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Human Wildlife Conflict (HWC): Pattern, remedies and existing policy mechanism

Krishna Bahadur KC

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Author : Krishna Bahadur KC Email: kriskc19@gmail.com
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Abstract

Human-Wildlife Conflict (HWC) creates major obstacles for biodiversity protection together with human safety worldwide because of habitat destruction and resource conflicts and changing climates. The research investigates HWC patterns and their impacts through various management strategies at both global and national levels with special emphasis on Nepal. HWC causes major financial losses and harms deaths and injuries to people worldwide through events like wildlife crop destruction and livestock predation and human attacks against wildlife. Nepal's fiscal records from fiscal years 2075/76 to 2078/79 indicate developing human death rates and compensation payments that highlight the worsening wildlife-human conflicts. The implementation of effective HWC management requires organizations to establish both preventive strategies like electric fences and crop diversity along with mitigating strategies through compensation plans and community programs. The National Parks and Wildlife Conservation Act and Wildlife Damage Relief Guidelines of Nepal focus on establishing buffer zones and revenue-sharing and victim compensation within their policy framework. For long-term success it is necessary to unite local expertise with multi-sectoral cooperation and adaptable strategic plans. Although human-wildlife conflict remains a permanent threat scientists and community members can reduce its effects through combined prevention methods.

Keywords: Human-Wildlife Conflict, management strategies, compensation mechanisms, biodiversity conservation, Nepal.

Introduction

The conflict between human and wildlife existed throughout human evolution. Conflicting situations arise when the needs and behavior of wildlife impact negatively on the goals

of humans or when the goals of humans negatively impact the needs of wildlife. Main reasons to consider the human wildlife conflict associated wild animals are: crop damage; livestock depredation; property damage; and human injury and casualties. Conflicts between people and animal, which are more amplified in biodiversity rich areas, is challenging issues for wildlife conservation. Competition between people and wildlife for sharing limited resources resulted various conflicts, which sometimes ended with killing of animals. Wild animals are in conflicts with human by causing damages. There are four main reasons to consider human wildlife conflict associated wild animals in Nepal, such as crop damage, livestock depredation, property damage and human injury and casualties (1)

Human Wildlife Conflict, generally, is the interaction between human and wildlife animals with its consequential negative impact on people, their resources, or wild animals. Human Wildlife Conflict has far reached environmental impacts. Human-wildlife conflicts also undermine human welfare, health and safety, and have economic and social costs. Impacts and Types of human wildlife conflict includes; Wildlife to Human (Crop raiding, Livestock depredation, Property Damage (houses, grain stores, cash crops) and Human injury and Casualty) and Human to Wildlife (Retaliatory Killings/Revenge Killing and Poaching). The causes (driving force) of Human wildlife conflict are; Human Population Growth (leads to encroachment into wildlife habitat, competition increases), Land Use Transformation (forest land into agriculture land/human settlement), Species Habitat loss, Degradation and Fragmentation (interconnected with population growth and land use change), Growing interest in Ecotourism and Increasing Access to Nature Reserve, Increasing Livestock Population and Competitive exclusion of wild herbivore, Abundance and distribution of wild prey, Increasing Wildlife Population as a result of Conservation Programs, Climatic Factor (snowfall) and Stochastic Events (fire). (2)

Scenario of HWC:

Global scenario of HWC showed that in USA, 75, 000 people get injured and 415 die/year and annual estimate of damage to agriculture producer is around US $ 4.5 billion. 1.5 million deer – vehicle collisions/ year, Annual Loss – US $ 1.6 billion (Tara Teel et al, Colorado State University) In Idaho, Montana and Wyoming wolves killed 728 livestock (sheep, cattle) between 1987-2001 (Musiani et al, 2003). Similarly in Europe, France (2007) damage to crops by wild boar and deer amounted to € 23 million. In Australia, production losses in 80's were estimated to be US $ 20 million/ year for South Australia alone. Losses to wool industry estimated at US $ 115 million/year. Kangaroos cause huge damage to crops and compete for forage with sheep and approx. 9 million kangaroos eliminated each year. In Africa, crop damage is the most prevalent form of human wildlife conflict across the African continent. In some semi-arid rural farming areas of Zimbabwe and Kenya, elephant damage to food crops accounts for 75 to 90 percent of all damage caused by large mammals (Hoare and Mackie 1993).

Regional scenario of HWC showed that in China, rural inhabitants of the mountain area of Simao near the Xishuang Bannar Nature Reserve, claimed that elephants damage reduced the community's annual income in 2000 by 28 to 48 percent and the total economic losses between 1996 and 1999 amounted to US $ 314,600 (Zang and Wang 2003). Similarly, in Bangladesh,

Sundarbans Reserve Forest, most of the tiger losses have transpired from retaliatory killing. It is reported that an average of tiger victims of 50 people from 1992-2002 and 168 people from 2003 to 2005. It is estimated that tigers have taken a toll of 1,000 human lives over the last fifty years (Dedatus 2003 and Halder 2005). In Bhutan, the study on the predation activity in Bhutan reveals that common leopards killing livestock was significantly high (70% of all kills), than tigers (19%), bears(80%) and snow leopards (2%). Several northern districts were identified as 'predation hotspots', where proportions of livestock lost to predation were considerable (Sangey and Vernes 2008). In India, at Kashmir, 29 people and 140 livestock were killed and 210 people were injured by bears from 2000 to 2006. 17 bears were killed and 7 were captured (Akhtar and Chuhan, 2010). A railway track passing through the Rajaji NP has been like a death trap to elephants and other wildlife species. An accidental death of 19 elephants in 1987 has been reported. In Sri Lanka, frequent crop destruction and encounters with human by wild elephants in the rural areas are recorded (Jayawardane 1992).

National scenario of HWC in Nepal from FY 2075/76 to 2078/79 is given below:

Fiscal Year	Death	Serious Injury	Simple Injury	Livestock Loss	Hut and House Damage	Stored Grain Loss	Crop Damage	Total Compensation in NRs.
2075/76	**30**	118	19	**1593**	595	438	2458	**8,90,84,090**
2076/77	**33**	110	67	**2198**	764	352	4640	**10,66,75,971**
2077/78	**40**	98	67	**2681**	293	216	5060	**14,09,93,556**
2078/79	**58**	115	69	**4350**	453	307	3924	**17,81,96,155**

Source: DNPWC Annual Report

The table shows that the number of death and compensation amount is increasing with the growing fiscal year.

Practices for HWC Management:

Practices for HWC Management (Global and Regional) includes that in Bangladesh Sundarban, putting up net fencing at the periphery of the forest that very close to the villages or erecting natural barriers is in practice to control tigers from straying. It has given psychological effect to produce deterrent to tiger (Dedatus 2003 and Halder 2005). In Indian Sundarban, human dummies and masks as deterrent have been tried and there is no report of people wearing masks on the back of their head being attached by tigers. Similarly, Nylon net and vegetative barriers, fencing and solar lights were found effective for livestock depredation by common leopards in Bhutan (Sangey and Vernes, 2008). In Zimbabwe, chilli (*Capsicum annuum*), an unpalatable cash crop, is a popular crop to reduce human-wildlife conflict effectively and generate income to people. The study shows that chilli is less vulnerable to wildlife than crops and is economically viable too (Parker and Osborn 2006). Stopping elephant poaching, creating water holes and restoring corridors are some other ways for conserving the elephants (Johi 2010). In Sri Lanka,

cultivation of Caster (*Rhizinus communis*) in barren and unutilized land has been done to escape crop depredation from elephants and enhancing farmer's income. In several places, electric fence has been erected. The staff and farmers are provided trainings on method of elephant control and conservation. Often, elephants are captured and translocated into a sanctuary considerably away or are trained for domestication. If all option failed, in such case the animals are destroyed as a last resort (Jayewardene 1992). In rare cases, birth control measures on rhesus in Himanchal, India and among hamadryan baboons in Saudi Arabia were taken on experimental basis to combat crop damage problem (Mahnot and Sahoo 2004). In Bangladesh, compensation is paid to the victim's families in case of casualty only (Akhtar and Chauhan 2010). While in India, government compensates of person killed and for permanent disability and pays all cost of treatment for injured persons. The informers are also paid for instant information on kills from WWF-Tiger Conservation Project (Ramkrishna 1999) and in India, eco-development program was implemented around tiger reserves in 1995 to foster local communities' participation in conservation for their own better future and indirect compensation to their hardship from wild animals (Melkanani et al 1999).

Similarly, practices for HWC Management in Nepal includes barbed wire-game proofing wire: none of these structure last long because it became barrier to both wildlife and human, construction of watch-towers (Machan) on farmlands for night watch and provided with torch light, siren and alarming bell: to keep animal away, construction of stone walls in Shivapuri-Nagarjun NP, practice of fire flame and even blank fire to drive away wild elephants but later they did not afraid of such devices.

Government declared wild boar as vermin. NPWCA, 2029 (4th amendment): BZ concept, upto 50% revenue to BZ. Government endorsed Wildlife Damage Relief Guidelines 2069 to provide support to wildlife victims. Scholarships have been awarded to school children of wildlife victims. Different health centers and veterinary services have been established at places in buffer zones. Awareness programs are conducted through eco-clubs in TAL regions. Promoted alternative energy like solar and biogas to reduce the consumption of forest resources. To reduce elephant-human conflict: elephant handlers were given Kunkie training to drive wild elephants, mobile squad at park headquarter and anti-depredation squads at village levels have been formed. Construction of bio-fence around national and community forests is encouraged. Various training on community capacity building including wildlife attack precautionary measures is conducted.

Best practices of Nepal for reducing HWC includes; Solar/Electric Fencing, Change in cropping pattern, Creation of Buffer zone Relief Fund, Snow Leopard Conservation Fund and Rescue operation of Problem Animal.

Existing Policies for HWC Management in Nepal

The existing policies in Nepal are:

- **National Parks and Wildlife Conservation Act, 2029 (4th Amendment):** was a milestone in conservation provisioning buffer zone and plough back of up to 50% of park/reserve income for local community development. The program was initiated in

1996 aiming to resolve the contesting issues of conservation like human-wildlife conflict and enhancing communities' livelihoods. (3)

- **Wildlife Damage Relief Guideline, 2069 (3rd Amendment, 2075):** Relief fund provided by PAs and distributed by respective PAs or DFOs. Human Casualties; Death: Nrs. 100000 (10 lakhs), Serious injury: at most Nrs. 200000 (2 lakhs and plus), Normal injury: at most Nrs. 20000 (20 thousand), Livestock damage: Nrs. 30000 (30 thousand) for cow, buffalo, ox and others upto 10000 (10 thousand), Crop damage: Nrs. 10,000, Property damage: Nrs. 10,000, Stored Grain damage: Nrs. 10,000. (4)

Conflict Management Measures includes; (2)

i. Preventive measures consist of artificial and natural barriers (physical and biological), guarding, alternative high-cost livestock husbandry practices: Movement activated guard (MAG) devices and electronic training collars (EC) are deterrent system and relocation: voluntary human population resettlement and Waste management systems that restrict wildlife access to refuse

ii. Mitigating measures consist of compensation systems, insurance programs, incentive programs, community based natural resource management schemes (CBNRMS): ecotourism industry, regulated harvest: culling/hunting and wildlife translocation.

Conclusion

As the conflict between human and wildlife existed throughout human evolution, it cannot be eradicated, it can only be reduced. For better management sound scientific knowledge should combined with practical knowledge of local people and their collaboration. Providing adequate and instant compensation can also help affected families and change their attitude toward wild animals. Inter-sectoral coordination and collaboration is required for effective implementation of mitigation measures. Lesson learned and sharing of best practices is required. Park specific HWC Management Action Plan is needed.

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