health Unit

The unit has two rescue teams that respond to all the wildlife rescue cases in the country. In addition to the rescue operations, the team provides technical support for wildlife research activities such as radio collaring. To date, the team has been involved in the radio collaring of wild elephants, takin and snow leopards. There is also a small wildlife clinic and laboratory which provide treatments, including minor surgeries, and conduct laboratory analyses of wildlife samples.

Royal Takin Preserve

The Royal Takin Preserve, located in Motithang, is a wildlife reserve area for takin, the national animal of Bhutan. Takin are a rare member of the goat family.



Figure 3: Participants receiving a briefing at the base of Tango Monastery.



Figure 4: Discussing HWC measures with the monks of Tango Monastery.



Figure 5: An officer from the Department of Forests & Park Services explains the HWC mitigation measures in place at Tango Monastery.

ANNEXES

Annex 1. Agenda

Day 1: Monday 6 November 2017

Time	Item	Speaker
Opening Ceremony		
08:15	Arrival of all invited guests and participants	
08:30	Welcome note	Officiating Director, DoFPS
08:45	Remarks	Prof Yoshitaka Kumagai, APAP Co-Chair
09:00	Overview of workshop agenda and objectives	Dr Scott Perkin, Head, Natural Resources Group, IUCN Asia Regional Office
09:15	Keynote address	Hon'ble Minister, MoAF, Bhutan
09:40	Vote of thanks	Chief Forestry Officer, NCD, DoFPS
10:00	Photo session and tea break	
Session 1 : Setting the Context Chairman: Prof Kumagai, APAP Co-Chair		
10:30	Registration of participants	All
10:50	A Conceptual Framework for Understanding Human-Wildlife Conflict	Dr Alexandra Zimmermann, Chair, IUCN SSC Task Force on Human-Wildlife Conflict and Head of Conservation Science, Chester Zoo
11:20	Special presentation on: Human-Wildlife Conflict in Bhutan: Status, Trends and Prospects	Phub Dendup, Chief Forestry Officer, Sarpang Forest Division
12:20	Discussion	
12:30	Lunch	

Session 2: Members' Presentations and Case Studies		
13:30	Bangladesh country presentation	Mr Kazi Nurul Karim, Assistant Conservator of Forests, Wildlife Management and Nature Conservation Circle, Forest Department
13:50	Cambodia country presentation	Dr Ou Ratanak, Deputy Director, Department of Southern Terrestrial Protected Area Conservation, GDANCP, Ministry of Environment
14:10	India country presentation	Mr Sanjay Shrivastava, Chief Conservator of Forests (WL), Uttar Pradesh
14:30	Japan country presentation	Mr Yuki Takase, Office of Wildlife Management, Wildlife Division, Nature Conservation Bureau, Ministry of Environment
14:50	Discussion	
15:00		Tea Break
15:20	Mongolia country presentation	Mr Enkhmunkh Ganbold, Senior Officer, Department of Protected Areas Management, Ministry of Environment and Tourism
15:40	Myanmar country presentation	Dr Tin ZarKywe, Assistant Director, Nature and Wildlife Conservation Division, Forest Department
16:00	Financing solutions in biodiversity conservation, with a focus on HWC	Mr Ngawang Gyeltshen, BIOFIN Coordinator, UNDP Bhutan.
16:20	Discussion	
Session 3: Small Group Discussion 1		
16:30	Introduction to the small group discussion	Dr Scott Perkin, IUCN
16:40	Small group discussions	
17:40	Reporting back from the small discussion groups	
18:00	Discussion	
18:15	Close for the day	
19:00	Formal Dinner Reception	Hosted by the Royal Government of Bhutan

Day 2: Tuesday 7 November 2017

Time	Item	Speaker
08:30	Welcome	Prof Kumagai, APAP Co-Chair
Session 4: Members' Presentations and Case Studies Chairman: Mr Sangay, Advisor ,DoFPS, MoAF, Bhutan		
09:00	Pakistan country presentation	Joint presentation by: Mr M. Samar Hussain Khan, Assistant Secretary Wildlife, Ministry of Climate Change and Mr Safdar Ali Shah, Chief Conservator of Wildlife, Khyber Pakhtunkhwa Wildlife Department
09:20	Republic of Korea country presentation	Mr Jung Gi Min, Deputy Director of Biodiversity Division, Nature Conservation Bureau, Ministry of Environment
09:40	Discussion	
09:50	Sri Lanka country presentation	Mr Dhammike Pebotuwa, Assistant Director (Elephant Conservation), Department of Wildlife Conservation
10:10	Vietnam country presentation	Mr Tran Trong Anh Tuan, Head of Species Conservation Division, Biodiversity Conservation Agency, Vietnam Environment Administration, Ministry of Natural Resources and Environment
10:30	Discussion	
10:45		Tea Break
11:15	HWC perspectives and experiences from the Hindu Kush Region	Dr Nakul Chettri, Senior Biodiversity Specialist, International Centre for Integrated Mountain Development (ICIMOD)
11:45	Discussion	
Session 5: Small Group Discussion 2		
12:00	Introduction to the small group discussion	Dr Alexandra Zimmermann
12:15	Small group discussions	
13:15		Lunch

Session 6: Emerging Best Practice		
14:15	Reporting back from the small groups	
14:45	Discussion	
15:00	Addressing Human-Wildlife Conflict: Emerging Best Practices from around	Dr Alexandra Zimmermann
15:30	Discussion	
15:45	Tea Break	
Session 7: Closing of the Workshop		
16:15	Conclusions and Next Steps	Dr Scott Perkin
16:30	Closing remarks	Director, DoFPS, Bhutan Amb Masahiko Horie, IUCN Councillor

Day 3: Wednesday 8 November 2017

- ❖ Field Trip (for international participants)

Time	Program
08:30 - 09:00	Travel from Thimphu to Dodena base (30 mins) and then drive to Tango base (30 mins)
09:00 - 10:00	Hike to Tango Monastery (Gentle slope and max. time taken will be 1 hour)
10:00 - 10:30	Visit the Tango Monastery
10:30 - 11:00	Tea Break/ Refreshment
11:00 - 12:00	Interaction with monks
12:00 - 13:00	Return back to Tango base
13:00 - 14:00	Lunch at Tango Base
14:00 - 14:30	Drive back to Thimphu and stop at the Wildlife Rescue and Animal Health Unit at Taba
14:30 - 15:00	Visit the bear enclosures and interact with the Wildlife Rescue Team
15:00 - 17:00	Visit the Royal Takin Preserve and Kuenselphordang Buddha Point
17:00 - 18:30	Drive back to hotel

Workshop facilitators: Scott Perkin, IUCN and Tshering Zam, NCD, DoFPS, Bhutan
Workshop Coordinator: Kezang Dema, Sr. Forestry Officer, NCD, DoFPS

Annex 2. List of Participants

1. International Participants

No.	Name	Organisation
1	Alexandra Zimmermann	IUCN Species Survival Commission Task Force on Human-Wildlife Conflict
2	Dhammike Pebotuwa	Department of Wildlife Conservation, Sri Lanka
3	Enkhmunkh Ganbold	Department of Protected Areas Management, Ministry of Environment and Tourism, Mongolia
4	Gimin Jung	Biodiversity Division, Nature Conservation Bureau, Ministry of Environment, Republic of Korea
5	Masahiko Horie	IUCN Councillor
6	Minseok Soh	Korea National Park Service, Republic of Korea
7	Minsun Kim	IUCN Asia Regional Office (seconded from the Korea National Park Service)
8	Muhammad Samar Hussain Khan	Ministry of Climate Change, Pakistan
9	Ou Ratanak	Department of Southern Terrestrial Protected Area Conservation, GDANCP, Ministry of Environment, Cambodia
10	Quazi MD Nurul Karim	Wildlife Management and Nature Conservation Circle, Forest Department, Bangladesh
11	Safdar Ali Shah	Khyber Pakhtunkhwa Wildlife Department, Pakistan
12	Sanjay Shrivastava	Chief Conservator of Forests (WL), Uttar Pradesh, India
13	Scott Perkin	IUCN Asia Regional Office
14	Tanya Wattanakorn	IUCN Asia Regional Office
15	Tin Zar Kywe	Nature and Wildlife Conservation Division, Forest Department, Myanmar
16	Tran Trong Anh Tuan	Biodiversity Conservation Agency, Vietnam Environment Administration, Ministry of Natural Resources and Environment
17	Yoshitaka Kumagai	Akita International University, Japan (APAP Co-chair)
18	Yuki Takase	Office of Wildlife Management, Wildlife Division, Nature Conservation Bureau, Ministry of Environment, Japan

2. National Participants

No.	Name	Organisation
1	Bago Dukpa	S/Jonkhar Forest Division
2	Buddha Kumar Rai	Department of Agriculture
3	Cheki Wangdi	Pemagatshel Forest Division
4	Chhoglay Namgay	Forest Protection and Enforcement Division, Department of Forests and Park Services
5	Chimi Tshewang	Department of Agriculture
6	Chordup Zangpo	Information and Communication Services, Ministry of Agriculture and Forest
7	Dorji Rabten	Phibsoo Wild life Sanctuary , Department of Forests and Park Services
8	Dorji Tobgyel	Department of Forests and Park Services
9	Dorji Wangchuk	Royal Manas National Park
10	Jamphel Gyeltshen	Nature Conservation Division, Department of Forests and Park Services
11	Jigme Sonam	Phrumsengla National Park
12	Jigme Tenzin	Watershed Management Division , Department of Forests and Park Services
13	Jigme Wangdi	Department of Livestock, Ministry of Agriculture and Forest
14	Kaka Tshering	Paro Forests Division, Department of Forests and Park Services
15	Karan Bdr.Ghalley	Dagana Forest Division
16	Karma Tempa	Bumdeling Wildlife Sanctuary , Department of Forests and Park Services
17	Karma Tenzin	Wangdue Forest Division
18	Kezang Dema	Nature Conservation Division , Department of Forests and Park Services
19	Kinga	Nature Conservation Division, Department of Forests and Park Services
20	Kingzang Lham	Nature Conservation Division, Department of Forests and Park Services
21	Kinley Choden	Nature Conservation Division, Department of Forests and Park Services
22	Kuenzang Gyeltshen	Nature Conservation Division , Department of Forests and Park Services
23	Namgay	Jigme Dorji National Park , Department of Forests and Park Services
24	Namgay Bidha	Nature Conservation Division, Department of Forests and Park Services
25	Ngawang Gyeltshen	UNDP Bhutan
26	Ngawang Gyeltshen	Nature Conservation Division, Department of Forests and Park Services
27	Pankey Dukpa	Jigme Singye Wangchuck National Park
28	Pema Chorten	Department of Agriculture
29	Phub Dhendup	Sarpang Forests Division, Department of Forests and Park Services
30	Rinchen Zangmo	Kuensel
31	Rinzin Namgay	Department of Livestock

32	Sangay Dorji	National Plant Protection Center, Ministry of Agriculture and Forest
33	Sangay Wangchuk	Sarpang Forest Division
No.	Name	Organisation
34	Sherab Jamtsho	Zhemgang Forest Division, Department of Forests and Park Services
35	Sonam Dorji	Nature Conservation Division, Department of Forests and Park Services
36	Sonam Norbu	Department of Agriculture
37	Sonam Penjor	Bhutan Today
38	Sonam Tobgay	Jigme Khesar Strict Nature Reserve , Department of Forests and Park Services
39	Sonam Tshering	Thimphu Forests Division
40	Sonam Wangdi	Nature Conservation Division, Department of Forests and Park Services
41	Tandin	Nature Conservation Division, Department of Forests and Park Services
42	Tandin Wangchuk	Trashigang Forest Division, Department of Forests and Park Services
43	Tashi Dendup	Wangdue Forests Division, Department of Forests and Park Services
44	Tashi Dhendup	Bumthang Forest Division
45	Tashi Tenzin	Kuensel
46	Tenzin Dema	Nature Conservation Division, Department of Forests and Park Services
47	Tenzin Jamtsho	Samtse Forest Division, Department of Forests and Park Services
48	Thinley Wangdi	Sakten Wildlife Sanctuary , Department of Forests and Park Services
49	Tilak Bhadrur	Samtse Forest Division
50	Tshencho Tshering	Nature Conservation Division, Department of Forests and Park Services
51	Tshering Dhendup	Wangchuck Centennial National Park, Department of Forests and Park Services
52	Tshering Gyem	Nature Conservation Division, Department of Forests and Park Services
53	Tshering Lhamo	Department of Agriculture
54	Tshering Pem	Nature Conservation Division, Department of Forests and Park Services
55	Tshering Phuntsho	UNDP Bhutan
56	Tshering Tempa	Regional Tiger Centre
57	Tshering Zam	Nature Conservation Division, Department of Forests and Park Services
58	Tshewang Nidup	Paro Forest Division, Department of Forests and Park Services
59	Ugyen Penjor	Nature Conservation Division, Department of Forests and Park Services
60	Ugyen Tshering	Jomotshangkha Wildlife Sanctuary, Department of Forests and Park Services

61	Vijay Mokta	WWF Bhutan
62	Yeshey Dema	National Plant Protection Centre, Ministry of Agriculture and Forest

Annex 3. Media and Materials

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INTERNATIONAL UNION
FOR CONSERVATION OF NATURE

ASIA REGIONAL OFFICE
63 Sukhumvit Soi 39
Wattana, 10110 Bangkok
Thailand
Tel +66 2 662 4029
Fax +66 2 662 4387
www.iucn.org/regions/asia

